Solar PV Bulk Purchase Group

for Cambridge and South Cambs Villages

Introduction

The eCoton team is forming a bulk purchase group for homeowners wishing to install solar photovoltaic (PV) panels. The group will comprise over 50 households in the South Cambs villages and in Cambridge. The group will close to new registrants at the end of September to allow sufficient time for the panels to be installed before the Feed-In Tariff drops at the end of March 2012.

Solar PV panels are currently a fantastic financial investment. The Feed-in Tariff is still at a high level whilst installation prices are dropping due to healthy competition in the marketplace. But the Feed-In Tariff drops for homeowners who install systems after March 2012. Homeowners must act quickly to take advantage of this sound financial investment. The eCoton team wants to spread the word that PV panels are not only good for the environment but they are also good for your pocket!

Price Objective

There is a large amount of variability in the quoted prices for PV panels. The eCoton team want to obtain the best price for the homeowners they represent without compromising quality.

As a guide, we have seen the price of just under £3000/kWp for a 3.9kW system advertised on the Tesco website. We want to achieve a better price than this for our homeowners. We hope that by delivering 50 houses to one installer, that installer will be able to make savings through zero marketing costs and efficient scheduling of surveys and installations.

The installer will provide a "menu" of prices for typical domestic systems which will be published at the information meeting in September.

Each £3000 invested should earn the homeowner over £400 annually and this amount will increase with inflation. See the section on finances.

How does the bulk purchase group work?

- Complete the electronic questionnaire sent out with this information pack to register with the group. Return the questionnaire to ecoton@hotmail.co.uk. This does not oblige you to buy at this point. (If you have not received the questionnaire then please email the same address to receive it).
- Throughout August the eCoton team will be carrying out a tendering process with selected installers.
- 14th September – Information meeting 7:30pm in Coton Village Hall. The chosen installer will be present to answer questions. The price menu will be published at this point.
- End September – bulk purchase group closes to new members
- Autumn 2011 – You will be contacted by the installer to arrange a survey of your house. If you and the installer are happy at this point, you will sign a contract with the installer. It is up to the individual homeowners to make sure that they are completely happy with the arrangement before signing the contract with the installer.
- Installation will take place before the end of March 2012. You may need to fairly flexible with the installation date to allow the installer to carry out efficient scheduling of all homes in the group.

How do the finances stack up?

The Feed-In Tariff

To earn money from a PV system the installer has to be MCS (Microgeneration Certification Scheme) accredited. The system is registered with your chosen power company using the documentation provided by the installer.

You are paid 43.3p for every kWh(unit) you generate irrespective of whether or not you use that electricity. The generated amount is recorded by the generation meter and payments are made quarterly by the power company with whom you have registered. Additionally the power company *assumes* that you export half of what you generate to the grid and they pay you another 3p for each of those units. Export meters can be fitted but these usually cost more than the money they would earn hence the reason why the power companies make this assumption. The generation and export tariffs will increase with inflation and will be paid for 25 years.

The following websites provide more information on the Feed-In Tariff

http://www.npower.com/web/feedintariffs/index.htm

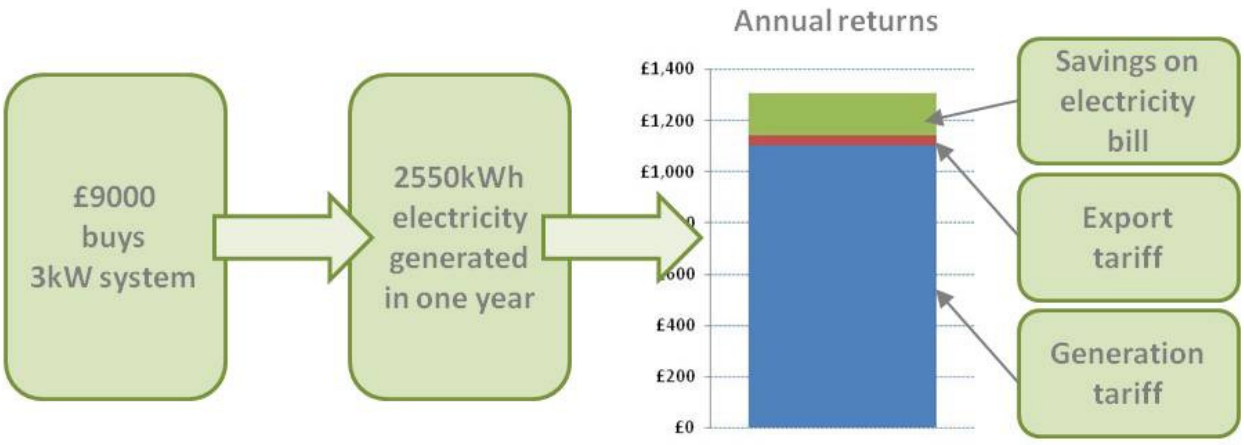
http://www.eonenergy.com/At-Home/Products/Feed-in+Tariffs/

Single Year Income

As an example, a 3kW system would cost £9000 and generate about 2550kWh in one year. The homeowner would earn £1308 in the first year comprised of

- £1104 from the generation tariff
- £38 from the export tariff
- £166 from savings on electricity bill (assuming 50% usage)

This annual return is 14.5% of the initial amount invested.



Assumptions and Variability in Calculations

- The eCoton team aims to negotiate a price lower than £3000 per installed kW of power.
- Each installed kW should generate about 850kWh of electricity in one year. There will be some variability due to roof pitch and orientation combined with how much sunshine we get. See later section in this pack.
- The savings you make on your electricity bill will depend on how efficiently you can use the electricity you generate.

25 Year Financial Forecast

When trying to forecast the financial returns of solar PV panels over 25 years there are two unknowns; energy price inflation and the amount of generated electricity used by the homeowner. The table below shows that these have little impact on the initial payback period but do make a big difference to the longer term revenue. Calculations show the impact of these variables for a 3kW system costing £9000.

Energy Price Inflation	Proportion of Energy Generated Used in Household	Payback Period	Earnings and Savings after 10 Years	Earnings and Savings after 25 Years
4%	20%	6.75 years	£14,065	£44,676
4%	80%	5.75 years	£16,380	£52,027
15%	20%	6.5 years	£14,589	£54,238
15%	80%	5.5 years	£18,475	£90,277

In doing these calculations we have assumed baseline inflation (RPI) of 4% which is the rate of increase of the generation and export tariffs.

For comparison purposes if you took your original investment of £9000 and put it in savings with a 4% interest rate, you would have £12,810 after 10 years and £23,070 after 25 years.

Maintenance Costs

If your roof pitch is above about 30°, it will probably not be necessary to clean the panels. You might want to hose the panels down if you notice output dropping but from speaking to people who already have panels installed, this will not happen often.

The inverter will probably need replacing after 8 to 10 years. So it is likely that you will have to replace the inverter twice during the 25 year life of your panels. Currently it is recommended that you budget about £1000 for a new inverter but prices are likely to drop.

Making the most of your generated electricity

Solar panels will only generate electricity during daylight hours. So this is when you have a supply of free electricity. It is therefore worth running appliances such as washing machines, dishwashers and irons while your panels are generating. Additionally you should run appliances one after the other such that the maximum power they are consuming is not higher than the power generated by your panels. Making these changes may save you around £100 annually at today's energy prices.

To learn more about your energy consumption it is worth installing an electricity monitor. Some electricity companies will provide these to their customers free of charge. If yours doesn't then you can borrow them from your local eco team or buy them for about £40.

What you need to know about Solar Photovoltaic Systems

What are solar photovoltaic panels?

Solar photovoltaic cells (also called PV cells or panels) generate electricity through harnessing the energy of sunlight. The stronger the sunshine, the more electricity is produced. They provide a green and renewable way of powering your home.

PV cells come in a variety of shapes and colours, from grey "solar tiles" that look like roof tiles to panels and transparent cells that you can use on conservatories and glass. The lifetime of solar PV panels is about 25 years.

The strength of a PV cell is measured in kilowatt peak (kWp). That's the amount of power the cell generates in full sunlight at 25^{o}C. The amount of electricity generated is measured in kilowatt-Hours (kWh - the units used on your electricity bill).

Panels can be “polycrystalline”, “monocrystalline”, “amorphous” or “hybrid” depending on the form of the silicon that power them. Different types of panels are more or less efficient in bright or overcast conditions. But they all work.

More discussion can be found at:-

http://www.squidoo.com/monocrystalline-versus-polycrystalline

What gets installed in your home?

- Panels and mounting track on the roof
- An inverter (to convert DC to AC) – probably in the loft
- A generation meter – probably by your current electricity meter and fuse board
- A display unit to show you how much you are generating
- Isolator switches and cabling

Installation takes between 2 and 5 days. This time includes scaffolding going up and coming down.

How big are solar panels?

Solar panels are roughly 1 x 1.5m varying with brand. They each weigh about 20kg (44lb). Individual panels produce between 180W and 245W depending on type. Typical domestic installations vary in size from 6 to 16 panels.

The maximum generation feed-in tariff of 43.3p is paid on systems up to 4kW. For systems between 4kW and 10kW the generation tariff is 37.8p. Most homes would not fit a system larger than 4kW on the roof. The average domestic system is 2.2kW.

The effect of roof orientation and pitch

In the UK solar PVs will generate the most electricity if they face south and are tilted at about 40o to the horizontal. However, good efficiencies can still be achieved if your roof is not south-facing and has a different pitch. The following table shows efficiency varying with roof pitch and orientation.

	WEST						SOUTH						EAST
ROOF ANGLE	90°	75°	60°	45°	30°	15°	0°	15°	30°	45°	60°	75°	90°
90°	56	60	64	67	69	71	71	71	71	69	65	62	58
80°	63	68	72	75	77	79	80	80	79	77	74	69	65
70°	69	74	78	82	85	86	87	87	86	84	80	76	70
60°	74	79	84	87	90	91	93	93	92	89	86	81	76
50°	78	84	88	92	95	96	97	97	96	93	89	85	80
40°	82	86	90	95	97	99	100	99	98	96	92	88	84
30°	86	89	93	96	98	99	100	100	98	96	94	90	86
20°	87	90	93	96	97	98	98	98	97	96	94	91	88
10°	89	91	92	94	95	95	96	95	95	94	93	91	90
0°	90	90	90	90	90	90	90	90	90	90	90	90	90

This table was taken from:-

http://www.freesolarpanelsuk.co.uk/the-best-angle-and-orientation-for-solar-panels-in-the-uk.php

More questions?

More information about solar panels can be found on the internet.

You can also send questions to ecoton@hotmail.co.uk.

Other Information

Planning Permission and Building Control

For domestic PV installations no planning permission is needed if:-

- Panels/fixings do not protrude more than 20cms beyond roof or wall surface
- The highest parts of panels/fixings are not higher than the highest part (usually the ridge) of the roof (excluding chimney) – i.e. panels on a flat roof (probably on angled frames) would need planning permission.

Planning permission is required if your home is listed.

In conservation areas in South Cambs, planning permission is only required if you plan to install the PV panels *on a wall that is visible from the highway*. There is also the fuzzy guideline that 'panels need to be sited, as far as is practicable, so as to minimise their effect on the appearance of the building and the amenity of the area'. We interpret this as; if there is a choice of roof location then you should choose the one which is most discreet.

Building Control is required for PV installations. Some installers can carry this out for you as they are part of the 'registered competent persons' scheme. Otherwise building control can be applied for retrospectively from your local authority. We will let you know more information once we have selected the installer.

About eCoton

Ecoton is a voluntary village group working in partnership with Coton parish council and the South Cambridgeshire District Council as part of SPEP, the Sustainable Parish Energy Partnership (www.spep.net). The aims of the partnership are to help residents reduce energy bills, tackle climate change and build a more sustainable future. Neither the eCoton group nor any individual members will make any money from the bulk purchase group.