

# Fen Road - CB4 1BS

Unusual renovation of two Victorian semi's, converted into one house

## Peter and Meg

Peter moved into this 1897 Victorian semi in 1978 and combined households with Meg in the property next door in 1997. Peter says:

'Energy efficiency has always been a priority for us. We both read John Seymour's *Self Sufficiency* back in the 60s and are grounded in 'alternative' solutions. Meg was inspired by CCF's Carbon Conversations course, and went on to lead sessions with Fabiola Blum. Peter drew inspiration from *The Autonomous House* (Vale and Vale, 1976) to carry out a DIY installation of solar water heating and some of the internal wall insulation.

'We take time to fully research options to ensure we make the right decisions. The best success has come in the kitchen, where energy and functional design aspirations have combined to yield double rewards.'

## Low energy measures

### Fabric first

This philosophy means getting the insulation, air tightness and ventilation fixed as a priority over renewable energy. The first step was to insulate some walls internally. This was supplemented in 2016 by external wall insulation funded by the Action on Energy Cambridgeshire scheme.

### Glazing

Some windows have been fitted with secondary glazing and the French doors are double glazed in compliance with Building Regulations.

### Heating, energy and ventilation

Solar water heating was installed in 2004 and provides all our hot water needs during the summer. A thermal store retains the heat until needed and has the feature of delivering hot water at mains pressure. A condensing boiler is also coupled to the store and takes over automatically in the autumn as the solar supply reduces. Underfloor heating in the kitchen draws on the store so that a proportion of the heating for this northern room is derived from the sun.

Radiators elsewhere run from the boiler in two separate zones. Counting the underfloor heating as well, this makes a 3-zone system controlled by Hive net-connected thermostats. There are two A-rated pumps in the system.

The bathroom uses a conventional extractor fan, but conversion to a simple Mechanical Ventilation and Heat Recovery (MVHR) system is in progress.

### Lighting and appliances

The house has used compact fluorescent lamps (CFLs) since they became available. One lamp is still going after 30 years! The recent work on the kitchen has introduced LED downlighters (7W each) which give a very satisfying colour and intensity of light. The new fridge has an A+ rating.

[www.openecohomes.org](http://www.openecohomes.org)

Fen Road, CB4 1BS – 2018

Open Eco Homes is a Cambridge Carbon Footprint project. Charity number 112736



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## Performance

The kitchen, completed in 2014, has become the centre of the household. By concentrating winter activity in a single space and using zoned heating, we minimise demand on the boiler. The kitchen is the best insulated space in the house and is comfortable when the floor temperature is 19-20 degrees. We enjoy it enormously. Solar heated water in the summer is a revelation – carbon footprint nil.

A rudimentary spreadsheet indicates that, compared with the original Victorian condition, we should ultimately reduce our heating demand by more than 70% when all measures are in place.

## Future plans

One of the greatest shortcomings of Victorian architecture is draughty suspended timber floors. The first of four rooms has been sealed and insulated, and incorporates under floor heating. This style of house also has a front door opening directly into the living room. A porch will provide a buffer space, and being south facing will also give us valuable growing space for the spring.

## Energy reduction and carbon emissions

The figures to the right show a reduction in energy use and carbon emissions since the renovations. Peter and Meg say the low figures are also down to behavioural change as well as the technological improvements. For example, not turning on heating in rooms that are not being used. They could claim zero carbon emissions on electricity use because they buy it from green energy supplier Good Energy, but Peter has used the grid average conversion factors here.

**Property age & type:** Built in 1897. Victorian semi-detached

**Wall type:** Original walls, solid brick

**Floor area:** 142m<sup>2</sup>

**Cost of retrofit:** £18,695

**Occupants:** 2 adults

### Key features

#### Insulation

- Internal insulation
- External wall insulation on gable walls

#### Glazing

- A mixture of single, secondary and double glazing

#### Heating

- Solar thermal heating
- Thermal store
- Condensing boiler
- Underfloor heating
- Wood burning stove
- Heat zoning scheme
- Radiator reflectors

#### Lighting

- CFL and LED lighting

## Contacts

[80 percent Hub](#) – Green Deal assessment

[Property Revolutions Ltd](#) – Property Management

## Products and Costs

LEDs are OSGRAM GU10 Warm White

EWI (quote No5)	£7,995.00
IWI (DIY)	£1,000.00
Floors (DIY)	£2,000.00
Architect	£4,000.00
solar heating (DIY)	£1,500.00
Boiler	£2,200.00

**Total** **£18,695.00**

	Energy		Carbon	
	kWh/m <sup>2</sup> /yr		kgCO <sub>2</sub> /yr	
	Elec	Gas	/m <sup>2</sup>	/person
<b>Before</b>	<b>20.5</b>	<b>144</b>	<b>39.1</b>	<b>2775</b>
<b>2016-18</b>	<b>17.8</b>	<b>63</b>	<b>21.6</b>	<b>1533</b>