**Oaklands End**

**Energy Efficiency**

* Loft insulation – subsidised offer in 2009. Added extra from Freecycle spare rolls. Eaves vents to overcome condensation in colder roof space.
* Cavity wall insulation – subsidised offer in 2009. Blown in through holes drilled in outer mortar and plugged. Not convinced about effectiveness – suspect variable coverage.
* Solar PV panels – 17 to get as close as possible to 4kw domestic maximum. Installed Dec-11 - £10,500 investment has earnt £18k+ to date – tax-free return >15%pa
* House is double glazed throughout. If I was replacing now, I would consider triple glazing.
* The extension to the rear of the house was specified to be low energy. There is 100 or 150mm of thermal rigid foam in the floor, walls and roof. The extension has not increased heating demand, because it insulates a north-west facing wall of the old house, including to bedroom window sills.
* Air Source Heat Pump provides house heating and hot water. Cost £10k, received £7k grant over 7 years. House had to be well insulated to qualify for grant and for system to be effective.
* Separate Air Source Heat Pump used to heat swimming pool in summer. When pool was re-lined, a thicker material was used to reduce heat loss. Insulating cover also uses sun to heat pool. All pipework insulated. Planning to retrofit invertor control to 500w water pump – most of the time it can run at c.25% power, saving about 3kwh per day.
* I would like to fit a UV steriliser to reduce chlorine requirements of the pool (chlorine manufacture is high energy). The pool & pipes no longer leak to ground, reducing energy wastage and chemical requirements. In the summer, I divert rainwater from the shed into the pool. This increases chlorine and soda ash use to maintain balance but reduces the build-up of nitrates, which are expensive to remove, including significant waste of heated water.
* I had a water meter fitted at the start of 2021. Normal occupancy of 2 persons plus pool uses under 300 litres per day. My water bill is 50% of previous fixed charge.
* Gradual conversion to LED bulbs – even to replace compact florescent, as financial case was good. Use of lamp units that can be remote controlled for colour and brightness in several rooms.
* Large 300 litre hot water storage tank. Provides buffer for ASHP hot water provision when priority may be on house heating.
* Central heating programmed to on at 0700 and off at 2200. Override used if needed outside this period. Lower daytime temperature – increased if necessary on the day.
* Hot water heating starts at 1000, to coincide with sun on solar panels. Swimming pool heat pump starts at 1100 in summer, when hot water demand is usually complete.
* Solar i Boost diverts excess solar PV generation into heating hot water. I let the heat pump take water to 51deg C and the Boost can use as much as 9kwh on a sunny day to take tank to 63deg C max. To date saved 687kwh, so expected to payback in less than 2 years. Saving would be much greater if I was not heating swimming pool in summer.
* Engineered wood floor in living room has best available thermal insulation underneath it.
* The old house has suspended concrete beam ground floors. This is probably the main source of heat loss today. I am investigating a blown insulation solution but need advice on how to deal with radon gas.
* When re-decorating ensuite bathroom, I used 10mm tile backing boards and realised they were ideal to insulate a cold window surround to eliminate black mould problem. I also built out from wall to house shower pipework, etc. The space was filled with rockwool loft insulation.
* More recently, I used same 10mm boards to insulate the external wall of tiled downstairs toilet.
* The idea has carried on to the utility room, which needed a complete refurbishment following the discovery of long-term damp from the soil stack. Instead of re-plastering, I have used backer boards with PVC decorative cladding that was originally made for bathrooms/showers. It is now available in a range of feature wall designs. The cladding is strengthened with hollow cells that also provide good insulation. Lower down, I have built out with plywood to conceal electrics and pipes. The voids are filled with rockwool insulation. Higher up, the pipework from the heat-exchanger to the hot water tank and central heating pipes is now concealed in plywood, also clad with PVC. Inside the boxes is more rockwool.
* I am insulating above the fitted wardrobes and fitted kitchen units that are on external walls with 50mm thick insulating boards that I found a good price for at B&Q.
* In the master bedroom, the external wall is being clad with 10mm backing board and PVC cladding. Eventually, I would like all external walls to have additional insulation on the internal side. At present, combination plasterboard and insulation solutions are too expensive.
* Front bay window tiled “roof” void has been insulated with rockwool. The window bay underside is insulated using a 100m piece of thermal rigid foam left over from the extension works.
* I use an induction hob in the kitchen. Far more energy efficient than halogen or conventional hobs and much safer. Only the pan gets hot and the hobs go into standby and then off, when it is removed. Also, useful space for home delivery groceries while you unpack them!