CASE STUDY

# 257 South Farm Road Worthing, BN14 7TN

## Overview

Address:

Owner: Janet Cranch

Type: terraced

Age: 1930

Beds: 3

Walls: brick

Area: 100 $m^2$

Residents: 1 adult

## Features

Condensing boiler

Double Glazing

Food cultivation

Grey water recycling

Solar PV (2.3kWp)

Underfloor heating

Underfloor insulation

Woodburning stove

## Introduction and approach

Janet has bravely embarked on a major programme to overhaul her house, much of which she is doing herself.

A new conservatory with insulated cavities, insulated floor, wet underfloor heating and high performance glazing is being built at the rear, whilst she has lifted her lounge floor and insulated under it herself. At the same time, she has insulated the loft up to the top of the joists and had it boarded, new double glazing fitted and a woodburning stove installed in the dining room.

A new PV array on the roof is generating ample electricity, which Janet is trying to exploit by coordinating her electricity and hot water use to match.

Much of the work is in a state of flux, but when completed she should have a warm, cheap-to-heat house, with minimal carbon emissions.

## Energy efficiency measures

### Heating and hot water

The boiler is a non condensing Potterton, which has been retained because it functions well and gas consumption is only 5000kWh, which would not justify the cost of changing to a condensing one. However, it is worth investigating whether a free change could be made under the Affordable Warmth ECO scheme.

Janet sets the thermostat to a modest 17°C, which, coupled with the discipline of not heating unused rooms, helps keep consumption so low. Heating only needs to run for two hours in the morning and three in the evening to maintain a comfortable temperature. Since the conservatory was fitted the house is a lot warmer.

In the lounge heating is boosted by a fireplace for burning logs and in the rear sitting room, a compact woodburning stove. Janet does not buy firewood, but gathers it from nearby building jobs, plus friends and neighbours.

Because of the free electricity from PV, Janet no longer heats water with gas, but instead used an immersion heater or kettle for hot water, when the sun is shining.

### Insulation

**Walls** – although there are cavities, the ties have failed and need remedial work before they can be filled. This is a low priority as this

is a terraced house, with a conservatory at the rear, so the external wall area is modest. The new conservatory has thermalite cavity block walls filled with rockwool.

**Double Glazing** – most windows have been upgraded to new, high performance double glazing. The new conservatory at the west facing rear also has similar glazing. This was fitted by Worthing Double Glazing Repairs, who have done rather a poor job, unfortunately, and many problems remain unresolved.

**Loft** – the loft is boarded over the 100mm ceiling joists, with rockwool in between, installed by Janet. Further insulation could only be fitted by raising the floor, which in this case is not considered practical.

**Floor** – Janet has raised the floor in the lounge and fitted 150mm of rockwool insulation between the joists herself, which rests on chicken wire stapled to the underside. She has also laid 100mm of celotex in the conservatory floor, which will be screeded over, when underfloor heating pipes are fitted in the summer.

### Renewables and low carbon technology

**Solar PV** – 2.3 kWp of panels are sited on the west facing rear pitch of the house roof. These generate over 2000 kWh pa and receive the higher rate of FIT.

**Woodburning stove** – This is a 4kW Villager Athlone stove, fitted by local HETAS installer Mark Chapman for £950 all in. It has a flat top that is used for cooking casseroles and boiling kettles.

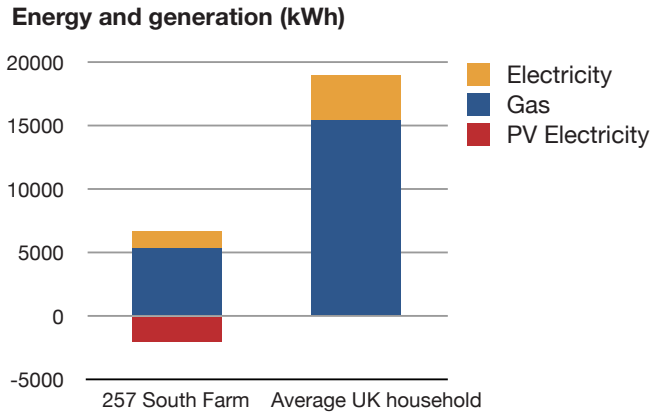
### Electricity

Lighting is via low energy bulbs, mainly CFC.

As much use is made of free solar PV electricity as possible, particularly for water heating. Some boiled water is saved in flasks for use when the sun is not shining.

### Carbon emissions

**Energy Use**: Electricity 1400 kWh pa, Gas 5300 kWh pa, PV 2000 kWh pa.




**Net $CO^2$ emissions**: Total 1.0 tonnes (82% less than average UK dwelling), 9.8 kg/m2 (85% less than UK average).

## Other sustainable measures/ lifestyle decisions

**Water conservation** – sink water downstairs and bathwater upstairs is used to fill the WC cisterns.

**Food cultivation** – Janet is a keen gardener and grows a wide range of fruit and vegetables, both in her back garden and an allotment.

**Recycling** – as much use is made of recycled materials as possible, including a built in oven that a neighbour was throwing away, a cast iron fireplace and mantlepiece. Similarly, while the building work has paused, Janet is using recycled carpets to help keep the house cosy.

## Lessons learned

Underfloor insulation was delayed on discovering extensive woodworm, which has been treated using water based chemicals, which were as environmentally friendly as possible.

In addition, she found that previous builders had dumped many sacks of rubble between the joists, which she has painstakingly removed to re-establish ventilation..

Some contractors quoting for PV, heat pumps and cavity wall insulation have quoted outrageous prices. Luckily Janet was wary and obtained competitive quotes.

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