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analyst view

Latest Fuel Cell Developments in the UK

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Taxicab refuelling at Air Products' Heathrow hydrogen station (Source: Air Products)

A popular question we get at events around the world is "what is the latest update on fuel cells in the UK?" Recently there has been quite a lot of activity, so this analyst view is intended to summarise the latest developments.

The UKH_2Mobility project, launched in January 2012, is continuing on schedule, with its first phase to investigate the potential for hydrogen as a fuel for ultra-low-carbon vehicles in the UK due for completion in September, potentially in the form of a publicly available report. With a favourable outcome, the second phase of the project will be to develop a strategy and business case to facilitate the necessary hydrogen infrastructure for the anticipated 2014/2015 rollout of fuel cell electric vehicles (FCEV).

Aberdeen City Council has secured funding for a hydrogen hub which will support Europe's largest fleet of fuel cell buses. The project, which includes funding from the Scottish Government, Scottish Enterprise, the Technology Strategy Board and the European Fuel Cells and Hydrogen Joint Undertaking, aims to have ten buses operating on the streets of Aberdeen by 2014. The buses will be refuelled at Scotland's largest hydrogen station, run by BOC, which is also designed to support FCEV.

The hydrogen for this project will be produced by electrolysis; a 1 MWe electrolyser provided by BOC will split water into hydrogen and oxygen. Scottish & Southern Energy Power Distribution will work with BOC to harness the electricity from a nearby wind farm to power the electrolyser which will also operate in a grid balancing capacity.

BOC's hydrogen refuelling station at the Honda site in Swindon completed the UK's first 700 bar refuelling in July filling a Hyundai ix35 FCEV. This event confirmed the BOC station as a dual-pressure site and at the beginning of the 2012 London Olympic Games it refuelled a fleet of black taxicabs.

The five fuel cell black cabs were running during the Games, ferrying VIPs between the various events. The refuelling at Swindon took place due to a minor delay in the opening of an Air Products

hydrogen station, located at Heathrow Airport. This station is also open to the public and, once open, refuelled the black cabs on a regular basis.

UK's first hydrogen powered train was unveiled by researchers at the University of Birmingham, built as an entry for the IMechE Railway Challenge. It is powered by a 1.1 kW fuel cell, storing hydrogen in low pressure metal hydride canisters. The locomotive weighs just 320 kg, but can pull passenger wagons, including passengers, weighing up to 4,000 kg. To view the train in action click here.

Britain's first hydrogen ferry is set to begin operation in Bristol harbour later this year. Built by a consortium of companies including No 7 Boat Trips, the Bristol Packet, and Auriga Energy, and is supported by Bristol City Council, the ferry will be able to carry up to twelve passengers at a time.

Residential fuel cells are well placed for success in the UK with many systems currently on trial. UK-based Ceres Power announced that its partners, British Gas (UK) and Itho-Daalderop (The Netherlands), are to purchase 174 micro-CHP units for sale and testing in UK and Dutch homes from 2014. This will be the first time the units are available to the public and select UK customers will have the opportunity to purchase a Ceres micro-CHP unit with a full service and maintenance package provided by British Gas. Ceres' product will qualify for the newly-increased micro-CHP feed-in tariff (FIT) in the UK. For a typical UK home with a Ceres micro-CHP unit, it is predicted that the annual FIT will go up from £350 to £436, on top of the predicted annual energy cost savings of £286. Feedback from these trials will be used by Ceres to refine the product and validate performance and operability prior to mass volume launch in 2016. The trials will be part of the new Ene.Field project, a large-scale demonstration of various fuel cell micro-CHP products across Europe.

Ceramic Fuel Cells Limited's BlueGen residential micro-CHP system also qualifies for the UK FIT, and is currently the only fuel cell micro-CHP product to be eligible both for the UK FIT and to receive certification under the Microgeneration Certification Scheme. Customers installing BlueGen with a commissioning date of 1st December 2012 or later will be eligible for the new m-CHP tariffs.

Also in the residential micro-CHP market, Japanese Ene-Farm member Panasonic announced it would invest £2 million opening a research centre in Wales in September this year, backed by an additional half a million pounds from the Welsh Government. Its intent is for the facility to adapt and modify Japanese residential fuel cell products for the UK and wider European markets.

Also in the stationary sector, UK-based AFC Energy announced it had commenced a project with Industrial Chemicals Limited to install an alkaline fuel cell at a UK chlor-alkali facility to generate electricity from by-product hydrogen. The installation would initially be AFC's Beta Plus System (around 40 kW), planned for late 2012, but the partners have plans to expand the system to 1 MW which would make it the largest fuel cell installation in the UK. Another UK-based company, ACAL Energy, commissioned its 3 kW backup power fuel cell system running on by-product hydrogen at a chemical plant in Warrington, UK, owned by chemical company Solvay. ACAL's Flowcath® system uses a low-cost liquid regenerating catalyst system to replace platinum on the cathode.

So that was quite a long answer to the question, but I hope you can see the fuel cell industry is definitely flourishing in the UK with both stationary and transportation projects of all sizes planned alongside hydrogen infrastructure investments for the future.

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