

# Green Homes Sheffield Host










## Further information

Host address:	Fireside Housing Co-op, 55-61 Melrose Road, S3 9 DN
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### More information about this home

This Housing Co-operative comprises four adjoining, south facing, 1890's terraced houses, featuring; single storey off-shot kitchens on three (until recently!), one having a two storey rear extension; 3 gennels, 2 of which shared with neighbours; Single or half-brick thick walls with no cavity throughout; Slate roofs, three with loft conversions.

### Low carbon measures on show

-  **Low cost:** loft insulation, draught proofing, basic heating controls, Central heating and hot water pipe lagging.
-  **Big insulation works:** Internal wall insulation, external wall insulation, floor insulation, loft conversion, flat roof insulation, major eco-refurbishment of kitchens to create 2 storey extension with high level of air-tightness. 3 contrasting gennels to demonstrate.
-  **Glazing:** Double and triple glazing, some DIY into original frames. High performance doors.
-  **Lighting:** Low energy lighting. Some low energy white goods
-  **High spec heating:** Various active and passive ventilation systems, with and without heat recovery. Various condensing boilers. Various heating control systems.
-  **Renewable heat:** Solar hot water - shared between two houses. Plumbing systems designed to minimise heat and water waste.
-  **Renewable electricity:** 4 x 2kW Solar PV systems
-  **Sustainable building materials:** Re-use of materials. Recycled plastic insulation in cellars and loft. New build FSC timber frame with wood fibre walls, recycled paper cavity insulation, lime render finish. Long-life guttering (rainwater harvesting)
-  **Lifestyle changes:** Self-managed co-operative housing (Fully Mutual Housing Co-operative). Consensus decision making. Resource sharing. Food growing (garden and 4 allotments). Ethical shopping and banking. Shared meals. Cycling. Only 1 car (hybrid) 1 work van for 4 households.



## Other info:

A SAP rating has not been calculated, but recent choice of priorities for energy improvements was helped by an energy survey carried out by Nick Parsons (see <http://sustainablebuilding.org.uk/>).

These properties now demonstrate a broad spectrum of energy improvements carried out over the last 15 years, from early draught-proofing and double glazing carried out under a local regeneration grant scheme, through DIY loft and cellar installation, to self-financed installation of solar thermal and PV systems and latterly a major eco-refurbishment project.

This project, which is the most unique feature of these houses, started as a plan to improve the cold, damp conditions in the offshot kitchens, and grew into their total demolition and replacement by a two storey extension built to high standards of insulation and airtightness. Design was by Al Burnell of Burnell Briercliffe Architects (<http://www.burnell-briercliffe.com>). The NBT/Parvatex timber frame/wood-fibre board/lime render 'Diffutherm' construction system was chosen (<http://www.natural-building.co.uk/> and <http://www.pavatex.co.uk>), using Warmcell cellulose fibre insulation to fill cavities (<http://www.warmcel.co.uk>). Some structural steelwork was incorporated on advice of structural engineers. Existing dining room floors were lifted and fitted with an air-tight membrane and insulated with Parvaflex. Advice and materials for air-tightness and the Diffutherm construction system was provided by NBT (Natural Building Technologies) who also provided site inspection and training for local contractors. The extensive Rationel (<http://www.rationel.co.uk/>) triple-glazed windows and doors were pre-constructed off-site.

Internal wood fibre insulation (Parvawall) was applied to remaining original north facing walls, and all other north facing windows DIY triple glazed with units supplied by Central Glass (<http://www.centralglasssheffield.co.uk/>). The central gennel has been fitted with Rationel high energy performance triple glazed doors, and new additional side doors from two houses open into this space, providing a buffer 'porch' effect.

The design of the two storey atria in three kitchen/dining rooms led to a complicated combination of passive and active ventilation systems, with and without heat recovery.

The shared ownership of the houses has also provided opportunity for combining some elements of the active ventilation systems, and hot water supplies. Heating and plumbing work was carried out by High Efficiency Low Carbon Ltd (<http://www.solarsheffield.co.uk/>).

Although the total cost of about £180,000 (£45,000 per house) is at the high end of re-furb projects on small terraced houses, this project provides an opportunity to see many individual components and methods on one site.



Finance was arranged through a combination of Ecology Building Society C-Change retrofit mortgage discount system ( <http://www.ecology.co.uk/> ) and personal 'loan-stock' investments from private individuals.

## Personal insights

Since the new spaces have only come into full use during the winter 2013/4, there has not yet been time to measure performance, although meter readings have been monitored weekly since well before work began. In fact, before and after figures for energy consumption will be difficult to analyse in relation to property alterations, due to many other variables, such as changed occupancy of the houses, altered daily routines, increased personal technologies, changes in behaviour due to heightened awareness, one replacement boiler and combining of elements of heating, hot water and ventilation systems between houses.

What we are experiencing are the personal pleasures of having transformed our dark dining rooms with cold, damp offshot kitchens into warm, dry, bright spacious kitchen/diners! The energy compromise of incorporating lots of glass on the north aspect is more than compensated for by the pleasure (and to some extent electric lighting savings) of the increased daylight. In addition, three residents now have extended bedrooms.

The mild winter has meant that the minimalist heating in these large rooms has not yet been fully tested, but early signs are hopeful. The fitting of just one small radiator in one, and just a towel rail in another, has left scope for increasing heating capacity without major alterations, should the need arise. The warmth in the one fully enclosed gennel is demonstrating our previous heat-loss, and encouraging negotiations with neighbours about the other two. It is too early to assess the performance of the ventilation systems, which rely on automatic humidity sensitive vents, and manual override when necessary. However, the trickle pumps which should slow down or switch off as required, have not yet done so, such that they may be using 65 watts continuously at present. It might be desirable to fit timers for night-time use.

The process has been challenging, long (About 10 months and still bits to finish off), expensive, disruptive and tiring, but also exciting and satisfying. We have learned the challenges of choosing to employ and negotiate with contractors with no experience of the construction method and no inherently 'green' ethos, who were willing to learn but tested to the limit.

Discussions on future improvements have included; fully insulating the south facing fronts of the houses, either internally or externally, possibly including porches over front doors; Fully enclosing the other two gennels; under floor air-tightness and improved insulation in the front rooms; more solar thermal panels to supply a pre-heating tank for the combi-boilers in the other two houses; substantial rain-water storage from the new roof (probably for outdoor use, including the outside toilet).

