



PHOTOVOLTAIC SOLAR PANELS - a case study of a domestic installation in York

I contacted a number of firms offering photovoltaic panels in April and May 2010 and had a number of site visits from representatives to look at our south south-west facing slate roof measuring approximately 30 square metres at the rear of our property. The predicted outputs and financial benefits forecast for the differing panel arrangements varied considerably and after consideration I selected a firm, Sheffield based Homeco Technologies Ltd that came with a recommendation from Nick Parsons of South Yorkshire Energy Centre, who I had met when he gave a one day building energy saving course at St Nicks. Installers need to be Microgeneration Certification Scheme (MCS) registered so that you can receive the feed in tariff payments (see below)

The installed system is composed of thirteen panels each of 175 W giving a total system size of 2.275 kWh. The panels produced by BP (BP4175T) are monocrystalline and arranged on the roof in two rows. There are more efficient hybrid panels but the higher cost of these means a lower rate of return on the investment. The BP panels come with a 25 year performance warranty with 93% module efficiency guaranteed for ten years and 84% module efficiency for the following fifteen years. This performance warranty appears to be slightly better than warranties on other competitors' panels

Shading of one part of the system reduces the generating capacity of the whole system. If all the panels are linked together in one string then when there is shading output is severely restricted. Thus to maximize the generating capacity where there is shading it is better to have a number of strings. In our particular case the panels are arranged in five separate strings.

For each string there is an inverter. The five inverters are housed in our loft space and look something like a large fuse box. From the inverters wiring is connected directly to the consumer unit (fuse box) so that electricity produced feeds into the system. There is a meter next to the consumer unit which shows the output of the solar panels.

OVERVIEW

- ⌘ 30 m² slate roof
- ⌘ 13 PV panels of 175W totalling 2.275 kWh potential
- ⌘ expected output 1,814 kWh per year
- ⌘ cost £13,440
- ⌘ estimated annual feed in tariff return £750
- ⌘ estimated annual saving on bills £200
- ⌘ estimated payback period of 11 years and the annual return around 9%

When the panels are generating more electricity than we are using the electricity is exported to the grid and our electricity meter stops. When we are using more electricity than the panels are producing the electricity meter clocks up in the usual way.



Five inverters and the meter



The 2.275 kWh system we have is predicted to produce 1814 kilowatt hours of electricity per year. This is approximately half our annual consumption.

Because our roof was in a poor state of repair we decided to re-roof before the panels were installed. We asked Homeco to do this work so as to make efficient use of the scaffolding and a seamless project. The re-roofing took two days and the installation of the panels took one day and a half. The project thus took three and a half days excluding putting up and taking down of the scaffolding.

Finance

The installation of the system cost £13,440 including VAT at 5%. (This does not include the re-roofing carried out prior to the installation of the panels but does include scaffolding costs.)

The feed in tariff (FIT) scheme pays at a guaranteed rate of 41.3 pence per kWh for systems installed between April 2010 and April 2012 for a period of 25 years. FIT rates will become progressively lower for systems installed in following years and as far I can gather there is the possibility that they might be withdrawn – but not for systems already installed. The estimated annual FIT return for the 1814 kWh we are expected to produce is £750. In addition the estimated saving against the previous annual electricity bill of £400 per annum is approximately £200. Until there is smart metering most energy suppliers assume that half the electricity produced is exported to the grid and there is a small additional payment of 3p per kWh exported. When inflation at 3% is taken into account the average benefit over the 25 year period is expected to be about £1,350 per annum. I estimate that the payback period is in the order of 11 years and the annual return about 9%.

Other practicalities

I contacted the planning department in York and was advised that while solar panels do not require planning permission a Buildings Regulation Application is necessary. (£25 + VAT).

Once the system was installed I contacted our electricity supplier and gave details of the system and the MCS certificate number. The electricity supplier requires a meter reading every three months. For the first three months of July, August and September the system produced 582 KWh and we received a cheque for £249. Output of the system is much lower in the winter months.

I would recommend Homeco technologies www.HomecoEnergy.co.uk 0114 2935019. The main contact is Chris Neil.

If you would like to ask Jonathan any questions or arrange a site visit, please contact Friends of St Nicholas Fields who will put you in touch: 01904 411821 or info@stnicksfields.org.uk