



Drum Housing helps family of seven out of fuel poverty **with Minus7**

Drum Housing Association wanted to demonstrate the low carbon whole house refurbishment potential for off-gas properties. A 1930s 3-bedroom semi-detached house without gas supply and immersion hot water was the perfect choice.

This ambitious refurbishment project utilised Minus7's technology to deliver significant cost, energy and carbon emission reductions to a family of seven with a

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high heating and hot water consumption rate.

Refurbishment

Several additional energy efficiency measures were included to primarily address heat loss, lighting and appliance use. The redundant chimney was removed, blocked door and window

openings were in-filled; redundant air bricks were also blocked, storage heaters and open fire were removed and a chimney balloon was used.

The floor area 68.5 m² was insulated to achieve a U value of 0.23w/m²k for solid floor and 0.22w/m²k for suspended floor, new loft insulation and new insulated

linings to inclined ceilings were also incorporated and new double glazed windows and tightly fitted doors were installed

A secondary heating system in the guise of a wood stove was incorporated into the design. The package of measures chosen, minimised disruption, and provision for a decanting allowance was only made for measures that caused significant upheaval, such as the floor insulation. T

How does it work?

Minus7's Solar Energy Processor auto-controls are configured to maximise the output from the solar endothermic roof collector, harvesting energy day and night down to temperatures of -7°C.

Any top up required is provided by a heat pump also contained within the Solar Energy Processor. As the heat pump is not connected to the heating and hot water demand of the building, it can run when electricity is cheapest to ensure the thermal stores are kept at a consistent temperature.

It is the thermal stores that act as the energy source for the building, with heat being transferred to the building

through the clever use of heat exchangers also contained within the Solar Energy Processor. Minus7's technology is the sole source

blend in beautifully with the tiles on the adjacent house. The front of the house thus retains its original slate roof. *See picture below*



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for both space heating and hot water for the dwelling.

Due to the location of the house, Minus7 tileplanks were only sited on the south side of the building. The premium powder coating used was colour-matched to

Installation

The speed of installation was impressive with 18.5m² of active tileplank being installed within 1.5 days; pipework to the Solar Energy Processor, tanks and supply to the building taking only a further 3 days.

Though the roof collector was considered under-sized by Minus7's in-house design team - normally 20m² is the minimum used – Minus7's system is able support the heat load requirements in normal winter conditions, generating enough renewable energy to provide hot water at a temperature of 41° and heating via low temperature Jaga radiators at a comfortable room temperature of 21°C.

Stakeholder Engagement

Drum Housing used this project to educate staff on how to realise the full benefits of a refurbishment scheme. Based on their previous experience of other technology, they understood that even the most advanced efficient building fabric and technologies can perform dismally if unaware or untrained occupants undermine their intended use. The residents were keen to be part of this exciting project and were given training on how to optimise their usage of Minus7's heating system. The residents were pleased to find the heating could be controlled using standard thermostats and timers.



Performance Guaranteed

With highly sophisticated remote monitoring, this project has been invaluable in measuring the performance of the Minus7 system and other low carbon measures that have been put in place. Minus7 performance guarantees have provided both tenants and Drum Housing with additional peace of mind.

Performance data is available on request – please contact emma@minus7.co.uk for further details.

Further Notes

In 2016 Minus7 has launched its hybrid photovoltaic solar thermal tileplanks - providing a full building-integrated solution for heat, hot water and electricity that offers carbon neutrality in optimal installations.

