

Drum Housing Association

## 'Experimental low carbon refurbishment'

Six homes built in the 1950's which have undergone a major refurbishment and have achieved carbon savings of over 60%.



Drilling boreholes for ground source heat pumps



Refurbished houses with solar panels



### Notable Features

Environmentally friendly homes with a unique solar roofing system the embedded, or embodied, energy contained in a new home takes a long time to recuperate. Many estimates show it takes over half the lifetime of the building! The Government's target of zero carbon homes by 2016 does not take in to account the embodied energy within these newly constructed homes, nor the infrastructure needed to support them. However older homes often have higher emission levels. This project shows that this does not have to be the case, as it slashes the emissions of six typical dwellings from the 1950's, beating the Government's target of a 60% cut in emissions.

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### Setting the scene

This refurb shows a carbon saving is possible on standard existing homes. Firstly the levels of insulation and heat and air tightness were raised in the homes, as getting the building envelope to a high environmental standard is paramount. Draughty flues were sealed, doors were core-insulated and windows were fitted with super-insulated double glazing. A 75% reduction in CO2 emissions due to heating was achieved through using ground source heat pump technology, with the additional benefit of waste water heat recovery, whereby a heat exchanger recovers up to 60% waste heat from water and recycles it back to the shower head. PV panels were installed which produce an estimated third of the homes' electrical needs. Some residents have chosen to fit meters which export surplus energy (for example in the daytime when perhaps the homes are empty) back to the grid. In addition the "easy wins" were undertaken, such as fitting low energy light bulbs, installing water efficient shower heads, and providing compost bins and water butts to those residents who wanted them.

### Beating the odds

Britain's homes contribute about 30% of the national CO2 output, and over a third of our housing stock was built before 1945. While it is unrealistic – and perhaps undesirable – to demolish all older homes, strangely sustainable refurbishment is a largely ignored area. Drum obtained funding from a variety of sources to enable this project which was completed in partnership with Energy Saving Trust and

Energy for Sustainable Development Ltd (consultants). The homes are situated in a rural off-gas area and were previously heated by a combination of solid fuel and electrical storage heaters. A survey of residents' running costs prior to the works revealed fuel bills of around £1,000-£1,250 on average.

### Reaping the benefits

Monitoring is still underway but Drum is confident that these will show at least a 60% reduction in annual running costs. In addition the homes are able to be put through the EcoHomes XB (EcoHomes for existing buildings) methodology to aid fully the understanding of the affects that the improvements have made. Drum is confident that this scheme played a major role in winning them the Housing Corporation's Gold Award for sustainability in 2007. The project has been the subject of a widespread publicity campaign and others in the housing sector have visited it, so hopefully will inspire others to attempt the same achievements on existing homes. Another of the project's impetus was the fact that many of the residents were elderly and in fuel poverty and Drum is extremely happy to have been able to help them.