

Professor Nashwan Dawood, BSC Civil Engineering, MPhil, PhD

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Professor Nashwan Dawood is the Research Director at the Net Zero Industrial Innovation Centre (NZIIC) and a senior member of the management team within the School of Computing, Engineering, and Digital Technologies. He holds a PhD in Civil Engineering and previously served as Associate Dean for Research and Innovation. He is visiting professor at Tabuk University.

Professor Dawood leads and advances research, teaching, and innovation initiatives at NZIIC, with a strong focus on asset management, decarbonisation, the hydrogen economy, and digital innovation for energy reduction in the built environment. He has made significant contributions to the field of decarbonisation technologies and has authored over 400 research publications.

He has successfully secured more than £20 million in UK research funding and is internationally recognised for leading high-impact research programmes. His expertise in decarbonisation and digital construction has played a pivotal role in shaping energy reduction strategies within the built environment.

Currently, he is leading a major project funded by Research England—the Hydrogen Innovation Project—in collaboration with UK universities and partners from the process and oil industries.

Professor Dawood maintains strong collaborations with industry, translating research into practical and innovative solutions. He has supervised over 45 PhD students, delivered professional training to industry, and contributed to numerous successful Knowledge Transfer Partnerships (KTPs).

An established authority in his field, he has been invited to speak at more than 10 leading international conferences and has held visiting professorships at institutions in Tabuk (Saudi Arabia), Miyagi (Japan), and Florida State University (USA).

More info can be found on: <https://research.tees.ac.uk/en/persons/nashwan-dawood>

Presentation title

Research England Hydrogen Project (REHIP): new processes, products and technologies: collaboration between NetZero Industrial Centre and Tabuk University

Abstract

The Research England Hydrogen Innovation Project (REHIP) is an £11 million initiative funded by Research England to accelerate hydrogen innovation in the UK, with a particular focus on the Tees Valley Industrial Cluster. REHIP brings together 14 Research Fellows and 10 academic researchers who work collaboratively with industrial partners to deliver research and innovation that supports the transition to a hydrogen-based economy.

The programme has developed 24 collaborative innovation projects spanning three strategic domains—heat, power, and transport—while also addressing the policy, regulatory, skills, and societal challenges associated with achieving a just transition to Net Zero. These projects are co-created with industry through an innovative sandpit approach that engages businesses, academics, policymakers, and community stakeholders to identify the most pressing industrial challenges and develop practical, research-led solutions. To date, two sandpit workshops have generated a portfolio of projects focused on developing new technologies, products, processes, and policy frameworks that will accelerate hydrogen deployment across industrial applications. REHIP provides a unique platform for strengthening collaboration between academia, industry, and communities, enabling researchers and businesses to co-develop solutions that will shape the future of the North of England's industrial clusters.

This presentation will showcase the outcomes and emerging impacts of the 24 innovation projects, highlighting advances in enabling the hydrogen economy through high-grade industrial heating, flexible low-carbon power systems, and hydrogen solutions for heavy-duty transport. It will also discuss the policy and regulatory barriers, workforce skills requirements, and community engagement strategies needed to ensure that the transition to Net Zero delivers economic, environmental, and social benefits.

Featured innovations include:

- Novel catalyst-coated nickel micromesh electrodes for high-efficiency seawater electrolysis.
- Integration of PEM electrolyzers with metal hydride compressors for heat-to- compressed hydrogen production and hydrogen/methane separation.
- A first-of-its-kind low-cost UV-cell flame rectification system for hydrogen combustion applications.
- Digital twin technologies for optimising Net Zero industrial processes across the Teesside Industrial Cluster.

The presentation demonstrates how collaborative, industry-led research can accelerate hydrogen innovation while supporting a resilient, inclusive, and sustainable transition to a low-carbon industrial future.