

# Passive House low energy low carbon buildings arrive in the UK!



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More than 650 buildings built to the exceptionally energy-efficient Passive House standard have been opened for visits across Europe this year, in the 6th International Passive House Days. And for the first time the list of participating buildings includes Passive House buildings in the UK.

Passive House buildings offer exceptional comfort yet need minimal heating, keeping occupants warm by being very carefully insulated, and making the most of warmth from the sun – as well as hanging on to any heat given out by occupants and by internal appliances. The concept can be applied to designing new buildings, and to refurbishing old ones. In continental Europe the Passive House approach to design is well-established and proven, and the oldest buildings have been up for some 18 years.

Passive House design has only recently been taken up in the UK, but is rapidly gaining in popularity. To date only two UK developments have been officially certified, but many more are in progress.

Two UK buildings are included in this year's event. One is a mixed use public building in Wales, which is one of the first two certified Passive House buildings in the UK (the second being a private house by the same design team). The second participating building is a new house in West Yorkshire that is almost complete, and currently undergoing certification. Two more UK buildings, one currently undergoing Passive House certification (a new Centre for Disability Studies), and another refurbished to near Passive House levels (a Victorian cottage), will be open for visits in the new year.

These buildings are being opened for visiting groups and interested parties, by arrangement ONLY. For details of the buildings and the arrangements for visiting each, please see "Passive House Days – Participating buildings in the UK" on the following pages.

The "International Passive House Days" are organised by the "Informations-Gemeinschaft Passivhaus Deutschland" (IG Passivhaus), several European Passive House Communities, the EU Project PASS-NET and other partners.

You can find participating Passive House projects outside the UK at [www.passivhausprojekte.de](http://www.passivhausprojekte.de). Information on Passive Houses and activities in countries not listed in this database is provided by [www.ig-passivhaus.de](http://www.ig-passivhaus.de) (click on Tage des Passivhauses / International PASSIVE HOUSE days)

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Passive House Days 2009 - Participating buildings in the UK

**Canolfan Hyddgen** is a multi-use community building, and is the first certified non-domestic Passive House in the UK. It uses a hybrid approach with a central masonry core, an external solid timber frame, and I-beam cassette roof. The building has high levels of insulation, and uses south facing glazing to enable heating by solar gain in the winter months, even in cloudy West Wales. Careful design and use of controllable shading protects against overheating, which could otherwise be a risk because of the large amounts of IT equipment (the building is a centre for IT teaching and learning).

The building's ventilation is carefully controlled, with unwanted air infiltration minimised by careful design and construction. The ventilation air is pre-heated by the exhaust air in winter (heat recovery ventilation), and in summer, cool night air is drawn in to cool the massive interior of the building for the following day. (More information at [www.jpwconstruction.idps.co.uk/passivhaus.html](http://www.jpwconstruction.idps.co.uk/passivhaus.html))

Professional seminar days are being arranged, to include a visit to Canolfan Hyddgen. Please contact [info@jpwconstruction.idps.co.uk](mailto:info@jpwconstruction.idps.co.uk) for further information, dates and prices.

**The Denby Dale Passive House** project in West Yorkshire is being built in the British vernacular style, using a cavity wall construction. The house will require minimal heating and is expected to use 90% less energy for space heating than the UK average (15 kWh/m<sup>2</sup> per annum, as opposed to 150 kWh/m<sup>2</sup> per annum). Built to a tight budget of £140K, the 118m<sup>2</sup> three-bed detached house aims to be an exemplar of how Passive House construction can be achieved inexpensively by a small, skilled construction team.

The project is being led and managed by Green Building Company (Green Building Store's construction division). [www.greenbuildingstore.co.uk/page--denby-dale-passivhaus.html](http://www.greenbuildingstore.co.uk/page--denby-dale-passivhaus.html). Organised visits are arranged on an occasional basis. To enquire about possible visits to the site please email [passivhaus@greenbuildingstore.co.uk](mailto:passivhaus@greenbuildingstore.co.uk)

New in 2010

**Disability Essex** has commissioned a Passive House standard building to house its new 'Centre for Disability Studies' which will form the charity's operational headquarters and training centre. The building features very high levels of insulation, air leakage less than 10% of normal levels, triple glazed windows for passive solar gain, and heat recovery ventilation with night time cooling facility, coupled to a simple ground source heat exchange system to provide fresh air cooling in summer. To conserve water, the urinals are waterless and WCs use a 4 litre flush.

The centre itself will be used as a teaching tool. It will show students, government bodies, industry, the third sector and the general public how the needs of the environment can be easily designed into the construction of a building.

The building will have 'absolute accessibility' addressing the needs of people with physical, sensory, cognitive, mental and learning disabilities, including specially designed corridors, rooms, doors, toilets and adjustable furniture.

The building is under construction and is due for completion at the end of January 2010. To arrange a visit, please contact: Stuart Kirk (Project Manager) [stuart.kirk@disabilityessex.org](mailto:stuart.kirk@disabilityessex.org), or Sue Nicholls (Project Assistant) [sue.nicholls@disabilityessex.org](mailto:sue.nicholls@disabilityessex.org).

Disability Essex is close to Rochford Station (Liverpool St - Southend line) and the organisation can arrange transport from the station for visiting groups.

Website for the organisation: [www.disabilityessex.org](http://www.disabilityessex.org); for the building: [www.centrefordisabilitystudies.org](http://www.centrefordisabilitystudies.org)

**Grove Cottage** is an extensive renovation of a Victorian house in Hereford. A rear extension has been added, to increase accommodation. The renovation and extension have been designed together to give near Passive House levels of energy performance and comfort for all parts of the house, old and new.

Grove Cottage after renovation: the house shows up blue in the infrared image. Compared to the neighbouring houses, very little heat escapes through the walls, and the outside surface remains cool.

The original fabric has been upgraded to ensure high standards of airtightness, so the building can fully benefit from heat recovery and comfort ventilation. The house has been re-roofed, clad with high levels of external insulation, and retro-fitted with high-performance doors and windows which replaced a mixture of single glazing and UPVC sash windows. Solar thermal collectors will be added later to contribute to domestic water heating and add to the energy and carbon dioxide savings.

The net result is that although the house is now 30% bigger, the overall energy use of the house is expected to show a dramatic drop, from the original unimproved house's CO2 emission rate (based on Primary Energy) of 13 tonnes/yr, to around 2.0 tonnes.

The solar collectors will contribute around 900kg/yr of the final carbon dioxide savings; most of the savings are already being made, mainly thanks to the dramatically reduced heating demand. The success of the design is vividly illustrated by the fact that in the cool wet weather in November 2009, the occupants were still warm using the heat recovery system alone, with the heating system switched off.

The porch and name plaque will be replaced, and the windowsills, re-used stone scrolls and window heads will be painted, completing Grove Cottage's street elevation, and demonstrating how all this has been achieved without dramatically changing the original proportions of appearance of the house.

Grove Cottage will be open for guided visits during 2010. Please contact [andy@simmondskills.com](mailto:andy@simmondskills.com)

AECB - the sustainable building association [www.aecb.net](http://www.aecb.net)

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