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CARES Visiting Scientist Seminar Series:

Getting real about net zero

Prof Niall Mac Dowell; Professor of Future Energy Systems,
Imperial College London

Thursday 2 November 2023, 10am - 11am

CREATE Pinnacle Room, L16; CREATE Tower



Cambridge Centre for
Carbon Reduction in
Chemical Technology

Abstract: At COP21 in 2015, the world coalesced around what has come to be known as the Paris Agreement which aims to limit global warming to well below 2°C and pursue efforts towards 1.5°C. In 2018, the IPCC published their special report on 1.5°C, making it clear that a key milestone of achieving this aim is getting to “net zero”. By 2019 national pledges started to come in. Starting with the UK, roughly 90% of the planet is covered by a net zero pledge of one kind or another. But what does net zero mean, exactly? Net zero CO₂ emissions, or all greenhouse gases? Absolutely zero carbon (fossil or otherwise in the energy system)? Is nuclear permissible, or should we rely exclusively upon wind, water, and solar power? Once the net zero pledge had been made, the question arose “who should pay”? For how long have we understood the anthropogenic and dangerous nature of climate change? What, if anything, does this mean about culpability? Recent publications by, *inter alia*, the IEA propose that fossil fuel use should imminently peak, and no further investment should follow – but how realistic is this, how can we reconcile this idea with that of addressing energy poverty, and to what extent is an apparent consensus on “phasing down” coal and phasing out fossil fuels compatible with broader questions of national sovereignty? If we do start focusing on deploying renewable energy, what is the impact of intermittency on the quantum of capacity required in order to replace or displace conventional thermal power generation? To what extent will EVs reduce oil demand? In all scenarios compatible with a Paris aligned outcome, the deployment of carbon capture and storage (CCS) and carbon dioxide removal (CDR) technologies emerges as being indispensable – but this technology has consistently failed to overcome barriers to commercialisation; how might this barrier be surmounted?



Biography: Niall Mac Dowell is a Professor in Energy Systems Engineering at Imperial College London. He is a Chartered Engineer, a Fellow of both the IChemE and the Royal Society of Chemistry. His research is focused on understanding the transition to a low carbon economy. Since 2010, he has published more than 100 peer-reviewed scientific papers at the molecular, unit operation, integrated process, and system scales in this context.

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