

People Exploring Low Energy Homes

Midsummer Common, CB4 1HA

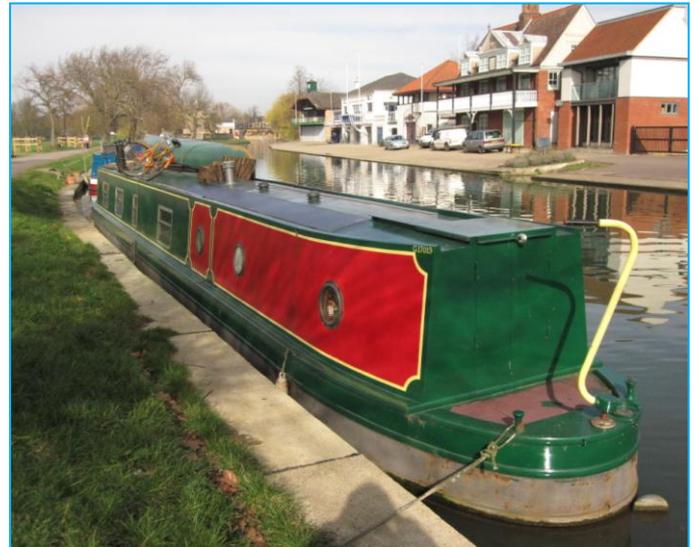
Andy Rankin – Andy says:

I moved to Cambridge just over 10 years ago to start work as a climate scientist at the British Antarctic Survey. Cycling along the river one day and pondering the gulf between house prices and an academic's salary, I realised there was a small counter-culture right in the centre of the city of people living **low impact lives** off the grid, and off the water and sewage networks. I decided to join them, and live on the river.

I ordered '**Coroskeir**' as a new hull from a boatbuilder in Liverpool. When she arrived she was simply a steel box – no doors, no windows, no engine, no plumbing, no electrics. Ten years on, I'm close to the end of fitting her out – although you may still spot a few rough edges of woodwork.

Low Energy Measures

As an environmental scientist I was keen for the boat to have a **very low carbon impact**. Boats tend to have **fewer electric appliances** than houses,



and without a TV, computer, dishwasher or tumble drier on the boat, there is immediately considerable energy saving in comparison to a conventional house.

I run a **small fridge in the summer** when more power is available, but in the winter the milk keeps cold enough on the base plate. Lighting is from **efficient 12V LEDs**. And heating in the winter is from a **wood-burning stove**.

Keeping the heat in is clearly important - but frankly if you want your home to be thermally efficient, it's best not to start by building it from sheet metal, making it long and thin, and immersing it in a bath of cold water!

So one of the first things I did was have the boat **spray-foam insulated**. This was reckoned at the time to be the most effective insulation for boats, and it has proved to be reasonably good.

Although with hindsight I would have had it sprayed on more thickly, and paid more attention to getting rid of **'thermal bridges'** where metal fittings pass through the insulation.

About the same time I fitted the windows. While double glazing is standard for houses, it's harder to come across double glazing for boat windows.

Another thing I would do now is **spend more time and money** on windows that **provide insulation**.

Over the summer I plan to replace the blinds with **thick curtains** and improve the **draught-proofing**, which should retain the heat more efficiently, and help significantly in the winter.

Overview

Age, Type: **2001, Narrowboat**

Wall type, Floor area: **Steel hull, 29 sq m**

Project timescale: **10 yrs, ongoing**

Cost of build: **£35,000 including hull**

Energy usage – 1 adult

5.2 kWh per sq m pa electricity via PV cells

39 kg pa propane gas

1000 kg pa logs for woodburning stove

Key features

+ very low carbon impact

+ insulation: hull, spray-foam

+ wood-burning stove

+ solar photovoltaic (PV) panels

+ wind turbine

+ electric motor

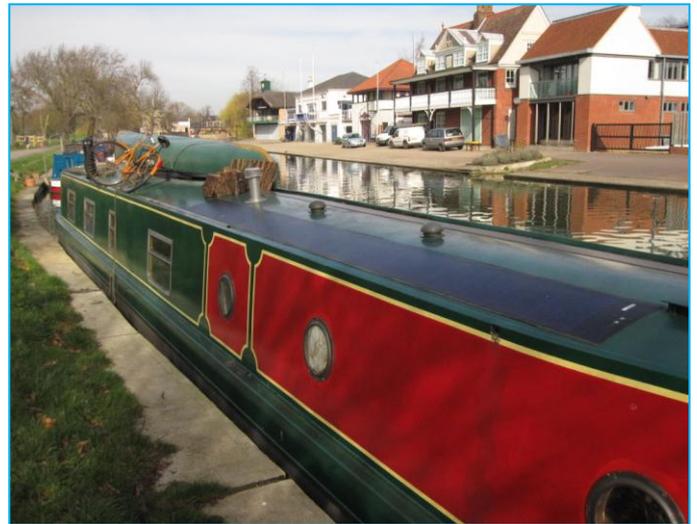
+ lighting: LEDs

+ composting toilet

+ very few electric appliances, small fridge

+ architectural salvage

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The boat also has an **electric motor** in place of the usual diesel engine, running from a large bank of batteries. These are usually charged by **solar photovoltaic (PV) panels** although on longer trips I do have to use a diesel generator to top them up.

After 6 years with BAS I decided to leave. I set up my own business - **Midsummer Energy** - supplying renewable energy systems.

I had already fitted the boat with solar PV panels, **three thin-film Unisolar PVL124 panels** that provide all the electrical power I need from day-to-day, and originally the business supplied solar PV systems to other people living 'off the grid'.

We have now branched out into larger grid-connect solar PV systems too, and we supplied several of the systems you may see at other Open Eco Homes.

Savings

As all my **electricity comes from solar panels**, and **heat from wood**, the only fossil fuel I regularly use is bottled gas for cooking.

I get through three **13kg bottles of propane per year**, which works out at around **117kg of CO₂ emissions per year** if my school chemistry is correct.

Which compares well the **UK average of 5 tonnes per house**.

Nevertheless I'll switch to **bottled biogas** as soon as it's available!

Future Plans

I plan to build a **composting toilet**, which may be in place in time for Open Eco Homes.

Professional Contacts

Other than the sprayed foam insulation, I did all the work of fitting out the boat myself (though I did get a lot of help from my friends)

Products

Insulation: Sprayed foam polyurethane insulation.

Lighting: 12V MR16 and strip lighting, Midsummer Energy www.midsummerenergy.co.uk (approx £18 per bulb).

Architectural salvage: much of the woodwork is from reclaimed timber.

Electric motor: LEMCO DC motor, running through a 4QD controller from a 48V, 200Ah battery bank. Total component cost around £2500.

Renewable energy

Wood-burning stove: Morso Squirrel, Ely Boat Chandlers www.elyboatchandlers.co.uk

Solar photovoltaic (PV) panels: Unisolar PVL124 thin-film laminate solar panels. I got these from a distributor in the US - now supplied through Midsummer Energy www.midsummerenergy.co.uk

Wind Turbine: AIR403 (around £600). In practice there are too many trees and buildings around, so wind turbines are not effective in Cambridge, so I no longer use this.