

1950s Bungalow Retrofit for Sustainable Family Living – Guilden Morden



Property Overview

Property age: 1950s with 2 extensions
Project timescale: Autumn 2019 - ongoing
Type: Bungalow
Wall type: Cavity
Floor area: 211m²
Occupants: 2 adults, 3 children
Cost of renovation: £25k

Meet your hosts, Emily & Alex

Emily says: We are both NHS doctors with three young children, three hens and two rabbits. We all love being outdoors, cycling, camping and being in nature. We wanted a home that would allow us to enjoy some nature on our doorstep, give our children space to explore and play, and to allow us all to experiment with greener ways of living. As doctors, we are keenly aware of the impact of the climate crisis on people's health. We also see the impact of diet on health and wanted to provide good food for our family. Having lived in this village for a number of years, we gradually needed a bigger house to accommodate our growing family. We looked for a property in the village so we could stay rooted here, and which would be easy to retrofit and have a large garden for growing food.

Design, Financing & Construction

The cost of retrofitting improvements was factored in when we bought our home in 2019: we were willing to make the initial investments and saw this as part of the purchase price of buying the home that we wanted. We started work almost as soon as we moved into the property: the aim was to minimise greenhouse gas emissions by improving energy efficiency, generating renewable energy and achieving long-term cost savings. At the same time, we wanted to improve indoor air quality, grow our own food, use water efficiently and manage all organic waste on-site.

In the design phase, we paid for an independent home energy consultation from [Dragon Renewables](#), who were extremely helpful. We then obtained quotes from various suppliers, although the insulation, draught-proofing and MVHR were installed by ourselves to keep costs down: the MVHR took 3 amateurs 4 days to complete. We also took the opportunity to create a large utility room with excellent ventilation - this has been invaluable for drying clothes in the winter months and means we never need to use the dryer.



Wild corner for hens

Our top tips:

- **Borrow a thermal imaging camera - [Cambridge Carbon Footprint](#) offers thermal imaging training & camera loans that are very helpful**
- **The ASHP has been great! If you are thinking of getting one, I would highly recommend [AOS Heating](#)**
- **Imagine where you want to be then work out how you're going to get there. Try to review your principles & progress your lifestyle towards them at least yearly. Don't dismiss any ideas; domestic changes will change the world.**



Trickle vents & door leaking heat

www.openecohomes.org

1950s Bungalow Retrofit for Sustainable Family Living – Guilden Morden - 2023

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



Performance

The renovations have, so far, largely met our aims. The solar panels were paid for with a loan from family and the calculated payback period at the time of installation was 7 years, although recent rises in energy prices means this has probably now shortened significantly. The solar PV has produced about 10% less energy than we were quoted (quoted 6,500kWh; delivered 5,450-6,460 kWh) but the energy savings have been about 30% more than quoted (quoted £800; delivered £1,155).

The old oil boiler that came with the house desperately needed upgrading, but we chose to invest in an air source heat pump (ASHP) instead. This has easily paid for itself within three years once the potential cost of a new boiler is factored in, alongside the reduced energy costs and [Renewable Heat Incentive](#) (RHI) payments. Our RHI payments started at £395 a quarter, and will run for 7 years, rising with inflation. Even if inflation drops rapidly, the RHI repayments (£11,582) will be slightly greater than the cost of the heat pump (£11,545). The ASHP has performed extremely well, and energy costs have been lower than expected. The MVHR has completely removed any visible damp or mould from the home.

Overall, we are very happy with all the improvements. We view all our renovation efforts as investments not just in the property but in our family, our lifestyle and as a means to support our future wellbeing. We have created a home that keeps us warm and healthy by eradicating mould and damp. Our large garden has been a work of passion in permaculture and we have created a circular food system through composting, rainwater harvesting and growing our own fruit and vegetables. We even installed a composting toilet and outdoor solar shower for long days spent as a family enjoying the outdoors. Our animals are also very happy with their own wild spaces to explore.

Future Plans

Draughtproofing and improving insulation is almost a never-ending task as there are so many little things that could be improved. New doors would make a big difference and we hope to do this in future. We are currently working on a nature garden with a pond in the front garden area. We also intend to switch to 100% electric vehicles (currently one electric and one plug-in-hybrid) when possible.

Growing our own food



www.openecohomes.org

1950s Bungalow Retrofit for Sustainable Family Living – Guilden Morden - 2023

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

Key Specifications

Insulation & Glazing

- Loft insulation (DIY)
- Draught-proofing (DIY)
- Insulation around glazing

Heating, Ventilation & Energy

- MVHR (DIY installation)
- 11.2kW Ecodan ASHP
- Direct-air wood burning stove (to work with MVHR)
- 21 x 325W Solar PV panels (6.8kWp)
- Zappi Home EV car charger
- 4.8kWh battery

Quality of Life Design

- Nature on the doorstep
- Improved indoor air quality

Water, Garden & Natural Systems

- Rainwater harvesting
- Compost toilet
- Outdoor solar shower
- Permaculture organic fruit & vegetable garden
- All organic waste composted on site

Energy Consumption:	Energy kWh/m ² /pa	Carbon kgCO ₂ e/pa	
		/m ²	/person
Electricity only			
House	31	5.9	250
2 cars (1 EV, 1 hybrid)	n/a	n/a	166
Total	n/a	n/a	416

(excluding wood burning)

Key Contacts, Products & Advice:

Advice: Jonathan Cooke, [Dragon Renewables](#)

ASHP + 2 radiators: [AOS Heating](#) (£11.6k)

Solar PV: [Contact Solar](#) (£6.9k)

Battery: [Pylontech](#) (£2k)

DIY MVHR: [BPC Ventilation](#) (£3.1k)

Home EV Charger: Zappi & Eddi (£1k)

Electricity Supplier for PV owners:

[Octopus Energy](#)

Thermal Imaging: [CCF](#) training & loan scheme

Gardening: [Charles Dowding's](#) No Dig Gardening;

[Huw Richards](#); [Permaculture Magazine](#)

