

Fuel cells and hydrogen: Britain's low carbon success story

The UK fuel cell and hydrogen sector has the potential to become Britain's low carbon energy success story. The UK is facing a substantial challenge, both in terms of securing energy supplies for the years to come, and achieving the CO₂ cuts that it is committed to deliver. Fuel cells and hydrogen are already contributing to the realisation of the UK's environment and energy goals, and are driving the UK's transition to a low carbon economy.

Currently, over 100 UK companies form part of the UK hydrogen and fuel cell industry. This is generally characterised by a mix of established international corporations and smaller entrepreneurial companies. The knowledge and expertise of the UK industry span the full length of the commercial value chain, from R&D to systems integration, and from finance to servicing. The world leading technologies developed in the UK are well placed for deployment across the international arena.

It is expected that the world fuel cell market might be valued at more than \$26 billion (USD) by 2020 and \$180 billion by 2050, of which the UK might have market shares of ~\$1 billion and \$19 billion respectively¹. UK organisations at all parts of the fuel cell and hydrogen commercial value chain recognise this global potential. Typically over 50% of the UK production is currently exported.

Stimulating job creation and economic growth

As we emerge from the global recession, governments around the world are recognising fuel cells and hydrogen as promising areas of future economic growth and job creation, prompting increased investment in this dynamically developing sector².

It is estimated that the European fuel cell and hydrogen industry already supports over 9,000 jobs: more than 3,000 directly and over 6,000 indirectly³. Looking ahead, fuel cell and hydrogen technologies will offer employment opportunities in a wide range of industries. The growth of fuel cell applications for material handling, portable, backup and stationary power are expected to generate a range of new jobs in the near term. More specifically, the global fuel cell industry is expected to create 700,000 green manufacturing jobs over the next decade, the overwhelming majority of which will be in stationary fuel cells, with almost 500,000 total jobs⁴. For both the stationary and transport sectors, for every job created in fuel cell manufacturing, another is expected in systems installation, maintenance and servicing, which could add up to a million jobs globally. And, as the market for fuel cells grows in the UK, there will also be growth in hydrogen related jobs (design and construction of production plant, ongoing operation, distribution, analysis etc).

In transport, many more job opportunities will be created over the next 10-20 years. This is particularly important for the UK automotive industry, which is a vital part of the UK economy. The

¹ Annual Report on World Progress in Hydrogen Energy, A Report by the Partnership for Advancing the Transition to Hydrogen, August 2011, www.hpath.org/WorldReport.asp

² <http://www.fuelcelltoday.com/analysis/industry-review/2011/the-industry-review-2011>

³ A Compendium of Job Estimates in the Fuel Cell Industry, Fuel Cell 2000, http://www.fuelcells.org/Fuel_Cell_Industry_Job_Estimates.pdf

⁴ Fuel Cell Today Industry Review 2010, <http://www.fuelcelltoday.com/news-events/news-archive/2010/january/fuel-cell-industry-could-create-700,000-green-manufacturing-jobs-by-2020>



Representing UK Hydrogen and Fuel Cell Industry

UK is a leading developer of advanced internal combustion engines for conventional powertrains (petrol and diesel). There is a strong rationale, recognised by all automotive OEMs, to transfer existing industry know-how to ultra-low emission vehicles. Fuel cells and hydrogen may allow the UK to preserve approximately 145,000 jobs in automotive manufacturing.

Government support for fuel cells and hydrogen will have a key role to play in attracting automotive OEMs to manufacture fuel cell electric vehicles in the UK, when they move production outside of Japan and USA in the next few years. The recently launched UKH2Mobility brings together three Government Departments and industrial participants from the utility, gas, infrastructure and global car manufacturing sectors. This group will evaluate the potential for hydrogen as a fuel for Ultra Low Carbon Vehicles in the UK before developing an action plan for an anticipated roll-out to consumers in 2014/15. Outputs are expected to include an assessment of the investments required to commercialise the technology, including refuelling infrastructure, and the actions needed to make the UK a leading global player in hydrogen fuel cell electric vehicle manufacturing, thereby paving the way for economic opportunities to the UK, through the creation of new jobs and boosting of local economies.

The potential impact of ultra-low emission vehicle manufacturing in the UK can be illustrated with the decision of Nissan to start manufacturing its fully electric vehicle, the Nissan Leaf, in the UK's Sutherland plant from 2013. This decision is expected to maintain about 2,250 jobs at Nissan and across the UK supply chain (for example, Nifco UK (based in Stockton on Tees) which will supply plastic moulded components for the battery packs for the Nissan Leaf, has created 128 new jobs and safeguarded 158 current jobs at the company by becoming a supplier to electric vehicles market).

Growing the UK fuel cells and hydrogen sector provides clear opportunities to retain high quality UK expertise, especially in the following areas: mechanical engineering, chemistry and chemical engineering, electrical engineering, material science, industrial engineering, power plant operation and maintenance, fuelling infrastructure installation, and hydrogen production.