

Innovation & Investment in Energy

Renewable Energy



Key Facts and Overview

- North East England has deeper roots in energy science and engineering than any other region in the world. The first global fossil fuel export industry was established here and innovation in energy technologies followed: steam power for locomotion (the Stephensons), then turbine technology (Charles Parson), then electric light (Sir Joseph Swan) and the world's first fuel cells (Thomas Bacon).
- Innovation and investment in energy technologies is flourishing in North East England, with more than £6bn planned for new energy projects.

- Over £100M has been invested over the last five years in energy technology capacity and the facilities needed for rapid and sustainable growth – similar levels of investment are planned.
- A business led Energy Leadership Council has been formed to provide strategic advice. Key companies such as Eaga Renewables, PB Power, Amec, Engineering Business, TNEI, Ensus, Clipper Wind and Arup are all operating in renewable energy sectors in the region.
- The North East is fast becoming a European hub for both Offshore Wind and Biofuels. Projects include a £60m investment by SembCorp in a 30MW biomass power plant, Clipper Wind's new turbine R&D project and the investment by Ensus in the largest bioethanol production facility in Europe.
- The development of local energy generation and distribution for both industry and householders is a focus for new innovation. Working with industry on 'own energy' schemes and with communities we are developing Energy Services Companies (ESCO's).
- A community of some 300 energy researchers is working closely with industry, located in state-of-the-art energy research laboratories and test facilities. Extending over 25,500 m², these facilities are unparalleled in any comparably compact area worldwide.
- The region currently generates approximately 87.8MW of energy from renewable sources.



Industry Support Organisations

- NOF Energy: Trade association for the offshore industry are also working on renewables re-employing knowledge, expertise and facilities for new markets.
- A range of industry, professional institutes and research networks based in the region based including North East Biofuels, PV-NE, UK Hydrogen Assoc and National Energy Action.
- Renew Tees Valley works on business development for renewable energy and waste management technologies through inward investment, new businesses and helping existing business to diversify into new markets in renewable energy.
- NaREC (New and Renewable Energy Centre) offers development, testing and consultancy services across the range of emerging new and renewable energy technologies with world-class testing facilities. Facilities and expertise are provided in wind, photovoltaics, marine, microgeneration and distributed energy.
- Centre for Process Innovation (CPI) and The Welding Institute (TWI) provide complimentary innovation facilities and expertise in low carbon fuels, fuel cells and energy materials and fabrication.

Research

A regional energy research consortium has been established 'Energy Research North East England' which brings together a strategic consortium of Universities and Technology Centre's. As part of the consortium Durham University has particular strengths in large scale wind energy; microgeneration; photovoltaics; plant and microbial genetics for biomass and biofuel production; geoscience aspects of carbon sequestration; and public engagement. Newcastle University has strengths in offshore power engineering; power engineering; power electronics, drives and machines; fuel cells and hydrogen technologies; second generation biofuels and biological CO₂ sequestration; and geothermal technologies. Since 1984, Northumbria University has enjoyed a strong international profile in photovoltaics, and is also at the forefront of low-carbon building services engineering. The globally leading position of Northumbria School of Design (amongst whose distinguished alumni is Jonathan Ive, designer of the iPod) add important wider perspectives to the Consortium's capabilities.

NaREC is an independent, cross-disciplinary research and development organisation serving developers, manufacturers and investors in new and renewable energy worldwide. Operational divisions covering wind, marine, micro-renewables, photovoltaics and electrical engineering progress new energy technologies through innovation in design, deployment and network integration. The expertise and facilities associated with the Centre for Process Innovation (CPI) at Wilton are focused on low carbon fuels and fuelling systems.



Case Study – Clipper Wind

CALIFORNIAN energy giant Clipper Windpower has announced the development of a new generation of offshore wind turbines in North East England. Clipper Windpower will use the New and Renewable Energy Centre's (NaREC) blade test and manufacturing facilities to engineer, construct and test a prototype 7.5 MW offshore turbine, which will be the largest in the world. A single 7.5 MW turbine could potentially provide for the electricity needs of more than 5,500 homes and offset more than 32 million tonnes of CO₂.

The US firm has also announced that Blyth is to be its European Centre of Excellence for Offshore Wind Technology. Securing the investment from Clipper Windpower - which has offices across the USA, Mexico and mainland Europe - is a major coup for the North East and for NaREC.

Key Opportunities

The region is investing in technology areas where the NE based companies and research base are able to capture a particularly large share of value. We are continuing to see significant planned investment in further development of industrial capacity through companies such as Clipper Wind, RWE npower and Centrica. We have identified four innovation platforms for further investment:

- The North East partnership of industry, research and public sector are developing innovative distributed energy systems and business approaches for both industry and householders. The aggregation of these opportunities through Energy Services Companies (ESCO's) is developing new models untried elsewhere;
- The development of Europe's leading open access development facilities for offshore wind are being scaled up and are attracting commercial investment in new design, manufacturing, supply chain and research partnerships with leading European and US Centres;
- The North East is increasingly central to the development of the UK photovoltaic (PV) industry with a number of research breakthroughs at Northumbria and Durham Universities, Romag the UK's largest manufacturer of architectural photovoltaic glass – powerglaze, and the NaREC Technology Development Centre in Blyth developing new pv products including concentrator and coloured solar cells. The addition of the PETeC Centre at NETPark and work at the Wilton Centre will develop a new generation of flexible PV.
- Research and development partners are designing, real world testing and deploying integrated microgeneration solutions into new buildings. The building design and market testing of integrated technologies including air source and geothermal heat pumps, solar thermal, photovoltaics and biomass boilers are now to be applied in new developments.

Pressure for progress towards sustainability and carbon reduction of the energy industries while maintaining growth is a key factor underpinning all of the areas highlighted. We are continuing to identify further areas e.g. wave and tidal power and integration of renewables and energy storage.

Contact Details:

To discuss the service further, or to receive an initial response to an investment proposal, please make contact by phone, e-mail or post today.

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