

b. Case Study 2 – Dudley United Kingdom



i Details of the Fuel Cell System

Application : Combined heat and power
 Customer/user : Black Country Housing
 Country : England
 City/Town : Dudley West Midlands
 Date : 2008/2009
 Hyper Partner : HSL

Fuel Type:

Natural gas	YES	Hydrogen		Other *	
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* Description: *Natural Gas*

Status of development:

Prototype		Verification model	YES	Serial model		Other *	
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* Description: *Verification model*

CE Certification (for each component): THE WHOLE SYSTEM WAS CE MARKED

Component Name	CE Certification			
1.Stack	YES ¹⁾		NO ²⁾	
2.H2 Supply system	YES ¹⁾		NO ²⁾	
3.Electrical supply/inverter	YES ¹⁾		NO ²⁾	
4.Control panel	YES ¹⁾		NO ²⁾	
5.Heat exchanger	YES ¹⁾		NO ²⁾	
6.Heat Store				
7. Electrical supply				
8.Battery Pack				

1) Which directives were used?

Hazop performed and Risk Assessment with Gordon Newsome HSE.
 Planning authority consulted but they said it was outside their control.
 Building control advised to treat it as an outside experiment.
 Fire Brigade did not have a procedure – one was written by Richard Baines which they adopted.
 Supply of gas (BOC) covered by Gas Regs
 This procedure was used for 1st installation (2003) was adopted again.
 Inform grid the system is going to be connected or disconnected (G83).

Which standards were used?

IGEM (Institution of gas engineers and managers) and IET (Institution of engineering and technology)

Who certified each component/the overall system?

BAXI had the system CE marked in Germany

- Please provide a copy of the certificate of conformance.

2) Was a risk analysis carried out? YES

- Please provide HAZOP information.
- Please provide information regarding to safety measures taken (i.e. fire protection, ventilation, safety sensor, etc)

The system was housed in a wooden shed it was treated more as a natural gas system would have been

treated. Fitted with leak detectors.

Nominal data:

Power out (kWe)	1.5kW
Heat out (kWth)	3.0kw
Fuel gas supply pressure (bar)	18 to 25 mbar
Voltage (V)	230
Frequency (Hz)	50
Ambient temperature range (°C)	
IP-rating	
Dimensions (m)	100cm x 73 cm x 185 cm
Weight (kg)	350

ii Installation

Location:

	Indoor	Outdoor
Remote		
Industrial		
Residential	Yes (lean-to shed)	

Additional information:

(e.g. single/multi family home, rooftop, laboratory, etc)

Single family home. Located in a shed attached to the house.

What affected your choice of site location?

Availability of site.

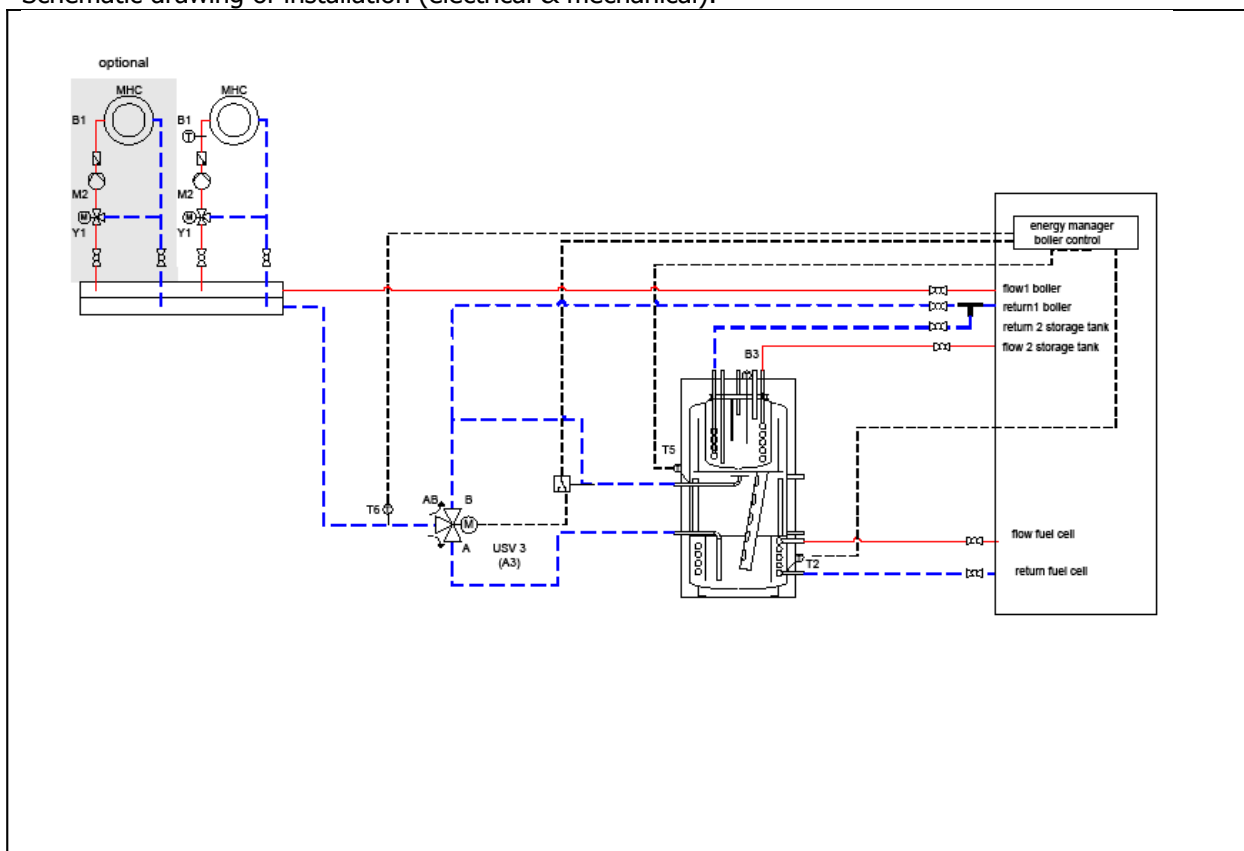
Installed by:

	Name, contact details
Installation company	Energised Ltd
Manufacturer	BAXI INNOTECH GmbH
Service company (maintenance)	Energised
Other	

Please provide copies of installation manuals, service & operational manuals and training material.

1. Before & during installation

Schematic drawing of installation (electrical & mechanical):



Site evaluation:

1. What safety and security measures were taken for each component of the fuel cell system? (e.g. ventilation, fire protection, sensors, barriers, walls, locks)

Considered under HAZOP and under site choice.

- 1.
- 2.

Fuel supply:

Piped	YES	Generated on site		Stored on site ¹⁾	
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- 1) Describe the fuel storage and any safety devices related to the storage, (e.g. number of cylinders used, size of tank used, storage pressure, materials used etc)

Natural Gas

- 2) Describe fuel piping used between components (material, length, internal and external diameter if known, shape connections, etc):

N/A

- 3) Describe what precautions were taken if the piping went through a wall (type of wall, type of sealing, piping instructions, fire protection, smoke protection, etc):

N/A

If the fuel cell was connected to a grid or appliance, what criteria had to be fulfilled?

The fuel cell was connected to the grid. Standard connection criteria for connection of distributed power generation to local distribution network was used (G83/1-1 2008 Engineering Recommendations).

2. After installation

What training did the installers, users and service personnel receive?

BAXI trained the installer and service personnel.
No intervention by the user.

What emergency procedures are/were in place?

Fire Brigade were made aware of location of installation and a special tel number was issued in case of emergencies.
Remotely monitored by (PLC) by BAXI.

If an approval route was necessary, describe by whom and what was needed?

The system was CE marked and similar procedures were followed as 1st installation.

Was any commissioning of the installation carried out? If so please provide details.

Commissioned in lab and then re-commissioned on site by manufacturer

Please describe the service procedure?

Re-commissioned on every service – period of service based on usage, running time and stops and starts

iii Lessons learned

What were the challenges/hurdles for approval?

Public perception of H2 (not good)
Fear of H2
No standards for installation in place lack of guidance
Is it gas or electrical?
Lack of knowledge within industry

What were the challenges/hurdles for installation?

Peripheral trades e.g. engineers and electricians were not sure of what to do.
Integrating the system with existing structures.

What problems were caused by techniques?

Small issue with lifting gear.

What problems were caused by administration, agencies?

N/A

What difficulties did the installer experience?

Lack of knowledge within industry.
I.T difficulties with German software, internet transfer and protocol.

What difficulties were experienced by the customer?

None

Describe any modifications to the installation process?

N/A

In your opinion, if a leak were to occur in the system, where would it be most likely to occur and what would be the most likely causes of the leak? (Describe multiple situations if necessary.)

N/A