



## Low energy buildings - Case Study: **The BASF House**



### Category / year

New construction: nearly zero energy building or better - Small residential (1-2 family houses) / 2007-2008



### Address

United Kingdom, Nottingham, Creative Homes Project, University of Nottingham



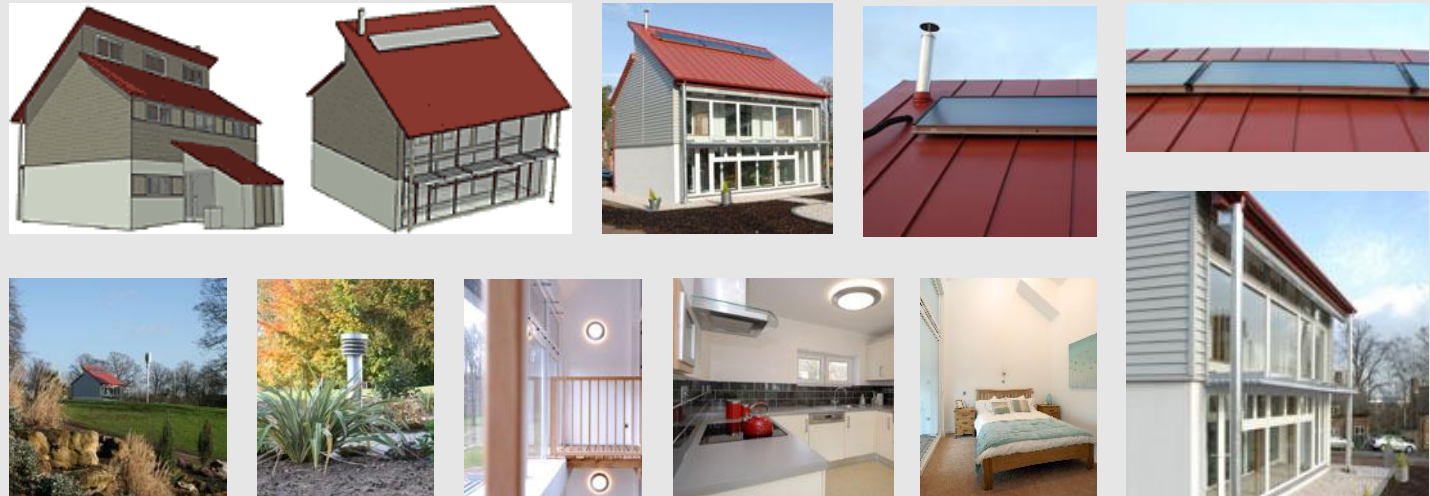
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### Pictures





## Description of the building

### Detailed description:

The BASF House is an 82 m<sup>2</sup> 1-family-home which can be extended to a row of terraces on demand. It is currently inhabited by 2 people. A low carbon emissions target was set for the house. Heat requirement reduction was essential; renewables are being used to heat the house and water. The house complies with the Passivhaus standards of 15 kWh/m<sup>2</sup> and can be called a 1.5 litre house. Materials were selected to balance the cost of building an energy efficient house against the requirement to make the house affordable to a first time buyer, based on whole life performance cost and energy use. Alternative methods of construction instead of traditional brick and block work reduced building time and the need for expensive skilled labour.

The house can achieve comfortable temperatures naturally by combining solar gains, natural ventilation and thermal mass provided by a new Phase Change Material (PCM).

Facing south there is a fully glazed, adjustable two-layer sunspace. The sun warms the air in the sunspace and acts as the primary heating source for the house. Windows between the solar area and the main part of the house can then be opened to enable the warm air to flow around the rest of the house.

### Building envelope:

*First floor and roof:* structural Insulated Panels (SIPs) with PU core. The low carbon roof is made of lightweight steel and coated with a BASF Coatings' coil coating infused with specially-selected heat management pigments which have solar heat reflectant properties. These materials resulted in a U-Value of 0.15 for walls and roof.

### Renewables:

An affordable Ground Air Heat and Cooling Exchange system and a biomass boiler to provide an effective, affordable heat and cooling source were incorporated.



## Energy consumption

### Energy values:

- *Heating demand:* ca. 12.5 kWh/m<sup>2</sup>/year
- *Cooling demand:* 0 kWh/m<sup>2</sup>/year
- *Final energy demand:* 12.5 kWh/m<sup>2</sup>/year (incl. hot water)

### Use of renewables:

- 100 % RES fraction of the energy used for hot water
- 100 % RES fraction of the energy used for cooling
- 100 % RES fraction of the total final energy demand (electricity not considered as renewable, even if from renewable supply)



## Awards won

- Finalist of the Sustainability Awards 2008, Category: Sustainability Innovation Award



## Links

### Website illustrating the building:

- [http://www.energyefficiency.basf.com/ecp1/EnergyEfficiency/en\\_GB/portal/\\_content/show\\_houses/show\\_houses\\_uk](http://www.energyefficiency.basf.com/ecp1/EnergyEfficiency/en_GB/portal/_content/show_houses/show_houses_uk)