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HOW THE UNIVERSITY OF PLYMOUTH IS SUPPORTING PLACE-BASED SOLUTIONS TO ACHIEVE CARBON NET ZERO

Summary

Successfully achieving carbon net zero will require profound changes to the UK economy and society. Appropriate solutions will need to be adopted at a national, regional and local level in cities, towns and neighbourhoods across the country. These solutions will vary across the country with no one-size fitting all. A place-based approach will be important. Universities are rooted in their respective city and regional networks and, as organisations where knowledge is gained, produced and exercised, they should play a key role at the forefront of leading the country's action to achieve carbon net zero.

"The great aim of education is not knowledge but action."

Herbert Spencer,
English philosopher (1820 - 1903).

The University of Plymouth has a variety of initiatives already underway to support place-based local climate action and these efforts were recognised with the institution coming fifteenth globally (out of 674 institutions) and second in the UK for its work on the United Nations Sustainable Development Goal 13 (Climate Action), within the 2022 Times Higher Education Impact Awards. The rankings are the only global performance tables that assess universities against the United Nations' Sustainable Development Goals (SDGs). This recognised the University's work to drive climate research and innovation, to support local climate action and its efforts to reduce energy use on its campuses. Building on this foundation, there are opportunities to accelerate

universities' climate action through developing specific funding to support local, place-based approaches. One route to achieving this could be through the new Shared Prosperity Fund and also universities' knowledge exchange and civic agendas.

Ranked 15th worldwide (2nd in UK) for Climate Action



Net Zero Visions workshop



Devon Climate Assembly hearing streamed from the Sustainability Hub

Key points

- Achieving net-zero is a whole-system challenge which requires sustained and coordinated action across all sectors of society.
- A successful net zero transition will require a place-based approach, driven by locally and regionally appropriate solutions that vary across the UK.
- Universities have an important role in helping the UK to meet carbon net zero; carrying out research and innovation, demonstrating national and global leadership, supporting education and skills development as well as developing sustainable campuses.
- Universities also have an important role in driving climate action locally; building on their independence, trust, networks and their range of expertise.
- By encouraging an interdisciplinary approach, universities will encourage the development of the integrated cross-sector net zero solutions that are required. Institutes that cut across different faculties, such as the University of Plymouth's Sustainable Earth Institute, can support this role.
- In order to truly unlock the potential support that universities can provide, dedicated funding for local climate action is required. One potential route to achieving this could be through the Shared Prosperity Fund and also universities' knowledge exchange and civic agendas.

Context

Science provides the evidence that climate change is happening and it indicates what the impact of climate change will be. The focus now needs to be on climate action. Greenhouse gases are emitted from every part of the UK economy. For the country to reach its carbon net zero target by 2050, sustained, co-ordinated action across government, business, academia and civil society is required. This transition will involve cross-sectoral thinking and complex interactions between technology, infrastructure, people, data, institutions, policy and the natural environment.

Achieving net zero is a whole-system challenge. Taking action will be a shared responsibility and a systems approach is needed to provide the framework to drive change across all levels of society involving individuals, community groups, social enterprises, businesses, charities and the public sector. Tackling poverty, inequality and deprivation must go hand-in-hand with strategies to improve health, education and support economic growth. Tackling climate change and preserving the natural environment must underpin all of this work. Universities are well placed to drive climate action forward and bring together these complex levels and sectors of society.

How universities can help the UK meet carbon net zero

Research and innovation will be an essential part of the drive to decarbonise. The implementation and enhancement of existing technologies will be as important as the development and adoption of emergent technologies. The UK Net Zero Research and Innovation Framework emphasises the importance of a 'bold, coherent programme of public sector research and innovation investment alongside appropriate policy support, coordinated with industry, to encourage and de-risk technology development and deployment and [also] mobilise private sector investment'¹. The framework represents a first statement of the UK's net zero research and innovation priorities over the next decade and universities will continue to play a vital role in identifying ways to reduce emissions.

In addition to research and innovation, universities will need to contribute by:

- **Supporting the development of education and skills:** increasing climate literacy with sustainability and climate justice becoming embedded in the curricula, helping both staff and students understand their own behaviours and contribution to climate change.
- **Demonstrating national and global leadership:** using their expertise to advise decision-makers at regional, national and international levels to address the climate emergency.
- **Developing sustainable university campuses:** setting ambitious targets for Net Zero.
- **Contributing locally:** building on their independence, trust, networks and the range of expertise. Universities have an important role in local place-based action around climate change.

Contributing locally with a place-based approach - University Action

One of the whole systems challenges identified within the UK Net Zero Research and Innovation Framework is taking a place-based approach, "A successful net zero transition will be driven by locally and regionally appropriate solutions that vary across the UK. Cities, towns and neighbourhoods will be the locations where integrated cross-sector net zero solutions are delivered"¹. Living Labs and local testbeds are highlighted as needing research and innovation support, as well as the built environment, energy and transport sectors. Securing meaningful public and local engagement will help ensure solutions are embedded and optimised locally.

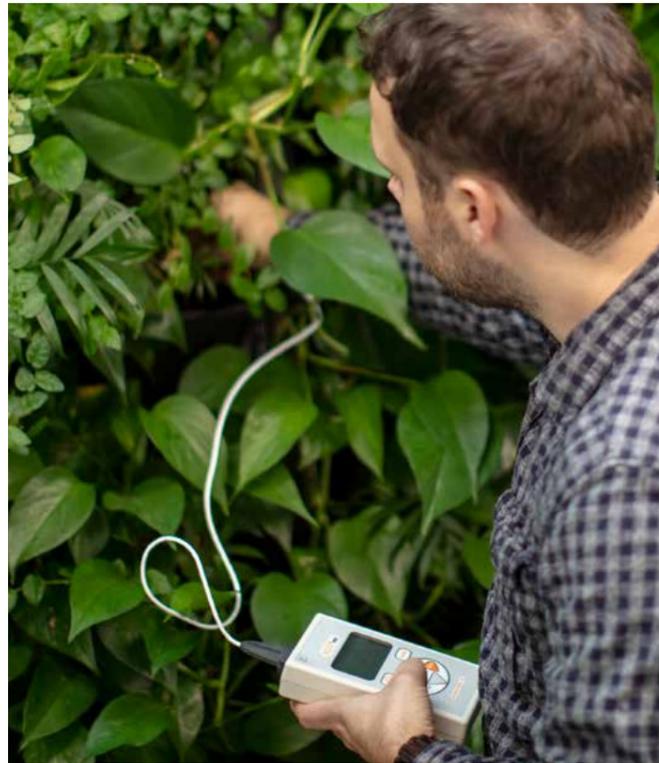
Universities can utilise their independence, trust and engagement across many climate action systems. For example, two University of Plymouth researchers, Professor Ian Bailey and Professor Iain Stewart are using their expertise to support the development of an evidence-led Devon Carbon Plan, through their membership of the [Devon Net-Zero Taskforce](#). The Devon Carbon Plan is the roadmap for how the county of Devon will reach net-zero emissions by 2050 (at the latest). The plan is divided into five systemic themes: Built Environment, Transport, Energy Supply, Food, Land and Sea, Economy and Resources. These are underpinned by a cross-cutting theme of Behaviour Change/Community Engagement.

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1030656/uk-net-zero-research-innovation-framework.pdf, Page 5, 18

The University of Plymouth's academics and researchers are well placed to support this whole systems approach building on their teaching and expertise in a broad range of relevant areas, as shown in Figure 1.

However, the true strength of universities is when synergies across systems are identified. This is currently being explored through Plymouth's Sustainable Earth Institute (SEI). The SEI can draw on expertise across all of the University's faculties and bring together researchers from natural and social sciences, engineering, arts, humanities, health and business. In 2022, one of the interdisciplinary challenge themes is Net-Zero Carbon. This kind of interdisciplinary (or even transdisciplinary) approach will support the future integrated cross-sector net zero solutions that are called for.

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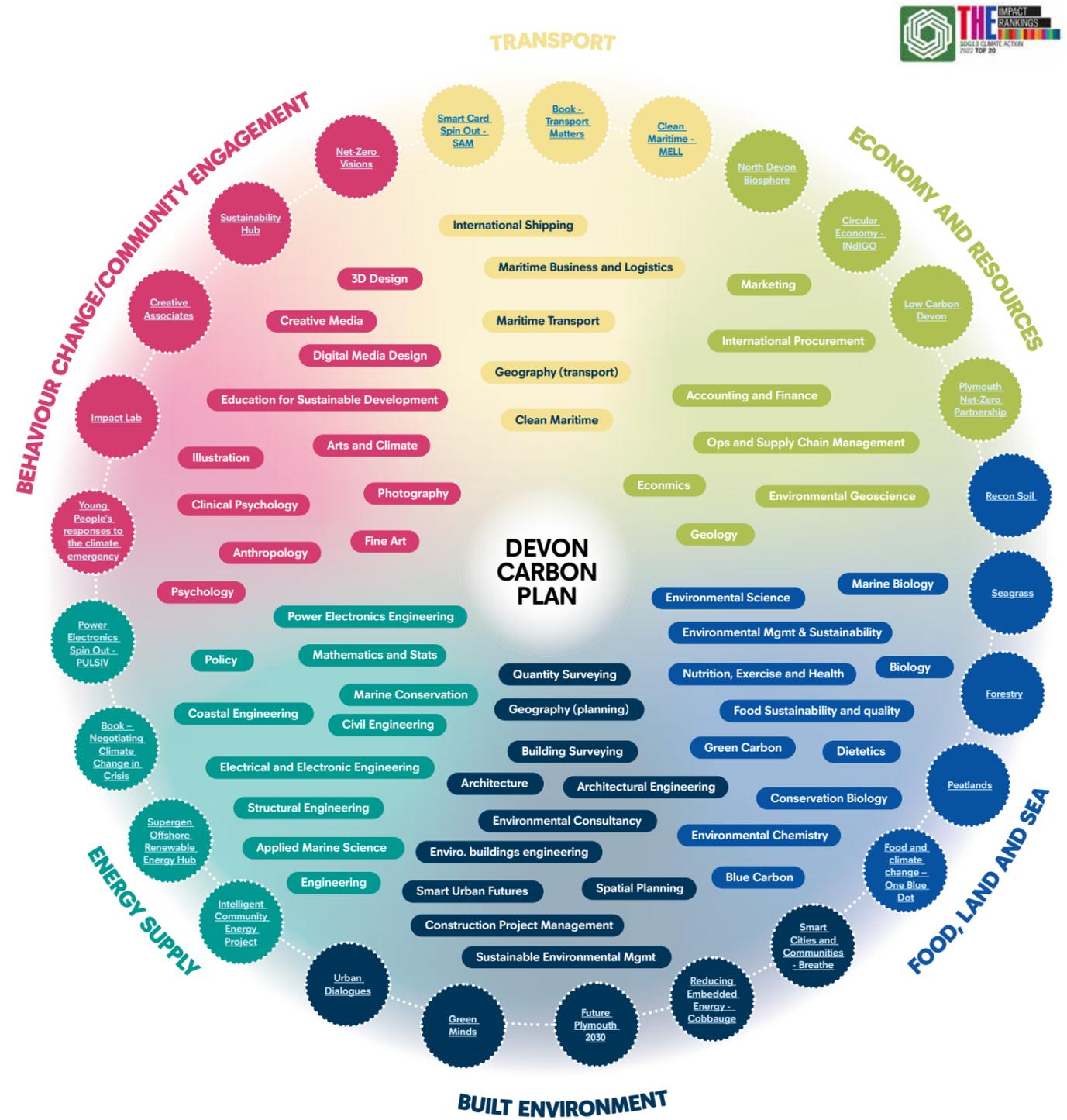
Monitoring green wall benefits at the Sustainability Hub

University of Plymouth Local Place-Based Action Initiatives - Devon

The University is already spearheading a number of interdisciplinary climate action initiatives across Devon:

Low Carbon Devon, a three year £2.6million project supported by the European Regional Development Fund, is helping local enterprises and organisations in the county connect with academic research, experts and business support to catalyse action in the community. Eligible Devon SMEs (including sole traders, micro-businesses, SMEs, social enterprises and community interest companies) can access support to help reduce their carbon use and/or develop low carbon products and services. Support is matched to each organisation's needs. Examples include: working with one of four specialist industrial research fellows or collaborating with an academic on a low carbon innovation. Industrial research fellows are helping enterprises to adopt low carbon technology such as green / living walls and power electronics (photovoltaic and LEDs), monitor energy efficiency and occupant behaviour in their buildings. The project has also undertaken a range of carbon reduction measures on the University campus and the results shared with local business and public sector organisations to inspire them to take similar action such as replacing old, inefficient lighting with LEDs and refurbishing a university building to high environmental standards (SKA Gold). This university-based project seeks to place Devon at the forefront of low carbon economic growth in the UK.

The Net-Zero Visions Project unites community groups with creative professionals and net zero transition experts to produce positive 'visions' of a net zero future. The project is designed to raise public awareness of the Devon Carbon Plan and engage people in the possibilities of change. The project is working with seven Devon communities to produce visions of how the county's villages, towns or cities can meet the challenge of being carbon net zero by 2050. Building on previous research exploring how novels and films have imagined the near future, the project combines science, the arts and community engagement to inspire climate action. The seven community groups will create a future 'vision' to be communicated across a range of media: animations, illustrations, interactive games and public murals. These will be used to engage the wider community in climate action. Picturing how a carbon net zero world might look is the first step towards creating it. This project aims to support and encourage local people to explore how the places they live might change for the better as part of the journey to realising the urgent goals of the Devon Carbon Plan.



University of Plymouth Net-Zero expertise mapped against Devon Carbon Plan themes

Interim Devon Carbon Plan themes:

- TRANSPORT
- ECONOMY AND RESOURCES
- FOOD, LAND AND SEA
- BUILT ENVIRONMENT
- ENERGY SUPPLY
- BEHAVIOUR CHANGE/ COMMUNITY ENGAGEMENT

University of Plymouth Courses / Expertise

- Local Research / Knowledge Exchange Project Examples (there are more!)
- Click links in the outer circles to read more

The University's local action initiatives in the city

The University of Plymouth is drawing on its expertise to support the development of the Plymouth Climate Emergency Action Plan and is involved in the following initiatives across the city:

The **Plymouth Net-Zero Partnership Action Group (PNZPAG)** aims to bring the city's larger carbon emitters together to collaborate on taking credible, measurable action on climate change. This has accelerated climate action in the city. Chaired by the Sustainable Earth Institute, the action group provides a forum for members to share their corporate journey to net zero and work together transferring knowledge, sharing best practice and collaborating on joint initiatives around decarbonisation, procurement and collective public engagement activities. The Action Group feeds into the Plymouth Climate Emergency Action Plan and has also supported the members with the development of their own annual plans.

Future Plymouth 2030 is an award-winning webinar series that explores the climate emergency through the built environment. Led by the University's Sustainable Earth Institute, the Royal Institute of British Architects (RIBA), Stride Treglown Architects and Plymouth City Council, it brings together university research with industry best practice. The Built Environment community is working towards the city's climate declaration goal of being carbon neutral by 2030. These webinars are a platform for sharing knowledge from the latest research, industry best practice and case studies. Up to and including April 2022, more than 1,100 people (and a further 700+ on-demand views) have attended 26 webinars featuring 81 guest speakers. Twenty-two academics have presented on their specialist areas representing disciplines such as architecture, environmental buildings engineering, electrical engineering, environmental science, geography

and sociology. The initiative has pooled resources to attract a wider range of guest speakers with varied expertise and leveraged multiple communication channels to reach a greater audience. Plans to continue the series include expanding the focus beyond the built environment by engaging with other key sectors that require decarbonising such as transport, plus exploring carbon offsetting, behaviour change/engagement and power generation.

The Sustainability Hub is an inclusive space for people to connect, exchange knowledge and work collaboratively on local sustainability issues. It is also a living lab, where researchers are carrying out studies in occupant behaviour patterns and testing low carbon solutions including novel power electronics, and the thermal conductivity and carbon sequestration of green walls. With its open-door policy, the hub encourages greater engagement between business, industry and the community with academic researchers. It is also the base for several of the University's sustainability-focused knowledge exchange projects, including Low Carbon Devon, Environmental Futures Impact Lab, and ReCon Soil. The hub can accommodate meetings, workshops and events with external partners to catalyse sustainability research, education and innovation. It also offers free venue hire to local business, enterprise and community groups to support their ambition for climate action and has hosted the Devon Community Energy Network, Plymouth Energy Community, Plymouth Tree Partnership, Environment Plymouth, Climate Action Plymouth, Extinction Rebellion and Plymouth Radical Cinema.

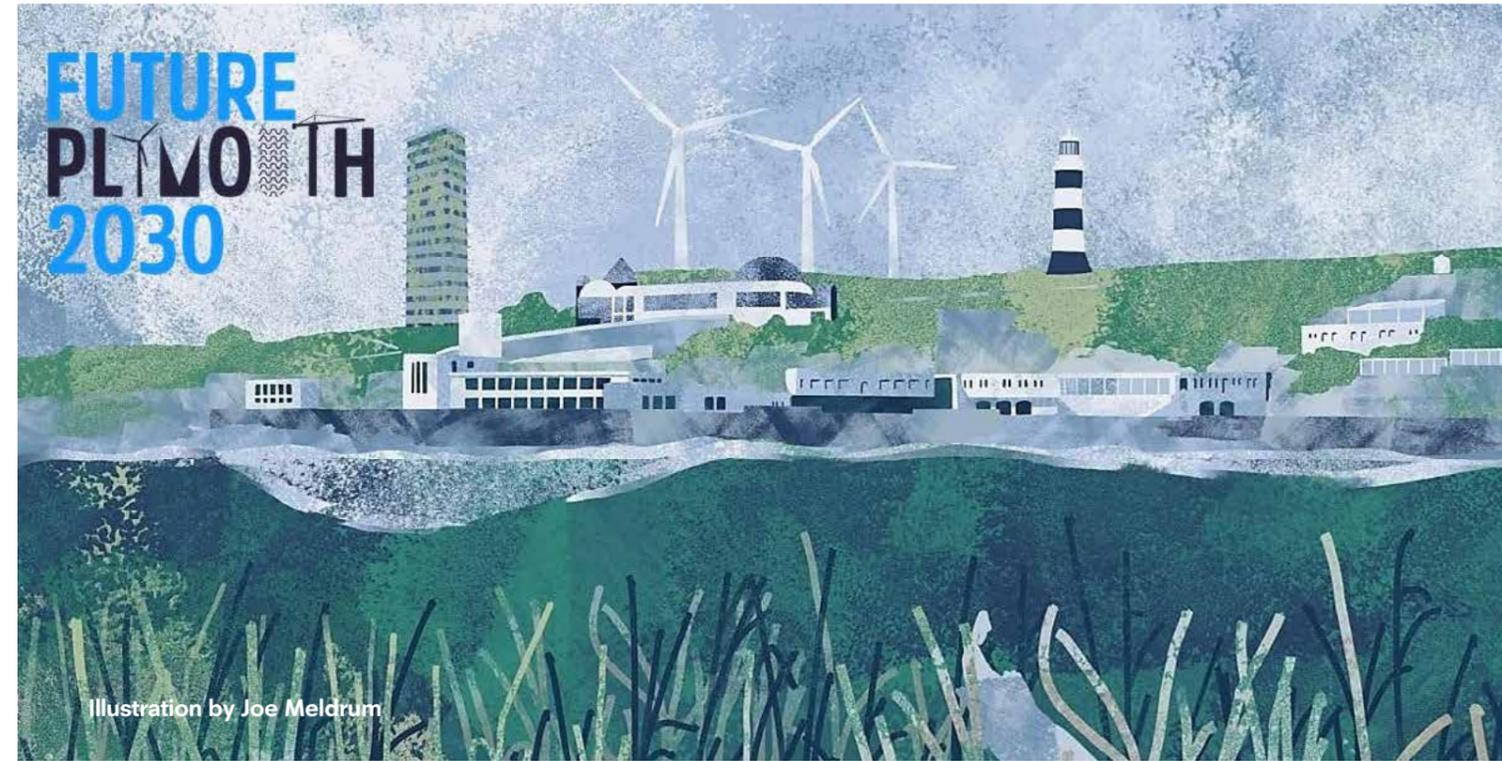


Illustration by Joe Meldrum

University Place-Based Climate Action – where next?

Whilst the aforementioned initiatives are encouraging, more needs to be done. Currently, most of the funding for these activities has been obtained through the European Regional Development Fund but, in order to truly unlock the potential

support that universities can provide, dedicated funding for local climate action is required. One route to achieving this could be through the new Shared Prosperity Fund also universities' knowledge exchange and civic agendas.

Conclusion

Identifying and investing in the actions that will have the most impact in reducing carbon emissions, and also drive long-term sustainability, is complex. Priority actions are not always the most 'popular' options. The University of Plymouth's experience to date demonstrates the importance of working within existing structures as well as building partnerships with other organisations who have similar goals and ensuring that all partners get value from that engagement. An interdisciplinary approach is useful as it explores responses to a problem through multiple lenses, sparking innovative and creative solutions.

Government-funded research and innovation, as well as appropriate policy and regulatory support, private sector innovation, investor funding and academic research will all play a key role in achieving carbon net zero. Many initiatives explored by the University of Plymouth have the potential to be scaled up and rolled out to other regions and cities within the UK but more funding is required to ensure that good ideas can be shared freely across the country and the duplication of effort minimised.

Supporting Literature

- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1030656/uk-net-zero-research-innovation-framework.pdf
- <https://www.universitiesuk.ac.uk/what-we-do/policy-and-research/publications/confronting-climate-emergency>
- <https://www.ukri.org/what-we-offer/supporting-collaboration/supporting-collaboration-research-england/knowledge-exchange-framework/>
- <https://civicuniversitynetwork.co.uk/>



Members of the Plymouth Net-Zero Partnership



Mural design from the Net-Zero Visions project



Acknowledgment:

The activities summarised within this report involve many different members of the Sustainable Earth Institute and external partners. Thank you to everyone involved.

A three-time winner of the Queen's Anniversary Prize for Higher and Further Education, the University of Plymouth is renowned for high quality, internationally-leading education, research and innovation.

The **Sustainable Earth Institute (SEI)** connects the University's world leading research expertise with the wider world to collaborate on creating a more sustainable future. We bring together researchers from natural and social sciences, engineering, arts, humanities, health and business, to take an interdisciplinary, systems-thinking approach to help tackle sustainability challenges.

Relating to the following Global Sustainability Development Goals



This Policy Brief is part of a series aiming to inform policy-makers of our sustainability research, in particular around Net-Zero Carbon and Healthy Landscapes.

To read more in the series visit: www.plymouth.ac.uk/sei-impact

Voice of a sustainable earth

Researcher biography



Dr Paul Hardman has more than twenty years of technical, project and business management experience, within the private, public and higher education sectors. For the past ten years he has been manager of the University of Plymouth's Sustainable Earth Institute (SEI), responsible for the strategic direction and day-to-day running of a University Research Institute. With more than 300 members from various disciplines, including science, engineering, arts, humanities, health and business, Dr Hardman supports a collaborative, transdisciplinary research environment and encourages external engagement to underpin the delivery of real world, innovative and impactful solutions to sustainability challenges.

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Full biography

plymouth.ac.uk/staff/paul-hardman