

Bittern Countryside

Community Interest Company



Energy Fact Sheet 1.

New Tariff information 2013

“Electricity from Sunshine”

Save energy, Save money
Save the environment!



Supporting the

Arnsdale Silverdale AONB

Low Carbon Landscape Initiative

Bittern Countryside Community Interest Company
Registered Office: The Old Station Building, Arnsdale, LA5 0HG
Registered number 6363720



Website: <http://www.arnsidesilverdaleaonb.org.uk/AONB/Support/Bittern-Countryside-CIC.html>

Introduction

This was the first in a series* of leaflets prepared by the Bittern Countryside CIC to help you understand renewable energy and see how it can save you money on your energy bills and reduce your carbon emissions too. We now have several extra year's experience in solar PV and prices are changing fast. We have updated this booklet to take account of this.

* *Fact Sheet 2 deals with woodburning and multifuel stoves. Fact Sheet 3 deals with buying, using and storing wood. Fact Sheet 4 "Avoiding Waste" deals with energy and resource conservation. Fact sheet 5 deals with ground and air heat pumps.*

Is Solar Photovoltaic suitable for me? Firstly consider the site.

Shading

First thing in the morning and last thing in the evening it is possible that surrounding buildings or trees may partially shade a PV array, when the sun is low in the sky. This effect will be more marked in winter than in summer! Providing shading occurs only for a short time early or late in the day, this will only have a very small impact on the annual energy generation, as very little power will be generated then. It is important however to ensure that no part of your PV array will be shaded during the main part of the day.

Orientation

The sun travels from East to West. (In the summer the sun can rise in the Northeast and set in the Northwest). Clearly therefore the more that a solar PV array is facing South the more energy is produced. As far as the slope of the roof is concerned, in the UK latitudes, the best angle is between 30 degrees and 45 degrees from horizontal. The impact is dependent upon the orientation of the array as shown in the table below. In winter the figures are much reduced with a 45° roof being much more efficient than a roof with a slope of 30°. If you have roofs facing east and west then you can still get a useful amount of electricity by having an array on each side (you will need an inverter for each array).

Orientation,	W	SW	S	SE	E
Slope of roof 30°-45°	860	980	1030	980	860

To sum up there are five main factors that will impact how much energy a solar PV system will generate:

1. The total size of the PV array.
2. The latitude of the location.
3. Which direction the PV panels face.

4. What slope the panels are mounted on.
5. Anything which shades the panels.

How do I get paid for my generated energy?

Your energy supplier must pay you a fee over the next 25 years for every kilowatt hour (kWh) of electricity you produce whether you use it or sell it to the electricity supplier. This is called a Feed-in Tariff (FIT). The rates depend on the total size of your system.

The system size is measured in kilowatt peak, the maximum energy that can be generated in ideal conditions (kWp) Larger systems attract even lower rates of Feed-in Tariff. The tariff for new installations will probably drop every 6 months. In order to get the higher figure you need to have an Energy Performance Certificate of D or above on your home, otherwise you will get the amount shown in brackets..

Panel Size	Rate/kWh installed before July 2013	Likely Rate/kWh installed July 2013 to Oct 2013
0 - 4kWp	15.44 (or 7.1p)	14.9p (or 6.89p)

This payment is measured via a meter and paid you by the energy supplier either yearly or quarterly. It is only available if your system has an Microgeneration Certification Scheme (MCS) certificate. (See under Local Suppliers below). The tariff has been changed dramatically since the scheme started. New installations get a much lower tariff for a shorter period of time. However the costs of installation have also dropped.

In addition to the FIT any energy you produce and use on site is free and your electricity supplier will also pay you for any unused power that you export back to the grid. At present the supplier will assume that you export half the energy you make and pay you 4.5 p for each kWh. The FIT is payable for 20 years and is index linked to the Retail Price Index. After 20 years FIT payments stop but you can continue to sell any surplus energy to your energy supplier.

How much energy will I produce on my roof.

This is difficult to quantify precisely but you should estimate that each 1 sq metre of panel will generate at least 100 kWh per annum. (Some panels are more efficient than others).

How much am I likely to make a year.

A 4 kWp system on a south facing roof in our area will probably provide at least 3,200kWh each year. This means that your electricity supplier should pay you around £565 index linked for the next 20 years. (FIT and export fee)

Do I need planning permission?

Most properties will not need planning permission, but you should contact your Local Authority at an early stage to establish the situation for your specific project. For all properties you will need to inform your local building control department of the local authority. There is not normally a charge for this. A reputable installer will make sure your system satisfies any criteria set. More information may be found in the Government's guidance for planning.

see <http://www.planningportal.gov.uk/permission/commonprojects/solarpanels/>

How does it connect to the grid?

Your solar PV panels are all linked together and connected into an inverter which converts the DC power from the solar PV panels into mains voltage compatible AC. For Solar PV systems less than 4 kWp you do not need permission from your electricity company to do this, but you must inform them.

Do you pay to connect to the grid?

Generally systems above 4 kWp cannot be connected to the grid without permission from the distribution company. In Cumbria and Lancashire you may also have to pay a one-off connection fee to Electricity North West Ltd. The fee varies depending on the rating of the installation - systems under 16A (4 kWp) are free. The fee covers the survey and any upgrading of cables on the electricity distribution network that may be needed for larger systems. This may occur if you are not on a three phase electricity system.

Is the installation unsightly and does it damage the roof?

Most panels sit on a frame just above your existing roof. This is fixed by ties to the roof timber. It should not do any damage to your roof. While the panels are neat and tidy they do not enhance the look of the property. A more visually satisfying solution is solar tiles. These replace the tiles on your roof but are more expensive. However if you are thinking of replacing your roof or having an extension they may well be worth considering as you can offset the cost of the solar tiles against replacement slates. New systems can sit on top of flat roofs without the need to be permanently fixed to them.

Are there any local suppliers?***

Your installer must be MCS accredited to enable you to get a Feed-In Tariff.

The following are among accredited solar PV systems installers in our local area:

- Love Solar (Appleby) <http://www.love-solar.co.uk/>
- Sundog energy (Penrith) <http://www.sundog-energy.co.uk>
- Sunrise Solar (Ambleside) <http://www.sunrise-solar.co.uk/>

**** Neither the AONB nor The Bittern Countryside CIC are endorsing any of these particularly.*

You might want to contact your electricity supplier as many also have installers. Most installers will give a free site visit and quotation but some charge a hefty fee for a site visit. Remember to factor this into your costs. You will also need to get an energy performance certificate.

Are there any systems up and running in the area?

There are now lots of systems in the area. Some have been up for many years. The Educational Institute in Arnside have had solar PV panels (Sundog) for four years and are very pleased with them. They are happy to talk to anyone about them. Check their website for contact details - www.arnsideeducationalinstitute.org/

Ken and Ann Kitchen at Kincaig, Stonycroft Drive, Arnside 01524 762 512 have had them installed for over 2 years (Love Solar) and are happy to let people see the installation. Love Solar also did Storth Primary School and Leeds Childrens Holiday Centre. You can also see solar PV panels at RSPB Leighton Moss.

What should I expect to pay for a system of PV panels on a roof?

This will depend on many things. The following table shows the approximate costs (as at May 2013), estimated energy generated and estimated payback time for a variety of different sized installations assuming a south-facing unshaded roof. It assumes the new feed-in tariff of 15.44p per kWh. You should certainly not need to pay more. However remember that you will be expecting this system to last 25 years and buy the best quality you can afford. Get several quotes and do not be tempted by high powered salesmen who want you to sign up straight away without a detailed quote. The panels should not need any maintenance over the life of the system. They are self-cleaning.

Rating	estimated annual energy kWh	Price (£) of system inc VAT	Estimated Annual feed-in payment	Approx extra income*	Total Estimated return	Time taken to pay for installation**
4 kWp	3200	5,500-7,500	£493	£282	£775	8 -10 years

* This includes the value of power you use yourself and the extra money you receive from the energy company for electricity that you export. The extra income due to your energy consumption will vary considerably according to your usage pattern. Most domestic users do not manage to use all of the electricity they generate themselves. This is because most continuous low steady energy is used at night by lights etc. Items that consume a lot of energy usually operate in short bursts, eg kettles, heaters, dryers. This means that for a lot of the day in summer the panels are producing solar power which isn't used by you. It would be prudent in costings to assume a 40% or less usage of your own solar energy with the rest going back to the grid. Remember if you are on a twin tariff with a high usage, the energy you use yourself will be taken from the lower band of charges (usually about 13p per kWh). The electricity company should pay you around 4.5p a kWh for 50% they buy back from you.

** These pay back times do not take account of any increase in tariff due to inflation or any increase in the price of energy. You will probably get your money back at least a couple of years sooner than stated.

Can I use my own power in a power cut?

No. If the mains power is cut your solar energy will also be disconnected. This is to avoid the power you provide going back down the power wires and electrocuting anyone working on the fault. You could however use your solar energy to keep a backup battery fully charged that could be used for LED lights etc in an emergency. Only off-grid systems use large energy stores (aka batteries) to provide 24 hour power that is totally independent of an incoming mains voltage supply.

Are all the panels and inverters the same?

Some panels are more efficient than others so use these if space is at a premium. Some makes of panels are also much lighter than others. This might be a consideration if you are worried about the strength of your roof timbers. Also some inverters do seem to be noisy.

Check that the inverter your supplier is providing will be more or less silent. Most equipment either comes from the UK, Germany or the Far East. In addition you may be offered a smart meter or a remote display meter showing how much energy you are producing. You will need to decide whether these are worth investing in. The cost of the installation will reflect these factors (reliability, efficiency, quietness, component sourcing and add-ons).

Where can I get more information?

Most installers have information on their web sites. You might want to go to the Energy Saving Trust web site. see - www.energysavingtrust.org.uk/

Are there any grants available?

There are no capital grants available from the government. The BCCIC has a scheme for schools and community buildings in the Arnside & Silverdale AONB which might be able to help fund the purchase of a solar PV system. They have so far helped Storth C. E. Primary School and the Leeds Children's Holiday Centre in Silverdale.

Case study from Ann and Ken Kitchen, Arnside.

2010 Mid July: Collect quotes from various suppliers for a 3.3 kWp system.

27th July: Love Solar came round and surveyed our roof etc.

28th July: Contact South Lakes Planning office to check about solar panels. Short form sent to us. Filled it in and got the OK within 5 days.

4th August: Contacted person who was given as a satisfied customer by LoveSolar.

9th August: Accepted Love Solar quote and agreed on start date as 14th September.

13th Sept: Scaffolding put up.

14th Sept: Solar panel installation started.

16th Sept: Panels up and most of the electrical work done.

17th Sept: Electrician off sick

20th Sept: Electrical work finished. Installer took us through the installation and how to apply for our Feed In Tariff from our electricity supplier. Started generating electricity.

21st Sept: MSC certificate arrived from Love Solar who also notified Electricity NW Ltd.

22nd Sept: Sent MSC certificate and application form to e.on (our supplier)

26th Sept: Received welcome pack from e.on with a further form to sign and instructions on when to send our meter readings to them.

2012 Sept: Generated 5,800 kWh in our first 2 years.

"We can certainly recommend Love Solar. They were fast, friendly and efficient and we have been very pleased with our system."

What happens when I sell my house?

This depends on you and your electricity supplier. Normally the FIT will stay with the house and it should be a real selling point that the new owners can look forward to a regular lump sum payment, lower electric bills and some free electricity. It might be possible however to have the FIT stay with you personally but this would depend on the new owners reading the meter on your behalf. The free electricity would stay with the new owners of course.

Facts and figures on solar PV installations in the Arnside and Silverdale AONB. Do we really get enough sunshine here?

We now have more data to go on but it is still hard to compare various different sized installations in different locations so the table below gives the number of weeks the system has been running, the total energy generated so far, the the size of the installation and its orientation.

Place	Weeks	Total kWh	Size of installation	Orientation
RSPB Leighton Moss †	12 years	13,438	1.8 kWp	SSE
E. I. , Arnside	5 years	21,715	5.0 kWp	SSW
Storth School	1 year	3,156	3.9 kWp	SSW
Arnside Kinncraig ††	2 years	5,788	3.3 kWp	SSW

† Technology has moved on since the RSPB panels were installed in 2003 and they are not as efficient as the modern panels.

†† Kinncraig is shaded for a small part of the morning.

Probable % distribution of energy generated by a Solar PV system in the AONB throughout the year

Winter Mid Nov - Mid Feb	Spring Mid Feb - Mid May	Summer Mid May - Mid Aug	Autumn Mid Aug - Mid Nov	Yearly total
7%	28%	37%	28%	100%

How can you make the most use of your free electricity?

The panels will generate some power even on dull days, but are obviously only capable of reaching maximum output when the sun shines - try to use appliances that use lots of power, like your washing machine on those days. If you have an immersion heater in your hot water tank, set it to come on in the middle of the day for a few hours. Try to have only one high energy use appliance on at a time. That way you will not draw on the mains supply from the wider distribution network, saving you money. Technology is now available to use the energy the panels produce to heat your domestic water when you don't need to use it for other things. You need to use the power as it is generated to get maximum savings on your electricity bills.

Where did the CIC get its information from?

All the information is drawn from recognised official websites, publications and from practical experience - contact us by email: bitterncic@arnsidesilverdaleaonb.org.uk or by telephone on 01524 761034 for more information.

Solar Installation Kincaig, Stonycroft Drive, Arnside
 Generation started Sept 2010: 5,788 kWh generated in 2 years

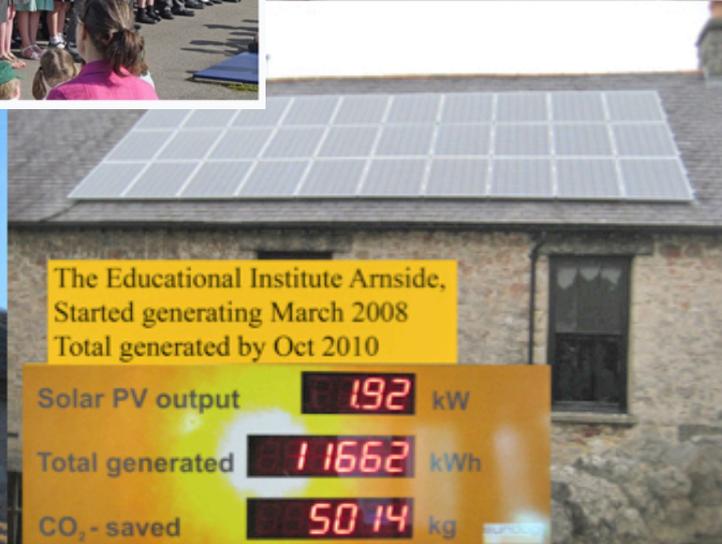


Storth School,
 Generation in 2012: 3,156 kWh



Generation started Feb 2003
 10091 kWh generated by Oct 2010

RSPB Leighton Moss



The Educational Institute Arnside,
 Started generating March 2008
 Total generated by Oct 2010

Solar PV output **192** kW
 Total generated **11662** kWh
 CO₂ - saved **5014** kg