

Completing the Loop

Case Study: Signpost Housing Association, May 2006

Why GSHP's?

Used in the right properties, Ground Source Heat Pumps (GSHPs) can provide heating (& hot water) at a lower cost to the landlord (capital & operating) and to the tenant whilst also providing environmental benefits through reduced carbon emissions (e.g. vs. oil systems). We felt that this was an option worth promoting!

The 'Completing the Loop' Project

GSHP technology is proven, it is a 'standard', commonplace option in other countries (e.g. the USA and continental Europe). There are relatively few GSHP installations in this country, though there are market developments which are now making the use of GSHP technology viable here in the UK. The 'Completing the Loop' project aims to show that there is a place for GSHPs in UK social housing and that this role could include retrofitting GSHP into some existing properties. Through the project we will be working with a number of social housing providers as they install GSHPs in a selection of their properties.

ESD are working with EarthEnergy, Powergen & Earth Energy Engineering as well as with Penwith Housing Association (who pioneered the retrofitting of GSHPs in social housing), Drum Housing Association, Signpost Housing Association and the Places for People Group. Match-funding for the project was obtained from the Energy Saving Trust's (EST) Innovation Programme (IP).

Signpost Housing Association

Signpost Housing Association was established in 1990 under the name of North Dorset Housing Association. Following purchase of North Dorset District Council's housing stock in 1994, they changed their name to Signpost Housing Association and now own nearly 4500 homes.

Within their Affordable Warmth strategy, they have a remit to carry out pilot schemes to investigate alternative heating systems that could help to reduce fuel poverty. Following a visit to see the GSHPs installed in properties owned by Penwith Housing Association, they decided that they should install a small number of GSHPs to see what opportunities the technology offers.



The Hod View Flats

Identifying the properties

The key task was to identify suitable properties for the GSHPs to be installed into. The first step was to review all their off-gas properties and their oil heating programme for the year and to find a minimum of 6 properties in close proximity (a Powergen HeatPlant scheme requirement). These properties had to:

- Have good access for the drilling rig
- Have the potential to reduce heat loss to an appropriate level for the GSHPs i.e. be of reasonably modern construction or have energy efficiency measures installed
- Have a heating system that needed replacing

Finding 6 suitable properties wasn't easy: Signpost found that on a single street, it was quite likely that some properties had been sold, some may already have had a new oil boiler installed and some tenants were happy with their existing heating system and didn't want a new one. However, they identified two potential sites.

The next stage was for the properties to be assessed by EarthEnergy Ltd. to ensure that there was suitable access for the drilling rig and to assess the geological conditions at the site. At this point, one of the potential sites was found to be unsuitable as only four of the properties had suitable access for the drilling rig. The Hod View flats had no such issues over access and a full survey of the properties was carried out by Powergen to ensure that the heat loss from the flats was acceptable.

Details of the properties

The Hod View flats are a block of 9 flats constructed in the 1960's. The properties are off-gas and the existing heating system was electric storage heaters. The block had cavity wall insulation (CWI) and double glazing already fitted. However, closer investigation with a borescope revealed that the CWI was patchy and could cause cold-spotting in the flats.

It was decided therefore that if the GSHPs were to be fitted, to ensure that heat loss reduced to acceptable levels, the existing CWI would have to be removed and new mineral wool insulation inserted. At the same time that this was being done, the insulation would also be topped-up to 250mm in the roof spaces. Once these measures were installed, heat loss was estimated to be reduced to between 38 and 60 W/m².

Installation and lessons learned

The GSHPs and internals were installed together in Autumn 2005. At the same time the insulation work was also carried out.

Looking back, SHA would do things slightly differently – they suggest the following:

- Do the drilling and ground side connection of the GSHPs first
- Then do the internals afterwards
- The insulation measures should be completed before the heating systems are installed. For the Hod View flats, issues over getting the old CWI out of the cavities and the new material in meant that some walls were not fully insulated at the onset of the winter period and supplementary heating was needed.



Installed GSHP

Costs

HeatPlant kit (5kW) plus installation - £5000

Internals and heating system - £3000 (slightly higher for the flats because of, for example, scaffolding costs, linking GSHPs to internals so could be reduced to say £2500 for a house)

This compares to approximately £6000 for an oil system (including oil condensing boiler, fully bunded oil tank and internals).

Tenant feedback

Out of the 9 flats, the tenants of one flat declined to have the system so the GSHP is installed but not connected. Tenants in six of the flats are very happy with their new heating system – they find it flexible, warm and have ample hot water. Most have key meters so running cost information is anecdotal but the tenants have said they are putting less on their key each week. One tenant is monitoring his electricity consumption on his laptop!

Of the remaining two flats, tenants have reported problems but this is due to, in one case, not understanding how the system should be used (e.g. longer times for the property to warm up when you turn the system on) and in the other case is linked to other problems associated to tenancy issues. Overall, SHA are very pleased with the outcome of the project and have identified potential sites for their next GSHP project!

Further Information

Completing the Loop project website: www.completingtheloop.org.uk				
Company	Name	T	E	W
ESD	Arnout Andrews	07971 512353	arnout@esd.co.uk	www.esd.co.uk
	Rachel Child	01225 816836	rachel@esd.co.uk	www.esd.co.uk
Powergen	Gary Sucharewycz	0870 419 2424	Gary.sucharewycz@powergen.co.uk	www.powergen.co.uk
Earth Energy Eng	John Parker	01865 784 903	jcwparker@compuserve.com	
EarthEnergy Ltd.	Brian Kennelly	01326 211070	kennelly@earthenergy.co.uk	www.earthenergy.co.uk
Signpost Housing Association	Bob Sheppard	01258 484 845	bob.sheppard@sha.co.uk	http://www.sha.co.uk/