



SOLAR PHOTO-VOLTAIC (PV) PANELS

Solar PV systems capture the sun's energy using photovoltaic (PV) cells made up in panels. This produces electricity. The panels are typically attached to a roof or walls but can be sited at ground level. The individual cells within the panel convert direct sunlight into electricity. Each individual cell is composed of one or two layers of semi-conducting material, usually silicon. When light hits on the cell it creates an electric field across the layers - the greater the intensity of the sunlight, the more electricity is generated. PV cells come in a variety of shapes and colours, from grey "solar tiles" that look like roof tiles to panels and transparent cells for applications as replacement for glass. The strength of a PV cell is measured in kilowatt peak (kWp) which describes the quantity of electricity the cell generates in full sunlight.

Panels can vary in efficiency. Hybrid cells are generally the most efficient for the UK. More information on this is in the Energy Saving Trust guide "A buyers guide to solar electricity panels"

Carbon Footprint of PV and other Renewables

The latest research suggests PV has a footprint of around 88g CO₂eq/kWh. This is higher than (say) large wind turbines but much lower than fossil fuel generation. There are cheaper ways of reducing carbon emissions but PV is not a bad way of doing so. This information is from a new POSTnote from the Parliamentary Office of Science and Technology on carbon footprints of energy generation. Website: <http://www.parliament.uk/business/publications/research/post/> . With thanks to Professor Gareth Harrison at Edinburgh University for this information.

Other information about PV

The panels need to be at a pitch of about 40° and facing between southeast and southwest. It is important that there is no shading between 10 am and 4pm where the panels are sited.

Generation tariffs 1 April 2010 – 31 March 2013

Technology	Scale	Tariff level for new installations in period (p/kWh) [NB tariffs will be inflated annually]			Tariff lifetime (years)
		Year 1: 1.04.10- 31.03.11	Year 2: 1.04.11- 31.02.12	Year 3: 1.04.12- 31.03.12	
PV	≤4 kW (new build)	36.1	36.1	33.0	25
PV	≤4 kW (retrofit)	41.3	41.3	37.8	25
PV	>4-10kW	36.1	36.1	33.0	25
PV	Standalone system	29.3	29.3	26.8	25

The cost of solar PV is approximately £5,000 per kWp installed. The annual output is estimated to be about 750 kWh for each kW of installed PV. For illustrative purposes if a 1 kW PV array is fitted and there is no shade, the annual savings in electricity required from the grid would be 750 kWh. At a cost of about 12.24 p (including VAT) per unit paid for electricity currently, not only would this save £91.80 per year on grid electricity, but £310 per year would be earned from FiTs. This would also save 0.41 tonnes of CO₂ per year whilst reducing the electricity demand.

Most Banchory installations are about 2.5 kWp which would save over 1 tonne of CO₂ annually and earn £775 from FiTs in addition to electricity savings of £229.50. The system has to be installed before April 2012 to benefit from the current FiT rate.

PV systems are very low maintenance. However a replacement inverter would be required at the cost of about £1,000.

Solar PV panels are heavy so the surface on which they are to be mounted needs to be sufficiently robust. To give an idea of the size and weight of a PV panel, a BP solar BP3125S which has a peak output of 0.125 kWp, is 1.517 m x 0.678 m and 50 mm thick and weighs 12 kg. A 1 kW installation would require an area of 8m².

Provided that the panels do not project above the ridge line of the roof planning consent is not normally required, unless the building is listed or is in a conservation area. However if the roof needs to be strengthened or altered to accommodate the panels (PV or thermal) then a building warrant would normally be required.

For more information on PV see the E.S.T's "A buyer's guide to solar electricity panels" at

<http://www.energyadvicecymru.com/Resources/Publications/Renewables/A-buyer-s-guide-to-solar-electricity-panels>

The Energy Saving Trust has renewables advisors who can provide a site visit and assessment report on the suitability of renewable technologies for your home. They can also tell you if the £2,000 interest free loans for renewable energy are still available. For details phone 0800 512 012.

If you would like to visit a local example of solar PV technology contact

<http://www.energysavingtrust.org.uk/scotland/Generate-your-own-energy/Welcome-to-the-Green-Homes-Network>

Here is the website link for MCS accredited installers. This is updated monthly.

<http://www.energysavingtrust.org.uk/scotland/Scotland-Welcome-page/At-Home/Generate-your-own-energy/Installing-home-renewables/List-of-certificated-installers-in-Scotland>

There is a special deal currently available with Eco Living although this is not necessarily a recommendation. Make sure to get more than one quote and preferably three before making your decision.

Banchory Energy Reduction Initiative (B.E.R.I.) is a local community organisation funded by the Scottish government's Climate Challenge Fund until March 2012 and run by volunteers and part time staff. Online information at www.banchory.org see link to community projects. Tel 077 697 125 20 e mail beri.banchory@hotmail.co.uk Drop in advice sessions at Banchory Town Hall Mondays and Fridays 10.30 – 12.30

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