

## **Penwith Housing Association**

### **Improving homes and acting on climate change since 1994.**

Penwith Housing Association, a member of the Devon & Cornwall Housing Group, manages over 6,000 rented homes across Cornwall. It has been taking action on improving the energy efficiency of its homes and reducing their carbon emissions from its beginning in 1994. This is achieved by ensuring that the properties have effective insulation and efficient heating systems. Although this is an ongoing process, to date this has resulted in reducing the carbon emissions of the whole stock by one third.

The Association has a national reputation for innovation and excellence in the field of renewable energy and energy efficiency. It pioneered the use of ground source heat pumps in social housing in the UK, building the first social housing homes to use them for central heating at Marazion in 1998. It later carried out the first installations to existing social housing homes. The Association now has over 50 homes fitted with GSHPs. It's most recent project during 2009 was the installation of GSHP systems to 23 existing homes at Marazion. Since PHA began this literally ground breaking work ground source heat pumps have become widely accepted as a standard technology for cost effective low carbon heating. In all cases the Association's key drivers for adopting renewable energy technologies has been to achieve improved comfort and to reduce energy costs for its customers and to reduced carbon emissions. The success of this owes a great deal to the willingness of the residents to embrace new technologies.

These renewable energy projects have benefited from external funding from a variety of sources including the government's 'Clear Skies' and 'Low Carbon Buildings Programme,' Penwith District Council and the Treneere Together Partnership.

In January 2010 the Association, working with John Parker Consulting, won a place in the second phase of the government's UK wide 'Retrofit for the future' competition which is aimed at developing designs to achieve the maximum possible carbon reductions in existing homes. The PHA 'HeatPod' design includes super-insulation techniques together with an innovative development of ground source heat pump technology. There are three key components to the project. The first of these provides a package of super-insulating measures to the house to reduce energy losses to a minimum. The second is the 'HeatPod' – a highly innovative concept for existing homes which is built around a prefabricated multi-purpose glazed conservatory. It provides additional living space to the home, with room for green features such as cycle storage and under cover drying. But in addition to this it contains much of the equipment required for reducing the carbon emissions of the dwelling. This includes the third measure, a new development of ground source heat pump technology, which brings together several sources of renewable energy and will thus achieve even higher levels of efficiency. HeatPod avoids the need for much disruptive work inside the home and it can be rapidly installed and 'plugged in' to 'decarbonise' the home. The design has been developed by the Association in partnership with the heat pump expert John Parker who, in conjunction with E.ON developed the first ground source heat pumps specifically for the social housing market. Preparatory work on the project is now under way with the aim of completing the retrofit work to the home in the early summer of 2010.

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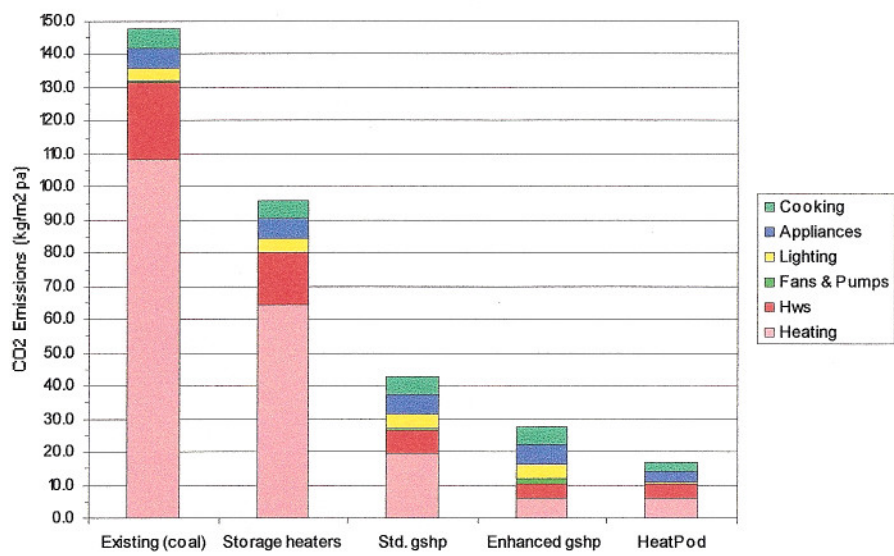
### HeatPod

A multi-purpose conservatory providing solar heat, covered clothes drying and extra space in the home, but also containing the technology to greatly reduce carbon emissions - a new ground / air / solar heat pump designed for this project, the hot water system and ventilation and heat recovery system. The HeatPod is fitted to the house together with new high levels of insulation.

HeatPod is the Penwith Housing Association project for the Technology Strategy Board 'Retrofit for the Future' initiative.



Comparison of HeatPod Annual CO2 Emissions - [kgCO2/m2 p.a.]



Histogram comparing HeatPod CO2 performance (kg/m2/yr) with fossil fuel heating and current GSHPs