

Our Flexible 1960s Home: Retrofitting for the Electric Age



Property Overview

Property age: 1968

Project timescale: January 2017 - Xmas 2022 (ideally)

Type: Mid-terraced

Wall type: Standard 50mm cavity wall

Floor area: 126m² increased to 132m²

Cost of renovations: £100k budget + Grants

Occupants: 2 adults (1 disabled; 1 aged 80+)

Meet your host, Paul:

This was our family home from 1969. Now there is just my Mum and me left. Following a disabling accident at work, I moved back in in October 2016 with the idea that by living with my Mum, we could hopefully look after each other rather than struggle separately.

Design, Financing & Construction

I started by looking at ways to alter the house to accommodate us both more easily, so that we were co-habiting rather than living in separate annexes. This meant allowing for ease of movement around the house, making cleaning easier, designing in easy dementia-friendly adaptations (should they be later required), and making sure that any elements of tech that I wanted to introduce would be compatible with my Mum's needs e.g. choosing [Lightwave light switches](#) that could be operated both manually and automatically. It was also important to consider access-related issues, such as doorway width, level thresholds, ensuring there was a space that could be converted into a downstairs bedroom and creating a downstairs bathroom. We also found that by working assistance devices into our plan, they blend in far better, e.g. the grab rail within the shower enclosure blends in seamlessly with the [Cirrus water saving shower](#) system.

As a family, we have always been environmentally-minded. Having moved back to the property, I was able to become an early adopter of an Electric Vehicle in 2017, which then led to my joining a Vehicle-To-Grid trial and now a Vehicle-To-Home trial. This prompted me into thinking of ways to make all our renovations greener and more energy efficient. At the start, my Mum was understandably 'very happy with the way things are now, thank you', but she has since really got on board with the greener living and energy efficiency proposals.

We have a very definite limit to funds as neither of us is in a position to work. So this is a once-only, must-get-it-right-first-time endeavour. For us, the payback is immediate in creating a healthier environment for us to live in; plus the development of a Vehicle-To-Home system should minimise our running costs after the initial capital investment, making it easier to budget. While the retrofit will likely increase the value of our home, we have no intention of moving!

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Flexible 1960s Retrofit, Oakington – 2022

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



Pre-Renovation



Mid-Renovation

Our top tips:

- Educate yourself - retrofit remains a niche area; suppliers and trades are not ready
- Plan - work out what can be done as a stand-alone improvement so that you can take advantage of any grants available
- Stand firm to your ideals & values - even with budget constraints - that's the path to contentment.



I had employed an architect at the initial stage to convince and reassure my Mum, however, my builder, Toby, is excellent, so maybe those costs could have been reduced. Covid obviously delayed progress, but it also allowed more time for planning and things just naturally fell into place when the builder became available in May 2022.

An [air source heat pump](#) (ASHP) was installed in December 2021. This was done prior to the other retrofit work in order to benefit from the Renewable Heating Incentive grant. Our house originally had forced-air heating when it was built and still has the ducting, so perhaps air-to-air heating could have been used, but in our experience, this style of heating is not very comfortable. We replaced the majority of our radiators and also added a [Mixergy water cylinder](#), due to its smart flexibility - which was a first for our ASHP installers.

Our house had blown-fibre cavity wall insulation installed ten years ago, and so, to improve energy efficiency, extensive insulation work was planned: [Icynene sprayfoam insulation](#) has now been applied to the pitched roof along with internal skelining insulation; meanwhile, current works include cork block EWI to the rear of the house, wood-fibre EWI to the front of the house finished with wood cladding, and increased insulation to the flat roof.

Our double glazing was replaced four years ago - we missed the opportunity to replace them with triple glazed units at the time. The 'standard fitting method' of the double glazing, however, has meant that those windows could be pushed out into the EWI to achieve the best thermal performance.

We took advantage of the [Solar Together](#) scheme in 2021 and installed a 4.76kW array on our SE oriented roof. Under the V2G scheme we had a very beneficial export rate, but under the V2H scheme the PV energy will be stored in the EV and also used to heat water in the summer. Any excess is then exported under the Smart Export Guarantee.

Ideally, we would have installed MVHR, but that would require ducting to most rooms, and wouldn't have suited our lifestyle of having windows open year round. Instead, we opted for [Demand Control Ventilation from Aereco](#). All our wet rooms are in the SW corner of our house, so for this system we only needed a couple of meters of ducting to extract the warm, moist air away from the showers, while the inflow of fresh air is controlled through special vents in a few specific windows, and a single wall-vent.

We took the opportunity to combine the eco renovation work with upgrades and improvements to our home, including: new layouts to both floors of the house, while retaining much

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Key Specifications

Insulation & Glazing

- Spray foam roof insulation
- EWI: cork blocks & wood fibre
- Demand Control Ventilation

Heating & Energy

- [ASHP](#)
- 4.76kW Solar PV
- EV Vehicle-To-Grid; now Vehicle-To-House
- LED lighting adapted to Circadian rhythms

Considered Quality of Living Design

- Dementia Awareness: same level access, wider doorways, easy to use handles
- Easy Cleaning by design, incl water softener
- Assisted bathroom features by design
- Broken plan living with soundproofing
- Good air quality: ventilation, low VOC materials

Water, Garden & Natural Systems

- Reuse of materials: windows, hardcore
- Green roof, water butts, soakaway
- Provision for grey water system

Key Contacts, Products & Advice:

EV: Nissan Leaf (bi-directional charging capability)

V2G Trial: [Ovo Energy](#)

V2H Trial: [Indra](#)

[AC Architects](#)

Solar PV £4,200 through [Solar Together](#)

[Icynene Sprayfoam](#) - paid with Green Homes Grant

Natural materials:

[cork flooring](#), [cork EWI](#), [clay paint](#), [wood fibre EWI](#), [marmoleum](#) for shower rooms

[Green Building Store](#)

Invaluable advice: [Open Eco Homes](#)

cherished characteristics of the original house; new bathrooms; combining two single bedrooms to create a third double bedroom; adding a small (2mx3m) extension to the upgraded kitchen; converting most of a double length garage into a habitable space and retaining a storage area behind a new garage door that now houses a dedicated plant area.

With the ASHP and kitchen becoming all-electric, we can now be free of gas.

