# Front cover

SUSTAINABLE DEVELOPMENT GOALS

LIVERPOOL JOHN MOORES UNIVERSITY

Report 2024

# Foreword

**This document is produced in 2024 reflecting upon LJMU’s contributions to the UN Sustainable Development Goals for the academic year 2022/2023.**

As the global challenges of our time continue to evolve, the United Nations 17 Sustainable Development Goals provide a shared blueprint for peace, prosperity and inclusivity for people and the planet, now and into the future.

Higher education institutions play a pivotal role in shaping a sustainable future for all and at Liverpool John Moores University, we recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans, forests and other vital habitats.

As an inclusive university, we are proud of our passion and purpose to transform lives and futures through our people who provide excellent education as well as delivering solutions to multiple global challenges through world-class research and high impact knowledge exchange.

In June 2024 we were placed in the top 60 UK universities and top 400 internationally in the Times Higher Impact Rankings for our commitment to the UN Sustainable Development Goals in our first submission to the THE Impact Awards. We are committed to continuing activity towards these important goals and driving change at a local, national and global level. It is within this context that we declared a climate emergency and have launched our Climate Action Plan, committing to becoming net zero for carbon emissions.

We most recently launched The Liverpool Research Institute for Climate and Sustainability (LiRICS) taking a pan-university approach to deliver impactful solutions to the challenges faced by society. The institute will provide new opportunities for greater collaboration and engagement both inside LJMU as well as externally with multiple regional, national and international partners.

Our social responsibility lies deep within our values as an inclusive, courageous, and community-focused university. We are integrating education for sustainable development in both research and academic programmes, and we are striving to operate in the most sustainable and environmentally responsible way possible.

The university has integrated the principles of sustainability into key areas across the institution including research and knowledge exchange, student experience and our place and partnership initiatives. As we reflect on our ongoing impact, we are mindful the path to sustainable development will continue to be challenging.

Our commitment to the UN SDGs is an ongoing journey and we hope those reading this report, which reflects our commitment to the goals throughout 2022/2023, will join us in celebrating our achievements, then and now, as we continue our progress towards a more sustainable and just planet on a local, national and international scale.

**Signed Professor Mark Power Vice-Chancellor**

**Signed Professor Keith George Pro-Vice Chancellor Research and Knowledge Exchange**

# **NO POVERTY**

END POVERTY IN ALL ITS FORMS EVERYWHERE

Eradicating poverty is not a task of charity, it’s an act of justice and the key to unlocking enormous human potential. Still, nearly half of the world’s population lives in poverty, and lack of food and clean water is killing thousands every single day. Together, we can feed the hungry, wipe out disease and give everyone in the world a chance to prosper and live a productive and rich life.

At LJMU, we are committed to tackling poverty on a local and global scale. That’s why we’re supporting our students with the cost of living crisis, through our support fund and a range of initiatives across our campus. This sentiment is built into our Access and Participation Plan which aims to improve equality of opportunity for underrepresented groups to access, succeed in, and progress from higher education and avoid poverty. Overseas, we are developing guidance that enhances financial literacy and promotes social inclusion.

“LJMU has taken a remarkable journey over the past 200 years, continuously evolving, whilst maintaining a steadfast dedication to widening participation, equality, diversity and inclusion, and student success. While we are proud of our work, we know there is more to do at all stages of the student lifecycle and our commitment to widening participation remains resolute. LJMU is highly committed to ensuring that the benefits of a university education are accessible to individuals with the academic potential, regardless of their socio-economic background”

* **LJMU Access and Participation Plan**

EDUCATION AND STUDENT EXPERIENCE

**Supporting students with the cost of living**

Across the 2022/2023 academic year, we’ve committed over £2 million to students facing financial hardship during the cost-of-living crisis.

This financial support was provided to 2536 students with the amount of support averaging around £716 per application.

Further to this we have arranged 150,950 hours of paid work for students worth £1,961,032 through Unitemps. Our Money Advice Team also provides impartial advice and assistance to students such as support to cover food costs and other important bills like energy through Energy Cost Assistance.

RESEARCH AND KNOWLEDGE EXCHANGE

**Planning the built environment to tackle fuel poverty**

LJMU researchers developed the Potential Fuel Poverty Index (PFPI) to analyse and consider how energy retrofitting and decarbonisation renovations can impact the wellbeing of households and the community. Tested with the LJMU exemplar houses at the BRE Innovation Park site, the PFPI is designed to be incorporated into multi-criteria decision analysis and Sustainability Assessment frameworks for use in global contexts. The purpose is to obtain the likelihood of fuel poverty that future interventions could pose to households, and to ensure interventions are socially, economic, environmental, and technically sustainable. The research leads a new direction of employing predictive models to quantify the social, fuel poverty implications of low-carbon transitions in planning stages worldwide.

**Leading the international FINCARE project**

Our researchers are actively collaborating with colleagues from the UK, Italy, and Romania to develop comprehensive guidance that enhances financial literacy and promotes social inclusion. This initiative forms part of the Financial Literacy for Social Inclusion project (FINCARE), a research and knowledge exchange programme dedicated to advancing credit union governance and improving financial education.

LJMU played a key role in supporting a symposium that brought together British and Romanian credit unions, with a focus on the unique structure and benefits of cooperative banks. The event facilitated important discussions on shared challenges and opportunities in financial inclusion.

As part of their efforts, our researchers developed two pivotal reports, now available to all credit unions. One of these, the Financial Education Handbook, is designed to equip readers with essential financial skills, enabling them to better manage family finances, make informed decisions, and ultimately avoid financial pitfalls such as debt and social exclusion.

The final recommendations produced by the FINCARE team have been influential, with their inclusion in both UK and Welsh government policies, helping to shape financial inclusion strategies at a national level.

PLACE AND PARTNERSHIP

**Partnering with NGOs and Parliament to challenge the stigma of poverty**

An LJMU Media, Culture, and Communication research team has worked with the NGO ATD Fourth World and the Member of Parliament for West Derby to challenge stigmas associated with poverty. The collaboration is based on participatory research and community involvement with NGOs, and created a multi-perspective workshop with ATD and LJMU students, ‘Challenging the Stigma of Poverty to Promote Discussion’. The collaboration emphasises student and staff initiatives to have open discussions about the experience of poverty, both to challenge stereotypes and to ensure essential needs are met for all our communities in Liverpool City Region. The work reached a national level in 2022 with an Early Day Motion in Parliament recognising the importance of journalism in reporting poverty in the UK and condemning any use of derogatory language which can lead to negative stigmatising. The team subsequently introduced guidelines on reporting poverty for the National Union of Journalists, ensuring the reporting of poverty is led by collaboration with people who have experienced it.

**HIGHLIGHTS**

1, **£2 million**

We have allocated over **£2 million** to support students experiencing financial hardship during the cost-of-living crisis.

2, **2536** **students**

We have supported **2536** **students** with financial support averaging around **£716** per application.

3, **150,950 hours**

We provided students with **150,950 hours** of paid employment through UNITEMPS, amounting to a total value of **£1,961,032.**

4, **2 Reports**

We developed **two reports** that have been made available to credit unions including a Financial Education Handbook.

# ZERO HUNGER

END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVE NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

Hunger is the leading cause of death in the world. Our planet has provided us with tremendous resources, but unequal access and inefficient handling leaves millions of people malnourished. If we promote sustainable agriculture with modern technologies and fair distribution systems, we can sustain the whole world’s population and make sure that nobody will ever suffer from hunger again.

We’re tackling hunger through a range of community initiatives on and off campus. Our work with Farm Urban is driving high-tech and sustainable food production, and in Southeast Asia, we are working to develop nature-based solutions to promote food security and agricultural management strategies.

*“*The Cook Together initiative is part of LJMU and John Moores Students' Union (JMSU) shared support in response to the rising cost-of-living. This year we are contributing an additional £600,000 to our hardship fund to provide further relief during the cost-of-living crisis. Additionally, we are supporting our students facing hardship through providing free lunches, supermarket vouchers, and nutritious recipes to help students cook healthy, affordable meals and to reduce food waste."

* **LJMU Cook Together Initiative**

EDUCATION AND STUDENT EXPERIENCE

**Supporting healthy eating and financial wellbeing through Cook Together**

LJMU understands the financial pressures students face due to the cost-of-living crisis and is committed to supporting their wellbeing through healthy eating initiatives. The Cook Together initiative encourages students to prepare healthy, nutritious meals that are both affordable and easy to make. We provide simple recipe ideas on our LJMU Cook Together webpage and promote batch cooking to reduce food waste. Our easy-to-follow recipes reflect the diverse cultures on campus and in our city, featuring dishes like spinach and sweet potato dhal, beef tacos, and chicken pad thai.

The programme also offered 800 free lunches and distributed £9,900 in emergency food and supermarket vouchers alongside the recipe cards to help students recreate these meals at home2.

Additionally, LJMU gave a 20% discount at Core cafes has been redeemed 487,377 times in 2022-2023, providing students more affordable access to food on campus3. Through these initiatives, LJMU supports students in eating well, managing their finances, and improving their overall wellbeing.

RESEARCH AND KNOWLEDGE EXCHANGE

**Developing nature-based solutions for food security**

Southeast Asia is highly vulnerable to both the immediate and long-term effects of climate change, including rising sea levels, more frequent and severe droughts, intense storms, and prolonged heatwaves. These hazards pose a serious threat to food security across the region.

As part of the COP 26 Universities Network, LJMU researchers contributed to a study exploring nature-based solutions for climate change mitigation within the ASEAN region, which includes countries such as Brunei, Myanmar, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

LJMU’s research focused on agricultural management strategies, particularly techniques to reduce nitrous oxide emissions in crop production. This included the use of slow-release fertilizers and nitrogen-fixing plants. Additionally, the research offered recommendations for irrigated rice cultivation, highlighting its potential to deliver ecosystem services similar to natural wetlands, such as drought regulation and biodiversity conservation.

The study emphasised the significant role of increasing green carbon in the ASEAN region, with the potential to reduce carbon emissions by 1.35 gigatonnes (Gt) of CO2 per year4.

PLACE AND PARTNERSHIP

**Fighting hunger through Fans Supporting Foodbanks**

Founded in 2015, Fans Supporting Foodbanks (FSF) is a joint initiative between rival Liverpool F.C. and Everton F.C. supporters, aiming to tackle food poverty in the city of Liverpool.

The important work is funded by The Everton in the Community Project which has helped to develop a growing network of fan-driven foodbanks in Liverpool and across the United Kingdom.

LJMU has collected donations that have supported 75,000 people in Liverpool by providing them with access to food³.

LJMU researchers, who also volunteer with FSF, are now working with the initiative to understand how it supports people, including how people learn of it, access it, and feel connected to their community because of it. They found 67% of surveyed users are female, 78% are over the age of 40, 62% have used FSF for a year or more, 43% of users would like more health and well-being advice, and that 38% of people surveyed shared that they have a disability. The team are working with FSF to ensure there is support where it is vitally needed.

**Pioneering urban agriculture and carbon reduction through re-wetting**

LJMU researchers, supported by the Liverpool City Region's Community Environment Fund, are pioneering urban agriculture through the establishment of three growing sites across Liverpool. As part of a re-wetting initiative, researchers planted 85,000 celery plugs across these sites to explore the potential of growing native wetland crops in urban areas. This project addresses the severe loss of lowland peatlands across the UK, where large areas have been drained and converted to farmland. 98% of lowland peatlands in Lancashire, Manchester, and North Merseyside have been lost to drainage, contributing significantly to carbon emissions.

Through re-wetting and cultivating water-tolerant crops like celery, the project aims to reduce carbon emissions and enhance environmental resilience, providing an innovative solution to mitigate climate change. The research is aligned with the Wildlife Trust’s efforts in Lancashire, Manchester, and North Merseyside, where the practice of paludiculture (wet-farming) is being trialled on peatland sites in Greater Manchester. This collaboration represents the first time in the UK that traditional food crops are being cultivated on re-wetted lands, showcasing a sustainable approach to carbon reduction and land restoration.

"We are so excited to be involved in the first trials of this kind and scale in UK lowland bogs and working towards the development of sustainable peatland farming systems. These celery trials represents the first in a number of crops being grown in peat-forming conditions with the aim of developing carbon neutral, or even carbon accumulating novel agricultural alternatives the current unsustainable practices."

* **Dr Stephanie Evers, Reader in Wetland Ecology and Biogeochemistry, LJMU**

**HIGHLIGHTS**

1, **£600,000**

An additional **£600,000** has been allocated to our hardship fund this year to support students during the cost-of-living crisis.

2, **£9,900 Food Vouchers**

**800** free lunches and **£9,900** in food vouchers, plus recipe cards to help students cook at home were distributed to students.

3, **487,377 interactions**

**20% discount** at Core cafes was **redeemed 487,377** times, providing students affordable access to food on campus..

4, **1.35Gt** **of CO2**

Increasing green carbon in the ASEAN region has the potential to reduce carbon emissions by **1.35 giga tonnes of CO2** annually.

# GOOD HEALTH AND WELLBEING

ENSURE HEALTHY LIVES AND PROMOTE WELLBEING FOR ALL AT ALL AGES

Over the last 15 years, the number of childhood deaths has been cut in half, proving that it is possible to win the fight against disease. Still, we are spending an astonishing amount of money and resources on treating illnesses that are surprisingly easy to prevent. The new goal for worldwide Good Health promotes healthy lifestyles, preventive measures and modern, efficient healthcare for everyone.

We work to ensure optimal health and wellbeing across multiple societal groups, from the youngest to oldest members of society, to elite athletes and individuals with significant health and wellbeing challenges. We promote healthy lives and physical, social and mental wellbeing across Liverpool, while our research aims to help with prevention, intervention and postvention of suicide, and other global heath challenges.

*“LJMU is a key partner in The Pandemic Institute alongside other institutions in the city, offering world-leading clinical and research expertise across all stages of the pandemic lifecycle”*.

***Professor Raphaela Kane, Pro-Vice Chancellor, Faculty of Health***

EDUCATION AND STUDENT EXPERIENCE

**Facilitating gym access to students and staff**

LJMU is committed to promoting physical fitness and overall well-being for both staff and students. To encourage a healthy, active lifestyle, LJMU offers discounted gym memberships to students, providing access to the Sport Building’s state-of-the-art gym facilities, fitness classes, and additional perks like discounted facility rentals and the BUCS UNIversal Gym scheme, which extends access to partner gyms across UK universities. In 2022 to 2023 4,995 gym memberships for students were discounted.

Additionally, LJMU supported staff well-being by offering complimentary gym access over the summer. This initiative enabled staff to benefit from the positive mental health effects of regular exercise, reinforcing LJMU's dedication to supporting a balanced, healthy lifestyle for the university community.

**Teaching adults and children to swallow medication**

The Pill School project, co-developed by LJMU researchers is a groundbreaking initiative designed to teach adults and children how to swallow solid oral dosage forms (SODFs), such as pills, which significantly improves medication adherence and access to vital treatments. This skill is often overlooked, with the assumption that adults can swallow pills easily and children cannot, but through proper training, individuals as young as three years old can master this skill.

The Pill School initiative has been integrated into LJMU’s undergraduate and Master’s Pharmacy degrees, ensuring future healthcare professionals are equipped to teach this important life skill. Students are trained using techniques like the pop-bottle method, where they practice swallowing placebo pills, which has proven effective in overcoming pill-swallowing difficulties. The programme has been introduced to clinical settings, including Alder Hey’s Cystic Fibrosis Clinic, and expanded internationally to universities and hospitals in the UK, Jordan, and Malaysia.

Pill School widens access to a broader range of medication options, particularly for children who may otherwise rely on unlicensed or off-label liquid medications. By improving pill-swallowing capabilities, the programme helps ensure better medication adherence, reducing waste and saving costs for NHS Trusts, with one partner clinic with proposing annual cost-savings of £46,5882. Pill School demonstrates its results through the patients in the cystic fibrosis clinic who now able to access life-saving therapies that are only available in pill form.

The programme’s success has led expansion, with planned incorporation of Pill School training into the curriculum at Brighton School of Pharmacy.

RESEARCH AND KNOWLEDGE EXCHANGE

**The LJMU model of investigating drug related deaths**

Drug related deaths are at record levels across England and Wales, with almost 5000 people dying from overdose in 2022 alone. Overwhelmingly these individuals are economically disadvantaged and many have experienced multiple levels of childhood trauma.

LJMU’s Public Health Institute developed a model in Merseyside in 2015 which utilised intelligence in order to try to reduce the number of such deaths, and now provides this system to 24 local authorities across England supporting them with implementation of the government’s drug strategy “From Harm to Hope” which aims to reduce the number of drug related deaths in coming years3.

The LJMU model utilises a multi-agency portal which pulls together a comprehensive picture of someone’s life prior to their death. The system captures both quantitative data to look at themes and trends around demographics, implicated substances and the results of toxicologies, but also qualitative data in the form of narrative on individual cases which LJMU-chaired drug related death panels consider.

It brings together professionals from an array of sectors including mental health services, social care, probation, pharmacies and DWP in order to identify learnings and missed opportunities which may have made a difference, such as safeguarding interventions for people in receipt of high value back payments, communication between pharmacies and treatment providers when someone has not picked up their opiate substitute prescription and improved discharge pathways from hospitals.

LJMU also hosts the UK’s largest drug related deaths conference annually. In 2023, 900 attendees from an array of sectors, including health, primary and social care and academia, attended, with the Dame Carol Black, the government’s independent advisor on drugs presenting as the keynote.

PLACE AND PARTNERSHIP

**Tackling the challenges of living well with dementia**

The Centre for Collaborative Innovation in Dementia uses a European-accredited living lab approach to co-create sustainable solutions for people living with dementia. By working in partnership with local citizens, healthcare providers, businesses, and academics, the centre places those affected by dementia at the heart of the innovation process. Through its living lab, the centre fosters an open environment for developing and testing dementia care strategies that meet real-world needs.

Building on its involvement in the Innovate Dementia project, the centre is now part of the European Network of Living Labs (ENoLL) which collaborates with partners in six countries³. The centre’s reach has expanded to health and social care co-creation groups and businesses, including its participation in the Interreg Europe-funded HELIUM project. This project works across multiple countries to create sustainable innovation spaces that enhance public health through collaborative solutions, improving overall health and wellbeing.

**Promoting physical activity through Global Active Cities**

LJMU played a key role in promoting physical activity through its collaboration with the Liverpool City Council on the Liverpool Active City programme, which was piloted in 10 cities worldwide. This model evolved into the Global Active Cities (GAC) movement, an international initiative aimed at increasing physical activity in urban settings. Liverpool was one of the first cities to be awarded the GAC title, recognizing its commitment to citizens' physical, mental, and social wellbeing.

LJMU’s Physical Activity Exchange has been at the forefront of research, surveillance, and evaluation of physical activity for over 25 years. This expertise contributed to project certification standards and policy improvements in cities representing 5.8 million residents4. In January 2023, LJMU, in partnership with TAFISA and EVALEO, hosted the inaugural International Active City Webinar, showcasing global best practices and innovations for creating active cities.

**The Pandemic Institute**

The Pandemic Institute is at the forefront of addressing emerging infectious threats, supporting 11 high-priority projects, including studies on virus transmission, rapid diagnostics, vaccine development, and public health education1. In 2022, it pledged £484,257 to support urgent research into the monkeypox outbreak, declared a global health emergency by the World Health Organization. Led by LJMU, this project focuses on improving public understanding of the virus and how it spreads, a critical step in containing the outbreak. The Pandemic Institute’s work is supported by its local founding partners, combining global expertise to respond swiftly to new health threats.

HIGHLIGHTS

1, **11 high-priority projects**

**11 high-priority projects**, including studies on virus transmission, rapid diagnostics, vaccine development, and public health education, with **£484,257** pledged to support urgent research into the monkeypox outbreak.

2, **£46,588****saving**

By improving pill-swallowing capabilities, the programme helps ensure better medication adherence, reducing waste and saving costs for NHS Trusts, with one partner clinic proposing annual cost-savings of **£46,588**1.

3, **24 local authorities**

LJMU’s Public Health Institute model now supports **24 local authorities** across England in implementing the government’s "From Harm to Hope" drug strategy to reduce drug-related deaths.

4, **5.8 million residents**

 LJMU’s Physical Activity Exchange has been at the forefront of research, surveillance, and evaluation of physical activity for over 25 years. This expertise contributed to project certification standards and policy improvements in cities representing **5.8 million residents.**4

# QUALITY EDUCATION

ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL

Education liberates the intellect and unlocks the imagination. It is the key to prosperity and opens a world of opportunities, making it possible for each of us to contribute to a progressive, healthy society. Learning benefits every human being and should be available to all.

LJMU is focused on both the quality of education provided through our curriculum, and our extensive external engagement initiatives. As part of our commitment to embedding sustainable development within our taught programmes, we are actively working to decolonise the curriculum. We’re also committed to supporting our local community, offering educational programmes delivering training for secondary school students in climate, chemistry and astronomy.

EDUCATION AND STUDENT EXPERIENCE

**Supporting African students with Unicaf**

LJMU’s collaboration with the UNICAF scholarship programme offers affordable, accessible education to students across Africa. This partnership allows students to pursue high-quality, internationally recognised degrees at a reduced cost, preparing them for global employment opportunities. UNICAF provides a flexible online learning platform with frequent start dates, extensive resources, and continuous support, ensuring both affordability and educational excellence. By offering degrees in public health, business, and technology, the programme significantly improves education accessibility across Africa and facilitates students contributing to their communities.

**Enhancing nature literacy through teacher education**

LJMU has pioneered the "Natural Curriculum" in Primary Initial Teacher Education (ITE) to address the growing need for nature literacy among future educators. Since 2016, the programme has integrated nature-related content and outdoor learning across the ITE curriculum, aiming to foster a deeper cognitive, emotional, and experiential connection to nature. Over 3,000 ITE students have participated, developing an appreciation for ecosystems, biodiversity, and the role humans play in climate change1.

At LJMU, climate and outdoor education are integrated into teacher training in multiple ways. Our Forest Schools programme delivers climate and sustainability education to infant schools and is embedded in teacher training courses. Additionally, our Outdoor Learning Zone is used by trainee teachers and school children from the Liverpool region, providing hands-on experiences that promote outdoor education and its benefits for children’s development and wellbeing.

A recent evaluation of the Natural Curriculum, involving 229 participants, assessed the programme’s impact on Nature Relatedness (NR). The findings revealed a positive influence, enhancing student teachers' NR and increasing their willingness to engage in outdoor education and environmental actions. This initiative not only addresses the gap in teaching through nature but also nurtures climate literacy and encourages active conservation efforts.

RESEARCH AND KNOWLEDGE EXCHANGE

**Supporting students to beat exam pressures**

LJMU research has uncovered the significant role exam anxiety plays in students’ emotional wellbeing and academic outcomes, particularly for GCSEs, A Levels, and BTECs. Female students are more likely to be affected by this anxiety, leading to lower academic performance.

In response, LJMU developed resources to support students, including the BBC Mindset Bitesize campaign, an OFQUAL-endorsed resource pack, and cognitive-behavioural group interventions.

These resources, including the 'Coping with Exam Pressure' guide, were highly utilized during OFQUAL's Children’s Mental Health Week in 2023, eventually reaching over 197,000 downloads. The guide, alongside related content on GOV.UK and the Ofqual blog, garnered considerable attention, reflecting strong engagement and feedback from students and educators alike.

PLACE AND PARTNERSHIP

**Bringing STEM to life for students**

Our Schools’ Observatory supports thousands of schools and colleges by providing free access to Liverpool Telescope images of space².

To stay at the cutting edge of both education and research, we are designing and building a new £30million telescope in the Canary Islands³ which will be four times more sensitive and ten times faster than any other fully robotic telescope in the world. This new telescope will allow even more schools to explore the universe in new and stimulating ways.

In other STEM activity, LJMU’s Absolute Chemistry project welcome 150 high school students from six Merseyside schools to the School of Pharmacy and Biomolecular Sciences for hands-on lab experience4. Supported by Shaping Futures and the OfS UniConnect programme, this outreach initiative aims to inspire local students to pursue science beyond secondary education. Students engaged in practical experiments, developing key subject-specific skills aligned with their school curriculum. The project focuses on building lasting relationships with partner schools, particularly supporting students facing social disadvantages. This long-term engagement is designed to improve students’ attitudes toward science and enhance their “science capital,” ultimately fostering a pathway to future careers in science.

“As we've seen with the Natural Curriculum, fostering nature literacy in teacher education has a ripple effect – our primary student teachers are more engaged, curious and connected to the natural world. When teachers bring nature into their classrooms and outdoor learning spaces, children develop a deeper appreciation for the environment and are more motivated to take action on climate issues.”

* **Dr Avril Rowley, School of Education**

**HIGHTLIGHTS**

1, Over **3,000 students** have participated, developing an appreciation for ecosystems, biodiversity, and the role humans play in climate change.

2, **200,000 Observations**

Over **20,000 teachers and school students** have already requested around **200,000 observations** of the universe.

3, **£30M TELESCOPE**

 LJMU is building a **£30 million** telescope to feed data to the National Schools Observatory.

4, **Six Local Schools**

 **150 students** from **six Merseyside schools** were welcomed to take part in the Absolute Chemistry project.

# GENDER EQUALITY

ACHIEVE GENDER EQUALITY AND EMPOWER ALL WOMEN AND GIRLS

Gender bias is undermining our social fabric and devalues all of us. By denying women equal rights, we deny half the population a chance to live life at its fullest. Political, economic and social equality for women will benefit all the world’s citizens. Together we can eradicate prejudice and work for equal rights and respect for all.

LJMU is committed to ensuring that all students, staff, and community partners experience a supportive and inclusive environment that helps them reach their potential within the university. Our work to promote gender representation at all levels of the institution has led to us achieving a gender balance within our Executive Leadership team. Additionally, our Staff Networks offer platforms for collective voices that reflect the diverse experiences across our organisation.

We are one of 39 UK universities to receive the Advance HE Athena Swan University Silver Award, recognising our ongoing commitment to gender equality. To date, we have achieved five Athena Swan Departmental Bronze Awards, and we aim for 90% of departments to achieve Bronze within the next five years. Currently, one department has applied for Bronze, and another has applied for Silver.

EDUCATION AND STUDENT EXPERIENCE

**Leading the way with campus-wide free period products**

In collaboration with John Moores Students Union (JMSU), our #LJMUFreePeriod campaign ensures free menstrual products are available in all female, gender-neutral and accessible bathrooms across our campuses. In 2023, this equated to £11,153 worth of products distributed.

**Dedicated support for staff and students with Report & Support**

LJMU has invested in a dedicated platform, Report & Support, to enable students and staff to individually or anonymously report instances of hate crime, discrimination, harassment and sexual violence. Supporting this cross-institutional initiative, our Student Advice and Wellbeing team now includes a dedicated team of Sexual Violence Liaison Advisors who provide specialist support to survivors of sexual violence, in partnership with local services including RASA, SafePlace and Savera.

**Providing menopause support through cafes and policy**

Signing up to the Menopause Workplace Pledge has strengthened our commitment to making LJMU a supportive and understanding place for all our staff. Our Menopause Matters Network has over 100 members, runs weekly menopause yoga sessions at the LJMU Sports Building, holds quarterly Menopause Cafés and provides information and support on understanding the menopause3.

Our Staff Menopause Policy advises line managers on the support available and signposts places to seek additional support, both for those experiencing symptoms and those wishing to support someone going through the menopause.

**Celebrating International Women’s Day with an astronaut**

At LJMU, we celebrate significant equality-themed dates, such as International Women’s Day, to reinforce our commitment to diversity and inclusion. In 2023, LJMU hosted Helen Sharman, the first British astronaut, at an event attended by 300 people at Liverpool’s iconic St George’s Hall. The event featured a panel discussion chaired by our Vice-Chancellor, with participation from members of our Executive Leadership Team, and welcomed pupils from various schools across the Liverpool City Region.

RESEARCH AND KNOWLEDGE EXCHANGE

**Dignity Without Danger project supports Nepalese females with menstrual health research**

Dignity Without Danger addresses barriers menstruators face in Nepal through a gender-equity lens. Collaborating with a network of co-investigators and activists from academia and civil society, the project worked closely with NGOs in the fields of Water, Sanitation, Hygiene (WASH), health, and education. Through these partnerships, the project developed several creative outputs, including films, virtual and in-person exhibitions, and a ‘Resource Kit for Menstrual Education,’ all aimed at improving menstrual and sexual health education in Nepalese schools. These efforts not only celebrated menstrual activists in Nepal but fought stigma surrounding menstruation, improved hygiene practices, and reduced school absences related to menstruation.

PLACE AND PARTNERSHIP

**Addressing male suicide through community support and partnership**

In 2023, *James' Place* continued its critical work in addressing male suicide, which remains the leading cause of death for men under 35 in the UK. Since opening its first centre in Liverpool, the initiative has expanded to London and Newcastle, providing free, life-saving therapy to men in crisis. Over 2,100 men have received support, with outcomes showing significant improvements in mental wellbeing.

The project, driven by a partnership between LJMU and *James' Place*, has established a non-clinical, welcoming environment where men can access rapid treatment through innovative therapies, such as the ‘Lay your Cards on the Table’ intervention. The service also alleviates pressure on the NHS by offering swift, community-based interventions, filling a critical gap in male mental health services. This model, showing considerable success, continues to expand, with more centres planned to open across the UK by 2026.

“At LJMU, we are dedicated to fostering a supportive and inclusive environment where everyone can reach their full potential. Our achievements, such as the Athena Swan Silver Award and the progress toward departmental Bronze Awards, reflect our strong commitment to advancing gender equality at all levels. We will continue to strive for balanced representation and to ensure that diverse voices are heard across our institution.”

**Moni Akinsanya, Associate Director: Diversity and Inclusion**

**HIGHLIGHTS**

1, **Silver Award**

Advance HE’s Athena Swan University **Silver Award** demonstrates our continued dedication to promoting gender equality across the institution.

2, **£11,153**

#LJMUFreePeriod campaign provided **£11,153** worth of free menstrual products across all female, gender-neutral, and accessible bathrooms on campus in 2023.

3, **100 Members**

The Menopause Matters Network has over **100 members**, offering weekly menopause yoga sessions, quarterly Menopause Cafés, and ongoing support and information on navigating menopause.

4, **331 articles**

331 articles on leading STEM figures from ethnically diverse backgrounds in LJMU’s EDIpedia

# CLEAN WATER AND SANITATION

ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

One in three people live without sanitation. This is causing unnecessary disease and death. Although huge strides have been made with access to clean drinking water, lack of sanitation is undermining these advances. If we provide affordable equipment and education in hygiene practices, we can stop this senseless suffering and loss of life.

At LJMU, we’re making efforts to address our water usage by installing efficient water dispensers, harvesting rainwater and using low-flush toilets in our buildings across campuses. Regionally, we are promoting sustainable energy on Hilbre Island and internationally we are proud to champion the voices of islanders in the Philippines.

“We all love the island. We love it as it is so what we want to do it not change that except to stabilise the buildings… and use the island as a centre for arts, science, and sustainability”

**Prof. Dominic Wilkinson, Principal Lecturer Architecture, LJMU.**

EDUCATION AND STUDENT EXPERIENCE

**Managing water consumption on campus**

LJMU actively monitors all water usage across campus, implements low-flush toilets and rainwater harvesting to conserve resources. Free water dispensers help reduce single-use plastics and associated carbon emissions, supporting our sustainability efforts.

**Students helping keep local beaches and parks clean**

LJMU and John Moores Students’ Union (JMSU) are actively committed to protecting local waterways, green spaces and supporting responsible waste disposal through initiatives led by students. Our Conservation Society partners with groups such as Friends of Crosby Beach, Friends of Sefton Park, and local environmental councils, to regularly organise beach cleans, litter picking, and habitat maintenance to prevent pollution from reaching our water sources. The clean-ups at Crosby Beach and Sefton Park focus on removing litter and invasive plant species, which can harm water quality and disrupt wildlife2. These hands-on efforts help protect marine and freshwater ecosystems, ensuring cleaner water and supporting the health of our local environment.

**RESEARCH AND KNOWLEDGE EXCHANGE**

**LJMU tackles invisible pollutants**

LJMU researchers have been at the forefront of investigating the environmental dangers posed by invisible pollutants such as PFAS (perfluoroalkyl and polyfluoroalkyl substances)3. These chemicals, found in everyday products like non-stick pans and waterproof clothing, persist in the environment for centuries and accumulate in water sources, plants, and animals, ultimately impacting human health. LJMU’s studies have highlighted the widespread contamination of water systems by PFAS and their harmful effects on ecosystems, wildlife, and people.

Through their work, LJMU has raised awareness of PFAS as a significant, yet often overlooked, environmental threat. The university's research underscores the urgent need for improved management of these chemicals and better public communication regarding their risks. This work helps inform policymakers and contributes to global efforts aimed at reducing the environmental and health impacts of PFAS.

PLACE AND PARTNERSHIP

**Creating a sustainable research centre**

The Hilbre Arts, Science, and Sustainability project at LJMU actively combines research, teaching, consultancy, and creative practice to develop a research hub on Hilbre Island. Collaborating with arts charities, local organisations, and LJMU staff, the project aims to renovate neglected buildings to provide a sustainable space for artists and scientists to work together. This specialist centre offers an opportunity to explore the island's unique flora, fauna, and tidal isolation as a tool for research and creative expression.

Currently, the project is focused on integrating renewable energy and sustainable water solutions, ensuring minimal environmental impact while maintaining the island’s status as a Site of Special Scientific Interest. Hilbre Island, accessible only at low tide, attracts a diverse range of academic disciplines year-round, from marine biology and astrophysics to creative writing and art. The refurbishment will transform the island into a model for off-grid, low-carbon research and learning environments.

**Exploring waterfront biodiversity at dockwatch**

In 2023 Dockwatch returned to Liverpool’s Royal Albert Dock. Dockwatch is a collaborative event with Liverpool John Moores University, the Maritime Museum, Canal River Trust and World Museum, showcasing the rich local marine biodiversity. Visitors enjoy this interactive event, with tanks displaying local marine life like crabs, starfish, jellyfish, and mussels, and live underwater camera feeds4.

Visitors learn about the research work of LJMU scientists and the World Museum's Botany team on pressing issues, including invasive species, climate change, shipping impacts, and environmental biofouling. Additionally, the Canal River Trust share insights on water quality monitoring in the docks. The event provides a unique opportunity for the local community to engage with marine biology academics and students, enhancing public awareness on local environmental challenges and the surprising biodiversity present in the city’s waterfront.

**HIGHLIGHTS**

1, **Free Water Dispensers**

**Free water dispensers** on campus encourage students to refill their bottles, helping to reduce single-use plastics and associated scope 3 carbon emissions, aligning with our sustainability efforts.

2, **Clean Beaches**

Clean-ups at Crosby Beach and Sefton Park focus on removing litter and invasive plant species, which can harm water quality and disrupt wildlife.

3, **Spotlight on Pollutants**

We’re informing policymakers and contributing to global efforts to reduce the environmental and health impacts of PFAS and other inviable pollutants.

4, **Biodiversity Showcase**

Collaborative event Dockwatch at Liverpool’s Albert Dock showcases biodiversity while raising awareness of environmental issues like invasive species and water quality monitoring.

# AFFORDABLE CLEAN ENERGY

ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

Renewable energy solutions are becoming cheaper, more reliable and more efficient every day. Our current reliance on fossil fuels is unsustainable and harmful to the planet, which is why we have to change the way we produce and consume energy. Implementing these new energy solutions as fast as possible is essential to counter climate change, one of the biggest threats to our own survival.

We are investigating affordable and clean energy solutions, and this is reflected across our teaching, research and knowledge exchange activities. We have forged partnerships with industry to test and develop new technologies such as biogas production, we are exploring green technologies through our exemplar houses, and we're working in Japan and Malaysia to ensure electric vehicles (EVs) remain low-carbon cars.

“The departure of 165,000 European workers combined with an ageing workforce, and the pandemic has created a perfect storm for future capacity in the industry. This collaboration between industry, higher and further education is now vital if we are to avoid a skills time-bomb in UK construction.”

**Professor Mike Riley, Director of Civil Engineering and Built Environment.**

**EDUCATION AND STUDENT EXPERIENCE**

**New MSc in Renewable Energy**

LJMU has launched the pioneering new MSc in Renewable Energy. The global demand for clean and renewable energy has been rising steadily due to recent collaborative international efforts to tackle climate change and reduce carbon emissions. Renewables such as hydroelectric, wind, and solar energy, require specialised equipment and skillsets.

As the UK’s recognised global lead in this sector, LJMU’s MSc RE incorporates specialist modules on Renewable Industry Economics, Renewable Energy Resources and Site Selection and Offshore Renewable Energy Technologies. It is developed in consultation with the renewables sector to build upon the skills for a career in the renewable sector ashore or offshore, supporting new projects from inception to completion, and steering complex existing projects throughout their life cycle.

**RESEARCH AND KNOWLEDGE EXCHANGE**

**Reducing air pollution from ship fuel**

Environmental air pollution at ports is a critical issue. LJMU researchers have investigated ways to reduce air pollution from the shipping sector by using fuel cells instead of diesel generators on Very Large Crude Carrier (VLCC) vessels. The research team developed five weighted criteria to rank emissions from seven types of fuel cells. Using the LJMU methodology, the team found the proton-exchange membranae fuel cell to be the most suitable type for VLCC. The team’s showed using this cell type for a real voyage scenario from the Persian Gulf to China would save up to 635,259 kg of CO2, 3.92 kg of CH4, and 9.024 kg of N2O emission.

**Tackling energy poverty in UK homes**

In 2022, almost a quarter of households in Britain were considered fuel poor according to an LJMU fuel poverty expert. In 2023, LJMU researchers focused on evaluating the effectiveness of energy advice in tackling energy poverty, particularly relevant amidst recent energy price hikes in order to tackle this national issue3. Through a detailed qualitative analysis, their work has revealed that while tailored, in-person energy guidance can support households by improving energy efficiency and reducing usage, it’s not sufficient as a standalone solution. The research highlights that the broader structural factors, such as market complexities and social inequalities, continue to hinder significant progress. LJMU advocates that meaningful advancements in energy poverty require not only personalised advice but also robust political and systemic reforms to address underlying causes. This research underscores LJMU's commitment to sustainable, affordable energy solutions that prioritise vulnerable communities.

PLACE AND PARTNERSHIP

**Testing new technologies in our Exemplar houses**

LJMU’s Exemplar houses reflect the three main types of domestic housing found across the UK, enabling real-world testing of new technologies. In collaboration with the Building Research Establishment, we launched the first purpose-built, multi-unit housing test facility in Northern England. Each house, modelled after 1920s, 1970s, and contemporary designs, allows for the testing of emerging green technologies and sustainable building methods, providing critical data for reducing emissions in UK housing4. This facility also offers businesses R&D opportunities, enabling product performance data collection that aids in product development and provides scientific backing for their market strategies. LJMU also looks forward to the development of net zero houses in the near future to help test the latest eco-home innovations.

HIGHLIGHTS

1, **MSc in Renewable Energy**

LJMU has launched the pioneering new **MSc in Renewable Energy**.

2, **635,259 kg of CO2**

Using LJMU’s new fuel cell analysis could save up to **635,259 kg of CO2** sailing from the Persian Gulf to China.

3, **Energy Advice Scrutiny**

Energy poverty research reveals that personalised energy advice requires systemic reforms, addressing market barriers and social inequities.

4, **Green Technology Innovation**

Testing of emerging **green technologies** and sustainable building methods in our **Exemplar Houses**.

# DECENT WORK AND ECONOMIC GROWTH

PROMOTE SUSTAINED, INCLUSIVE AND SUSTAINABLE ECONOMIC GROWTH, FULL AND PRODUCTIVE EMPLOYMENT AND DECENT WORK FOR ALL

Economic growth should be a positive force for the whole planet. This is why we must make sure that financial progress creates decent and fulfilling jobs while not harming the environment. We must protect labour rights and once and for all put a stop to modern slavery and child labour. If we promote job creation with expanded access to banking and financial services, we can make sure that everybody gets the benefits of entrepreneurship and innovation.

LJMU is working to promote sustainable, and equitable, economic growth. Through our work with businesses across the region, we’re supporting innovation to create low carbon goods, processes and services with international reach. On campus, our Accounting, Business and Law Clinics are providing students with valuable work experience while supporting our local community, plus our widening participation work is ensuring sustained support for underrepresented groups.

“As the Business Clinic continues to expand, we are proud to have collaborated with over 70 organisations on 95 projects in 2022/23. This impressive effort has contributed over 50,000 hours of student time dedicated to working on business projects.”

**Dr Track Dinning, Liverpool Business School**

EDUCATION AND STUDENT EXPERIENCE

**Improving employability through student clinics**

Students at LJMU enhance their employability prospects while supporting local communities and organisations through Business, Accounting, and Law Clinics. These clinics allow students to work on real-world challenges and provide valuable services to those who may not have access to professional advice.

In the 2022/2023 academic year, the Business Clinic facilitated the delivery of £2.168 million worth of free consultancy services, involving 555 projects with external organisations2. This represents a significant increase from the previous year, where £1.314 million worth of services were provided. Around 1,160 students from the Faculty of Business and Law engaged in these projects, gaining hands-on experience that strengthens their career prospects.

The Accounting Clinic, launched in 2022, offers pro bono services to UK charities requiring annual independent examinations, with work led by final-year Accounting & Finance students and overseen by academics.

LJMU’s Legal Advice Centre continues to offer pro bono legal services, focusing on vulnerable individuals and organisations. In the 2022/2023 academic year, the centre supported 1,376 individuals and 178 hearings at the Liverpool Civil and Family Court, marking a 147% increase from the previous year. Through these services, LJMU's clinics significantly contribute to the economic and social wellbeing of the Liverpool City Region.

**Support student beyond the curriculum**

The LJMU Unitemps Branch has been at the forefront of ensuring students are paid a fair wage not dependant on age and are able to access jobs outside the night time economy.

The LJMU Discovery Internships are offered to up to 200 students per year working within a business on a project via Unitemps. LJMU covers the full cost of this programme as commitment to supporting SMEs in the local economy.

In 2022-23 LCR Graduate Futures was an additional opportunity for companies and students to engage in longer internships with both students and graduates, sandwich years and graduate placements.

The LJMU Start-Up Hub exists to support student a graduate entrepreneurs to build a new venture. In 2022-23 the Hub supported over 500 students at various stages of their development and 30 new start-up were reported to the Higher Education Business and Community Interaction Survey.

LCR Founders supported students to work in cofounding teams and benefited students across LJMU and the University of Liverpool.

RESEARCH AND KNOWLEDGE EXCHANGE

**Supporting businesses through immersive technology**

LJMU’s research into human-computer interactions and immersive technology has fostered impactful collaborations with local businesses, such as CGA Simulation, a Liverpool-based virtual simulation and games development company. Research conducted by LJMU’s Research Centre for Brain and Behaviour on driver anxiety levels was instrumental in the development of a VR driving simulation game for CGA Simulation, generating £117,378 in revenue. This collaboration also led CGA to secure an additional £500,000 grant from Innovate UK to lead the Artificial Learning Environments for Autonomous Driving (ALEAD) project.

LJMU’s expertise contributed to CGA receiving a Defence Science and Technology Laboratory grant to create a virtual tool for assessing the mental workload of emergency planners. Beyond this, LJMU has also collaborated with companies such as Onteca UK, helping develop the "Chill Panda" children’s app, and Immersive Interactive, where research influenced a complete overhaul of their software framework. These partnerships have bolstered job creation, revenue, and growth within the Liverpool City Region, illustrating the economic and societal impact of LJMU's research.

PLACE AND PARTNERSHIP

**Supporting SME innovation at the Low Carbon Eco Innovatory**

The Low Carbon Eco Innovatory (LCEI), a project part funded by the European Regional Development Fund, offers organisations the opportunity to identify options for low carbon development and innovation.

At LJMU, we support a range of organisations with mapping out low carbon strategies and developing bespoke action plans to increase long term profitability and drive a low carbon future. Green Bell Packaging partnered with LCEU to launch the UK’s first compostable and plastic-free mailing bags. The bags exposed to water reduced in mass by up to 35% over six weeks, and samples composted in soil and water showed even faster degradation.

The LCEI assists organisations at each step with bespoke science and strategy. We have helped businesses develop 120 new low-carbon products. So far, we have placed 20 PhD students in SMEs through the LCEI and have supported 247 SMEs, reduced 1,600 tonnes of greenhouse gas emission, and saved over 10,000 tonnes of carbon.

“Meeting the team at the Low Carbon Eco-Innovatory (LCEI) has moved us forward considerably… Using the 3D printing processes and technology has assisted in reducing our time to market, our costs and ultimately our carbon output.”

* **Paul Newman, Omni Design Group**

HIGHLIGHTS

1, 50,000 Hours

50,000 Hours of consultancy provided to organisations supported by the Business Clinic (based on 12 hours per student).

2, £1.3M

Estimated value of business for free legal services delivered to communities and organisations.

3, £117K

The development of a VR driving game generated £117,378 for CGA Simulation.

4, 10,000 TONNES

 The LCEI has saved more than 10,000 tonnes of carbon.

# INDUSTRY, INNOVATION AND INFRASTRUCTURE

BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALISATION AND FOSTER INNOVATION

Investing in infrastructure and innovation is pivotal to driving economic expansion and advancement. Scientific research should be enhanced to upgrade the technological capabilities of industrial sectors in countries around the world, encouraging innovation in a sustainable and equitable way, to drive future innovation.

At LJMU, we’re using innovative approaches to teach our students about new technologies while providing global citizenship skills at the same time. Our researchers have worked across multiple industry sectors, supporting sustainable innovation and industry growth across the Liverpool City Region and beyond.

“The LCR 4.0 team at LJMU has been fantastic every step of the way; they clearly understood our business and the products we create and put forward a new innovative prototype that will help further prove the concept of our drainage system. Having access to the students and staff to talk about our business, our journey and bring together all that knowledge has been a perfect partnership; they have opened us up to areas and networks I thought were impossible for an SME like ours.”

**Robert Stuart, Biopipe Products Group**

**EDUCATION AND STUDENT EXPERIENCE**

**Sustainability insight in construction education**

Following the success of our BSc in Climate Change, all LJMU BSc and MSc courses in Civil Engineering and Construction Management now include modules on Sustainable Infrastructure or Science and Materials for Sustainable Construction, launched in 2022. These modules support students in identifying material choices to meet a sustainability brief, including identifying materials that are fit for purpose, as defined by testing standards whilst also considering the environmental impact and sustainability.

LJMU is investing in cutting-edge technologies to ensure our students are at the forefront of sustainable construction. ‘Spot’ our £150,000 Boston Dynamics autonomous robot dog, is equipped with a 3D laser scanner to capture construction progress and report against plans and key metrics.

**RESEARCH AND KNOWLEDGE EXCHANGE**

**Improving maritime risk assessment**

LJMU research has led to the development of a Risk Assessment Informed Decision Support Tool (RAIDS) for use in large maritime engineering systems.

RAIDS has since led to changes in regulations and public policy which have led to several benefits including improved offshore safety through reduced collisions between installations and vessels and new engineering safety training approach for high-risk industries.

RAIDS has also seen a reduction in pilot-related vessel traffic incidents and the introduction of guidelines on drug and alcohol abuse.

The research has had a direct quantifiable impact on both regulatory and public policy governing risk-based maritime systems operations.

LJMU partner, Risktec Solutions is a specialist provider of risk management consulting. Risktec uses the Tool as part of its training offer, and LJMU provides formal CPD and postgraduate education in Risk to all Risktec engineers. The company has generated revenues of over £7.5m since 2014 and has an approximate revenue per year of £1.2 million.

PLACE AND PARTNERSHIP

**One Day: championing gender equity in Liverpool City Region’s industry**

In 2019, the Liverpool City Region Combined Authority (LCR CA) faced criticism for its all-male cabinet, lacking female representation in its decision-making processes. This exclusion motivated LJMU researchers to initiate the 'One Day' movement, aiming to address gender disparities and promote inclusive growth in the region. They conducted interviews, gathered data, and analysed the findings to support the One Day initiative report. The initiative has achieved significant milestones: The LCR CA’s Corporate Plan for 2021-2024 incorporated One Day’s recommendations for a fairer and more inclusive region. It has created four equality panels (gender, disability, LGBTQIA, and race) within the LCR CA to ensure diverse perspectives in decision-making and strengthened policy partnerships with the Women’s Budget Group. The One Day report and subsequent activities have engaged over 200 women, influencing regional policy and economic decisions. The initiative has fostered a more inclusive economic landscape in the Liverpool City Region, benefiting all its 1.6 million residents2.

**Shaping the manufacturing industry of tomorrow**

LJMU is a key delivery partner in the LCR 4.0 programme, an initiative aimed at transforming the manufacturing sector in the Liverpool City Region through digital innovation. The programme provided critical support to 303 local SMEs, helping them access expert knowledge, advanced technologies, and collaborative opportunities at LJMU to improve productivity3.

The LCR 4.0 led to the creation of 125 full-time equivalent (FTE) jobs, the introduction of 57 new products to the market, and the development of 88 new products for businesses. Additionally, 86% of participating enterprises were supported in developing new products, 71% launched products more quickly, and 43% saw an increase in employment.

It is estimated that this programme generated £31 million in Gross Value Added (GVA) and will create 955 new jobs within six years, highlighting LJMU's vital role in driving regional economic growth4. Over the past three years, LJMU secured £5.2 million from European Structural Investment Funds (ESIF), including ERDF funding, to support this and other regional development programmes, further demonstrating the university's commitment to innovation and supporting local businesses.

HIGHTLIGHTS

1, **£1.2 million Revenue**

The Risktec Solutions training business, informed by LJMU research, has an approximate revenue per year of **£1.2 million.**

2, **1.6 million residents**

The One Day initiative has fostered a more inclusive economic landscape in the Liverpool City Region, benefiting all its **1.6 million residents**.

3, **303 SMEs Supported**

**303 SMEs** accessed support through the LCR 4.0 SMEs programme.

4, **955 New Jobs**

LCR 4.0 is on target to generate **955 new jobs** within the Liverpool City Region.,

# REDUCE INEQUALITY

WITHIN AND AMONG COUNTRIES

Inequalities based on Protected Characteristics and other characteristics including class, income and education are persistent across the globe. This dangerously impacts long-term social and economic development and harms opportunities to reduce poverty for all people.

Inclusivity is one of LJMU’s four core institutional values. Our work to reduce inequalities and drive inclusion is overseen by the university’s Inclusivity Board, comprising members of the university’s Executive Leadership team and other key stakeholders. In addition, our Associate Deans for Diversity and Inclusion provide leadership at school and faculty level and across Professional Services to embed inclusive practice both in the curriculum and across our broader engagement with staff, students and community partners.

LJMU’s Diversity and Inclusion Team work proactively within the university community to embed diversity and inclusion practices. The team lead on a range of Culture Change initiatives throughout the academic year, provide bespoke D&I advice and are responsible for compliance with our institutional obligations under the Equality Act 2010.

EDUCATION AND STUDENT EXPERIENCE

In 2022, students launched the Respect, Inclusion, Diversity, and Equity (RIDE) Society at LJMU, bringing together 51 members from diverse academic stages and backgrounds to advocate for inclusivity and representation across campus. RIDE has made a notable impact by organising EDI events, co-leading training and contributing to a range of pan-university projects and panel discussions. In collaboration with the Doctoral Academy and EDI HR Team, RIDE created specialised resources and workshops tailored for doctoral students, ensuring robust support for diverse voices.

A standout initiative, the ‘On the Same Page’ quarterly event, brings together students, academics, artists, community members, and charities to explore EDI themes through author discussions and panel sessions. Events have highlighted topics like men’s mental health with a diverse panel of speakers, as well as a discussion on disability studies, held on International Dwarfism Awareness Day. By connecting with a broad community, these initiatives not only celebrate diversity but also build a sense of belonging and strengthen community ties at LJMU.

RESEARCH AND KNOWLEDGE EXCHANGE

**Challenging the criminalisation of same-sex sexual acts**

Section 153(c) of the Malawi Penal Code currently criminalises any consensual same-sex sexual activity. In collaboration with the Centre for Human Rights Education Advice Assistance (CHREAA) LJMU examined sexual orientation, gender identity/expression and same-sex sexual activity among people in prison in Malawi. Our research garnered unique insights into the dynamics and complexities of prison conditions. We found that severe congestion, lack of sleeping space and food insecurity, exposed people in prison (including juveniles) to greater incidences of sexual violence and transmission of human immunodeficiency virus (HIV) and other sexually transmitted infections. CHREAA continue to use this research to challenge the constitutionality of this law, because, in addition to the many problems associated with criminalisation, the law impedes victims of sexual violence from seeking redress and accessing health care and help. The work has been cited in the United Nations Population Funds Technical Brief: Transgendered People and HIV in Prisons and other Closed Settings in 2022.

PLACE AND PARTNERSHIP

**Supporting higher education for under-represented groups**

LJMU’s Diversity and Inclusion team funded ten bespoke projects, led by colleagues from across Faculty and Professional Services. These projects seek to address inequalities in access to HE for specific communities including the Gypsy, Traveller, Roma, Showmen and Boater (GTRSB) communities, women’s representation in engineering and construction (Lean Into Construction) and the experiences of disabled staff within higher education.

LJMU has a long history of supporting care-experienced students to access and succeed in higher education. Following an initial endowment from Yoko Ono’s Spirit Foundation, our John Lennon Imagine Award programme provides 1:1 advice and guidance, dedicated financial support and all-year round accommodation for care-experienced students and those estranged from their families.

Our Outreach team work with Local Authority Virtual Schools and Leaving Care teams to provide a wide range of opportunities for currently looked-after young people to consider higher education as a viable option. Each year, we host a residential Summer University for Year 10 young people currently in Local Authority Care, to visit LJMU and work with current care-experienced LJMU students who act as valuable role models to this vulnerable group of young people.

**Identifying migrant disaster victims with Face Lab**

LJMU’s Face Lab won the 2023 Times Higher Education Research Project of the Year award for Arts and Social Sciences by working to identify migrant victims in Europe. By fostering legal and social collaboration and utilising cutting-edge techniques, Face Lab is providing a humanitarian solution to the issue of how to identify these victims.

Currently, only 22% of deceased migrants are identified, leaving many families without closure. Face Lab uses craniofacial anthropology and forensic art techniques to enhance identification and help families learn what has happened to their loved ones.

Face Lab has made significant progress since inception, successfully identifying victims in the Canary Islands and Greece. It is advancing its collaborations through partnerships, for example the University of Milan, Texas State University and the University of Thrace.

*Face Lab* researchers have since advised Interpol on craniofacial analysis for disaster victim identification. In 2023, the research led to the successful MDVI COST Action proposal, including seven member countries and two Global South partners, funded for four years to continue addressing the crisis.

HIGHTLIGHTS

LJMU holds the NAVAJO Charter- mark, signifying, commitment and knowledge of the needs, issues and barriers facing LGBTIQA+ people in Merseyside.

LJMU is a Disability Confident Employer. Staff are supported through the Disability Staff Network

LJMU was awarded the Liverpool Bambis Breastfeeding Friendly Mayoral Award

LJMU was recongnised in 2022 with the Race Equality Charter Bronze Award for our commitment to eliminating racial inequalities and developing an inclusive culture that values all staff and students.

# SUSTAINABLE CITIES AND COMMUNITIES

MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

The world’s population is constantly increasing. To accommodate everyone, we need to build modern, sustainable cities. For all of us to survive and prosper, we need new, intelligent urban planning that creates safe, affordable and resilient cities with green and culturally inspiring living conditions.

LJMU plays an important role in supporting the sustainability of the Liverpool City Region. As part of our Climate Action Plan, we’re championing sustainable travel and initiatives across our city and campus. Not only are we aiming for carbon net zero, we’re also championing biodiversity initiatives across our campus and have reduced the energy consumption of our estate by 20%, since 2021/221.

“Technology to transform how we reduce the carbon footprint of our roads…The research and development stage is going to be a critical phase and it’s brilliant to have Liverpool John Moores University, as well as our local roads maintenance contractors Dow high, Colas and Huyton Civil all involved. This project will unite the city’s academic and construction prowess and show Liverpool can be truly world-leading on providing solutions on the climate change agenda.”

**Karen Agbabiaka, Liverpool City Council’s Interim Chief Highways Officer**

EDUCATION AND STUDENT EXPERIENCE

**Active and Sustainable Travel plan**

LJMU declared a climate emergency in 2020 and is striving to achieve carbon net-zero status.

As part of this institution-wide effort, we put in place an institutional Active and Sustainable Travel Plan, encouraging students and staff to take part in active travel wherever possible.

We’re focusing on sustainability in day-to-day life and encourage all staff and students to walk or cycle for most journeys to and between campus buildings.

RESEARCH AND KNOWLEDGE EXCHANGE

**Extending road lifespans and cutting resurfacing needs**

LJMU researchers have developed COLBIFIBRE, an innovative cold mix asphalt (CMA) that significantly improves the sustainability of road surfacing. Unlike traditional hot mix asphalt (HMA), COLBIFIBRE requires no heating, incorporates waste materials, and delivers enhanced durability and engineering properties. This CMA technology reduces CO₂ emissions by up to 85% during production and eliminates fume exposure, making it a safer, greener alternative2. UK, French, and Irish councils now prioritize COLBIFIBRE for road maintenance, contributing to longer-lasting roads and minimized resurfacing requirements.

PLACE AND PARTNERSHIP

**Driving sustainable travel with digital innovation**

LJMU plays a pivotal role in the Liverpool City Region (LCR) Sustainable Green Travel Corridors Project, a £16.7 million initiative co-funded by the European Regional Development Fund. This project, part of a broader regional effort to promote walking and cycling as alternatives to car travel, aims to improve the uptake of sustainable, active travel across the region by focusing on digital innovation.

As part of the initiative, LJMU has installed VivaCity AI sensors along six key cycling and walking routes to monitor road usage, air quality, and weather conditions. This data feeds into the Smart Green Dashboard, a management tool developed by LJMU, providing local authorities with real-time insights to make strategic infrastructure decisions that promote green travel. The sensors and dashboard are critical in supporting the Liverpool City Region’s plan to create more efficient, eco-friendly transportation options.

Additionally, LJMU launched the Smart Green Journeys mobile app, which empowers residents to explore walking and cycling as viable alternatives to driving for short journeys. The app provides users with real-time data on routes, alongside estimates of carbon savings and financial benefits. It’s estimated that an average user could save up to 44kg of CO2 and £20 per month on a 9km commute4. Backed by the Liverpool City Region Combined Authority, the app supports the region’s broader environmental goals while helping residents make healthier, more cost-effective travel choices.

This initiative contributes to improving public health, air quality, and sustainability, while also addressing socio-economic challenges by creating more accessible and environmentally friendly transport options.

**LJMU develops eco-friendly sea-walls to combat coastal flooding**

LJMU collaborates with Virtus Concrete Solutions to develop eco-friendly sea-walls designed to prevent coastal flooding. Supported by £5.5 million from Innovate UK’s Launchpad programme, this project focuses on creating low-carbon, cement-free "Geo-blocks" made from recycled industrial and construction waste materials, such as paper, glass, and demolition debris. These sustainable concrete blocks, developed by LJMU’s School of Civil Engineering and Built Environment, reduce the carbon footprint of coastal protection structures while enhancing their durability and resilience4. The project is one of 23 innovations funded by Launchpad, which promotes net zero and digital technologies across the Liverpool City Region.

**Sustainable road building using demolished infrastructure**

LJMU engineers are spearheading an innovative project revolutionising road and pavement construction by recycling demolished infrastructure. Using novel technologies developed, this initiative will drastically reduce CO2 emissions, cut construction costs, and minimise disruption to road users. The project, funded by a £4 million grant from the Department for Transport’s Live Labs 2: Decarbonising Local Roads competition, will pilot three demonstration sites in Everton, Picton, and Belle Vale, focusing on sustainable road building and maintenance. This effort aligns with Liverpool’s ambition to reach carbon net-zero by 2030 and LJMU’s commitment to achieving carbon net-zero.

**HIGHLIGHTS**

1, **20% Reduction**

Reduced energy consumption of our estate by **20%** since 2021/22.

2, **85% Reduction**

The introduction of CMA has led to a reduction in CO2 emissions by up to 85% during production and fume exposure by 100%.

3, **44kg of CO2**

TheSmart **Green Journeys App helps users save** up to **44kg of CO2** and **£20 per month** on a **9km commute** by encouraging walking and cycling instead of driving.

4, **Co2 Reduction**

Recycled Blocks reduces the carbon footprint of coastal protection structures while enhancing their durability and resilience.

# RESPONSIBLE CONSUMPTION AND PRODUCTION

ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

Our planet has provided us with an abundance of natural resources. But we have not utilised them responsibly and currently consume far beyond what our planet can provide. We must learn how to use and produce in sustainable ways that will reverse the harm that we have inflicted on the planet.

At LJMU we’re focused on sustainable learning. The concept of sustainability has influenced our curriculum, with students having the opportunity to learn about sustainable production, while our research and knowledge exchange efforts have helped to revolutionise material production as far afield as Bangladesh and the Philippines.

“Our extra modular ‘how to’ workshops have proved very valuable across the school because now more than ever we need to be more conscious when it comes to sustainability, not just in fashion, but as a lifestyle and a way forward.”

**Cathy Reilly, Liverpool School of Art and Design**

EDUCATION AND STUDENT EXPERIENCE

**LJMU's Laptop and Recycled IT Scheme tackles IT poverty**

LJMU offers two schemes to help students access essential technology and to recycle old IT equipment. The Laptop Scheme allows students to apply for a voucher to purchase a new laptop from an external IT provider. The Recycled IT Scheme is open to all students and provides access to recycled and refurbished laptops and desktop computers. The LJMU devices are refurbished and tested by local social enterprise Bulky Bob’s. Recycling computers reduces electronic waste, conserves valuable resources, and lowers carbon emissions. Refurbishing devices requires significantly less energy than producing new ones, reducing greenhouse gases. By reusing materials and limiting landfill waste, this approach promotes responsible consumption, meeting current needs sustainably and minimising environmental impact.

**Sustainable fashion through traditional crafts**

LJMU Art and Design students are gaining experience in making sustainable design choices through hands on workshops.

These workshops, attended by 120 students, cover some of the traditional skills associated with the creation of fabrics and materials¹.

Through traditional crafts such as leather bevelling, fabric weaving and spinning, students can make a link between fabrics and the animals they come from, and the connection to local production, increasing their sustainability literacy with fashion choices.

RESEARCH AND KNOWLEDGE EXCHANGE

**Turning industrial waste into new bricks**

An international trial undertaken between LJMU and Chittagong University of Engineering & Technology (Bangladesh) has successfully developed a novel brick created solely from industrial waste, capable of replacing traditional clay and cement blocks.

Traditional production in Bangladesh’s brick sector involves toxic fumes and poor working conditions, with highly- polluting open kiln processes being outlawed to reduce air pollution and carbon emissions.

However, the new brick is unfired, meaning large savings in coal and timber can be made, thus reducing air pollution and carbon creation.

Fortunately, the novel brick is equivalent in durability, strength and robustness to existing clay and cement and uses zero primary resources². The block is designed to help coastal communities in Bangladesh build up flood defences in with minimal resource requirements.

**Minimising the environmental impact of mining in the Philippines**

LJMU is part of a £1.5 million international collaboration, co-funded by the UK Natural Environment Research Council, with the aim of enabling a new era of sustainable mining in the Philippines: project PAMANA³.

The move from fossil fuels to sustainable and more technically complex energy technologies, such as wind, electric and solar, is reliant on increased production of ‘technology critical materials’ in a sustainable way.

The Philippines has globally significant critical mineral deposits. The project seeks to understand how to mine sustainably so that environmental impacts are minimised, global demand for these materials is met, and climate change can be mitigated. It is working to develop and verify a 3D numerical model of how mine contaminated waste has moved through Philippine river catchments over centennial time scales and to predict future scenarios and remediations; these models will be the foundation for increased engagement with policy makers to identify and implement best practices in the Philippines and worldwide.

PLACE AND PARTNERSHIP

**Providing local and sustainable food options**

We encourage sustainable food consumption and reduce waste through our partnerships with local organisations.

We are co-leads of the Love Food Hate Waste and Liverpool Food People (alongside the Knowledge Quarter Sustainability Network). We have saved and delivered 1,688 meals for the Liverpool community through our dedicated food waste reduction app.4

Our University-wide Hospitality Policy ensures that staff use internal catering services which has reduced delivery miles, packaging and food waste and encourages sustainability in food consumption and production. As part of this strategy, 85% of our food packaging is now compostable.

Clean brick manufacturing has become a key industrial priority since the Bangladeshi government moved to outlaw highly-polluting open kiln processes by 2023/24 in a bid to cut air pollution and carbon emissions.

A successful trial supported by LJMU means that this new brick uses zero primary resources and displays all the properties of a conventional brick.

HIGHLIGHTS

1, 120 STUDENTS

120 students have been able to learn traditional skills such as leatherworking and weaving.

2, 0 RESOURCES

A novel brick created solely from industrial waste uses zero primary resources.

3, £1.5M

We are part of a collaboration of five UK universities to provide a holistic understanding of mining impacts on Philippine river systems.

4, 1,688 MEALS

We have saved 1,688 meals from wastage and delivered them to the Liverpool community.

# CLIMATE ACTION

TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

We are standing at the brink of climate calamity. Climate change is an undeniable threat to the world’s growing population, with sea-level rise already having doubled in the last decade and communities around the world already suffering the effects of extreme weather. Through education and innovation, cooperation and commitment, immediate action must be taken to protect the future of our planet.

We’re committed to protecting our environment and supporting a sustainable future for the global community. That's why we launched the UK’s first undergraduate degree on climate change and have adapted our buildings to reduce carbon emissions. On a national and international scale, our ground-breaking research is tackling coastal pollution in England and Wales, and peat fires in Indonesia.

LJMU declared a climate emergency in 2020. We know how important this issue is to our students and staff and have committed to achieve net zero for scope 1 and 2 emissions.

In our Climate Action Plan, we have set ourselves challenging, but crucial, targets to help us meet this goal.

* **LJMU Climate Action Plan**

EDUCATION AND STUDENT EXPERIENCE

**Leading the way in undergraduate education on climate change**

LJMU led the way in undergraduate climate change education by offering the first BSc in Climate Change in the UK, launched in 2020. The first cohort of students graduated in June 2023. Following the success of the BSc, LJMU has extended the offer with an MSc in Climate Change.

The BSc has been developed in response to a clear need for graduates with the knowledge and practical skills required to tackle climate change, from technical knowledge to the ability to communicate with the public. It covers the scientific, political, social, and economic aspects of climate change science, with practical field-based learning using remote sensing technologies and Geographic Information Systems (GIS). Students are supported to complete 4-6 week work placements in their final year with an LJMU partner employer.

The MSc includes taught modules on Climate Change to 2100, GIS, Environmental Research Methods, Sustainable Environment Management, Environmental Monitoring and Modelling, and Sustainable Infrastructure. Students will then conduct their own scientific research to prepare a dissertation under the supervision of a dedicated academic tutor.

RESEARCH AND KNOWLEDGE EXCHANGE

**Prioritising key sustainability indicators in the built environment**

Sustainability Indicators (SIs) are used to understand and share complex sustainability information in the energy sector. LJMU researchers developed a framework to identify and prioritise a set of SIs for heating systems in new buildings. Its critical perspective ensures reflection on how to maximise sustainability when different factors interact and are governed by stakeholder preferences. The developed framework uses analytic hierarchy methodologies within three phases: identification, refinement, and prioritisation to weight 22 SIs, including four economic, eight environmental, and ten social key factors.1 By providing a specific, implementable set of indicators, the LJMU framework has overcome a key barrier to measuring and tacking the sustainability performance of energy technologies in the built environment.

**Coastal pollution risk from legacy landfills due to climate change**

LJMU has identified over 3,000 coastal sites in England and Wales at risk of pollution from legacy landfills.2 Without flood defences, industrial waste sites in these areas could release harmful contaminants, such as copper, arsenic, and lead, into surrounding environments as sea levels rise. This poses a significant threat to ecosystems in estuaries and coastal zones.

The study found that of 30,318 legacy waste deposits, 3,384 are located in coastal zones, with 711 priority sites lacking protection against flooding or sea-level rise. The findings are part of a national project, funded by the Natural Environment Research Council, aimed at assessing risks and informing government strategies for managing these waste sites under changing climate conditions.

PLACE AND PARTNERSHIP

**Increasing flood resilience in Cumbria**

In response to the increasing frequency of extreme weather and flooding in the UK, LJMU hosted workshops in 2022, bringing together members of the Cumbrian Flood Action Groups as part of a pilot study, aimed to investigate the factors necessary for sustaining resilient grassroots flood action groups. These groups play a crucial role in local flood management, especially across flood-prone regions like Cumbria.

By 2023, the research has expanded, focusing on developing practical solutions to ensure the long-term effectiveness of these groups. The project involved classifying and evaluating the resilience of North West flood action groups, identifying critical success factors that help these groups withstand the pressures of frequent flood events. The findings aim to produce best practice guidelines for sustaining community-led resilience efforts and improving collaboration between local groups and policymakers.

Given the UK Environment Agency’s increasing emphasis on community-led flood response plans, the research’s outcomes are critical. The project supports vulnerable communities in taking a more active role in flood response, particularly as the responsibility for managing flood risks shifts toward those most affected. This initiative lays the groundwork for future collaborations and develops resilience strategies at a national level for varying flood risks and regional contexts.

**Using innovative architecture to reduce carbon emissions**

Our Climate Action Plan commits us to reducing our scope 1 and 2 emissions, and our eco- friendly buildings have helped us to achieve a 34% reduction³.

We commissioned an energy modelling study to determine the energy performance of the Henry Cotton Building. The survey found that a number of upgrades would improve the building’s energy efficiency and lower its carbon footprint.

The extensive works involved replacing existing gas fired boilers with 11 high-efficiency heat pumps and replacing an old, wasteful air handling unit with a new high-efficiency model.

Our estate hosts a range of green initiatives, from rainwater harvesting and solar panels to wildflower gardens and green roofs.

We get 100% of our electricity from renewable sources, recycle two-thirds of our waste and we have halved our total carbon emissions over recent years4.

“In 2023 LJMU commissioned a Decarbonisation Plan and undertook a comprehensive programme of site surveys, best-practice building modelling and a detailed costing exercise to identify a pathway to Net Zero”

* **LJMU Carbon Management Plan 2024-2029**

**HIGHLIGHTS**

1, 22

The LJMU Heat Systems Sustainability Indicators framework weights 22 factors to assess heat system sustainability in the build environment.

2, 3,000

LJMU research has identified over 3,000 coastal sites at risk from legacy landfills.

3, 34% REDUCTION

We have reduced our Scope 1 and Scope 2 carbon emissions by 34% since 2015/16.

4, 100% RENEWABLE

100% of our electricity comes from renewable energy sources.

# LIFE BELOW WATER

CONSERVE AND SUSTAINABLY USE THE OCEANS, SEAS AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

Our oceans are the world’s largest ecosystem, covering over 70% of the Earth’s surface, we rely on them for food, energy and water. Conserving and using them sustainably is essential to support biodiversity and protect marine resources and ecosystems for future generations.

LJMU research and facilities help to protect marine life and preserve our oceans. Our world-leading programme in maritime logistics, works closely with ports and maritime companies, to turn maritime shipping into a more environmentally friendly and sustainable endeavour, as we train the next generation of maritime experts and environmental stewards. The bio-ecological sphere, forms part of our training, which allows us to track life across the oceans and measure the impact of our activities on ecosystem functions.

EDUCATION AND STUDENT EXPERIENCE

**Meeting the training needs of the maritime industry**

At the Maritime Centre, LJMU addresses the diverse training needs of the maritime industry through top-tier facilities and specialised courses. The unique training simulators include a ship-handling simulator, a ten-workstation Electronic Chart Display and Information Systems (ECDIS) suite with 360° field of view, an engine room simulator, and a Liquid Cargo Operations Simulator (LICOS). These facilities are designed to train maritime professionals, deck officers, and marine engineers, allowing students to experience real-life scenarios such as equipment faults and manoeuvring challenges.

The simulators also hold significant practical, economic, and sustainability value. They have been used extensively for research purposes, including validating new berthing facilities, studying the impact of civil engineering projects on marine environments, and assisting in maritime accident investigations and insurance claims. These capabilities demonstrate the Maritime Centre’s integral role in advancing both maritime education and industry research.

RESEARCH AND KNOWLEDGE EXCHANGE

**Marine scientists use DNA traces to uncover biodiversity**

LJMU academics lead numerous projects underpinned by DNA technologies that rapidly and comprehensively analyse the health and diversity of marine ecosystems using environmental DNA (eDNA) found in seawater. The team keep finding that eDNA provides a powerful, universal toolkit to characterise ocean biodiversity across food webs, tracking rare and elusive species, and capturing the essential functions of ecosystems more effectively than traditional visual and capture-based methods. Engagement with fisherfolk, the seafood industry, and civil society has also resulted in novel avenues to combat illegal wildlife trade and contribute to more sustainable fishing practices.

**CSI techniques combat illegal shark trade**

LJMU is employing crime scene investigation (CSI) techniques to combat the illegal wildlife trade, particularly in sharks and rays. These methods, originally developed for analyzing marine ecosystem health using environmental DNA (eDNA) found in seawater, have proven highly effective in detecting a wide range of species. eDNA provides diverse species data in a cheaper, safer, and more inclusive manner compared to traditional methods, benefiting marine conservation by detecting twice as many species in a fraction of the time3.

Turning their focus to the illegal shark fin trade, LJMU researchers used these techniques to identify shark fin residues at fish processing plants and on boats. By sampling dust and scraps from facilities in Indonesia, the team uncovered 61 shark and ray species, more than half of which would have been missed by conventional tissue sampling. Over 80% of the species identified are protected under international agreements, highlighting the prevalence of illegal activity.

These CSI techniques offer a faster, more efficient tool for tracking illegal wildlife trade and are now being developed for portable, on-site use to further aid in conservation efforts.

PLACE AND PARTNERSHIP

**Global collaborations and industry impact in marine and offshore research**

At LJMU, we collaborate with a diverse range of regional, national, and global partners in the marine, offshore, and environmental sectors. Our partnerships span organisations such as Peel Ports, local environmental trusts, Natural England, the Natural History Museum, Cefas, and the British Antarctic Survey. Internationally, we work with leading marine research institutions, including Stanford’s Hopkins Marine Station, the South African Institute for Aquatic Biodiversity, Fisheries & Oceans Canada, and Italy’s A. Dohrn Zoological Station.

One of the key contributors to this global network is the Liverpool Logistics, Offshore and Marine Research Institute (LOOM), which specializes in marine, offshore, and transport sectors. LOOM’s multidisciplinary research focuses on the design and operation of large systems within these sectors, with particular expertise in risk and safety management. This includes advanced studies in areas such as logistics simulation, ship safety, offshore structural assessment, and port operations.

LOOM's research has significant global impact. It has contributed to modernising marine and transport industries through blue economy projects including leading work in the EU Interreg Atlantic 17-partner consortium project EMPORIA4KT: Empower Academic for Knowledge Transfer for Value Creation in the Atlantic Area. LOOM’s projects have improved port efficiency, container movement optimisation, and ship scheduling, benefiting terminals across Europe and the Far East.4

LOOM collaborates with over 50 global industry leaders, including Shell, Maersk Line, and the UK Maritime and Coastguard Agency, and has established partnerships with renowned academic institutions like World Maritime University and Beijing Jiaotong University.

HIGHLIGHTS

**1, 10**

Our Maritime Centre’s Electronic Chart Display and Information System is mission ready with ten training workstations

**2, PFAS in Water**

**PFAS** in global water systems highlighting the long-term environmental and health risks posed by these chemicals and driving efforts to improve public awareness and policy changes.

3, **2x Species Identified**

The technique has already managed to detect **twice as many species** as other methods, in a fraction of the time.,

4, >**50 Collaborators**

LOOM collaborates with over **50 global industry leaders**

“By adopting crime scene type methods, we uncovered evidence of twice as many species in a fraction of the time and effort it would take to sample fish in the factory,”

**Professor Stefano Mariani, LJMU School of Biological and Environmental Sciences**

# LIFE ON LAND

PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALF BIODIVERSITY LOSS

A flourishing life on land is the foundation for our life on this planet. We are all part of the planet’s ecosystem and we have caused severe damage to it through deforestation, loss of natural habitats and land degradation. Promoting a sustainable use of our ecosystems and preserving biodiversity is not a cause. It is the key to our own survival.

LJMU’s commitment and research efforts to protect life on land are global. Artificial intelligence technology using animal recognition techniques is aiding wildlife conservation, including tracking and protecting some of the world’s most elusive animals, like the pangolin. Our international research projects are also protecting endangered species in Indonesia, while across the Liverpool City Region, we’re working with local authorities to put nature at the heart of city planning.

"We’re currently facing a climate and ecological emergency, so it’s really important we work with partners to help them navigate their way forward. Without a thriving environment, we won’t have a thriving economy.”

**Dr Colm Bowe, Founder of the LJMU Natural Capital Hub**

EDUCATION AND STUDENT EXPERIENCE

**Greening our campus**

Our campuses consist of natural, semi-natural and landscaped environments which provide a good mix of habitats. These are key contributing areas for biodiversity cultivation and feed into a broader agenda to enhance the natural resources in and around the university.

LJMU has implemented several sustainability and biodiversity initiatives across its campus to enhance the green infrastructure and promote biodiversity. We achieved Silver accreditation through the Eco-Campus programme this year. To build on this award, we are developing a new green wall to cover 108m, enhancing the site's green infrastructure by +0.3% and adding +0.02 biodiversity units. The wall will feature pollinator-friendly plants, provide food for bird species, and contribute to urban cooling and air pollutant capture. As a proof-of-concept, we piloted the "No Mow May" initiative, promoting our grassland species diversity.

This year, our student volunteering projects saw 675 total volunteers lead projects including the National Gardening Week, the Growing Project, to enhance our green space at Kensington Fields Community Centre, our World Animal Day Hedgehog Tracker Tunnels project, and our Conservation Society’s Crosby Beach Cleaning sessions.1 We have completed an internal biodiversity baselining exercise to assess the estate's current biodiversity value, which we will monitor annually to involve students in building biodiversity skills.

With our partner Mersey Forest, we have launched the Forest School at our John Lennon Art and Design Building, complete with bug hotels, wildflower species, and native trees and shrubs (from 40cm to over 2 metres tall), where we train the next generation of teachers in how to use outdoor learning spaces to improve learning outcomes.

LJMU's campus is designed to nurture urban wildlife with beehives, hedgehog homes, and bird hides, a mini allotment at the Tithebarn Building, and Wildlife Gardens and the Herb Garden at our Byrom Street campus.

RESEARCH AND KNOWLEDGE EXCHANGE

**Using Artificial Intelligence (AI) to tackle biodiversity loss**

Our cutting-edge Conservation AI platform is renowned in the field of conservation technology. The platform uses drone and AI technology to detect animals, humans and man-made objects, and works to prevent biodiversity loss caused by poaching. Using machine learning to generate high-precision interpretations of thermal camera data from drones, the technology is accelerating has the potential to make animal surveys up to 100 times faster and is in use by organisations worldwide, including the BBC, WWF and Chester Zoo. In Madagascar, the team is working with the Darwin Initiative and the Aviation Civil de Madagascar to develop a national framework for operating drones to systematically monitor biodiversity in key places. This is a vital issue for biodiversity, including species such as orangutans. Approximately 89% of Malagasy plant life, 92% of its mammal species, and 95% of its reptile species exist nowhere else on Earth. In 2023, the team has tested the monitoring system in a 200Ha reforestation area of Alaotra, Madagascar.

**International standards for relocating threated plant species**

Around the world, at least 37 countries have legislation intended to limit or offset the impact of manmade disturbance and development on threatened plants. However, LJMU research found many of the legislative goals are process driven to support land development and do not address conservation outcomes. The research team proposed global standards of practice for all mitigation translations, based on redefining the process to include conservation objectives based on restoration targets. The team proposed the formation of a national registry of plant translocations to support future research and tracking on the cumulative impact as seen through international lenses, and now works to support the US Centre for Plant Conservation Reintroduction Database.

PLACE AND PARTNERSHIP

**Natural capital at the heart of our City Region**

Liverpool City Region (LCR) Combined Authority and LJMU are prioritising nature in urban planning. LJMU’s Natural Capital Hub created the first natural capital baseline for the LCR by mapping green spaces, water and air quality to enable sustainable city planning and wellbeing. Natural capital is the parts of the environment that do things for is, including woodlands, wetlands, and grasslands. They offer enormous benefits including carbon sequestration, natural flood defense, and improvement of air quality. The Natural Capital Hub hosts the LCR Natural Capital Working Group for civic policy and strategy. It works with policy stakeholders throughout the City Region and the country, using data science to advise local and regional authorities on nature-based flood defenses. It advises DEFRA, the Woodland Trust, and the Community Forest on how to evaluate large-scale woodland creation schemes including the £650m Nature for Climate Fund, which supported over £86m of funding for woodland creation in 2022-2023.

In the LCR, the Natural Capital Hub works in partnership with Natural England and Merseyside Environmental Advisory Service to deliver training for spatial development and planning officers, whose green spaces support 145,000 visits per year. On campus, LJMU has baselined all habitats on our estate to the UK Habitat Classification System V2 and the Natural England Biodiversity Metric 4.0 to steer our planning through biodiversity development.

**HIGHTLIGHTS (instead of key statistics)**

1, 675

675 student volunteers contributed to SDG 15 projects.

2, 100x faster

Conservation AI has the potential to make animal surveys up to 100 times faster.

3, 200Ha

LJMU AI Drone technology has been successfully tested on a 200Ha site in Madagascar

4, £650m

The Natural Capital Hub advised on evaluating the £650m Nature for Climate Fund

# PEACE, JUSTICE AND STRONG INSTITUTIONS

PROMOTE PEACEFUL AND INCLUSIVE SOCIETIES FOR SUSTAINABLE DEVELOPMENT, PROVIDE ACCESS TO JUSTICE FOR ALL AND BUILD EFFECTIVE, ACCOUNTABLE AND INCLUSIVE INSTITUTIONS AT ALL LEVELS

Around the world, we need peace in every sense. Compassion and a strong moral compass is essential to every democratic society. Yet, persecution, injustice and abuse still runs rampant and is tearing at the very fabric of civilisation. We must ensure that we have strong institutions, global standards of justice, and a commitment to peace everywhere.

LJMU is committed to creating a peaceful and inclusive society. We're recognised as an Armed Forces friendly organisation and have received the gold award from the Ministry of Defense Employer Recognition Scheme. We also work closely with Merseyside Police, with LJMU being one of the biggest training providers of ‘blue light’ students in the North West. These graduates are the people you go to in an emergency; police, paramedics, nurses and midwives.

“Through our many partnerships with police, NGOs, forensic examiners, international organisations and forensic institutes, we intend to influence the diversity and inclusivity of forensic research, both for researchers themselves and for the wider implementation into forensic investigation”.

**Professor Caroline Wilkinson, Director, FORRI**

EDUCATION AND STUDENT EXPERIENCE

**Student law clinic provides vulnerable groups with support through court**

LJMU has partnered with Support Through Court, a social justice charity providing free help to vulnerable people facing court.

Through this initiative, our Law students run an on-site service at Liverpool Civil and Family Court. Working through the Legal Advice Centre, hosted in Liverpool Business School, our students enable the charity to continue to offer its life-changing work in Liverpool City Region.

All our student legal support is provided for free and on a face-to- face basis. In 2022-2023, LJMU clinics delivered an estimated total of £1.3m of legal services to communities and organisations in the City Region.

RESEARCH AND KNOWLEDGE EXCHANGE

**Families lay war dead to rest in Cyprus**

Families in Cyprus can lay their relatives to rest after more than 50 years as LJMU forensic anthropologists recovered and identified remains from multiple war graves.

The team visited Cyprus in the summer of 2023 to excavate five graves known to contain the remains of Greek-Cypriots and Turkish-Cypriots killed during the conflicts between 1964 and 1974. The team has worked with the Cypriot government for over two decades to investigate war graves and recover remains. They have developed identification methodologies that have enabled the return of over 300 victims of armed conflict to their families, providing them with important answers about what happened to their loved ones.

**Launch of new Forensic Research Institute**

LJMU has launched the Forensic Research Institute (FORRI), a research and training cohort of over 100 researchers with expertise in evidence collection, analysis, reporting and testimony. FORRI’s current research focuses on craniofacial analyses, combatting illegal animal trade, crime scene reconstruction, CCTV analysis with machine learning, and psychological rehabilitation of sexual violence perpetrators. FORRI works closely with criminal justice agencies to apply its research in all settings, from crime prevention to victim identification and support.

FORRI is a pan-university institute, giving a single platform for LJMU research to liaise with the criminal justice system, funding bodies, and the regional, national, and international forensic research communities.

PLACE AND PARTNERSHIP

**Collaborating Centre for Violence Prevention**

LJMU hosts the global World Health Organisation Collaborating Centre (WHO CC) for Violence Prevention. WHOCC status empowers us to develop collaborative work on violence prevention and at all geographic levels.

The WHOCC at LJMU takes an applied approach to violence prevention. We provide a range of knowledge, skills, resources, and evidence that organisations need to assess and address violence. Our specialist expertise falls in youth and alcohol-related violence, including in nightlife. Our new resources cover knife violence, elder mistreatment, and violence against individuals who have disabilities. We develop intelligence systems providing multi-agency data on violence; original research among diverse population groups to strengthen understanding of the drivers and consequences of violence; systematic literature reviews to provide the most up-to-date knowledge of effective prevention; and intervention evaluations.

We encourage a stronger health sector role in violence prevention, including building the WHO’s capacity to calculate, interpret, and act on indicators of violence worldwide. In this work, we have reviewed, classified, and developed an evidence base of 763 studies to measure the effectiveness of violence prevention interventions.

We proudly support the Armed Forces and are signatories of the Armed Forces Covenant to acknowledge and understand those serving or who have served in the Armed Forces. In 2022, we achieved the silver award under the Ministry of Defence Employer Recognition Scheme. We celebrate Reserves Day (Wednesday 21 June) and Armed Forces Day (Saturday 24 June) on campus.

HIGHLIGHTS

1, £1.3m

We have given over £1.3m of free legal and business support through our student clinics.

2, 300

We have identified over 300 victims of armed conflict using forensic anthropology methods.

3, 763

We have built an evidence base of 763 studies on effective violence reduction

4, Silver Award

We achieved the silver award under the Ministry of Defence Employer Recognition Scheme in 2022

# PARTNERSHIP FOR THE GOALS

STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALISE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT

The Global Goals can only be met if we work together. International investments and support are needed to ensure innovative technological development, fair trade and market access, especially for developing countries. To build a better world, we need to be supportive, empathetic, inventive, passionate, and above all, cooperative.

As an institution, we are actively working towards these goals by prioritising actions to align our teaching and curriculum with the SDGs. To aid research, we’ve launched several research institutes, to facilitate knowledge exchange, and internationally, over 20,000 students are studying with us in our 25 partner institutions, across the globe, making us the fourth largest provider in the UK.

“This is a catalyst for university leaders, professional services, and academics wanting to learn new digital pedagogies through collaborative events, and to share ideas with peers in Vietnam.”

**Professor Tony Wall, Liverpool Business School, UK Lead of the Digi:Đổi Consortium**

EDUCATION AND STUDENT EXPERIENCE

**International partnerships**

International partnerships advance SDG progress through positive change to policy, enhanced organisational outcomes, and empowering people who are thousands of miles apart yet share the same goals.

Over the 2022/23 academic year, LJMU worked with over 16 international education partners to serve a transnational education student base of 21,780, up from 14,925 in 2021-22. LJMU is immensely proud of jointly developing graduates who make such a positive contribution worldwide. We are especially keen to see our international partner students embrace the lifelong learning ethos in their careers and post-graduate studies, particularly those who would not have accessed higher education without our partnerships.

RESEARCH AND KNOWLEDGE EXCHANGE

**Driving digital transformation in the UK and Vietnam**

Funded by the British Council Vietnam, LJMU is leading the Digi:Đổi Consortium – a global network to deliver a future-proofed, scalable digital transformation hub in Vietnam in collaboration with the Ministry of Education and Training in Vietnam and the Association of Vietnamese Universities and Colleges. Together, we are promoting digital cultures in higher education and involving digital technology companies to support national scale developments.

The Digi:Đổi Consortium ("đổi” means “transformation” in Vietnamese) is making policy recommendations to drive mutual digital transformation in universities across Vietnam and the UK by pooling expertise. It has created over 300+ transformation projects, including 10 collaborative online international learning experiences. More than 500 tutors and teaching teams are working with the project, and more than 3000 university students have been engaged and involved in co-design in both countries.

**Leading an international partnership with Malaysia**

LJMU is the Secretariat of the UK-Malaysia Consortium (UK-MUC), launched by the British Council in Malaysia in January 2022 for strategic cooperation between 16 UK and 23 Malaysian universities.

Working with the British Council Malaysia, the Department of Higher Education Malaysia and the Department for International Trade UK, UK-MUC has generated long-term collaborations and shared priorities aligned with the Malaysian Higher Education Blueprint 2015-2025 and the UK International Education Strategy. Under LJMU’s Secretaryship, UK-MUC has enabled 78 international workshops, conferences, and other activities covering transnational education, mobility, research, and technical and vocational education.

PLACE AND PARTNERSHIP

**Our commitment to the Sustainable Development Goals**

We are leading by example in our commitment to the UN SDGs.

In 2014, we joined the Athena SWAN Charter, and received an Institutional Bronze award, in recognition of our ongoing work relating to gender equality. We signed the Race Equality Charter in 2022, helping us to break down institutional and cultural barriers for Black, Asian and Minority Ethnic staff and students.

We are institutional signatories of the Armed Forces Covenant, demonstrating our proud commitment to peace, justice and strong institutions.

We declared a climate emergency in 2020, implementing the LJMU Climate Action Plan and LJMU Sustainability Report. Our staff lead the way in research and teaching, which provides solutions to local, regional, and global challenges of climate change³.

We are leading up to the launch of the Liverpool Research Institute for Climate and Sustainability, a new interdisciplinary focus point to enable the transition to a more sustainable future. The Institute is led by researchers who are investigating actions and long-term initiatives to secure a greener and more equitable future. The Institute will bring together staff with expertise across the breadth of the Sustainable Development Goals, with strands emphasising LJMU’s strengths in research on climate, health, consumption and production.

HIGHLIGHTS (update from key statistics)

1, 21,780

LJMU partnerships empowered 21,780 transnational education students to pursue higher education in academic year 2022-2023.

2, 3,000

The Digi:Đổi Consortium has engaged over 3,000 students in Vietnam and the UK.

3, 78

The UK-MUC has enabled 78 workshops, conferences, and other strategic collaborations between UK and Malaysian universities.

4, 2022

We declared a climate emergency in 2020 and implemented the LJMU Climate Action Plan.

# NEXT STEPS

This report highlights our commitment to the UN Sustainable Development Goals throughout the academic year 2022/2023. Our passion for a more sustainable and equitable world has seen further developments since this time, with key actions, goals and milestones achieved across our leadership and governance, education and student experience, research and knowledge exchange, place and partnership as well as campus management initiatives, which align with the goals.

**Carbon Net Zero**

Our ambition is to achieve a net zero carbon future.

To do this the university is investing in sustainability work with the recruitment of additional staff and funding resources allocated to climate and sustainability programmes and projects all whilst further embedding sustainability and climate justice into the curriculum for every student.

**Environmental initiatives on campus**

LJMU has been recognised for its environmental initiatives on campus following an external inspection.

EcoCampus, an environmental management scheme for higher and further education, has awarded the university silver status.

Auditors visited LJMU for a tour of our facilities, to interview members of staff and review environmental and sustainability policies and procedures.

The award demonstrates that LJMU meets the required standards for silver and is well placed to work towards gold status.

It reflects the commitment to embedding sustainability and responsible environmental management in every element of the university, from the curriculum to operational activity on campus.

The university has successfully reduced the energy consumption of our operational estate by 20% since 2021/22 and in the last year has set out plans to reduce further to deliver our Climate Action Plan. We completed a comprehensive decarbonisation plan to identify the technologies and pathway to achieving net zero carbon, while a new carbon management plan sets out hard and soft measures to reduce emissions over the next five years, including, for the first time, scope 3 targets and activity.

During the year, we undertook a campus-wide photovoltaic feasibility study to enable us to target installation and maximise our clean generation of electricity.

Meanwhile, an environmental study has revealed dozens of species of wildflowers and grass are thriving across our estate. The findings come from the university’s participation in Plantlife’s No Mow May initiative, in which three areas of lawn across the campuses were left to grow throughout the month. The findings will help to inform a future Biodiversity Plan for LJMU, which will deliver on the university’s commitment to increase biodiversity across the estate.

**Climate and Sustainability Research Institute**

As part of our Climate Action Plan, LJMU is launching a new research institute to bring together and accelerate world-leading research around climate and sustainability.

Launching in autumn 2024, The Liverpool Research Institute for Climate and Sustainability (LiRICS) will take a pan-university approach to research and knowledge exchange in order to deliver impactful solutions to the challenges faced by society.

The research institute has four objectives around sustainability and climate action research and knowledge exchange which includes, increasing external income, increasing the volume of internationally excellent and world-leading outputs, creating educational opportunities for behaviour change and enabling collaborative engagement and impact initiatives for internal and external stakeholders. A key focus for the new institute will be transformational activities with external partners.

**Liverpool Centre for Olympic Research on Inclusion**

Ahead of the Paris 2024 Games, LJMU held a launch event for the new Liverpool Centre for Olympic Research on Inclusion (LCORI).

The centre is the first to focus exclusively on inclusion and joins a network of Olympic Study Centres across the globe.

The centre’s vision is to create a global community in which everyone is included and able to participate in society, regardless of their ability, gender, ethnicity or socio-economic background, and where change is encouraged and celebrated to deliver this inclusive global community.

Its purpose will be to advance knowledge and practice related to inclusion and participation for all in events and the impact this may have on society.

Following the launch, academic members from across LJMU’s Liverpool Business School, School of Sport and Exercise Sciences and Public Health Institute will work with global partners to deliver real-life impact on projects that focus on The Olympic Games, sport and inclusion.

**Maritime expertise supporting sustainable shipping**

LJMU’s expertise in marine engineering and technology is central to a project to develop new battery-powered ships.

The university’s School of Engineering is the research partner in a consortium working on sustainable solutions for electric vessels.

The project, led by Bibby Marine along with LJMU, the Port of Aberdeen, Shell, ORE Catapult, DNV and Kongsberg, received a £20 million investment from Innovate UK.

The home of the country’s first nautical college, LJMU is committed to leading research and innovation in the regional and global maritime industries.

**Free legal support for Windrush community**

An LJMU initiative is providing access to free legal advice to Windrush communities in the North West of England.

The Legal Advice Centre is working with the charitable grassroots organisation, Liverpool Advocates for Windrush, to offer specialist help to the Windrush generation and their descendants, many of whom have found their legal status in Britain in doubt.

The Windrush generation are people who migrated to the UK from Commonwealth countries between 1948 and 1973 and take their name from the ship HMT Empire Windrush which brought the first immigrants.

Its thought there are thousands of people across Merseyside who are entitled to justice and compensation.

LJMU’s School of Law runs the Legal Advice Centre, which offers initial advice and guidance on family, disputes, commercial matters and other legal matters.

**Cheshire and Merseyside Social Value Award**

LJMU is the first university to be recognised with a Cheshire and Merseyside Social Value Award in acknowledgement of our dedication to creating social value across the region.

The award celebrates LJMU as an anchor institution with a university-wide effort contributing to impactful social value through projects and initiatives such as tackling period poverty by providing free menstrual products for students, staff and visitors on campus; supporting local communities through pro bono business, accounting and legal advice clinics; and partnerships with industry to find sustainable solutions to challenges such as climate change and supporting the adoption of innovative new technologies.

The award application was driven by the Centre for Management Development and Innovation at LJMU, a partnership with Liverpool University Hospitals Foundation Trust (LUHFT), which combines academic rigour and real-world application to support the improvement of culture, processes, innovation and practice through the enhancement of management and leadership.