

Hydrogen Fuel Cell Powered House Unveiled in Black Country

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A hydrogen fuel cell system which is powering a house in Lye in the West Midlands will be unveiled on Friday 10th October by Science and Innovation Minister Ian Pearson MP.

Black Country Housing Group (BCHG), in partnership with the University of Birmingham will launch the hydrogen fuel cell system which is powering the house's electricity, water and central heating. The fuel cell unit is housed in a shed in the back garden of one of their newly-built homes in Stocking Street – a quiet residential cul-de-sac.

The £2 million project which is jointly funded by regional development agency Advantage West Midlands and the Engineering and Physical Sciences Research Council demonstrates that hydrogen – a component of water and one of the earth's most abundant resources – is a viable alternative to fossil fuels. This installation uses the natural gas infrastructure, the gas being converted into hydrogen by a reformer and the hydrogen is then used in the fuel cell. Hydrogen produces no carbon emissions unlike coal or gas and is much more efficient in operation. In the future, a hydrogen infrastructure – hydrogen piped to individual buildings and residences – will make this type of technology ideal for domestic use.

A fuel cell combines hydrogen and oxygen through a membrane to produce electricity, heat, and water. The fuel cell will produce electricity as long as fuel (hydrogen) is supplied.

The University of Birmingham is leading the research project to learn more about hydrogen and fuel cells in a domestic context. By remotely monitoring the equipment at the house, researchers can find out more about the hydrogen fuel cell system, its efficiency, performance, operation, and durability. A supply chain in the West Midlands is also being established to allow small companies to manufacture components for the growing market in this new technology.

The new fuel cell is a Baxi Innotech unit that generates 1.5kW of electricity and provides 3 kW of heat suitable for domestic heating and hot water that is transferred to a 600-litre water tank heat store next to the fuel cell. The heat is circulated through conventional radiators and to the hot water cylinder in the house, while the electricity generated by the fuel cell powers the house. If the house needs less electricity the extra generated is exported to the National Grid. If the house needs more electricity, the additional amount required is imported from the grid.

Richard Baines, Director of Sustainable Development at BCHG, said: 'Hydrogen fuel cells are leading the way when it comes green energy and it's our belief in this technology that has driven us to install the fuel cell. Minimising impact on the environment is everyone's responsibility, but as a social housing landlord we are able to make a real difference to the technology used in homes.'

Professor Kevin Kendall from the University of Birmingham's School of Chemical Engineering and lead investigator says, 'Ultimately all our homes will have these units. But first, more research and industry development is needed to optimise the technology.'

Dr Waldemar Bujalski from the University of Birmingham's Fuel Cells Group says, 'We are grateful to Advantage West Midlands and the Engineering and Physical Sciences Research Council for the money to invest in the equipment and to be able to undertake a research project of this kind.'

Mark Kelly, Chief Executive Officer of Baxi Group says, 'In order for us to meet the government's targets for carbon emissions reduction, it is necessary for a transformation in the domestic heating market. Baxi Group has invested heavily in a combined heat and power (CHP) strategy, developing cutting edge technology that will reduce the use of energy from fossil fuels, reduce home heating costs and reduce our dependence on the central power network.'

Dr Richard Hutchins, Corporate Director of Economic Development at Advantage West Midlands says, 'The creation of a low carbon economy is a priority of the regional economic strategy and energy is a key theme for Birmingham Science City. This is an exciting project and an important part of a wider programme of activity that will help to cement the West Midlands' reputation as the lead centre for hydrogen energy research while also creating high level jobs. It is an excellent example of how we are working together to produce a cleaner environment while leading the way in an emerging sector.'

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Notes to Editors

You are invited to attend or send a representative. Please call the numbers above for accreditation.

1. Baxi

The equipment in the house and the test unit in the laboratory have been developed by Baxi Innotech, part of the Baxi Group, one of Europe's biggest manufacturers and distributors of domestic and commercial water and space heating systems. Both units have been installed by Energized Ltd (a West Midlands based SME run by Mr Andrew Parker) which is the only accredited company by Baxi Innotech in England for services and maintenance of this new emerging technology.

2. Funding

This research is funded by Advantage West Midlands (£563,000) and the Engineering and Physical Sciences Research Council (£1.5 million).

3. BCHG

BCHG launched the world's first house heated and powered by hydrogen fuel cells in 2004; opening the way for others to follow, as part of a pilot programme. As a social landlord, BCHG is increasingly planning for the future, as climate change becomes a reality and supplies of gas, coal and oil diminish.

The key difference between the new system and its predecessor is that this system is connected to the National Grid. BCHG's first hydrogen fuel cell home was not connected because the grid can interfere with operation and the housing group needed to eliminate that variable.

Other differences include the hydrogen supply – it was pure bottled gas previously but a reformer extracts hydrogen from natural gas. In the new system Proton Exchange Membrane (PEM) cells are used, whereas alkaline cells were used previously.

BCHG (Black Country Housing Group) is a community regeneration agency, with housing at its heart, working in Sandwell, Dudley, Wolverhampton and Birmingham.

The Group specialises in urban renewal, economic and social regeneration, through building new affordable homes, providing care and health services to communities and supporting social enterprise and financial inclusion.

It is landlord to tenants in more than 1500 homes and has over 30 years experience in providing quality homes and support services for families, couples, single people, older people and those with special needs.

The Group has established an innovative environmental consultancy service, e²S, which advises on sustainability issues for landlords, house builders and public sector organisations.

As well as being a landlord, through its Care and Repair team BCHG provides a home improvement service to the councils of Sandwell, Dudley, Birmingham and Wolverhampton. This helps vulnerable people access funding and contractors to make improvements to their home.

www.bcha.co.uk (<http://www.bcha.co.uk/>)

4. The University of Birmingham

The University of Birmingham's School of Chemical Engineering Fuel Cell Group has recently unveiled its own hydrogen fuelling station situated on its Edgbaston campus. The University also owns 5 hydrogen fuel cell cars which are being used in a study to ascertain the feasibility of hydrogen vehicles.

University of Birmingham Fuel Cell Group

The Fuel Cell Group was set up in 2000 by Professor Kevin Kendall who jointly, with Dr Waldemar Bujalski and Dr Bruno G. Pollet, is leading the research projects in hydrogen vehicles and Combined Heat and Power systems stemming from a range of AWM funding including the Science City initiative. For more information visit <http://www.fuelcells.bham.ac.uk>

5. Birmingham Science City

Birmingham Science City is a widely drawn partnership of industry, business, education and the public sector, working together to establish the West Midlands region as a centre for world-class scientific research. By building on the region's well established reputation for innovation, working closely with the knowledge base and bringing partners together through supported projects and communications, Birmingham Science City aims to promote the value of science and innovation in improving Quality of Life. For more information please visit www.birminghamsciencecity.co.uk

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