DESNZ Science and Technology Advisory Council (STAC) members

July 2025

Professor Paul Monks CB, FRMetS, FRSC, FInstP (STAC Co-Chair)

Chief Scientific Adviser & Director General, Department for Energy Security and Net Zero (DESNZ).

Professor Paul Monks CB is the Chief Scientific Adviser (CSA) for the Department for Energy Security and Net Zero (DESNZ). As CSA, he delivers independent and impartial science and engineering advice to ministers and policy makers across the department's policy and delivery portfolio and Clean Energy Superpower Mission.

Paul also works closely with the Government Chief Scientific Adviser (GCSA), the cross-government network of departmental CSAs, and the DESNZ Chief Analyst, to strengthen the links within and across departments, encouraging effective engagement and knowledge sharing, and to support delivery of a robust evidence base to underpin policy decisions. Prior to joining the department, Paul was Pro-Vice Chancellor and Head of the College of Science and Engineering at the University of Leicester, where he remains a Professor in Atmospheric Chemistry and Earth Observation Science. Paul was awarded the Companion of the Order of the Bath (CB) in the King's New Year Honours 2025 for Services to Science in Government.

Professor David Greenwood FREng (STAC Co-Chair)

CEO of Warwick Manufacturing Group (WMG) High Value Manufacturing Catapult Centre.

Professor David Greenwood is the CEO of the High Value Manufacturing Catapult Centre at WMG, University of Warwick, where he also serves as Director for Industrial Engagement. With a career bridging academia and industry, David brings extensive expertise in energy systems, advanced manufacturing, and industrial innovation.

Prior to his current role, David founded and led the Energy Directorate at WMG, growing a team of over 200 researchers and engineers. Under his leadership, the directorate delivered pioneering projects across a diverse range of sectors, including automotive, aerospace and marine. His research focuses on batteries, electric motors, power electronics, and the systems integration and control necessary for advanced propulsion and energy applications.

Before transitioning to academia, David spent two decades in industry, culminating in his role as Head of Hybrid and Electric Systems at Ricardo UK Ltd, a global engineering consultancy. His industrial background underpins his commitment to bridging the gap between cutting-edge research and real-world application.

David plays a central role in shaping the UK's electrification landscape through strategic advisory and governance positions. He is a board member for the UK Battery Industrialisation Centre and the Faraday Institution and advises Innovate UK's Faraday Battery Challenge.

David has served as a board director for CENEX and UKBIC and has held advisory board positions at the Advanced Propulsion Centre and EPSRC, Strategic Advisory Committee (SAC) for Energy.

In recognition of his significant contributions to engineering and industrial innovation, David was elected a Fellow of the Royal Academy of Engineering in October 2023.

Professor Benjamin Sovacool PhD, FAcSS, FRSA, MAE

Professor of Energy Policy, University of Sussex.

Dr. Benjamin K. Sovacool is Professor of Energy Policy at the Science Policy Research Unit (SPRU) at the University of Sussex Business School in the United Kingdom. He is a Fellow of the Royal Society for Arts, Manufactures and Commerce, a Fellow of the Academy of Social Sciences, and a Fellow in the Academy of Europe (Academia Europaea).

He works as a researcher and consultant on issues pertaining to global energy policy and politics, energy security, energy justice, climate change mitigation, and climate change adaptation. More specifically, his research focuses on renewable energy and energy efficiency, the politics of large-scale energy infrastructure, designing public policy to improve energy security and access to electricity, the ethics of energy, and building adaptive capacity to the consequences of climate change. In the United Kingdom, he has served as a Principal Investigator on projects funded by the Economic and Social Research Council, Natural Environment Research Council, and the Engineering and Physical Sciences Research Council.

His research has been endorsed by U.S. President Bill Clinton, the Prime Minister of Norway Gro Harlem Brundtland, and the late Nobel Laureate Elinor Ostrom, among others. He was a Lead Author of the Intergovernmental Panel on Climate Change's Sixth Assessment Report (AR6), published in 2022, and he serves on the Board on Environmental Change and Society for the National Academies of Sciences, Engineering, and Medicine in the United States.

With much coverage of his work in the international news media, he is one of the most highly cited global researchers on issues bearing on controversies in energy and climate policy.

Emeritus Professor David Newbery CBE, PhD, ScD, FBA

Director, Cambridge Energy Policy Research Group.

Professor David Newbery is Director of the Energy Policy Research Group and Emeritus Professor of Applied Economics, University of Cambridge, Fellow Emeritus, Churchill College.

Professor Newbery is a Fellow of the British Academy and of the Econometric Society. With Cambridge degrees in Mathematics and Economics, his main research for the last 35 years is on quantitative analysis and evidence-based policy options in energy economics and the design, monitoring, regulation and performance of electricity markets, including transmission pricing and regulation, integrating renewable electricity and the role of carbon pricing in the energy transition. President of the European Economic Association (1996), President of the International Association for Energy Economics (2013), he has published over 150 articles in peer-reviewed journals, receiving the Econometric Society's Frisch Medal and recognised as the world's leading energy economist in 2009.

His early interest in the economics of risk produced a major book with Stiglitz highlighting missing markets as critical to contract design. He worked at the World Bank (1981-3) on energy transitions and as Director of the Cambridge Department of Applied Economics (1988-2003) on UK privatizations and the transition from socialism to the market in Central Europe post-1989. He has advised British and other governments and regulators in the electricity, gas, coal, rail, water and postal sectors. He has recently ended 10 years on the Single Electricity Market Committee of the island of Ireland and of Ofgem's Network Innovation Competitions, while continuing as an active researcher and adviser.

Professor Elizabeth Patricia Thornley BSc, DPhil, FREng

Professor of Energy and Bioproducts Research Institute, Aston University.

Professor Patricia Thornley is a fellow of the Royal Academy of Engineering with 32 years' experience working on energy projects in industry and academia. She is director of the UK's SUPERGEN Bioenergy hub, director of the national Centre for Doctoral Training in Negative Emission Technologies and director of the Clean Maritime Policy Unit in the UK's Decarbonising Maritime Hub.

Patricia's research at the Energy and Bioproducts Research Institute at Aston University focuses on sustainability assessment of energy systems: evaluating the environmental, economic and social consequences of implementation pathways at the interface of the academic, policy and industrial communities. She was editor in chief of the Q1 Journal: Biomass and Bioenergy from 2017 to 2024 and is passionate about public engagement; serving as an expert in the 2020 Climate assembly and making (inter)national radio and television appearances.

Patricia has given advice to the CCC, Carbon Trust, DECC, DESNZ, DfT, Defra, BEIS, MEP's, MP's and NGO's. She has provided expert review services for research organisations and funders in Europe, New Zealand, Brazil and China and has been commissioned by government departments, engineering companies, trade associations, multi-national companies and SME's to undertake consultancy work.

Professor Emily Shuckburgh OBE

Director, Cambridge Zero.

Professor Emily Shuckburgh is Director of Cambridge Zero, the University of Cambridge's major climate change initiative. She is also Professor of Environmental Data Science at the Department of Computer Science and Technology. Her primary research is focused on the application of AI to climate science and in this context she is Academic Director of the Institute of Computing for Climate Science, and co-Director of the UKRI Centre for Doctoral Training on the Application of AI to the study of Environmental Risks (AI4ER). Her research also considers the nexus between climate change, biodiversity loss and societal challenges and in this context she is co-Director of the Centre for Landscape Regeneration, which is taking a systems-based approach to exploring future land-use options for the UK. She previously worked for more than a decade at the British Antarctic Survey where she led a UK national research programme on the Southern Ocean and its role in climate.

Emily is a Fellow of Darwin College, a Fellow of the Cambridge Institute for Sustainability Leadership, a Fellow of the British Antarctic Survey, a Fellow of the Royal Meteorological Society, and an Honorary Fellow of the Energy Institute. Among her other responsibilities she is Honorary President of the Aldersgate Group and a Trustee of the UK Centre for Ecology and Hydrology. She is also co-author with HM King Charles III and Tony Juniper of the Ladybird Book on Climate Change.

Dr Erica Thompson

Associate Professor of Modelling for Decision Making, University College London.

Dr Erica Thompson is an Associate Professor of Modelling for Decision Making at UCL's Department of Science, Technology, Engineering and Public Policy, where she works on an interdisciplinary programme of research funded by a UKRI Future Leaders Fellowship. She is also a Fellow of the London Mathematical Laboratory and a Visiting Senior Fellow at the LSE Data Science Institute.

With a background in physics, statistics and climate modelling, Dr Thompson works on the appropriate use of mathematical modelling to support real-world decisions, from statistical questions about methodologies of inference from models, to psycho-social questions about the formation of confidence and the role of expert judgement. Her research is rooted in real-world applications including climate information for mitigation and adaptation, anticipatory humanitarian decision-making and disaster

risk financing, and economic and financial risk management. She has worked closely with the insurance sector, and is also a member of the Start Ready Governance Committee (disaster risk finance) and a Commissioner for the Lancet Commission on Strengthening the Use of Epidemiological Modelling. Cross-cutting themes in her work include guidelines for the appropriate use of models and statistical methods, and the responsible and ethical application of models to support decisions, including new developments in machine learning and Artificial Intelligence.

In addition to her research profile, Dr Thompson has given public lectures on maths, modelling and decision making, and regularly speaks to policy and industry audiences. She was invited to deliver the Royal Statistical Society's "Significance Lecture" in 2024, and is the author of "Escape From Model Land" (2022), an accessible exploration of the power and pitfalls of models.

Professor Feargal Brennan

Professor of Offshore Engineering, University of Strathclyde.

Feargal Brennan is the James Blyth Distinguished Professor of Offshore Engineering at the University of Strathclyde.

He is Research Director of the Wind & Marine Systems and Structures (WAMSS) Centre for Doctoral Training. He is a Director and the Offshore Wind Champion for the EPSRC Supergen Offshore Renewable Energy Programme, Principal Investigator of Ocean-Refuel and Co-Investigator of the CoTide UKRI/EPSRC Programmes. He sits on the UK government Department of Energy Security and Net Zero Science Expert Group, SOWEC (The Scottish Offshore Wind Energy Council) the NZTC (Net Zero Technology Centre) academic advisory board and the GUH (Global Underwater Hub) board. He is the UK standing member and leader of the UK delegation to the ISSC (International Ship and Offshore Structures Congress) and has served as expert witness for commercial offshore wind litigation cases at the London Court of International Arbitration.

Dr Fiona Rayment OBE, FREng, FRSE

Government Adviser, Non-Executive Director and Visiting Professor at University of Manchester.

Dr Fiona Rayment enjoys a plural career covering nuclear advisory and non-executive director roles and has dedicated decades to the nuclear sector with extensive strategic and operational experience. She is a chartered chemist and engineer with a PhD in chemistry from University of Strathclyde, Glasgow and a fellow of the Royal Academy of Engineering, Royal Society of Edinburgh, Royal Society of Chemistry, Nuclear Institute and American Nuclear Society.

Fiona has recently served as Chief Science and Technology Officer at the U.K. National Nuclear Laboratory, as a member of Euratom's Science and Technology Committee, was the first chair of the UK's Nuclear Skills Strategy Group.

Her current roles include being a member of the Office of Nuclear Regulation Chief Nuclear Inspector's Independent Advisory Panel, a visiting professor at the University of Manchester, President of the Nuclear Institute, Non-Executive Member of the Board of the UK Space Agency and Non-Executive Director of Nuclear Restoration Services.

Fiona has long advocated widening participation in science and engineering and champions approaches enabling diversity and inclusion.

She was awarded an OBE in 2017 and the French Légion d'Honneur in 2020.

Mr Jonathan Wood CEng, FRSA

Vice President & Chief Technical Officer, Cummins Inc.

Jonathan Wood is Vice President and Chief Technical Officer at Cummins Inc, a Fortune 150 global power solutions company. He has over 30 years of international experience in engineering, product development and manufacturing across commercial transportation, industrial, and power generation sectors.

Since joining Cummins, Jonathan has held a series of senior technical leadership roles, including Executive Director for Turbocharger and Emissions Engineering, Vice President for Components Engineering, and Vice President for New Power Engineering. In these roles, he led the development of key technologies such as advanced turbomachinery, emissions aftertreatment systems, and zero-emission solutions including battery-electric, hydrogen fuel cell, and electrolyser systems. He has overseen major product launches for markets in US, Europe, India and China in response to advancing regulations in air quality and decarbonisation.

As CTO, he leads a global technical organisation and is responsible for the company's research & development investment portfolio, environmental strategy and technical talent strategy. His work supports a mission to achieve decarbonisation through a diverse range of power solutions.

Jonathan has lived and worked in both the UK and China and maintains deep engagement with global OEMs, suppliers and regulators across the US, Europe, India and China. He holds a Master's Degree in Mechanical Engineering from the University of Sheffield, is a Chartered Engineer (CEng) with the Institution of Mechanical Engineers and Fellow of the Royal Society of Arts, Manufactures & Commerce (FRSA).

Professor Julian Allwood FREng

Professor of Engineering and the Environment, University of Cambridge.

Professor Julian Allwood is Professor of Engineering and the Environment at the University of Cambridge and directs the Use Less Group. His research explores pathways to zero emissions based on small modifications to technologies that already exist at scale. A particular focus of his research is to identify opportunities for business growth compatible with real zero emissions. This has led to many patents and several spin-out companies, including Cambridge Electric Cement Ltd., which recycles cement at scale without emissions and DeepForm Ltd, which reduces the emissions of car body manufacturing by 30%.

Julian was a Lead Author of the 5th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) with a focus on mitigating industrial emissions. He is an Honorary Fellow of the Institution of Materials, Minerals and Mining, a Fellow of the International Academy of Production Engineering (CIRP) and served as chairman of its metal forming section. He is a member of the UK's Energy Research Partnership and for ten years was joint editor-in-chief of the Journal of Materials Processing Technology. In 2021 he was awarded the highest international honour for research in metal forming.

Julian's career began with 10 years' work for Alcoa on flat rolling, before academic positions at Imperial College and Cambridge. From 2009-13 he held an EPSRC Leadership Fellowship, to explore Material Efficiency as a climate mitigation strategy – delivering material services with less new material. This led to publication in 2012 of the book "Sustainable Materials: with both eyes open" which can be read online at www.withbotheyesopen.com. His second book, "A Safe Climate, in Good Faith", written with Andrew Davison the Regius Professor of Divinity at Oxford, will be published by Cambridge University Press in 2025.

Professor Mercedes Maroto-Valer FRSE, FEI, FIChemE, FRSA, FRSC

Director, UK Industrial Decarbonisation Research and Innovation Centre (IDRIC) and Deputy Principal (Global Sustainability), Heriot-Watt University.

Professor Mercedes Maroto-Valer is Deputy Principal for Global Sustainability at Heriot-Watt University, where she holds the Robert Buchan Chair in Sustainable Energy Engineering and heads the Research Centre for Carbon Solutions (RCCS). She leads the global sustainability agenda across campuses in Scotland, Dubai and Malaysia and her portfolio covers cross-cutting activities in teaching, research and social responsibility.

She is Director of the UK Industrial Decarbonisation Research and Innovation Centre (IDRIC) focused on accelerating the sustainable transition to net zero of industries. IDRIC's interdisciplinary program covers the whole system of industrial

decarbonisation, from advancing and scaling up technologies (CCUS, hydrogen and other low-carbon fuels, electrification, negative emissions technologies) and their integration in industrial processes, to addressing skills and supply chain needs, examining wider socioeconomic impacts and assessing policy and regulatory drivers of the transition. She has brought together the research and innovation ecosystem, with over 40 universities delivering 100 projects and collaborating with 200 stakeholders from industry, trade associations, governmental and public bodies.

She is recognised as a world expert on energy systems; carbon capture, conversion, transport and storage; integration of hydrogen technologies and low carbon fuels. She has extensive experience delivering major R&D programmes resulting in impactful achievements in leading engineering innovations. She has recently become Director of the EPSRC Centre for Doctoral Training in Green Industrial Futures delivering the next generation of global leaders to realise the green industrial revolution.

She spearheads the technological diplomacy of the energy transition, with leadership roles internationally and in the UK, including the Council of Engineers for the Energy Transition (CEET) under the auspices of the United Nations Secretary-General. She also represents the UK at the global intergovernmental clean energy initiative Mission Innovation – Technical Advisory Group.

Professor Nicholas Pidgeon MBE FBA

Professor of Environmental Psychology and Risk, Cardiff University.

Nick is Professor of Environmental Risk and Director of the Understanding Risk Research Group at Cardiff University. His research and science policy work is interdisciplinary, spanning psychology, geography, risk research and the sociology of technologies. He has worked over the years on the organisational causes of major industrial accidents, on non-monetary valuation of risk, and on public engagement with environmental and technological risks and sustainability.

He is currently a co-investigator to the UK Energy Research Centre, the Leverhulme Centre for Climate Change Mitigation, and the ESRC Behavioural Research UK Leadership Hub. Nick has published over 200 research papers and edited two books (Man-Made-Disasters 2nd edition 1997, and Social Amplification of Risk 2003).

His most recent work focuses on the acceptability of energy infrastructures and system change, sustainable behaviours and biographies of energy use in everyday life, the social impacts of the domestic net zero transition in heat, perceptions of climate change risk and adaptation, and community understandings of enhanced weathering in agriculture.

Professor Pidgeon has filled numerous science advisory roles in the past, including for DfT, HMT, DEFRA, the Welsh Government, Cabinet Office, The Royal Society and the US National Academy of Sciences, and the former Department of Energy and Climate Change. He is an Honorary Fellow of the British Science Association

and was awarded an MBE in 2014 for services to climate change and energy security awareness. Elected a Fellow of the British Academy in 2023 he received a Distinguished Achievement Award from the Society for Risk Analysis in 2024.

In 2006 he chaired the All-Party Parliamentary Group on Climate Change inquiry, which recommended the setting up of the UK Climate Change Committee.

Professor Nilay Shah OBE FREng

Professor of Process Systems Engineering, Imperial College London.

Professor Nilay Shah is a leading expert in sustainable energy and industrial systems at Imperial College, where he is a Professor of Process Systems Engineering and Co-Director of the School of Convergence Science for Sustainability. His research focuses on sustainable processes, carbon capture and storage (CCS), hydrogen infrastructure, biotechnology and whole-system energy modelling, with a particular emphasis on optimising low-carbon industrial processes to support the transition to net zero. He is also a member of the UK Hydrogen Delivery Council, working alongside industry leaders to accelerate the deployment of clean hydrogen.

He has received many awards, and he is particularly interested in the transfer of technology from academia to industry and its rapid scaling. He has provided consultancy services on process optimisation, innovation and industrial applications of new technology to a large number of process industry and energy companies, as well as being a co-founder of technology companies: Process Systems Enterprise Ltd and Zero Petroleum Ltd (a synthetic fuels business with both jet and gasoline platforms).

NS is also enthusiastic about providing service to the profession and government. With the national academies, has worked on many influential reports on topics such as biofuels, greenhouse gas removal, engineering biology, energy storage and most recently rapid electricity system decarbonisation.

Professor Richard Dawson CEng FICE FREng

Professor of Earth Systems Engineering, Newcastle University.

Professor Richard Dawson is Professor of Earth Systems Engineering in the School of Engineering at Newcastle University (UK). His research applies systems approaches to quantify risks and improve the resilience of engineering systems. This includes work on flood risk, water security, energy and transport networks, cascading infrastructure failure, and climate change adaptation.

He is a Chartered Engineer, Fellow of the Institution of Civil Engineers and was elected a Fellow of the Royal Academy of Engineering in 2023. Between 2019-2025 he was a member of the Adaptation Committee of the Climate Change Committee

and was a Lead Author for the Intergovernmental Panel on Climate Change's 6th Assessment Report.

He has published extensively and received a number of prizes for his work, including the Aon Foundation Jose Maria Sarriegi Major Catastrophe Research Award (2019), Lloyds Science of Risk Prize (2012) and Institution of Civil Engineers' Robert Alfred Carr Prize (2004).

Professor Sara Walker SFHEA

Director of Birmingham Energy Institute.

Professor Sara Walker is Director of Birmingham Energy Institute. She has been working in the energy sector since 1996, with a career spanning industry and academia. Her research focus is on renewable energy and energy efficiency in buildings, energy policy, energy resilience, and more recently she has focused on whole energy systems. She is Director of the EPSRC Hub on Hydrogen Integration for Accelerated Energy Transitions (HI-ACT), and Co-Director of the EPSRC Energy Demand Research Centre. She is an Advisory Committee Member for the UK Energy Research Centre and the UK CCS Research Centre and also contributes to the EPSRC Scientific Advisory Committee for Energy and Decarbonisation.

Dr David Wright FREng, FIET, MIGEM (Ex-Officio STAC Member)

Co-Chair Energy Research Partnership.

Dr David Wright is a Chartered Engineer and former FTSE100 executive with over 30 years' experience leading energy and infrastructure operations in the UK and US. He most recently served as Chief Engineer and Chief Risk Officer of National Grid, following eight years as head of the UK electricity transmission business. His leadership spanned safety, resilience, major project delivery, and strategic risk across a £60bn asset base.

He brings deep expertise in engineering governance, risk management and business transformation for complex infrastructure, alongside direct board exposure and regulated subsidiary oversight. David led National Grid's technical due diligence and subsequent £9bn acquisition of Western Power Distribution and is now building a non-executive portfolio focused on infrastructure, sustainability, and national resilience.

A Fellow of the Royal Academy of Engineering, David co-chairs the UK Energy Research Partnership and is an adviser to the UK military. He enjoys outdoor pursuits, team sport, and time with his family in the Lake District and on the Isle of Wight.