

A SMALL MODERN DETACHED HOUSE IN NORTH KINGSTON, from 1999 - 2022

Our 2-bedroom house was built in 1991, constructed of brick with a concrete-tiled roof and an integral garage. Its total floor area is 107 m², arranged in an unusual shape, partly because of the constraints of the site, with a lot of outside walls and three separate roof spaces which tend to make it less thermally efficient.

1999

Cavity wall insulation was one of the first things we did, encouraged by a special offer from SeeBoard. The house's original construction, with an inner wall of Thermolite block, was already better insulated than most older houses, but adding insulation was a painless improvement, which created no mess, was all done outside and took only a day. The insulation is still there, hasn't compacted, and has caused no problems.

Adding a conservatory

We did this mainly because we wanted a dining room extension which would not make the inner rooms any darker, but we were also conscious that a lot of glass was potentially a problem, overheating in summer and losing heat in winter and took steps to mitigate that.

The conservatory was fitted neatly into a SE-facing corner, with a well-designed ventilation system in the roof as well as side-windows, and the glass is low emissivity and double-glazed. We ensured that the new floor had a reflective foil layer to reduce heat loss through the floor. We added high performance reflective blinds, which are a bit untidy but function well. The result is a room that is tolerable in hot weather, and which acts as a solar collector for the whole house in spring and autumn. We kept the sliding door into the conservatory so that we can shut it off in cold weather, and it has its own zoning valve which switches off the radiator in the late evening when it is no longer needed.

The work took some weeks but was mostly outdoors and we were pleased with the company we chose, though it no longer exists.

What we learnt: some salespeople in 1991 had no idea about suitable ventilation or blinds, over-heating, low-emissivity glass... but maybe things are better now? Someone with a different house, particularly if they have a heat-pump, might also consider under-floor heating.

1999 - 2015

Loft insulation: our house has three different roof spaces, two of which were inaccessible! We increased the insulation to at least 150mm in all three, which involved cutting holes into the roof spaces that had no access hatch, a messy job but only needing doing once! We also added a layer of insulated plasterboard on an uninsulated inner ceiling, and sealed all holes and joints in plasterboard ceilings, for example, for light fittings or cables, to prevent warm moist air rising into cold loft spaces.

2001

Good Energy: we switched energy provider to Good Energy for both electricity and gas, mainly to encourage low-carbon energy generation and because it was an effortless win for the environment, though it was slightly more expensive then.

2007

Hardwood floors 19mm thick were added downstairs, mainly to replace worn fitted carpets. Because the original floor was already very well insulated, the new floor made little difference to that, but it was an opportunity to remove skirting boards and seal the floor to wall gap to eliminate draughts.

2008

EPC: we had an energy performance assessment of our house, which prompted the next improvement -

2009

An air-source heat-pump (ASHP) and a hot-water-tank replaced our gas combi-boiler. We also had to replace some radiators for bigger or double radiators that could run at the lower temperatures produced by an efficient ASHP. We added insulation to the hot-water-tank and to internal and external ASHP pipework.

What we learnt: as early adopters we had to experiment to find the most efficient weather-dependent settings, as the technology was new to the various plumbers and fitters and electricians involved in the installation, though companies we've employed since for servicing and maintenance have understood the technology well. We also learnt not to believe competitive salespersons, one of whom told us, misleadingly, that a rival ASHP would sound like Concorde taking off. We visited a showroom to listen to one, and although they do make some noise, it is a low hum, nothing like an airplane - and we chose a Daikin ASHP because it could be fixed high on an external wall out of the way. We also learnt from a friend's similar installation that it is a bad idea to have the external unit too far from the internal unit(s).

2011

Solar panels: a 3.85 kWp solar PV system was installed on a SE-facing roof. The generous Feed-In Tariff (FIT) offered at the time was an incentive and compensates for the fact that we benefit only intermittently from the energy generated (mainly on sunny days) and most of it goes into the grid.

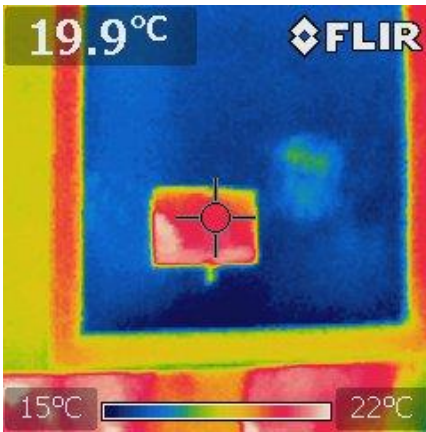
What we learnt: the gap under our solar panels proved very attractive to feral pigeons for nesting, and a few years later we had to have scaffolding expensively re-erected so that a pest-control firm could install sturdy anti-pigeon netting. If this had been done when the panels were installed it would have cost a tenth of what installing it later cost us!

2015

Ventilation: we installed a heat recovery ventilation unit at the top of the stairs and next to the bathroom. It is a trickle ventilator, on all the time in winter when our windows are closed, boosts when humidity rises above 70%, and recovers about 75% of the heat in the outgoing air. Installation involved knocking a hole in the wall, which was messy, and the system requires an electrical connection (not a problem for us as we had a light fitting there), but it is positioned well to cope with our small house's ventilation requirements and we have no condensation. Bigger houses than ours would probably need more than one unit.

2018

Windows and doors: as the original wooden window frames began to show signs of rotting, we decided to replace the double-glazed, but slightly draughty, windows with low emissivity, argon-filled triple-glazing in well sealing PVC-frames. The thermal image below shows the effect of a patch of low emissivity film on one of our old windows, with the film reflecting heat back into the room.



Because we had the new windows and doors specially pre-painted their external and internal appearance is not very different from the original casement windows, they will be very low maintenance and the house is cosier and quieter, so we think this is one of the more beneficial changes we have made. We also replaced a glazed front door with one that complies with current building regulations. People with older houses than ours with, for example, draughty sash windows and panelled doors would benefit even more.

Problems: after a few years some double- and treble- glazed units are showing signs (condensation) of leakage in the seals - these may have to be replaced before it becomes a bigger problem.

Our energy consumption

It is difficult to make useful comparisons between 1999, when we moved in and were out at work all day, and now, when we are retired and at home much more. But in 2008, before we installed the heat-pump and the solar panels, our total energy usage per year was 12,900 Kilowatt hours and now, in 2022, it is 6,400 Kilowatt hours - halving in a period when our lifestyle and household requirements have remained much the same.

As we have changed lightbulbs (from incandescent to fluorescent to LED) and electrical appliances, as and when needed over the years, we have acquired low energy equipment, but it's hard to assess these gradual gains in efficiency. Generally, we have made little effort to quantify the personal financial costs versus the benefits, but we think our improvements have been worthwhile for a range of reasons.

What we learned or would do differently: if we had installed the heat-pump and solar panels before we refurbished our kitchen (in around 2006) we would have gone all-electric at that point - and we probably will at some time in the future. Generally, we have made improvements to our house ad hoc, not necessarily in the "right" order, but as and when things needed replacing or we could afford home improvements, or we learnt about better technologies, or there were government incentives.

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