

Hanover Fair 2004, Hall 13, Stand D52/2:

Vaillant presents its latest field test generation of fuel cell systems at the Hanover Fair

Development of fuel cell heating appliances for decentral electricity and heating supply forges further ahead

Hannover, 19th April 2004 – The beginning of field tests with a new generation of fuel cell heating appliances (FCHAs) under the responsibility of Vaillant brings fuel cell technology for decentral household energy supply into a new phase. The objective of testing the systems, which were developed in close cooperation with the US company Plug Power, is to examine how complexity and thus the systems' costs can be reduced and their reliability improved further. These are the main preconditions that must be fulfilled for series production. Vaillant is presenting a working appliance of the latest field test generation 'Euro 2' at its stand in Hall 13 at the Hanover Fair. In addition, Plug Power is presenting a hydrogen-powered fuel cell system for supplying telecommunications and IT installations.

As a result of the ongoing project work by Vaillant, this means that the company this year is demonstrating the third field test generation or the fifth technology generation of fuel cell heating appliances as a whole. With its some 40 systems now undergoing field tests, including in Germany, the Netherlands, Austria, France, Spain and Portugal, Vaillant is the European leader in 5 kW PEM fuel cell heating appliances for decentral electricity and heating supply for blocks of flats. Another 20 appliances will be added by the middle of this year. More than 30 of the appliances under test were installed together with 11 partner companies as part of an international field test titled 'Virtual Power Station with Fuel Cell Heating Appliances' and linked with each other via a central control centre. This project is being promoted by the European Commission. Further appliances were put into operation together with other cooperation partners.

How the Vaillant fuel cell heating appliance works

The fuel cell heating appliance (FCHA) uses hydrogen produced out of natural gas by means of a reformer. The hydrogen together with oxygen is directed into the fuel cell stack where an electro-chemical reaction generates high-efficiency heat and electricity. With the up to 4.6 kW of power the FCHA generates, the normal electricity consumption of a block of flats is fully covered. The additionally produced heat of up to 11 kW largely cover two-thirds of the thermal energy needs of the flats for a whole year, and thus also enables hot water supply outside the winter heating period. An added condensing heating appliance with variable output provides the heat needed for thermic peaks. The direct current generated is converted into network-conforming alternating current (230V) by a transformer and fed into the household mains. Electricity for peak consumption period is taken from the network and the unused electricity from the fuel cell is fed into the public grid. Due to the system processes, the FCHA emissions contain only traces of carbon monoxide (CO), nitrogen oxides (NO_x) and hydrocarbon (C_xH_y). The release of carbon dioxide (CO₂) in the medium output band is 25-50 per cent lower than the customary electricity generation process. Coupling power and heat production also results in high overall usage levels of about 85 per cent, thus saving up to 25 per cent of primary energy.

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