

Hydrogen fuel cell powered house

Hydrogen is not only applicable for use as a zero emissions fuel in transport applications but it can also be used to supply heat and power to buildings. In the Midlands Energy Consortium we are committed to demonstrating that this technology can really be applied.

In this project Midlands Energy Consortium academics are working with the Black Country Housing Group to demonstrate the hydrogen fuel cell powered house.

The house in Lye in the West Midlands was unveiled by Science and Innovation Minister Ian Pearson MP in October 2008. The hydrogen fuel cell system is powering the house's electricity, water heating and central heating. The fuel cell unit is housed in a shed in the back garden of the newly-built home.

The £2 million project, which is jointly funded by regional development agency Advantage West Midlands and the EPSRC, demonstrates that hydrogen is a viable fuel. Hydrogen produces no carbon emissions unlike coal or gas and is much more efficient in operation.

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. In the future, it is hoped the hydrogen would come from renewable sources.

The University of Birmingham is leading the research project to learn more about hydrogen and fuel cells in a domestic context. They are remotely monitoring the equipment at the house to find out more about the hydrogen fuel cell system, its efficiency, performance, operation, and durability.

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.

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