

## Completing the Loop Case Study: Drum Housing Association, May 2007

### Why GSHP's

Used in the right properties, Ground Source Heat Pumps (GSHPs) can provide heating and hot water at a lower cost to the landlord (capital & operation) 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 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 Places for People. Match-funding for the project was obtained from the Energy Saving Trust's (EST) innovation Programme (IP).



We worked with Powergen as partners on this project because their Heatplant is a GSHP developed specifically for social housing and has a track record in social housing.

### Drum Housing Association

Drum Housing Association was established in 1996 as East Hampshire Housing Association following the purchase of the East Hampshire District Council housing stock by LSVT. The name change to Drum Housing Association occurred in 2002 when various businesses, managing approx. 4500 properties, were brought into a group structure. In 2007 the Association became a member of the newly created Radian Group.

Drum have a sustainability strategy in place outlining their commitment to environmental, social and economic factors. This helped to endorse their use of the new innovations.

Drum Housing Association had been aware of GSHP's for some time and had visited Sweden to see an installation in progress in 2004. Therefore Drum were aware that the technology was well established in Europe and emerging in the UK.

### The Schoolfields Project

Residents at the site were unhappy about solid fuel heating and running costs. Because these homes were off gas and a programmable heating system was required, the options available to us were limited, making Heatplants a sensible choice.



Their good working relationship with Arnout Andrews at ESD gave Drum the opportunity to trial GSHP's at Schoolfields with ESD support via the 'Completing the loop' project.

### Identifying the Properties

The main criteria for the selection of suitable properties were:

- That they should be in an "off gas" location to give maximum benefit to residents.
- Comprise a high proportion of existing solid fuel systems.
- That they should be in need of heating system replacement to meet "Decent Homes " standards.
- A minimum of 6 properties in close proximity were required to meet the project requirements.



It was also necessary to be able to meet the heat loss requirements of the Heatplant so more modern property types were considered most suitable.

A site visit to possible locations identified School Fields as the most likely site and it was then assessed by Earth Energy for geological suitability and plant access.

The estate was chosen with an expectation of limited take up by residents. In the event all 18 existing DHA residents took up the offer, and with the repurchase of one further flat only the remaining owner occupier declined the works. The idea of a small pilot scheme was further lost with the inclusion of a further 6 properties on an adjoining estate.

### Details of the Properties

School Fields is a mixed development of 20 units built during the 1980's comprising 2 and 3 bedroom houses and 1 and 2 bedroom flats. The village of Kingsley is not on mains gas and the existing heating systems were a mixture of solid fuel back boilers with radiators and electric storage heaters, many of which were reaching the end of their useful life.

The properties were originally constructed with full cavity insulation and had previously been fitted with PVCu replacement double glazing.

To ensure heat loss was minimised it was decided to top up the loft insulation to a minimum of 250mm prior to installing the new heating.

### Installation and lessons learned

Work on the boreholes, originally scheduled for the summer, commenced in November 2006 with completion anticipated by Christmas. Adverse ground conditions caused early delays and drilling was eventually completed in January 2007. The groundworks and Heatplant installation followed on from this. It was intended that the internal work would occur simultaneously with the groundworks but delays with drilling and groundworks together with the Christmas holidays made this impractical. All Installations were fully operational by March 2007. In retrospect Drum Housing Association would do the following differently:-

- Appoint a single contractor that would take on full Project Design and Management responsibility for drilling, ground works and internal installations.
- Carry out the works outside of the heating season to minimise the need for temporary heating and inconvenience to residents.
- Greater advance planning in respect of borehole and Heatplant positioning, the associated groundworks and landscaping alterations resulting from the works.



## Costs

Bore holes and 5kW heat plant (incl. Heatplant housing and supply only of HW cylinder) - £ 5800.00 + VAT per property.

Internal installation - £ 2500.00 - £ 3200.00 + VAT depending on property size.

Insulation top up – approx £ 200.00 per property.

There are further landscaping works in consequence of the installation for which costs are as yet not clear.

## Tenant Feedback

With 100% take up by DHA tenants on the estate the new technology did not put people off as had been anticipated. All systems now seem to be running well and residents appear happy with the installations.

Early installations suffered problems related to trapped air in the radiator system, of which Heatplant were found to be less tolerant than traditional boiler systems. This was resolved by layout changes and later systems were problem free. One Heatplant developed a fault that led to insufficient heat output. Once the problem was identified it was quickly resolved and is now operating satisfactorily.

Some residents took a while to understand how the system worked, the warm up periods and that hot water takes priority when both are switched on. The contractor spent a considerable time explaining this and setting systems up for residents and it seems to have been resolved. It would have been better to have been able to provide good guidance in writing from the outset, together with advice about electricity tariffs.

Monitoring is currently in hand to generate actual data in respect of electric usage and to allow comparison with previous costs. With the timing of the installation however it will be Easter 2008 before a full heating season is complete and this can be usefully assessed.

Overall DHA are pleased with the early outcomes of the project and would consider further installations provided the lessons learned regarding project management can be put into effect.

## Further Information

| Completing the Loop project Website: <a href="http://www.completingtheloop.org.uk">www.completingtheloop.org.uk</a> |                      |              |                                       |                          |
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