People Exploring Low Energy Homes

www.openecohomes.org
www.cambridgecarbonfootprint.org

Thoday Street, CB1 3AX

Alex and Mike

Alex and Mike are committed to using low cost natural building materials and doing as much of the work themselves as possible. Renovations can often appear to be costly but if you follow their approach you can make yours more affordable without any loss of comfort and with probable gains in air quality.

Alex says…

'I'm an eco-builder – training and building in natural materials such as straw and cob, timber and lime, using intelligent design to build extremely low energy, clean and beautiful homes. I'm also training in renewable energy.'

Overview

Property age: Built 1910
Type: Semi-detached
Wall type: Solid
Project timescale: In progress since July 2015, expected end date early-mid 2017
Floor area: 90 m2

Cost of retrofit: £10-15k

Occupants: 2 adults

	Energy kWh/m²/yr		Carbon kgCO₂/yr	
	Elec	**Gas**	**/m²**	**/person**
Before	20.75kWh	63kWh	n/a	n/a
After	14.22kWh	n/a	n/a	n/a

Key features
Insulation and Glazing

- Hempcrete internal wall
- External walls repointed with lime mortar
- All but 2 windows have double-glazing

Heating/energy

- Worcester condensing boiler
- PV (3.92 kW)

Natural materials

- Tadelakt plaster in bathroom
- Lime or clay plaster/eco paints
- Cob oven in garden

'My philosophy is to use natural, non-toxic, minimally processed materials that will eventually return harmlessly to the earth.

Indoor air pollution is generally far higher than outdoors (something that shocked me when I first learned it!). This is because of the materials used in building and then all the toxins we bring in in the form of materials: paints, plasters, plasterboard, furniture, electronics, etc.

Building and renovating with natural materials gives a head start in a healthy indoor environment. We're aiming to use only natural and sustainable materials throughout. We repointed the external walls with lime mortar, raking out the old lime mortar and bits of cement mortar.'

Insulation

'Hempcrete wall insulation is a natural building material that is highly insulating and also breathable. It can absorb and expel moisture and as such is particularly suitable for older properties. It is a combination of hemp and lime and can be mixed and applied by non-professionals. This makes it an attractive option for people who want to learn new skills, cut costs and feel a great sense of pride in their renovation.'

Heating and renewable energy

'We worked hard to get the solar PV installed before the Feed in Tariff was reduced, so we got the slightly higher payment. The panels should pay

back financially within 10 years and then make a profit for the next 15 years.

For the rest I tend to think of it like a new bathroom or a new car – you'll never see that money back but you 'profit' from the use and enjoyment of it. It's more an investment in living the way we want to live.

We're making improvements to the energy consumption of the house as we make other improvements – so in renovating the kitchen and bathroom it just makes sense to put in insulation and water-saving devices, for example.

We installed a new boiler in Aug 2016 (as the old one had been condemned!). It's a Worcester condensing boiler, highest efficiency rating, with a smart 'Wave' internet controlled programmer which has weather and load compensation.'

Finances

'You can save a lot of money if you take it slowly and can spend some time doing it yourself. We have decided to do a lot of it ourselves – some of the repointing, the internal insulation, improving our airtightness, the outdoor cob oven from salvaged materials and of course food growing.

By living in the house first we're able to decide what renovations make sense to us. We're beginning to understand what we use, when and where, and therefore what changes we need to make.

For example, an airtightness test and thermal imaging, installing a water meter, weekly recording of electricity use, gas use & solar generation. We're still in the early stages but the solar PV brings great joy every time I see the panels or check our readings!'

Performance

'The PV should make payments of £250-300 plus electricity savings of £160 annually. This should get a bit better (by about £40 annually) when we install a smart meter as we use less than the deemed 50% of the electricity generated. More importantly we're saving upwards of 1200kg CO^2 annually by putting surplus electricity into the grid.'

Future plans

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Planning external wall insulation (woodfibre/cork).
Considering limecrete floor for the kitchen.
Replacing all bulbs with LED as they expire.
Installing a smart meter.

Advice

'10:10 http://www.1010uk.org for overall lifestyle tips on reducing carbon. CAT (Centre for Alternative Technology) for info on renewable energy solutions – and a visit to see them in action – fantastic day out in beautiful Wales!' CAT also runs courses http://www.cat.org.uk

Professional contacts

Joju Solar for PV - £7,800 for 3.92kW system
http://www.jojusolar.co.uk

Peter Pope for air tightness test
http://www.carltd.com/associates/Peter-Pope

Collaboration 23
http://www.collaboration23limepointing.co.uk/

UK Hempcrete
https://www.ukhempcrete.com

Products and costs

The Hempcrete Book, written by Alex Sparrow and William Stanwix, published by Greeen Books

https://www.ukhempcrete.com/the-hempcrete-book/
http://www.greenbooks.co.uk

What would you have done differently?

'Ask me next year!'

What is your top energy-saving tip for householders?

'Understand your home and where you're losing heat and spending money needlessly. Look at the boring stuff – insulation and increasing air tightness are major winners. I'd recommend a (free) thermal imaging test done, courtesy of CCF and a simple airtightness test (Peter Pope) to make major savings by plugging gaps.'