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CARES Visiting Scientist Seminar Series:

Quantifying and qualifying the role and value of CCS in net zero technologies

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UTown Auditorium 1



Cambridge Centre for
Carbon Reduction in
Chemical Technology

Abstract: The world is overwhelmingly reliant on fossil energy. Whilst the relative proportion of fossil energy is showing signs of a gradual reduction – from 93% to 84% in the period 1965 to 2021, the absolute quantity of fossil energy consumed has more than tripled in this period. It has been repeatedly demonstrated that CO₂ capture and storage technologies will be vital in meeting the terms of the Paris climate agreement. In this talk, we will provide insight as to how the role and value of CCS technologies varies by nation, which some regions prioritising baseload power, others the industrial sector, and others a flexible complement to intermittent renewable energy. We also consider the value of improved technologies and also to whom that value accrues. In the context of the power system, the combination of energy storage and renewable energy is often proposed as an alternative to CCS. Thus, we evaluate the system cost and performance implications of an energy system that relies on energy storage, and seek to provide insight in to the form of energy storage technology that may ultimately be best suited for at-scale deployment in the energy system. We then evaluate the impact on a given nations socio-economic performance using employment

and gross value added (GVA) as performance indicators. Finally, we present some conclusions from this work.

Biography: Prof 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 and has published more than 200 peer-reviewed scientific papers, technical reports, and books in this context.



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