

People Exploring Low Energy Homes

## Eltisley Avenue, CB3 9JG

Tom and Anne Bragg:

Tom is a retired electronics engineer and Cambridge Carbon Footprint's Chair of Trustees. Anne also has an engineering background and is the Director of The Creativity Partnership. They bought their home in 2001 and have a longstanding interest in sustainability and innovation Tom works with Open Eco Homes and has participated in Carbon Conversations.



### Overview

Age, Type: 1902 , Mid-Terrace  
 Wall type, Floor area: solid wall, 129 m<sup>2</sup>  
 Project timescale: on-going  
 Cost of build: **Approx. £5,000 so far**

|               | Energy                 |           | Carbon                |             | 2 people |
|---------------|------------------------|-----------|-----------------------|-------------|----------|
|               | kWh/m <sup>2</sup> /yr |           | kgCO <sub>2</sub> /yr |             |          |
|               | Elec                   | Gas       | /m <sup>2</sup>       | /person     | Notes    |
| <b>Before</b> | <b>23</b>              | <b>97</b> | <b>27.9</b>           | <b>1799</b> |          |
| <b>After</b>  | <b>11</b>              | <b>16</b> | <b>7.7</b>            | <b>495</b>  |          |

### Key features

- DIY loft insulation
- DIY under-floor insulation
- Innovative DIY Awnings for shading and rotary clothes line.
- Draft proofing
- Solid wall insulation coming, with Cambridgeshire Solid Wall Fund Double or DIY secondary glazing
- Low energy light bulbs throughout
- LED lighting in kitchen
- Wood burning stove, scavenged wood
- Low, dual-flush loo.
- Marmoleum (sustainable flooring) in kitchen

### The Building Process

The house shows the dramatic impact of a steady succession of improvements, many of them DIY, some professionally installed. Overall, the aim has been to make a comfortable home, with low carbon emissions.

This has involved a process of exploration, taking measurements, trying things out and adjusting renovation plans according to what worked.

The aim of the planned solid-wall insulation is to help them enjoy comfortable temperatures without a high consumption in the years to come.

### Low Energy Measures

**Heat:** They have a wood stove providing over half the heating from burning scavenged and hand-cut wood. Wood is stored in a sedum roof wood store. After an initial round of draft proofing, air tightness was further improved with the help of a thermal imaging camera and blower-door to locate leakage points.

Novel, home made awnings are easy to install, and together with passive stack ventilation help keep the

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house cool in summer

**Lighting:** 5 different types of LED lighting have been installed in the kitchen. Low energy lighting has been fitted all through the rest of the house.

**Insulation:** DIY under-floor insulation has progressively been installed on most of the ground-floor. The loft insulation aims to give good insulation in limited depth, while maximising the usability of the space for storage



### Future Plans

Solid wall insulation is planned in 2014 with grant help from the [Cambridgeshire Solid Wall Insulation Fund](#). Upgrading and enlarging the poor 1970's loft extension with high standard insulation and glazing.

### System Performance

Home-energy carbon emissions have been cut by 72% since 2001. This is due to technical improvements such as improved insulation & draft-proofing, the wood stove, low energy lighting and secondary glazing. Behavioural factors have also been very important, for example, turning down the gas central heating and dealing with electricity standby "vampires" and turning off appliances when not in use. It's all working very well although the boiler is less reliable than anticipated.



Tom also says: "Renovating our kitchen would have been a good opportunity to fit internal solid-wall insulation. And we'd now choose wooden or recycled glass worktops, rather than Italian marble".

### Products and Costs

Boiler: Bosch Worcester Greenstar HE plus combi, LEDs in Kitchen:

Robus Acorn from [Lighting Direct](#) on ceiling  
 3W under cupboard lights from [Simple Lighting](#)

[Marmoleum](#) (sustainable flooring) on Kitchen floor  
 Secondary glazing (in sitting room) from [Go-Glass](#)  
 DIY secondary glazing with 2mm acrylic from [Engineering & Design Plastics](#),  
 with adhesive Velcro from [MDP hook & loop](#)

[Morso 04](#) wood-stove, installed by Peter Wakely, 01954 211049

[Ifö Cera](#) 4/2 litre flush loo from [Green Building Store](#)

Loft Insulation (DIY): 90mm fibreglass plus 60mm [Celotex](#) over joists – could do with more.

DIY under-floor insulation: 200mm. fibreglass [See Article](#)