

Zero Carbon House

Making a suburban Edwardian house Zero Carbon with reasonable measures, and without busting a gut.



Around a quarter of the UK's energy goes to heating homes; mostly with boilers burning natural gas – a fossil fuel.

Going zero carbon is in theory simple: switch from gas to electricity - increasingly generated without fossil fuels. But electricity costs much more than gas.

In 2018 we bought a leaky old Edwardian detached house in Orpington. We have adapted it to Zero Carbon, using readily available and affordable measures.

- 1 Replaced the gas boiler with an Air-source heat pump, sitting next to the house
- 2 Increased insulation as much as possible (where reasonable)
- 3 Double-glazed all windows
- 4 All-electric cooker (with fast-acting induction hob)

Heat pumps *move* heat from outside to inside. The same principle as a fridge. Typically they use 1kW of electricity to move between 3 and 4kW into the house. This works even if it's below freezing outdoors and you want a cosy 20 degrees C indoors.

People say that heat pumps work best with under-floor heating, working at lower temperatures than radiators. But under-floor heating is difficult and expensive to install in old houses. Fortunately heat pumps work perfectly well with radiators, provided they're reasonably sized. We didn't need to change ours.

Insulating Edwardian solid brick walls is disruptive and expensive. *We haven't needed to.*

Insulating the loft is straightforward, so we added 12" (300mm) of mineral fibre quilt.

We insulated the timber ground floor, with 4" (100mm) thick foam board under the existing boards.

We replaced single-glazed windows with new uPVC windows with double-glazing.

This has brought the cost of heating with electricity down to roughly the same as the old cost with gas. To reduce costs further we have the Domestic Renewable Heat Incentive (RHI) which pays us around £10,000, spread over the next seven years. (www.ofgem.gov.uk)

It's all been achieved with reasonable and affordable measures. If you'd like to come and have a look, feel free to get in touch.

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