



Case study

The Orrell's, Droridge

Dartington, South Hams

RENEWABLE ENERGY 4
DEVON



Introduction

The Orrells are a family of four which includes two school age children. Originally from Exeter they moved to Dartington in 2001.

Richard Orrell is a professional meteorologist and appreciates the urgent need to dramatically reduce global greenhouse gas emissions. Installing renewable energy is one of many actions he has undertaken to reduce his family's impact.

Project development

2kW solar photovoltaics was installed in 2003, followed by solar thermal in 2005. More PV was added in 2008 bringing the total capacity to 4.4kW. Significant energy efficiency measures were put into place, as well as replacing gas with biomass heating, as follows:

- A gas-powered boiler was replaced with 2 high-efficiency wood burning stoves, one linked in to the existing central heating system and the second running stand-alone.
- A solar hot water system was installed for water heating and photovoltaic panels for electricity generation.
- Cavity walls were filled during 2002.
- Soft coat low-e, argon filled void, double glazing was installed wherever existing glazing was inadequate.
- Insulation in roof spaces to circa. double building regulation requirement
- Ground level floors insulated with FSC certified fibre board. Cork flooring.
- Additional electricity is sourced through "Good Energy," a green energy supplier.

How the system works

The house is heated entirely from passive solar, biomass (wood) and waste heat (body, cooking etc). Additional heating and hot water to the well-insulated house are provided via the biomass stoves and the solar hot water panels. The photovoltaic panels generate electricity and are grid-connected with Good Energy as the supplier.

Costs and benefits

- Largely self sufficient on solar hot water between mid-April and mid-October.
- Photovoltaic panels now generate around 2200kWh pa.
- Carbon Savings – 8 Tonnes a year
- Grants received were 50% off the cost of the pv and £500 off the solar hot water.
- Financial savings/pay back
The Orrells were not interested in this personally as they feel society does not attach a meaningful price to the act of emitting greenhouse gases.
- For information RE4D calculates at an electricity cost of 0.09 £/kWh, assuming benchmark costs and taking grants into account, payback as 44.4 years. However this does not take the current value (Mar 2008) of Renewables Obligation Certificates (ROCs) at 0.09 £/kWh and rising electricity costs, more than halving this figure.

Technical details

PV modules

2kWp PV array which consists of 12 Isofoton 165Wp mono crystalline modules.

Installers

Solar Sense UK Ltd installed both hot water and PV systems

Wider benefits

The main priority was to minimise carbon emissions. Other key priorities of the family are to minimise waste through careful consumption and purchase, developing local closed-loop cycles (e.g. grow as much food oneself, compost waste, use compost to nourish the soil for further growth), minimise travel that uses fossil fuel for energy, model a lifestyle to demonstrate that substantial change is possible and enjoyable!

“Our goal is – One Planet Living. In other words, out of conscious and deliberate choice we increasingly move to a lifestyle which is sustainable in the long term.

Whilst supporting some of the tentative steps taken so far by the UK government to try and reduce greenhouse gas emissions, I also believe that there is a moral and very practical need for everybody to adopt a lifestyle which is ‘carbon-benign.’”

Further information

Solar Sense UK Ltd - <http://www.solarsense-uk.com>

Contact RE4D

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For independent advice and support

