

Wille Cottages were built in 1898, a small brick terrace on the edge of the Lewes Conservation Area. I moved in in April 2010 after major structural and renovation work; the house now has two bedrooms and an open-plan ground floor including a small conservatory extension replacing a plastic corrugated roof; the total floor area is around 75m<sup>2</sup>. My aim was to create a sturdy house that would require little short-term maintenance and would keep energy use down, while retaining its general character. The improvements resulted in a **61% reduction in carbon footprint** (and further measures have now added to the %); my house is listed on [www.superhomes.org.uk/82](http://www.superhomes.org.uk/82) as an example of **unobtrusive retrofitting of low-energy measures to an ordinary period house**.

### Electricity generation and storage

I had **6 photovoltaic solar panels installed (8.3m<sup>2</sup>)** in Mar 2010 by [www.southernsolar.co.uk](http://www.southernsolar.co.uk), with a rating of 1.29kw. The estimated annual output was 1089kw/h, but I'm **consistently achieving c.20% over that**. The **solar PV Feed-In Tariff** pays me for every kw that I generate, whether or not I use it myself. So I can use free electricity from my panels and also get paid to generate it! And as from December 2014 I have a **Victron EcoMulti Hub-4 lithium storage battery system** (2300kWh storage, 3kVA inverter, 24 volts, 70-amp charger) which allows me to operate on solar panel power at night and during a mains electricity outage. It tops up from the grid if I run down the batteries (e.g. if I use a lot of power outside sunshine hours in winter) but the system works seamlessly and the only visible sign is the near-ceasing of my main electricity meter. It's maintained by [www.sunstore.co.uk](http://www.sunstore.co.uk) of Worthing; more details on the EcoMulti are available on [www.victronenergy.com/inverters-chargers/ecomulti](http://www.victronenergy.com/inverters-chargers/ecomulti).

My mains electricity usage is now minimal, but even before the storage-battery installation my annual electricity bill was c.£160, a fair amount of which was the standing charge. Much of this was due to my replacing of most lightbulbs with **LED lighting** (see separate factsheet), which resulted in dramatic savings well covering the cost of the switch. Don't hesitate to do this!

### Windows

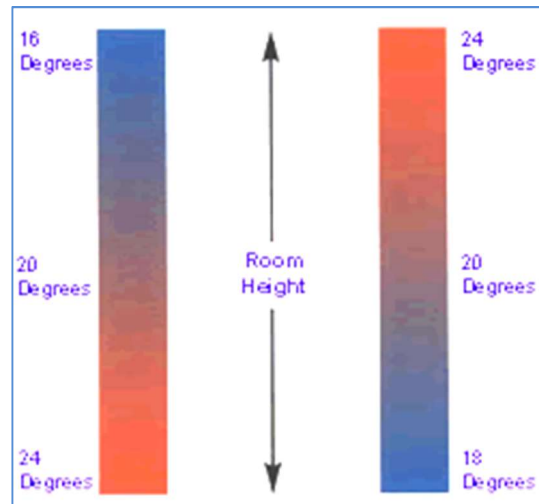


The non-period windows are double-glazed; all the original sash windows have been rehung and fitted with draught-strip, and the front door is draught-stripped. All the windows also have acrylic secondary glazing using very easy, cheap and unobtrusive **magnetic-strip secondary glazing** (see separate factsheet), which reduces heating bills, stops draughts and condensation, blocks noise ..... 100% worthwhile! Do see the video that I and two colleagues have made about this: <http://tinyurl.com/EcoLewes>

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### Heating

For hot water/ heating I have a combi boiler rather than a hot-water tank (so solar thermal panels were not an option). I have **underfloor heating** in the sitting-room, as a new concrete floor was installed as part of the structural alterations and it was a simple matter to add the underfloor tubing. It was expensive but is really gas-efficient and heats the space where you are rather than (as with radiators) the ceiling! (Underfloor heating on L, radiators on R in the diagram above)



### Insulation

During the house renovations, the builders added insulation behind all the floors, walls and ceilings that they were working on; in the attic there is rockwool plus **Warmcel** (made from recycled newspapers). There's **thermal plasterboard** in the back part of the house. The front of the house has a **cavity wall**, and this was insulated using polystyrene beads. I have **Sempatherm reflective panels** behind all the radiators. In my chimneys I have **chimney sheep** ([www.chimneysheep.co.uk](http://www.chimneysheep.co.uk)) to reduce heat loss when the fire isn't lit. **My annual gas bill is less than £300**; I'm aware that it would be even lower if I didn't have the conservatory extension, but it brings lovely light into the house.

### Other eco measures

- ❖ **Isolation switches** on items which otherwise stay on standby, and on appliances such as extractor fans and cooker electrics which otherwise kick in needlessly
- ❖ **Cork laminate flooring** in the kitchen and wool carpets with recycled felt underlay

- ❖ In the attic I have a **sun-tube**, which is a small highly-reflective tube in the roof which lights up the attic just as well as a skylight, with much less of a 'footprint' on the roof. Recommended for windowless rooms anywhere – it can go for several metres through the house.
- ❖ I have water-butts, compost bins, and sustainable decking in the back courtyard for good water runoff; and a neighbour happily grows vegetables in my front garden on a **LandShare** arrangement

