



L-R: Marcus Brigstocke, Muhammad Ahmad, Luke Pulford, Muhammad Wakil Shahzad, Arif Shahab, Muhammad Mehroz, Simon Parker.

Mar 13, 2025 15:35 GMT

## National recognition for eco-friendly aircon innovation

**An energy-efficient cooling system developed by scientists at Northumbria University has been crowned one of the most ground-breaking innovations of the year.**

Optimum Air Con – an innovative cooling system developed in response to the global climate emergency – won the Innovation of the Year - Thermal Comfort category at the [Chartered Institution of Building Services Engineers](#)

(CIBSE) Building Performance Awards 2025.

The event celebrated individuals, organisations, products and projects that set new benchmarks for sustainability, innovation and performance in the built environment.

With global air-conditioning energy demand projected to triple by 2050 – placing further strain on energy grids, particularly in underdeveloped countries – the need for affordable, energy-efficient and environmentally friendly alternatives has never been more pressing.

Optimum Air Con is a pioneering cooling system developed by EcoTechX, an academic start-up in the process of ‘spinning out’ from Northumbria University.

The system is known as a Novel Indirect Evaporative Cooler (NIEC) and represents a significant breakthrough in cooling technology.

Traditional Mechanical Vapor Compression (MVC) air conditioning systems present three major challenges: high energy consumption, high maintenance costs and use of hazardous refrigerants.

Indirect Evaporative Coolers (IECs) were later developed as an alternative to MVCs, utilising water’s evaporative potential to cool supply air. However, there are known limitations with current IECs, such as poor performance, frequent maintenance requirements and complicated manufacturing.

[Dr Muhammad Wakil Shahzad](#), an Associate Professor at Northumbria University and Founder of EcoTechX, has been working with a team of researchers to develop [pioneering water and cooling technology solutions for the last decade](#). He explained: “Our Optimum Air Con system addresses the constraints of current IEC systems through simplified design and optimised airflow.”

Optimum Air Con ensures stable indoor temperatures, typically around 23°C, ideal for human comfort, equipment performance, and building health. “By using a natural process to cool the air, the NIEC avoids the dryness often associated with conventional air conditioning, creating a more comfortable and healthier indoor environment”, added Dr Shahzad.

In terms of building performance, the NIEC contributes to substantial energy savings, consuming up to 65% less energy compared to conventional air conditioning systems. This not only lowers operating costs but also reduces the carbon footprint of the building. The system's simplicity and robustness mean minimal maintenance, reducing long-term operational costs and downtime. Additionally, Optimum Air Con can be integrated with existing air conditioning systems as a pre-cooler, further enhancing overall energy efficiency by up to 45%.

The CIBSE Building Performance Awards judges noted that the entries this year were of a high quality and demonstrated innovation. Optimum Air Con was praised for its excellent performance which “demonstrated genuine innovation with broad applicability across property types and use cases”.

They were also impressed by how its design integrated with existing systems to enhance efficiency and sustainability without requiring a full replacement.

Dr Shahzad secured internal University funding, followed by a [Northern Accelerator](#) Proof-of-Concept grant to develop a prototype of the Novel Indirect Evaporative Cooler (NIEC), which showed exceptional performance.

Dr Shahzad's achievements earned him a place in Innovate UK's prestigious pre-accelerator programme, Innovation to Commercialisation of University Research (ICURE), enabling further technological refinement and a comprehensive market survey. Recognised as a leading air conditioning technology for sustainable cooling, the NIEC project won Dr Shahzad a place on ICURE Exploit, a 12-week programme for teams recommended for spin-out that provides intensive company formation and business growth support.

This achievement paved the way for a [£2.8 million Ayrton Challenge funding opportunity](#) to develop and scale up an innovative cooling solution for Pakistan. Additionally, the ICURE Grand Scale Kick Start program was secured to utilise Innovate UK's network for market expansion.

Work to scale-up and commercialise the patented Optimum Air Con device via upcoming spinout company EcoTechX, which will be able to supply communities worldwide, follows the [successful commercialisation of the team's Solar2Water system](#). The system uses solar energy to extract moisture from the air and turn it into clean, safe drinking water.

Professor Louise Bracken, Pro Vice-Chancellor for Research and Knowledge Exchange at Northumbria University, said: “Northumbria's commitment to research excellence provides a supportive environment for the development of groundbreaking innovation. Through collaborations like the Northern Accelerator programme, research endeavours with commercial potential are nurtured into spinout businesses, fostering economic growth while addressing pressing global challenges.

“The successful development of advanced, research-informed products such as those developed by Dr Shahzad and his team underscores the importance of university links with industry which drive innovation and deliver tangible solutions to real-world problems.”

Northumbria University ranked highly for its engineering research power in the [Research Excellence Framework 2021](#), with 90 per cent of its studies rated as either world-leading or internationally excellent.

Discover more about Northumbria University's Department of Mechanical and Construction Engineering by visiting [www.northumbria.ac.uk/mce](http://www.northumbria.ac.uk/mce). To find out about the Optimum Air Con and Solar2Water technologies, visit <https://ecotechx.com/>

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UNIVERSITY OF THE YEAR 2022 (Times Higher Education Awards)

Northumbria is a research-intensive university that unlocks potential for all, changing lives regionally, nationally and internationally.

Two thirds of Northumbria's undergraduate students come from the North East region and go into employment in the region when they graduate, demonstrating Northumbria's significant contribution to social mobility and levelling up in the North East of England.

Find out more about us at [www.northumbria.ac.uk](http://www.northumbria.ac.uk)

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