

# DRAYTON & ELLIS

Renewable energy installers  
and heating engineers



## A brief guide to Solar PV



Photovoltaic solar panels generate electricity during the daytime. This leaflet aims to explain clearly how installing a Photovoltaic Solar array for the generation of electricity can benefit you, and to help clear up some of the misunderstandings relating to potential earnings from the governments Feed In Tariff (FIT) payments.

*For more information, please 'phone or visit our website. If you have any further questions, please call to make an appointment for a no obligation survey and quotation.*

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### ***"Is Solar PV really worth the expense?"***

Many of our clients ask us this question. At the present levels of the governments Feed In Tariff (FIT) the answer is definitely **yes**. The level of payments is likely to drop in April 2012, but once you are signed up, the level of payment to you remains constant.

The amount of money earned from a Solar PV system depends upon the size of the array. The output is measured in kW, and the orientation of the modules, and the inclination of the roof they are fitted on, will affect the performance.

**As a rough guide a 1 kW peak system, facing due South on a pitched roof, will provide income and savings of approximately £425.00 per year.**

Four - 245 Watt modules (panels) will give nearly 1 kW peak output. There would need to be at least 7 square metres of roof area to fit them.

The basic cost for a system of this size can start from £5000.00 fully installed. The cost per kW peak, installed, is cheaper for larger systems. This is because there are fixed costs, such as scaffolding, electrical connection etc.

***Remember! You get paid for all the electricity you generate, whether you use it or not!***

Any performance figures we quote on a prospective solar PV system, have to be calculated using the Building Regulations Standard Assessment Procedure (SAP) figures. The SAP figures are quite conservative. They use figures for solar radiation based on a 20 year average. We can therefore calculate the annual average output of the system. This allows us to give a good, accurate estimate of the expected earnings and savings over a year.

## Case study.

### A system we installed for one of our clients;

A 2.2 kW peak system, comprising nine, 245 Watt solar PV modules (panels), fitted on a tiled roof, facing due South, with an inclination of approximately 30 degrees. There is no shading of the modules from any adjacent objects, structures or trees.

The calculation formula we have to use for predicted electricity generation looks like this;

$$0.8 \times \text{kWp} \times S \times Zpv$$

Where:

- kWp = the peak power of the array when installed
- S = annual solar radiation (taken from a table in the building regulations that allows for the pitch of the roof and the orientation)
- Zpv = A factor to allow for any over-shading (taken from another building regulations table)

So for this particular installation the formula shows that the expected generation in a 12 month period is;

$$0.8 \times 2.2 \times 1073 \times 0 = 1888 \text{ kW/hrs}$$

### So the important bit, the money!

The installed cost was £10,558.00 all inclusive

The projected income and earnings from the FIT are;

<b>Earnings</b> -1888 kW/hrs @ 43p per unit	=	<b>£811.84</b>	see note 1
<b>Earnings</b> - power fed back to the grid	=	<b>£28.32</b>	see note 2
<b>Savings</b> - Electricity you don't buy	=	<b>£94.40</b>	see note 3
<b>Total income and savings per year</b>	=	<b>£934.56</b>	

**Tax free, index linked, for 25 years**

1. This is the current FIT payment for each unit generated, it is paid whether you use the electricity generated by the solar array or not!!
2. 3p per unit is the current rate for electricity fed back to the grid, the assumption is that about 50% of the electricity you generate will be fed back
3. This assumes you will use half of the electricity you generate. This will save you the cost of buying about 944 kW/hrs (units) of electricity which at present is at least 10p per unit, on average

The figures in the case study show that the payback time for the installation is just over 11 years, with a return on investment of nearly 9%. You will notice that most of the income from the FIT is for the generation of the electricity, **not** in savings on your electricity bill.

On this particular system, it was generating 100 watts at 9.30 in the morning during a heavy rain shower, when the solar irradiation level was only 55 watts per square metre! So the sun does not even need to be shining!

**REMEMBER; this is index linked, guaranteed and tax free for 25 years;**

**Yes tax free for 25 years!**

- Potential increases in the cost of the electricity you buy from the grid are not taken into account. We know over time this cost is only going to go up
- The more electricity you can use, of the electricity you generate, the greater your savings, because you then buy less from the grid
- This means you should try to use all your 'energy heavy' appliances during daylight hours, e.g. washer, dryer, kettle etc