Please use the comment feature to add your thoughts to each slide:
(1) What can be strengthened? (1) Anything missing?

"Climate Change" Research Institute: Scoping Document

Vote for or suggest names here

Introduction and context

- Climate change, adaptation and resilience are global challenges recognised internationally (IPCC, Paris Agreement)
- LJMU has called a climate emergency, and developed a climate action plan (net zero 2035) and 2030 strategy – sustainability is a core strand
- Climate change has critical mass spanning all faculties of LJMU
- LJMU submitted its first *Times Higher Impact Rankings* report, with many impact exemplars contributing to climate change adaptation and resilience
- Opportunity to position the Institute in a way to accelerate impact.

Build: work with traction - existing institutes and centres

Faculty of Engineering and Technology

Built Environment and Sustainable Technologies Research Institute

LOOM Liverpool Logistics, Offshore and Marine Research Institute

Novel and Bio-Based Materials

Radio Frequency & Microwave research

Building Engineering and Construction Practice

Sustainability & Energy Management

Sensor Development

Faculty of Arts Professional and Social Studies

Sustainability and Social Justice Research Group.

The Centre for Educational Research (CERES)

Natural Curriculum

Faculty of Science

Geography and Environmental Science

Sustainable Societies

Sustainable Environments

Environmental Change

LJMU Biodiversity and Conservation Group

Faculty of Health

Public Health Institute **Environment and sustainability**

Faculty of Business and Law

Principles of Responsible Management Education (PRME)

Pan-University

Institute for Health Research

Green Spaces Research Group

Business and Sector Collaboration

Low Carbon Eco-Innovatory.

Aims and Objectives

- Overarching aims:
  - To drive **co-action towards place-based climate change adaptation**, leveraging research and knowledge exchange activity which delivers practical solutions to the priorities of key regional, national and international stakeholders.
- Objectives: To increase collaboration across subjects and stakeholders in:

  O1 External grant income capture including doctoral partnerships and KTPs (RKE/Place)

  O2 Internationally excellent and world-leading outputs and thought leadership (R)

  O3 Opportunities for behaviour change including through educational provision, mentoring and SME support (business clinics) (T&L)

  O4 Collaborative engagement and impact initiatives jointly designed with external impact partners (RKE)

Build: work with traction –central role of climate action

Source: LJMU (2023) Sustainable Development Goals Liverpool John Moores University Report 2022/2023.

1
Supporting Open-Source Construction in Uganda

2
Developing nature-based solutions for food security
Creating spaces for urban farming in the city centre

4
Supporting African students online with Unicaf
Climate and outdoor education in teacher training

6
Managing water consumption on campus
Helping islanders adapt to sea-level rise
Creating a sustainable research centre

7
Extending electric vehicle lifespans with a new solder
Producing biogas from pig slurry
Testing new domestic technologies in our Exemplar houses

8
Supporting SME innovation at the Low Carbon Eco Innovatory

9
Shaping the manufacturing industry of tomorrow

11
Active and Sustainable Travel Plan
Prolonging the life of our roads and reducing resurfacing
Creating sustainable green travel corridors
Increasing green travel uptake through the Smart Green Journey app
Sustainable road building using demolished infrastructure

12
Sustainable fashion through traditional crafts
Turning industrial waste into new bricks
Minimising the environmental impact of mining in the Philippines
Providing local and sustainable food options

13
Leading the way in undergraduate education on climate change
Combining ecology research with astrophysics techniques to tackle peat fires
Increasing flood resilience in Cumbria
Using innovative architecture to reduce carbon emissions

14
Trawling remote polar seas for microplastics
DNA detectives use crime scene methods to curb illegal wildlife trade
Supporting maritime innovation

15
'Greening up' our campus
Putting nature at the centre of planning policy
Applying nature-based solutions to climate change

17
Showcasing sustainability in business education
Driving digital transformation in the UK and Vietnam
Our commitment to the Sustainable Development Goals

Filho, W.L., Wall, T., Salvia, A.L. et al. The central role of climate action in achieving the United Nations' Sustainable Development Goals. *Scientific Reports* 13, 20582 (2023). https://doi.org/10.1038/s41598-023-47746-w.

ljmu.ac.uk

Further specific examples from the November 2023 Design Sprint

Selected examples from the Workshop

- Resilience of houses to cyclones under climate change in Madagascar,
- Resilience to flooding in Ghana
- Coastal resilience – a number of partner universities in Vietnam and India
- Climate change and agriculture, visiting fellow at LJMU from India, built from previous NERC and Ministry of Earth Sciences, India, with partner universities
- Organisation of international conference on resilience of water supply systems, NERC and Ministry of Earth Sciences, India
- Eco-literacy – Philippine project –storying literacy beyond linguistic expression towards ecological and socio-cultural expressions that affect livelihoods and planet
- Carbon Awareness in Education - 'rewilding education' - reframing education
- Experience in writing REF case study (2014) - coastal adaptation to climate change
- WIREs Climate change publication – climate change impacts on cultural heritage
- UN2030 Hub
- CGUK (Clean Growth UK) - Brighton University, Portsmouth Uni & LJMU
- LCEI funding – vertical farming.
- DESNZ funding – OMENZ, Biorenewable fuels.
- Networks: UKUAT, SEB and PEPG. IPRS.
- Industry partners [Mersey Waters, Merseyside ENv Services,
- Policy links – DEFRA, Natural England, Environment Agency, HIstoric England, Impact Case Studies current and future e.g. environmental literacy
- Natural Capital Hub – links with UK Government agency and departments, local government, LCR LNP etc. over £1 million in income generation last 3 years.

Some examples from the Workshop

- Nature North collaboration – inc. Environmental organisations + those outside that have a material interest in nature recovery.
- LCRCA – links with housing retrofit team –BRE? Test houses – LCR Natural Capital working group, Spatial Develop Strategy, Climate Action Plan.
- Eco-Innovatory
- Centre for Research into Energy Demand Solutions, now the Energy Demand Reseach Centre – NS has received grants from these previously, future grant opportunities will become available
- Wirral Waters/Peel – ongoing regeneration in Birkenhead. They are planning to develop a community "eco hub" - to advise and train people on sustainability, housing retrofit. LJMU could have a presence here.
- Big Help Project – a charity in Liverpool (https://www.bighelpproject.com/). They are currently seeking funding to develop a climate/sustainability hub that will help disadvantaged communities engage with climate change issues whilst also improving their health and wellbeing (e.g. through reduced energy bills, warmer homes).
- Fuel Poverty Research Network – UK wide network of fuel poverty researchers and organisations
- EU Energy Poverty Advisory Hub
- InterPEAT: Includes a highly networked Innovate KTP
- Freeport DTP – Thanh (leading)
- External partners, organisations and stakeholders – also links to Place and Partnership theme
- 2030 HUB organisation
- Equipment and monitoring resources across faculties
- Uk-Malaysia British Council consortium
- Capitalise on links to health organisations/NHS. Health and wellbeing, access to nature, air quality etc. Intersection of climate/environment and health

Impact – Build on Case Studies

Relevant LJMU Research Impact Case Studies

- Racing the King Tide – Documenting Adaptation to Sea Level Rise
- Astro-Ecology: Tackling peat fires – a major contributor to climate change - using thermal imaging and drone technology
- Low Carbon Solutions
- Transport logistics systems: resilience and sustainability

Relevant LJMU Research in Liverpool City Region

- **Smart Energy, Smart Care**
- **Low Carbon Solutions**

Critical mass of LJMU research publications

Climate Change
500 LJMU publications[1]

SDG13 Climate Action
157 publications[2]

Sustainability
118 publications[3]

1 Climate Change search term Scopus 2018 to 2023
2 SDG 13 Climate Action SciVal 2020 to October 2023
3 Sustainability search term Scopus 2020 to 2023

LJMU SDG 13 Research Performance

Overall research performance	Overall	2020	2021	2022	2023
International Collaboration (%)	84.1	85.4	78.4	79.5	94.3
Field-Weighted Citation Impact	2.3	2.6	1.5	2.4	2.6
Citations per Publication	12.5	25.0	14.3	7.9	1.7
Outputs in Top Views Percentiles (top	39.0	45.0	43.2	43.2	21.2
Authors	**1028**	**318**	**228**	**299**	**328**

Publications at Liverpool John Moores University within SDG 13: Climate Action (2023) | 2020 to 2023 YTD

LIVERPOOL JOHN MOORES UNIVERSITY

LJMU SDG 13 Top 20 Research Clusters

Topic Cluster	Scholarly Output	Publication Share	Field-Weighted Citation Impact	Worldwide Prominence Percentile
Aerosols; Air Quality; AtmosphericAerosols TC.42	17	0.05%	1.91	96.99
Concretes; Compressive Strength;Cements TC.68	16	0.03%	2.67	98.997
Galaxies; Stars; Planets TC.1	14	0.03%	2.79	97.659
Forests; Landscapes; Plants TC.151	7	0.02%	1.5	95.251
Buildings; Air Conditioning;Ventilation TC.176	7	0.02%	1.02	97.391
Climate Models; Model; Rainfall TC.5	6	0.01%	1.19	98.863
Electricity; Energy; Economics TC.81	6	0.01%	1.13	99.666
Disasters; Floods; Risks Tc.438	5	0.02%	2.88	92.441
Water; Water Resources; WaterManagement TC.527	5	0.04%	2.05	83.144
Glaciers; Holocene; Glacial Geology TC.103	4	0.02%	2.01	88.562
Asphalt; Pavements; Asphalt Pavements TC.389	4	0.02%	0.67	91.505
Heavy Metals; Soils; Cadmium TC.214	3	0.01%	0.11	93.712
Solar Energy; Photovoltaic Cells; SolarRadiation TC.340	3	0.01%	1	94.649
Primates; Pan Troglodytes; Behavior TC.350	3	0.04%	1.79	63.144
Calcium Carbonate; Calcite; Fouling TC.758	3	0.04%	2.82	79.264
Electric Power Transmission Networks;Wind Power; Electric	2	0.00%	0	99.465
Remote Sensing; Image Classification;Satellite Imagery TC.153	2	0.00%	5.95	97.458
Ozonization; Degradation; WastewaterTreatment TC.206	2	0.00%	12.18	99.264
Exergy; Heat Pump Systems;Rankine Cycle TC.271	2	0.01%	2.29	95.05
Media; News; Journalism Tc.279	2	0.01%	1.51	90.435

SDG 13 Publications by School

LJMU researchers consistently publishing **high proportion of outputs** with international collaborations above 80% (LJMU benchmark is ~70%)

SDG 13 Climate Action search term 2020 to 10/10/2023, Scival

School	Number of staff	Scholarly Output
CBE	22	96
BES	14	50
ENR	5	21
ARI	7	14
LBS	6	14
CSM	3	3
PBS	2	3
LSS	1	2
Total	**60**	**203**

Benchmarking

LJMU Scopus Benchmark with SDG 13 Climate Action:

- Western Sydney University (THE leader)
- University of Central Lancashire
- University of Chester
- University of Liverpool
- University of Salford

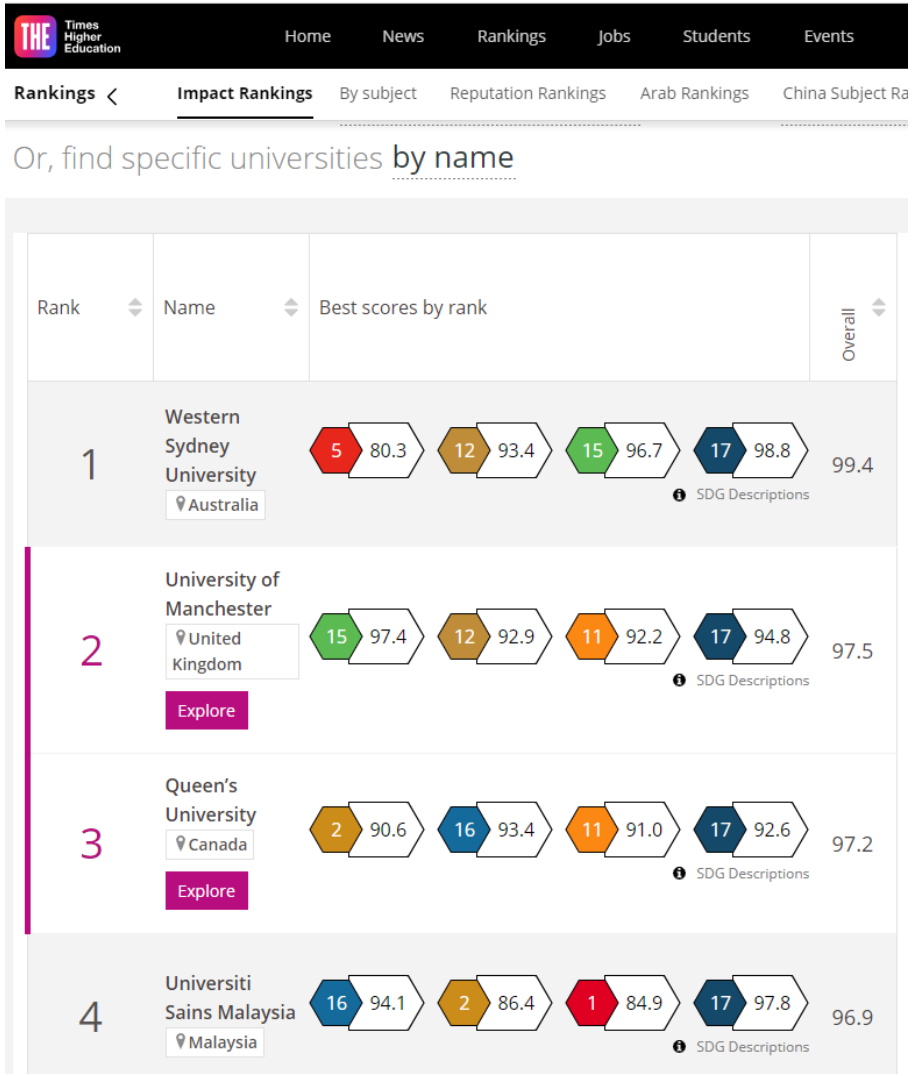
Sustainability Publications by School

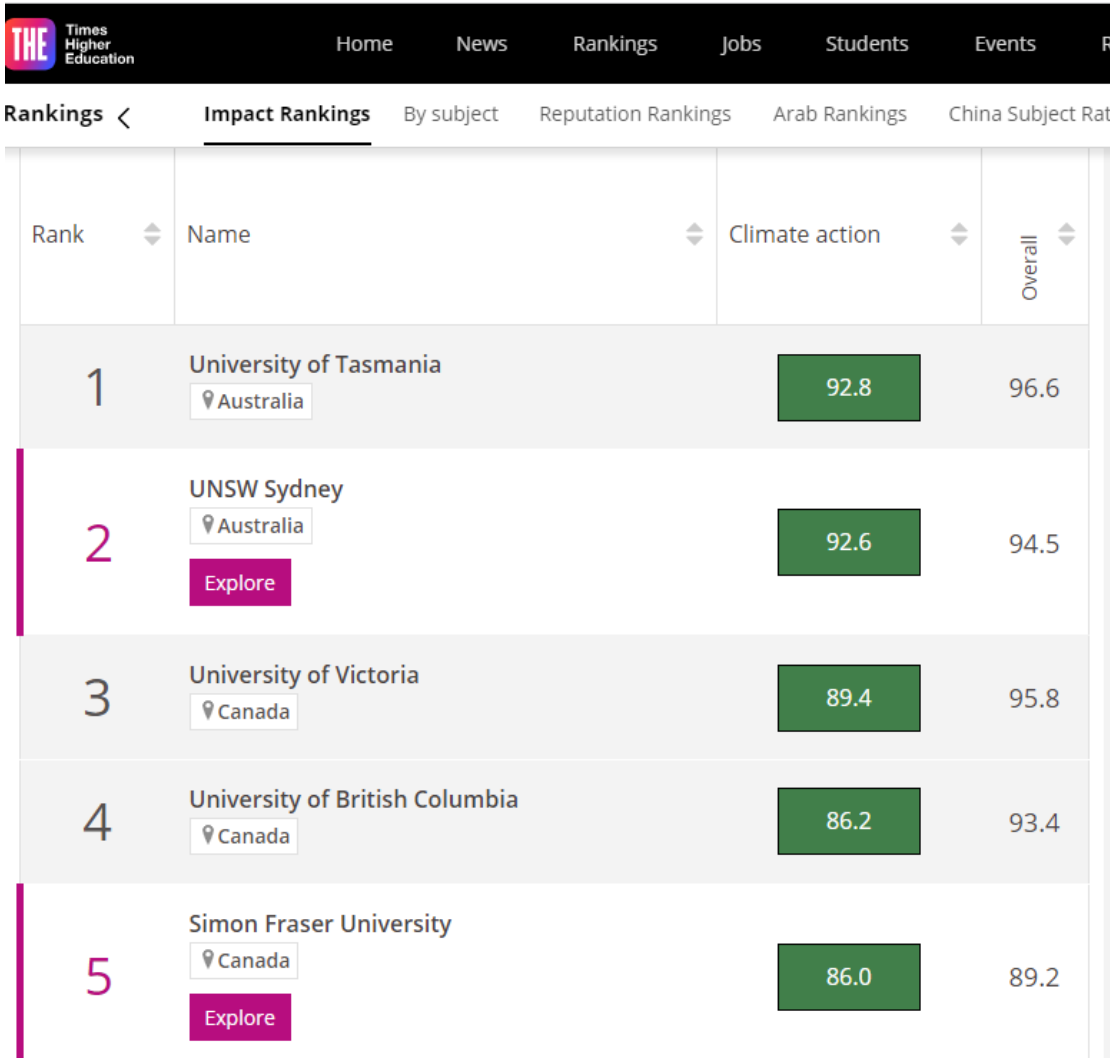
Sustainability[3]
119 publications

Sustainability search term, LJMU
Scopus publications 2020 to 2023

School	Number of sustainability publications
CBE	43
LBS	29
BES	15
ENR	14
PBS	5
EDN	4
CSM	2
HSS	2
SPS	2
LSA	1
NAP	1
PSY	1
TOTAL	119

THE Rankings SDGs and Climate Action

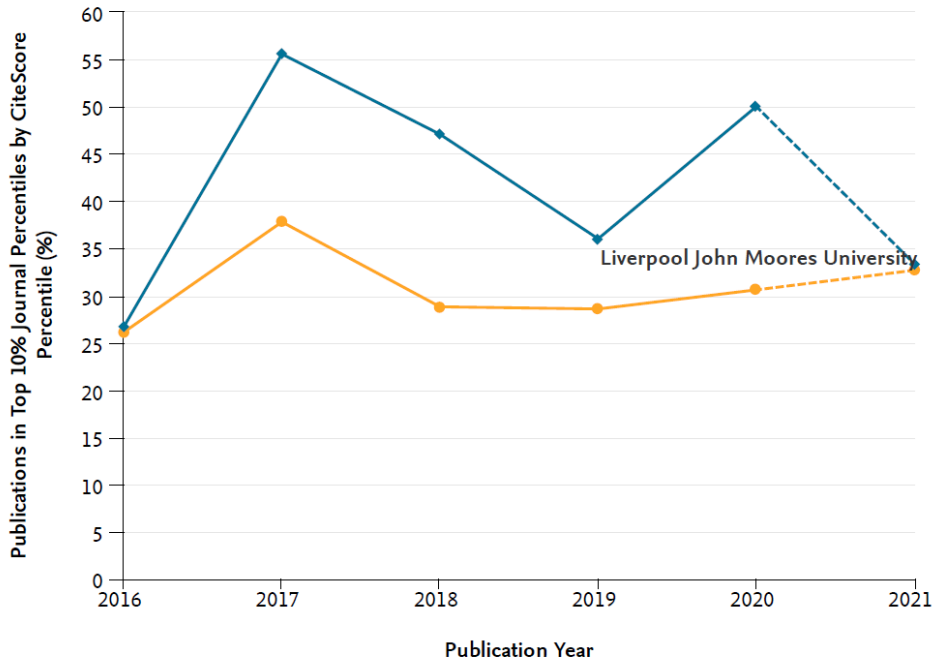




SDG 13 research **above** overall LJMU benchmark

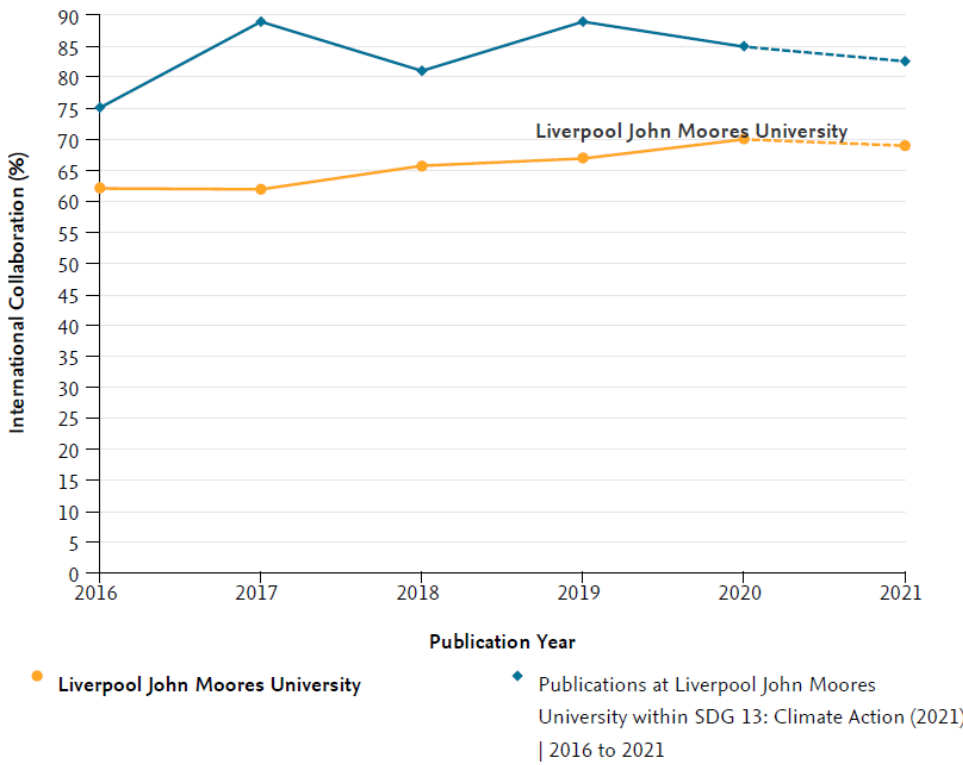
SDG13 publications benchmarked against LJMU. Publication Year and Publications in Top 10% Journal Percentiles by CiteScore Percentile (%)

Year range: 2016 to 2021 · Data source: Scopus, up to 26 Jan 2022 ·



Benchmarking the Publication Year and International Collaboration (%)

Year range: 2016 to 2021 · Data source: Scopus, up to 26 Jan 2022 ·



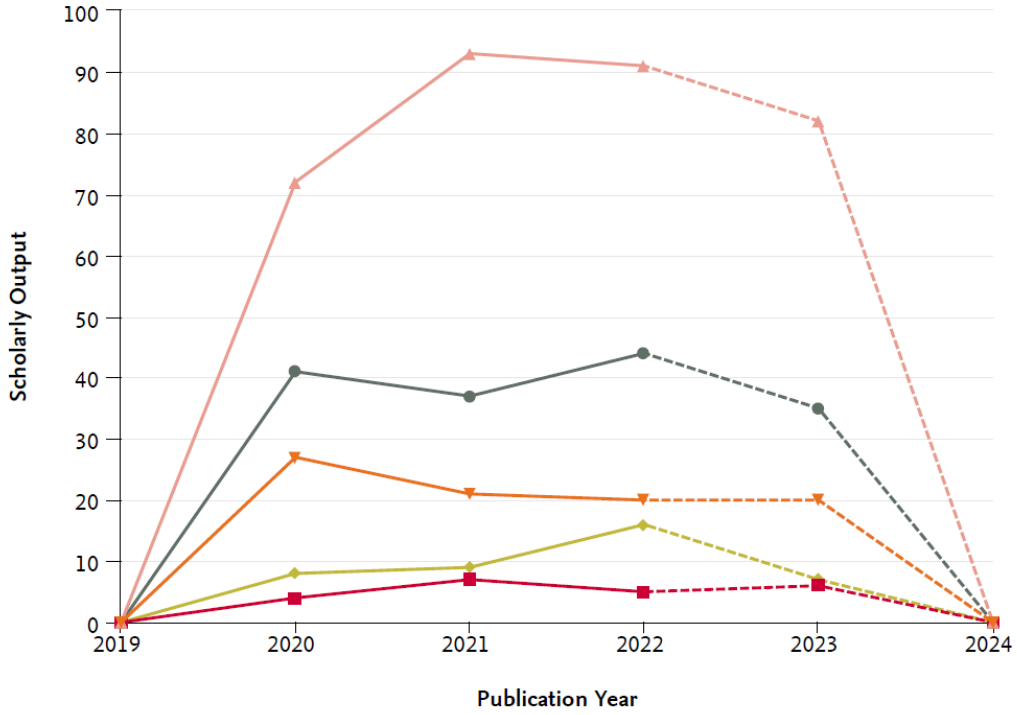
Climate research (SDG13) **above** peer group

Benchmarking SDG13 Publication Year and Scholarly Output

- Publications at Liverpool John Moores University within SDG 13: Climate Action (2023) | 2020 to 2023
- Publications at the University of Central Lancashire within SDG 13: Climate Action (2023) | 2020 to 2023
- Publications at the University of Chester within SDG 13: Climate Action (2023) | 2020 to 2023
- Publications at the University of Liverpool within SDG 13: Climate Action (2023) | 2020 to 2023
- Publications at the University of Salford within SDG 13: Climate Action (2023) | 2020 to 2023

Benchmarking SDG13 Publication Year and Scholarly Output

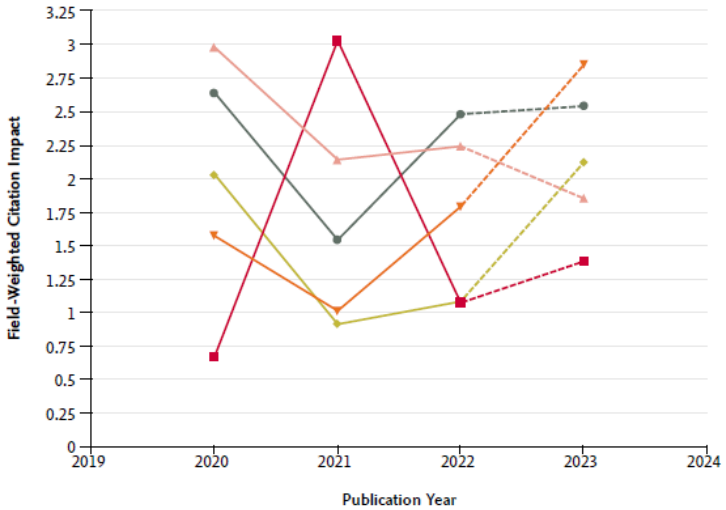
Year range: 2019 to 2024 · Data source: Scopus, up to 11 Oct 2023



Relative **strong** performance in Impact, Top 10 and **above** peer group for international collaboration

Benchmarking SDG13 Publication Year and Field-Weighted Citation Impact

Year range: 2019 to 2024 · Data source: Scopus, up to 11 Oct 2023



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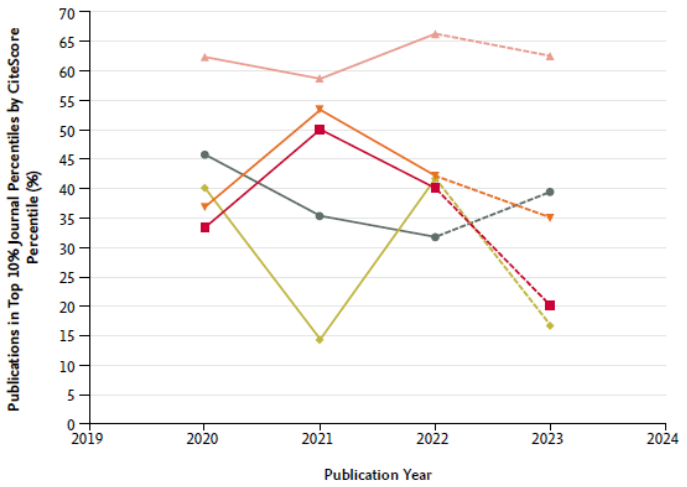
- Publications at the University of Liverpool within SDG 13: Climate Action (2023) | 2020 to 2023
- Publications at the University of Salford within SDG 13: Climate Action (2023) | 2020 to 2023

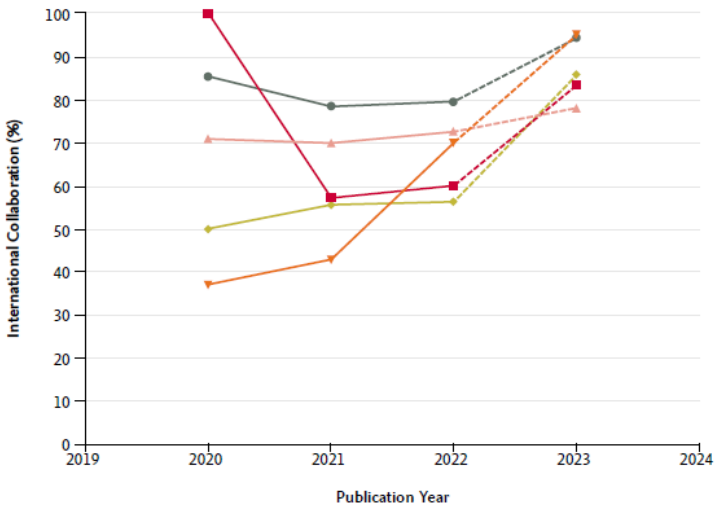
Benchmarking SDG Publication Year and Publications in Top 10% Journal Percentiles by CiteScore Percentile (%)

Year range: 2019 to 2024 · Data source: Scopus, up to 11 Oct 2023



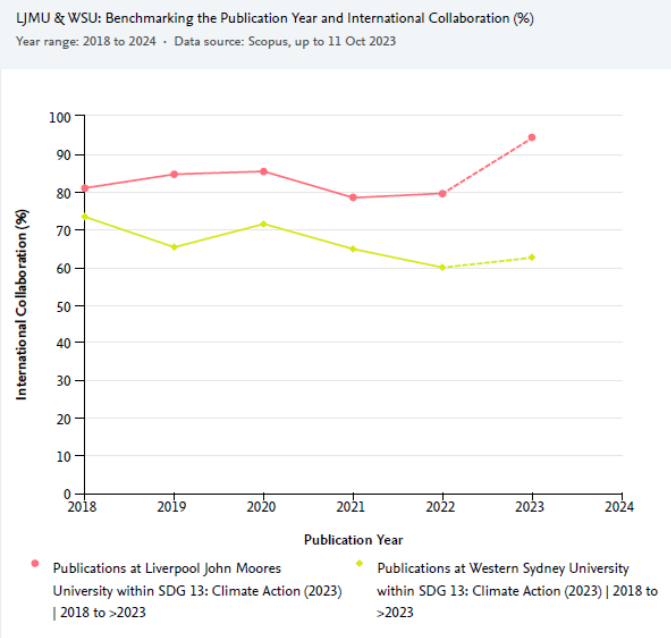
Benchmarking SDG13 Publication Year and International Collaboration (%)

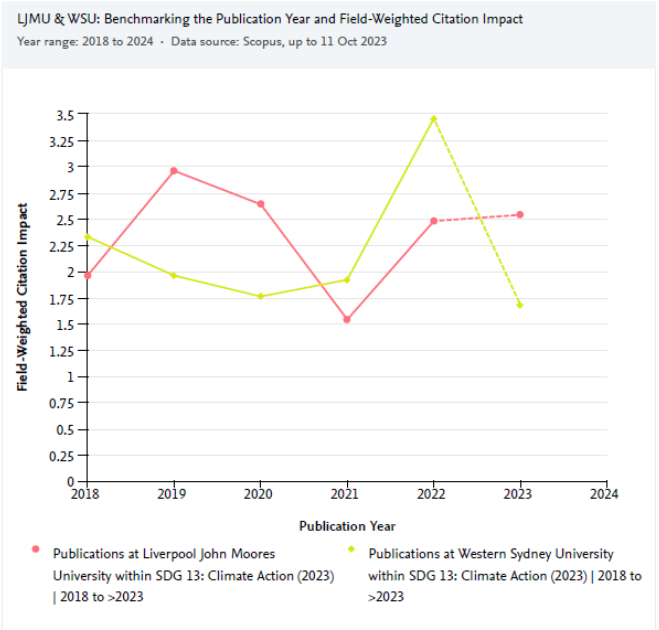
Year range: 2019 to 2024 · Data source: Scopus, up to 11 Oct 2023

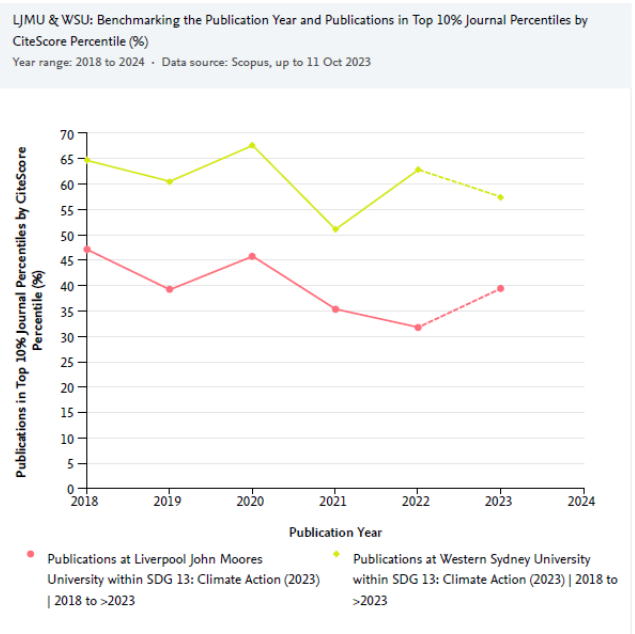


- Publications at Liverpool John Moores University within SDG 13: Climate Action (2023) | 2020 to 2023
- Publications at the University of Central Lancashire within SDG 13: Climate Action (2023) | 2020 to 2023
- Publications at the University of Chester within SDG 13: Climate Action (2023) | 2020 to 2023
- Publications at the University of Liverpool within SDG 13: Climate Action (2023) | 2020 to 2023
- Publications at the University of Salford within SDG 13: Climate Action (2023) | 2020 to 2023

Positive benchmarking against Western Sydney University (THE leader)







LJMU publishes ~30% fewer outputs compared to WSU but in terms of FWCI (a metric that is proxy for quality), LJMU research is holding its own.

Comparator Centres and Institutes

Liverpool John Moores University Built Environment and Sustainable Technologies Research Institute - BEST focuses on tackling sustainability challenges in civil engineering and built environment through innovative technologies and effective management practices.

UCLAN - Research Centre for Sustainable Transitions - brings together engineers, social scientists, architects and psychologists to address the challenges of climate change. Centre for Global Development - brings together researchers from all subject areas to develop robust and equitable research partnerships that will address major challenges to society.

University of Liverpool - Centre of Excellence for Sustainable Food Systems (CESFS) **-** brings together knowledge and research of biological, management, behavioural, and climate sciences to improve health and the environment. Heseltine Institute for Public Policy, Practice and Place - brings together academic expertise from across the University with policy-makers and practitioners to support the development of sustainable and inclusive cities and city regions. Research Centre for Marine Sciences and Climate Change **;** Stephenson Institute for Renewable Energy - specialist energy materials research institute, aiming to transform the future of energy generation, storage, transmission and energy efficiency. Zero Carbon Research Institute **-** designing strategies to help business achieve the UK Governments plan to become Net Zero Carbon (NZC) by 2050

LIVERPOOL JOHN MOORES UNIVERSITY

Circa 32 PhD Research Projects

Faculty	Status	Project title
Arts, Professional and Social Studies	Active	Evaluating Early Years Education for Sustainability in the in the UK to inform Education for Sustainability in Gibraltar
Arts, Professional and Social Studies	Active	An evaluation of Primary BA (QTS) trainees' efficacy for engaging in green spaces: Developing effective outdoor pedagogies to enhance the primary curriculum
Arts, Professional and Social Studies	Active	Doctoral Research Project
Business and Law	Leave of Absence	An investigation of internal CSR practices within the oil sector in Nigeria
Business and Law	Active	The role of Corporate Social Responsibility in Poverty alleviation in Pakistan
Business and Law	Active	Global Value Chains and Ethical Trade: A critical examination of approaches to responsible sourcing
Engineering and Technology	Active	Integrated Catchment Rainwater Harvesting Model Using GIS –Machine Learning Techniques for Agricultural Use Under Climate Change
Engineering and Technology	Active	Mandating the end of fossil-fuel heating systems in the UK houses: Sustainability assessment of alternatives and implications
Engineering and Technology	Active	Creation of a Decentralised Renewable Energy Infrastructure Plan, Design and Framework for Nigeria
Engineering and Technology	Active	Sustainability in the decommissioning process of UK offshore installations and the management of hazardous waste
Engineering and Technology	Active	A Framework for the Sustainability Assessment of Urban Regeneration in China
Engineering and Technology	Active	Renewable energy and strategies for mitigating energy shortages in West Africa with A use-case in Togo
Engineering and Technology	Active	Analysis of Sustainable Supply Chain Management (SSCM) Practice in the Ethiopian Coffee Supply Chain
Engineering and Technology	Active	A multi-criteria decision analysis for an environmental framework of a hybrid solar-wind-hydrogen power plant
Engineering and Technology	Active	Energy efficiency benefits of electric over hydraulic actuators in wind turbine blade pitch control systems
Engineering and Technology	Complete	A Novel Indoor Adaptive Thermal Comfort System to Reduce the Energy Consumption for the Residential Dwellings
Engineering and Technology	Complete	Investigation into the uses of Life Cycle Analysis (LCA) as an Alternative Method of Site Selecting Tidal Power Schemes
Engineering and Technology	Active	Development of a framework for the reliability and survivability design of Wave Energy Converters (WECs)
Engineering and Technology	Complete	Smart Grid Security Systems
Engineering and Technology	Active	A holistic approach to utilising animal waste for biogas energy generation in rural areas in Nigeria
Engineering and Technology	Complete	Development of Dielectric Spectroscopic Resonant Sensor for Application in Vegetable Oil Verification and Industrial Waste Oil Recovery Process
Engineering and Technology	Active	Integrated Modelling for evaluating environmental impacts of green packaging: a comprehensive study
Engineering and Technology	Active	Activated industrial sugarcane bagasse ash as an eco-efficient mineral addition to enhance the durability of cement-based materials.
Engineering and Technology	Active	Performance Evaluation of a Combined Floating Offshore Energy System (OFOES) in Operational and Extreme Conditions
Engineering and Technology	Active	Investigation into the viability of hydrogen fuels in commercial shipping vessels to improve shipping industry sustainability
Engineering and Technology	Active	Supply Chain Sustainability and Firm Performance Inquiry into Practice, Pressure, and Performance among Large and Medium Manufacturing Industries in Ethiopia
Science	Active	Past, present and future of disjunct distributions: applying a spatially explicit modelling approach to understand the causes of disjunct distributions and the implications for climate change vulnerability
Science	Active	A Natural Capital Approach to management of a UK estuary
Science	Active	Climate Change Impacts on Vulnerable Montane Ecosystems: Patterns and Mechanisms of Plant Community Responses to Experimental Drought and Warming
Science	Active	The ecological and biogeochemical processes involved in restoring peatland functionality: a practice-based approach for informing biodiversity and carbon sequestration policy and management.
Science	Active	"How can research into the interrelationship between environmental, social and cultural value systems be most effectively applied to inform decision-making, taking into consideration the natural capital approach. And what are the levers for improving both evidence-based policy and local action to increase biodiversity?"
Science	Active	Development of alternative land management strategies for lowland peat soil under agriculture to reduce greenhouse gas emissions and promote peatland ecosystem services

Teaching, LJMU and Home Collaborative partners

Course

30968 Water, Energy and The Environment
33261 Environmental Health
35556 Civil and Environmental Engineering
35719 Biological and Environmental Sciences
35720 Biological and Environmental Sciences
35728 Civil Engineering and Built Environment
35729 Civil Engineering and Built Environment
36718 Environmental Law
36753 Environmental Science
36790 Sustainability in the Built Environment
36376 Climate Change UG
36574 Climate Change and Sustainability PGT
36836 Climate and Environment Sciences UG
46376 Climate Change UG Fnd
46836 Climate and Environment Sciences UG Fnd
36186 Sustainability and Behaviour Change
36188 Sustainability and Ecology
36526 Sustainability and Behaviour Change UG
36527 Sustainability and Ecology
36788 Industrial and Systems Sustainability
36789 Industrial and Systems Sustainability
36790 Sustainability in the Built Environment
36791 Sustainability in the Built Environment

Co-design so far: Design Sprint Nov 23

Design Sprint Attendees and Subject

Faculty of Engineering and Technology	Faculty of Science
Faculty of Engineering and Technology	Faculty of Science
Faculty of Engineering and Technology	Faculty of Science
Faculty of Engineering and Technology	Faculty of Science
Faculty of Engineering and Technology	Faculty of Science
Faculty of Engineering and Technology	Faculty of Science
Faculty of Engineering and Technology	Faculty of Science
Faculty of Engineering and Technology	Faculty of Science
Faculty of Arts and Professional Services	Faculty of Science
Faculty of Arts and Professional Services	Faculty of Science
Faculty of Arts and Professional Services	Faculty of Science
Faculty of Arts and Professional Services	Faculty of Science
Faculty of Arts and Professional Services	Faculty of Science
Faculty of Business and Law	Faculty of Science
Faculty of Business and Law	Faculty of Science
Faculty of Business and Law	Faculty of Science
Faculty of Business and Law	Faculty of Science
Faculty of Health	Estates Development
Faculty of Health	ITS
Faculty of Health	Campus Management
Research and Innovation Services	Office of Registrar and COO

Word	Times used
Climate	46
Research	38
LJMU	31
sustainability	21
Education	20
Funding	16
Impact	14

What ways may the institute operate to maximise its impact?

Impact partners and collaborations:

- Accessible and visible list of partners and staff and school collaborations
- Climate Change Board with key partners on from LCR
- Tag staff profiles against SDGs
- Scopus and scival data to generate key collaborators in impact terms
- Thematic areas – P&P, RKE, People and Skills to collaborate
- Symplectic, email signature SDG tagging
- Local, regional, national and international stakeholders, beneficiaries and collaborators
- Tag all research outputs with SDG (where applicable)
- Policy and practical solutions in terms of who we work with
- Clear and visible website presence
- Working with local schools, teachers and pre-service teachers to educate next generation of pupils

What ways may the institute operate to maximise its impact?

Governance and structure

- Key core structure that links in/ secondees in additional staff / researchers for specific (sustainability) themes or stakeholder engagement.
- Research panels for papers – especially inter-disciplinary – for flexibility; also flexibility in funding;
- Defined leadership
- Enough resource (potentially initially unaligned).
- Project manager for institute to help joint the dots and make connections to other departments in the university - I.e. research support office.
- External representation on Board
- Admin support

What ways may the institute operate to maximise its impact?

Publications:

- Group publications
- Multidisciplinary publications
- Explore links of existing research topics/skills to climate
- Solution and mitigation – linked to policy
- Create an environment to assist in publication creation (time)
- Create an environment to assist in data production and analysis (people, facilities, computational resources)

What ways may the institute operate to maximise its impact?

Grant income / research income:

- Leverage of local/ad hoc funding
- TDPs - (inter)national
- Database/calendar for relevant research funding opportunities
- Influencing funding bodies
- Using internal funding more effectively to achieve net zero
- Group discussion to aim at targeted funding opportunities

What ways may the institute operate to maximise its impact?

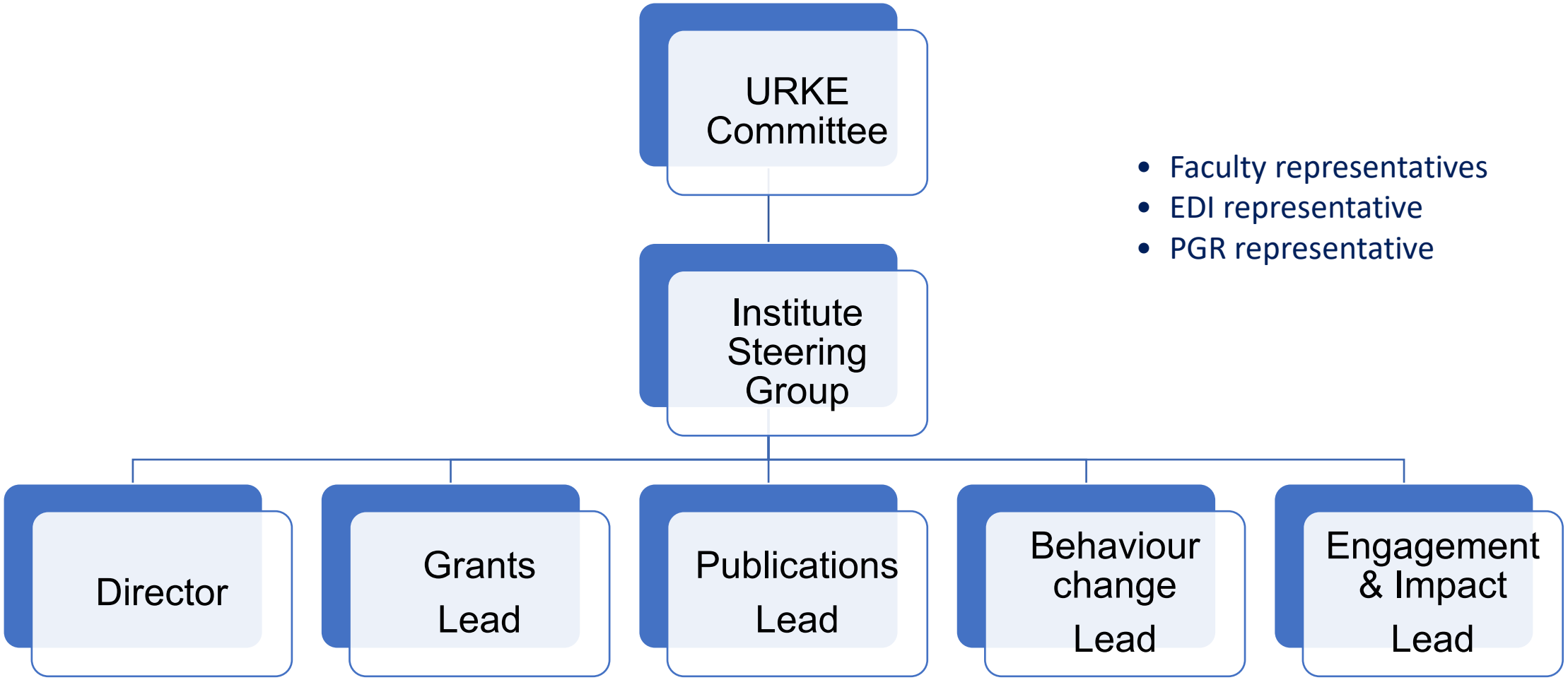
Postgraduate research students, staff development of staff (early, mid, established career):

- Funding generation, external engagement.
- Doctoral Training Programmes (external) - hub and spoke model (overarching topic and subthemes)
- Internships – for DTP offer and other students
- Match-funding/case-type research programme funding
- Training hub for PGRs and researchers
- Mentorship within institute for researcher development.
- SDG/Climate awareness raising in schools/depts who are we missing?
- Peer review/support for grants and papers

Plan to sustain research environment with income (QR investment, grants etc)

- Membership/acquisition of Doctoral Training programme
- Opportunity to secure both research and knowledge transfer income streams
- Partnership/external networks
- Plan of activities to maintain a vibrant research environment:
  - Seminars
  - Conferences
  - Visiting researchers
  - Enriching student experience/inspiring colleagues

Governance/membership



- Faculty representatives
- EDI representative
- PGR representative