

Ainsworth Street – CB1 2PD

Thorough, AC Architects-designed renovation of Victorian terraced house

Meet your hosts Zoe and Samin

We are a family of four: two adults and two teenage children. We also have two cats. As a family we wanted a home that had light, space, comfort and warmth; we wanted to minimize our carbon footprint and waste; and we wanted a home in which we could entertain, cook for, and accommodate our friends and family, knowing that they would be comfortable.

We bought the house in 2005. For a decade, we were freezing in the winter, and too hot in the summer. There were certain parts of the house that we didn't use because of the cold and damp. We gave up turning on the radiators as the heat would just escape out of the uninsulated roof, windows and walls (our main living area at this point was heated by a wood burner). We wanted to fix all these issues, as well as the "bodges" inflicted on the house by previous owners.

We knew that the cost would be high; but it was important to us that the house was renovated to the highest possible standard. Even though some of the payback periods were over 20 years, we wanted to future-proof the house: ecologically, economically, and as a place to live in comfort for the long term.

The renovation process

During 2014-15 we went to workshops at Cambridge Carbon Footprint, and, through Open Eco Homes and SuperHomes, visited local eco-renovated homes. We employed AC Architects, and it then took two years of planning with them – detailed technical reports, eco renovation discussions, family time preventing quick replies – before the work started. AC recommended several builders to us: we chose RWD. They both understood what we were setting out to do, and they had worked together on several projects before.

AC project-managed the renovation but we were extensively involved, both formally in fortnightly meetings, and on many other matters, such as arranging utility meter changes, choosing fixtures/fittings and so on. The work was so extensive that we moved out of the house for eight months (July 2017 – Feb 2018). We moved back in when only some external work remained; the work was finished in April 2018.

The renovation was very successful. The house feels air tight and quiet. We now have much greater comfort throughout the house, more light, and lower heating bills (despite now heating more of the house, more of the time). We don't use our wood burner as the main heating source anymore. The solar PV meets electricity demand from the house first, then heats water, then goes out to the grid. (We have had feed-in tariff payments back from the grid every quarter.) The cats have gained comfort but lost their cat-flap; they have to wait to be let out, and they have a litter tray indoors. Some members of the family previously needed to wear onesies in the winter; they don't any more. Oxfam also benefited: moving house twice in eight months meant we gave a lot of unwanted goods away – twice.



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Age: Late Victorian
Type: Terraced house
Wall type: Solid wall
Floor area: 167m²
Cost of project: £235,000 including new kitchen and all improvements.
Occupants: 2 adults, 2 children, 2 cats.

Key features

Insulation and glazing

- External front/rear walls (PIR) – 0.17 W/m²K (Kingspan KoolTherm K5 External Wall Board).
- PIR internal insulation to sides: Dining area, pantry, bedroom 3 – 0.18 W/m²K (PIR Celotex GA4000).
- Aerogel internal insulation to side external walls in kitchen/landing/stair – 0.32 W/m²K (Thermablok Aerogel Thermaslim IWI Board).
- Roof external insulation (PIR between and over rafter) – 0.16 W/m²K (PIR Celotex).
- Ground floor insulation, insulated concrete slab with underfloor heating throughout – 0.16 W/m²K (PIR Celotex K11).
- New triple glazed windows (0.8 W/m²K); Velux triple-glazed rooflights (1 W/m²K).
- New high spec insulated doors.

Heating/energy

- A+ rated fridge, A rated washing machine (no drier), A+ rated dishwasher, low-energy lightbulbs.
- New, A rated Ideal Logic+ H18 condensing gas boiler.
- Sunpower 4kW PV array.
- iBoost diverts excess solar PV energy to an immersion heater in the water tank.
- Honeywell Evohome-controlled wireless radiator valves.
- Jotul F530 Wood Burning Stove – 8kW.
- We buy our electricity and gas from [Bulb](#).

Water

- Water butts. Low-volume toilet flush.

Materials

- The roof tiles are made from recycled slate. We kept all the wood that came out of the house and are using it for garden and allotment projects. We also re-used what we could (whitegoods, floorboards, bathroom fixtures/fittings).

Energy use (before)

Electricity: _____ 2,483 kWh pa
Gas: _____ 7,189 kWh pa

Energy use (after)

Electricity: _____ 2,004 kWh pa
Gas: _____ 6,322 kWh pa

We combined our eco-renovation with other substantial improvements the house needed. These included installing new pressurized hot water, foul water drainage, and gas heating systems; a new kitchen (the old one didn't survive garden storage over the winter) and bike storage. We brought more light in to the house by introducing new roof lights into the living/kitchen area and a new window by the front door. We created more storage on the ground floor and in the loft (by removing old and inefficient ways of heating the space and water in these areas). We also took out the gas and electricity meters, and the water stopcock to the outside of the house.

Information

The best sources of information were: our architects and builders, Cambridge Carbon Footprint workshops, Open Eco Homes and SuperHomes hosts, the internet. Talking to everyone involved in the project (solar PV engineer, gas grid surveyors, and so on) was also incredibly useful and informative.

Satisfaction?

We are very happy with the result. There wasn't much we would have done differently. We could have done it earlier, but we didn't have the guts to do it until now. Our top tip is to: think big, push through, ask for help. And: Insulate!

Key contacts

- **Architect:** www.acarchitects.com
- **Builder:** www.rwdbuildersltd.uk/
- **Kitchen:** www.howdens.com
- **Bathroom:** www.ridgeons.co.uk
- **Bike rack:** www.thebikestoragecompany.co.uk
- **Windows and doors:** www.valdi.com
- **Rooflights:** www.velux.co.uk
- **Hot water system and Solar PV:** www.solarworks.co.uk including pressurized hot water tank from www.newarkcoppercylinder.co.uk