

# Scientists set out immediate actions and future research priorities to help UK to reach net zero target

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Nordex USA manufacturing facility - Jonesboro, Arkansas, USA. Credit: Science in HD on Unsplash

A new paper by leading UK scientists sets out key solutions and policy

actions that should be implemented now, as well as priority research areas for the next decade, if the UK is to reach its net zero target by 2050.

Achieving this target will require a mix of technological, societal and nature-based solutions working together to enable systemic change. Research in the 2020s must be prioritised into solutions for sectors that are particularly difficult to decarbonise, such as aviation, [electricity generation](#) and storage, and maritime shipping.

The report, led by the University of Cambridge, also highlights net zero solutions which could be implemented now, such as the electrification of road freight, hydrogen produced using [renewable energy](#) instead of current carbon-intensive methods, and changes to land use planning to prioritise denser, mixed-use, low traffic neighbourhoods.

The briefing, "[Net-Zero Solutions and Research Priorities in the 2020s](#)," is published by the COP26 Universities Network and brings together 26 leading scientists from 10 UK universities, including Cambridge engineers Dr. Daniel Ainalis, Professor David Cebon, Dr. Shaun Fitzgerland, Dr. Samuel Grimshaw, Dr. Hugh Hunt, and Dr. Maria Vera-Morales. It comes at a critical time ahead of the United Nations COP26 Climate Change Summit, which takes place in Glasgow this November.

"It is abundantly clear from the recent IPCC report that the 2020s will be the crucial decade to reduce emissions in order to meet the Paris Agreement goals, and the decisions made at COP26 will be critical in achieving that," said co-lead author Dr. Erik Mackie from Cambridge Zero, the University's climate initiative. "This cross-disciplinary report will aid decision-makers by identifying the key actions that we must take now, and the priority areas where we should urgently focus our research efforts to tackle hard-to-decarbonise sectors."

The paper highlights net-zero solutions in eight priority sectors, setting out actions to take now, research priorities for the next decade, and future benefits for each sector. These are:

- Electricity (generation, storage, system and networks)
- Buildings
- Road transport
- Industry
- Land/sea use and agriculture
- Aviation and shipping
- Waste
- Greenhouse Gas Removal (GGR).

Nature-based Solutions (NbS) – key actions that can work with nature to address climate change and biodiversity loss across all sectors, while also supporting economic recovery—are highlighted separately.

"The coming decade will be about action and implementation, and we need to focus on solutions that can be practically implemented before 2030—our report highlights some of these solutions for each of our priority sectors, many of which will have co-benefits due to their interdisciplinary nature," said co-lead author Dr. Elizabeth Tennyson, Marie-Curie Research Fellow in Cambridge's Cavendish Laboratory.

"No single sector is the [solution](#): many sectors need to work in parallel in order to get to net zero. We hope this policy brief will not only influence change but also encourage further innovations."

Additional solutions highlighted in the report include the retrofitting of buildings, increased R&D investment to bring low-carbon farming practices to market, and the deployment of Carbon Capture Utilisation and Storage (CCUS) at scale by mid-2020s to support the first low-carbon and net zero industrial clusters.

The authors stress that each solution should be assessed with respect to greenhouse gas emissions reductions, energy efficiency and societal implications to provide a basis for developing long-term policies, maximising positive impact of investment and research effort, and guiding industry investors in safe and responsible planning.

"It is great to see this group of universities pooling their expertise and coming to a broad consensus view about the needs for research and immediate actions in the fight against climate change," said co-author Professor David Cebon from Cambridge's Department of Engineering, who leads the Centre for Sustainable Road Freight.

Of 26 co-authors on the paper, 14 are from the University of Cambridge, from fields including chemistry, engineering, architecture, computer science, and epidemiology.

Established in 2020, the COP26 Universities Network aims to improve access to evidence and academic expertise for the UN Climate Summit in Glasgow for the UK Government, NGOs and the international community, working together to deliver ambitious [climate change](#) outcomes.

Provided by University of Cambridge

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