

# DIY 1960s EnerPHit retrofit: CB1



## Property overview

**Property age:** 1960

**Type:** Detached

**Wall type:** Cavity (65mm)

**Floor area:** 133m<sup>2</sup>

**Project Timescale:** 2008-2025 (projected)

**Cost of Build:** £35,000 retrofit, + £45,000 extension

**Occupants:** 2 adults

**Blog:** <http://wookware.org/house/retrofit/>

## Meet your host: Wookey

We bought our home in 2007 and began work almost as soon as we moved in. We realised on moving in that the house was draughty and inefficient so needed work for long-term low running costs. We were primarily motivated to minimise our carbon footprint whilst making a comfortable place to live and were happy to take a long-term view (20+ years).

## Financing, Design and Construction

Apart from the solar PV, the work was all self-financed. The PV was funded through a £2,500 grant plus the Feed in Tariff (FIT) at the original 2010 rate. We did not consider the home a financial investment as we felt that it was just work that needed doing and that everyone who can, should be doing this to protect the future climate.

To prepare for the renovations I did a lot of research reading on Navitron and Green Building forums. This enabled me to do a lot of the work myself and minimise the cost of contractors. Contractors were used to build the extension and complete the rendering for the external wall insulation.

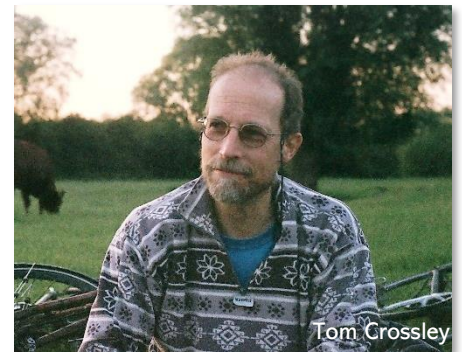
Our original aim for the renovation was to upgrade the house to The Association for Environment Conscious Building's (AECB) CarbonLite standard. However, we upgraded our ambition to reach EnerPHit level (Passivhaus retrofit standard: 25 kWh/m<sup>2</sup> per year space heating). This has been a long process as we were doing the work in stages (DIY at weekends). It reduces costs but gives us time to be sure that things are done properly – I have very high attention to detail. But of course, it is slow and living in a building site for years is a bit of an undertaking - especially really messy things like angle-grinding reveals. The eco retrofit of the main house was put on pause for roughly four years while we added in an extension to join the main house with the separate garage.

We did decide to decorate the living room even though we had not actually finished everything as there is only so long you can stare at the mess. That was a good call, and I would recommend finishing areas you look at/use a lot even if it is not maximally efficient. We also set a rule of at least one weekend a month doing something else otherwise it gets a bit much. We are hoping to have everything complete by 2025.

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

DIY 1960s EnerPHit retrofit: CB1 - 2021

Open Eco Homes is a [Cambridge Carbon Footprint](#) project. Charity number 1127376



Tom Crossley



## Performance

We have been very happy with the performance of the home so far – although it has taken more than a decade! Since implementing the changes, we find the house to be much more comfortable to live in: warm in winter and cool in summer with no draughts and little outside noise. Our gas and electricity usage are much lower. It is quite airtight and we have noticed a lessening of dust mite allergies in the winter due to using the MVHR. In fact, it is lovely smelling the fresh air even in winter when using the MVHR.

If I were to do anything differently, I would have gone for a higher standard from the start and done external wall insulation (EWI) throughout instead of a mix of internal and EWI. I started with relatively modest targets (and a much smaller budget), and found I got more enthusiastic about the depth of the retrofit as the project developed.

## Future plans

Over the next four years we plan to install floor insulation and a heat pump, probably including underfloor heating. We will also modernise the DHW, replace our diesel van with an electric vehicle, fix the chimney thermal bridge, and change the gas hob to get rid of gas entirely.

## Information and advice

We found our suppliers through a range of media over the years. Through forums (mentioned above), Open Eco Homes, attending the ecobuild/futurebuild show, through NSBRC and AECB friends and even from watching local works. These were also useful sources of information, alongside the Passivehouse Plus Magazine and the Cambridge AECB local group.

I would recommend doing external wall insulation with triple glazing if you possibly can – it is the right answer for most buildings. My top tip would be to try to think ahead 20 years and imagine yourself looking back. What would you wish you had done better?

### Key contacts, products and advice

Extension (groundworks & structure): [Green Hat Construction](#)

Vacuum tube solar thermal panels: [Eco-nomical](#)

Balance of system and upgraded low-power pump: [Navitron Pump & MVHR](#): [eBay](#)

Gas system boiler: [Viessman Vitodens 100](#)

Leca Beads: [Mike Wye Associates](#)

Doors, Compacfoam: [Green Building Store](#)

External wall insulation, render & trims: [Back to Earth](#)

Internal wall insulation: [Ridgeons](#)

Extension windows: [Greensteps](#)

House windows: [Internorm](#) and [Fakro roof windows](#)

Underfloor heating: [Uponor](#)

**Other products:** Loft insulation, flue liner, MVHR pipes, Ubbink foam ducting, Foamglass perinsul blocks, Ancon basalt wall tiles, Helixfix roof ties, magnesium oxide boards, PVC door threshold supports, pultruded fibreglass thermal break.

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

DIY 1960s EnerPHit retrofit: CB1 - 2021

Open Eco Homes is a [Cambridge Carbon Footprint](#) project. Charity number 1127376

## Key specifications

### Energy Usage

Electricity	Gas	Other fuel	Water
1100kWh pa	6kWh pa	200kWh*	12m <sup>3</sup> pa

\*Estimation of wood in woodburner

### Insulation

- Loft, internal wall and external wall insulation.
- 200mm cavity fill on extension.
- All walls U value less than 0.16.
- 200mm underfloor in extension.
- Garage/Workshop: 100mm walls, 50mm floor, 270mm roof.
- Perimeter insulation down to footings.
- Triple glazing throughout.

### Heating and Energy

- Solar thermal DHW (stratified thermosiphon).
- MVHR.
- 2.9kW Solar PV.
- Underfloor heating in extension.
- Woodburner.

### Lighting and appliances

- LEDs throughout.
- A+++ Freezer.

### Water

- 1200L water butts (6) for garden.
- Cistern hippos.

### Sustainable building materials

- Woodfibre external wall insulation.
- Timber in extension.

### Garden and natural systems

- 11 raised beds.
- Greenhouse for vegetables.

### Lifestyle changes

- 96% journeys by bicycle.
- Time hot water use for when water is hot.

