



Case study Hatherleigh Multi-use Community & Enterprise Centre

RENEWABLE ENERGY 4
DEVON



Introduction

A Parish Appraisal identified the need for a new community centre in 1995, to replace the existing 100 year old town hall. This multi-funded facility includes childrens day nursery, meeting rooms, theatre/cinema, sports hall and courts plus changing facilities. The rationale behind the installation of renewable energy technologies was to use the most cost effective heating and hot water systems for the centre, and to meet new eco-friendly standards. The new centre cost £1.6 Million.

Project development

- The Hatherleigh Multi-use Community and Enterprise Centre was pioneered by the Hatherleigh Area Project (HAP). In 2002 a report by Devon Association for Renewable Energy suggested that the new centre could use a ground source heat pump (GSHP) and solar water heating (SHW) system.
- Sustainability was built in at an early stage: for instance by orientating the centre SE / SW they were able to maximize passive solar gain.
- During the design and construction stage HAP also drew upon free consultancy from the 'Community Renewables Initiative' (CRI). Advice was also provided during the installation stage through CRI and RE4D.
- The original budget only included £40k for the heating system, so successful funding applications were made to the Low Carbon Buildings Programme and the South West Regional Development Agency. Due to space restrictions bore holes were used instead of horizontal trenches for the GSHP, although this increased the costs. Once funding was in place the systems were installed - in October 2006.

How the system works

- The ground source heat pump uses pipes in seven 80m deep bore holes to 'extract latent heat from the ground. As the ground remains at a temperature of 10-12°C all year round this low grade heat can be used to heat water circulating through an under floor heating system at 35-40°C.
- The GSHP is quite large so requires a robust power connection which was not a problem in a town, but may have been an issue in a more remote rural setting.
- The centre makes use of solar thermal to heat water (as the heat pump is less efficient at providing water at the 60°C required). As a back up there is also a high efficiency oil boiler, mainly providing top-up water heating in the winter.

Costs and benefits

- The Ground Source Heat Pump should meet 95% of the heat-load of the building, providing around 71,250 kWh th pa and cost £37,842 with grant funding covering 50% of this.
- This should save approximately 18.6 tonnes CO₂ p.a. compared to heating oil. However this does not take account of the electricity consumed by the heat pump itself, allowing for this the CO₂ saving is 8.4 tonnes per annum. If the electricity was bought on a green tariff or generated by renewable technology on site, the saving would be the full 18.6 tonnes CO₂.
- The Solar Hot Water system should save 780-1010kgs CO₂ pa compared to oil water heating.

Technical details

GSHP

32.6 kWth, with 7 boreholes at 80m deep

SHW

4.8m² flat-plate collector - 4 kWth

Heating distribution system

Wet under-floor heating system, set in thermal cement-screed

Installers

ACASTER Plumbing & Heating Ltd and Earth Energy Ltd

Wider benefits

The centre is also very energy efficient: cavity wall insulation, low-energy lighting, and double-glazing mean that the overall heating requirements are as low as possible. By integrating renewables and sustainable design Hatherleigh Area Project has reduced the carbon footprint of the building, and reduced running costs for the community and future users of the centre.

The Centre Manager said "We found that where multiple systems are being installed by different companies, there needs to be someone to co-ordinate the installations and take overall responsibility. This also applies post installation, when advance panning is required to get the best out of the systems and accommodate the Centre's users"

Further information

The site can be visited at any time, and more information can be obtained by calling the Centre Manager on 01837 810239.

Contact RE4D

www.re4d.org

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For independent advice and support

Image gallery

Underfloor heating in main hall



Thermal store



Heat pumps



Solar Hot Water panels

