



Fuel Cells and the Hydrogen Economy

Key Facts and Overview

- North East England boasts the only UK facility dedicated to the assisting and promoting of fuel cells in stationary and portable applications.
- North East England, and particularly the Tees Valley, has a unique position in the UK:
 - Has access to all the major fuels for fuel cells. This includes: 75 kt/yr of hydrogen production, 35 km of hydrogen pipelines and 1000t of storage.
 - The capacity to export over 1,000 MW of additional electrical power to areas of high demand in the south.
 - The second largest deepwater port in the UK handling large volumes of low-carbon fuels.
 - Offshore geology that is favourable for carbon dioxide sequestration.
- Hydrogen from wind: A proposal has been developed which uses the Tees Valley's underground hydrogen storage caverns to store surplus wind energy.
- Regional academic expertise explores fuel cell technology, and also links into renewables, mobile and static applications and design.



Industry Support

The region has three organisations that work together to support the development of fuel cells and the hydrogen industry:

- **CPI Fuel Cells Application Facility:** A key stream of the Centre for Process Innovation is the Fuel Cells Application Facility (FCAF).
- **Renew Tees Valley (RTV):** Promotes the use of renewable energy technology in the Tees Valley. It supports a number of projects and specialises in the Tees Valley fuelling and infrastructure systems, coal gasification and supporting carbon sequestration and the introduction of newer, greener sources of hydrogen.
- **New and Renewable Energy Centre (NaREC):** Set up to bring substantial benefits to the UK's new and renewable energy industry, it is a Centre of Excellence, fast-tracking concept evaluation, feasibility studies and prototype evaluation and testing through to early commercialisation. The focus is on the development of renewable energy technologies and their integration into the electrical grid infrastructure.

Regional Initiatives include:

- A range of smaller projects are in operation or being developed in the Tees Valley:
 - Fuel cell powered signs are operating at the transporter bridge and used for portable speed monitoring in the Tees Valley. Further prototypes are being built.
 - One of the port lighthouses is being commissioned with fuel cell power.
 - All are the result of collaboration between RTV, FCAF and a number of partner companies.
- There are also a number of larger projects in progress with more partners working together:
 - The Middlehaven development, a major Tees Valley regeneration project, is planned to have a private wire network. Energy Services Company (ESCO) will supply its heat and power through combined heat and power and district heating. It will be a low carbon system based on gas engines, bio-mass and ultimately fuel cells.
 - Progressive Energy is developing plans on a coal gasification plant in the Tees Valley. The 800 MW clean coal power plant can produce up to 40 tonnes/hour of hydrogen and 5 million tonnes/year of CO₂ for Enhanced Oil Recovery.
 - A major project is focused on the fuelling systems for low carbon fuels. This will work with local fleet operators to reduce the carbon content of their fuels over the next ten years. This project includes green fuelling stations to dispense compressed natural gas and hydrogen, and bio-diesel are also being considered. A range of power systems from internal combustion engines to fuel cells in conventional and hybrid vehicles will be involved.



Companies

■ The region has a range of commercial companies operating in fuel cell industries including:

Company	Activity
Hiltech Developments	FC control systems and test stations.
GT Group	Manufacture gas and liquid hydrogen fuelling systems around the world.
Air Products	Produce hydrogen in Teesside.
BOC	Produce hydrogen in Teesside.
Varitext	Working with the CPI FCAF to produce FC powered road signs.

We have world standard chemical process consultants and electrical design companies throughout the region.

Finance

There are many sources of finance and venture capital available to companies in the region. Unique in North East England is **Nstar** set up by One NorthEast. It focuses on high risk venture capital, and it partners with the commercial venture capital community to invest in new technology spun out of universities or created within the small to medium sized enterprise market. Nstar can create tailored supply chains for large corporations through this process. Nstar has total funding of £60m (\$108m) split into Proof of Concept Fund and Co-investment Funding.

Market Access

The Model below demonstrates how all of the expertise and support organisations place North East England in a unique position to support companies in the commercialisation of research and getting new products to market. At the centre of the process is the Investment & Aftercare Team that will sit with you to understand your own individual requirements and come back with a tailored investment solution to include some or all of the elements below. From here in the UK or offices in North America, China, Japan, Korea, Australia, Norway and Germany, the team will help you get your products and services into the market.



Contact details

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