Northumbria University NEWCASTLE

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New technologies for renewable energy to be developed by region's universities

The North East's reputation for renewable energy research has received a major boost, with confirmation that the UK's next generation of doctoral researchers in this field will train in the region.

In news announced today by the Engineering and Physical Sciences Research Council (Monday 4 February), £5.2 million has been awarded to Northumbria, Newcastle and Durham Universities to open a new national Centre for Doctoral Training in renewable energies. Industry partners have contributed further, taking the total project value to approximately £11 million.

The EPSRC Centre for Doctoral Training in Renewable Energy Northeast Universities will be known as ReNU. It will train 65 PhD students across the three universities over the next five years.

Although there has been a strong growth in the renewable energy sector in recent years, the next revolution within the energy sector will be in providing sustainable power sources for what is known as 'distributed devices'. It is estimated that more than 40 billion smart and interconnected devices, such as smartphones, tablets and Fitbits will be in use by 2024, all of which will need to be charged frequently.

Further massive growth is expected in new devices, such new forms of unmanned electric transportation and medical technologies that can monitor and treat patients at home rather than in hospital. This makes it vital that renewable energy sources are used to charge and power them.

Researchers at ReNU will be working to create and develop new materials and devices that will convert energy into power at the point of use. This could include automatically recharging the devices without the need to plug them in to be recharged every night. Their goal is to develop new materials that can be mass-produced, making them sustainable and inexpensive to use.

One such example of this is work being undertaken by Dr Neil Beattie, who is leading the ReNU centre at Northumbria University. He is currently investigating how to produce a specialist form of paint that could be sprayed onto cars or rooftops to generate solar energy at any location.

He said: "Global demand for electricity is constantly increasing and as a result, we need to find new, innovative ways to power our devices and vehicles using renewable and distributed energy technologies. Imagine a world in which there are billions of interconnected mobile devices – and a world with new modes of transportation, such as unmanned electric aerotaxis. Now imagine the challenge of providing power to these devices. It quickly becomes unmanageable. We need to find new ways to efficiently convert and store energy at the point of use."

As well as receiving expert guidance from renowned academics at Northumbria, Newcastle and Durham universities, PhD students studying in the Centre for Doctoral Training in ReNU will also receive enhanced training

to develop their business and innovation skills. The four-year course includes an in-built mini-MBA qualification, intellectual property training and a two-week placement in China studying renewable energy at a leading academic institution.

Dr Libby Gibson will be leading ReNU at Newcastle University. Her work focuses on “artificial photosynthesis”, which uses the energy from sunlight to generate fuel from water and carbon dioxide. She said: “The energy landscape is evolving rapidly as we discover more sustainable and versatile ways to power our devices and vehicles. We’re excited to bring together expertise from across the science and engineering disciplines to work together both to tackle the challenges at this research frontier, and also to equip our doctoral candidates with the breadth of skills required to tackle the changing needs of the industry in the future. This region has a strong heritage for innovation in energy and we’re delighted to play a part in its continuation.”

Dr Chris Groves, who will be leading ReNU at Durham University, undertakes research to understand how the movement of electrical current on the nano-scale influences the performance of solar cells. He said: “De-carbonisation of energy is one of the most fundamental challenges facing our society. Huge changes in how we generate, transport, store and use energy are needed to meet the expectations of the Paris agreement. We are excited to be playing a leading role in training the next-generation of engineers, chemists, physicists and materials scientists who will perform the research that enables this transition.”

The bid to run the centre received extensive backing from the industrial sector. Global businesses including Airbus, Siemens and Shell, regional SMEs and organisations such as the North East Local Enterprise Partnership all sent letters of support to EPSRC confirming their support for the research that will be undertaken.

ReNU is backed by almost 40 external organisations that have confirmed that they will work in partnership with ReNU. In addition to a strong portfolio of industry partners these organisations include strategic networks, not-for-profit organisations and leading research institutions. They will provide support in a range of ways, including membership of a strategic advisory board, supporting individual projects and setting challenges for the doctoral candidates to work on.

Northumbria, Newcastle and Durham universities already work in partnership on the £1.8 million North East Centre for Energy Materials (NECEM). Funded by EPSRC and the Industrial Strategy Challenge Fund, NECEM unites the broad range of expertise in engineering, chemistry, biology and physics to research and develop new high-performance materials that will improve efficiency in energy generation, storage and transmission.

Professor Andrew Wathey, Vice-Chancellor and Chief Executive of Northumbria University said: "A key strength of this consortium of North East universities is the breadth of expertise across the energy sector. With complementary strengths in areas such as solar energy conversion, thin film technologies, wave and tidal energy, Northumbria, Newcastle and Durham have worked in partnership to develop this compelling doctoral training programme. Building on the success of our research through NECEM, ReNU will enable doctoral researchers to develop the entrepreneurial skills required to drive UK productivity in the area of Clean Growth, one of four grand challenges identified by the Government in its Industrial Strategy."

Science and Innovation Minister, Chris Skidmore, said: "As we explore new research to boost our economy with an increase of over £7 billion invested in R&D over five years to 2021/22 – the highest increase for over 40 years – we will need skilled people to turn ideas into inventions that can have a positive impact on our daily lives.

"The Centres for Doctoral Training at universities across the country will offer the next generation of PHD students the ability to get ahead of the curve. In addition, this has resulted in nearly £400 million being leveraged from industry partners. This is our modern Industrial Strategy in action, ensuring all corners of the UK thrive with the skills they need for the jobs of tomorrow.

"As Science Minister, I'm delighted we're making this massive investment in postgraduate students as part of our increased investment in R&D."

The news further cements Northumbria's reputation for research excellence and follows recent announcements of doctoral training partnerships funded by NERC – the ONE Planet partnership focusing on global change – the Economic and Social Research Council's NINE partnership with universities in Northern Ireland and the North East of England for social sciences research, and the Arts and Humanities Research Council (AHRC) Northern Bridge

consortium for research into the arts and humanities disciplines.

Anyone interested in finding out more about ReNU or who would like to apply for one of the PhD projects being funded by the Centre should visit www.northumbria.ac.uk/renu

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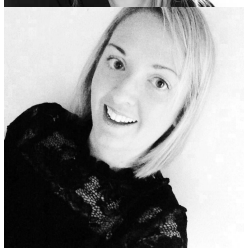

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