

The Sheffield Solar Farm

Micro-Generation Database

January 2013, Report 19



Giving us accurate readings

Occasionally people are adjusting their readings to make them fit on the month boundary (start or end of the month). This may introduce errors into our reports, so we strongly recommend that you do not do this.

If you take a reading a few days after the start of the month, you may be tempted to adjust it so that it sits on the month boundary, before you send it in. It is likely that you will find the value for the month boundary by assuming that you generate the same amount each day. In reality the amount of generation varies greatly day by day, so this may introduce significant errors to your data. The knock on impact of this is that, though your generation graph will look OK, the plotted efficiency of your system will vary greatly.

We have our own methods for calculating your generation on the month boundary, which is how we give you your monthly figures. The method we use is quite complex and takes into account the weather for the missing period.

Our method also allows us to estimate your generation even if your reading is up to 10 days away from the month boundary, so most of the time we will still be able to calculate your system's performance, even with irregularly entered data.

A good view for solar panels

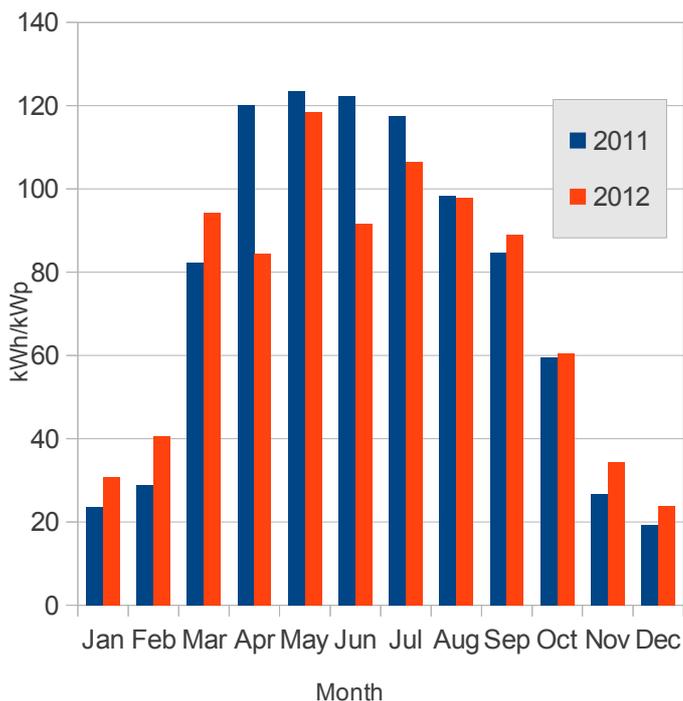
This picture of the month shows a promising day for a PV system (but only if the panels are not covered in snow).

The view is to the south, and the sun is just rising. Plenty of albedo reflection from the snowy ground ahead will assist in a good days generation.



Comparison of average generation

2011 - 2012



Comparison of generation, year on year

The graph to the left shows a comparison of average generation from years 2011 and 2012. It is apparent that through the summer of 2012 generation was down on the year before, but performance during the winters was slightly higher.

Generation for 2012 was down 4.4% on the year before, with April and June showing the most significant reductions. Generation in April 2012 was down 30% on that of the year before.

The higher generation during the latter months of 2012 shows the late onset of the winter. Additional generation then was countered by lower generation in January 2013.

The reduced generation in 2012 was reflected in tsworth's article on the forum:

"It is now 2 years since I started generating electricity from my solar panels on 26th Feb 2011. In my first year our 3.44kw system generated 3,500 kwh and in my second year, 3,200kwh. I am hoping this is just that we had a rubbish summer in 2012. We were spoilt by a scorching spring and early summer in 2011 (I remember a sizzling beach holiday in Northern France in Easter 2011) Lets hope 2013 is better. I would be interested to know if others have seen similar reductions."

I think we're all still hoping for that spring!

Split rate energy tariffs

There has been some discussion on the forum about split rate import tariffs. These are energy tariffs like Economy 7 which encourage people to use less electricity at peak demand times (more discussion about this later).

rogerhoward posted "I recently noticed the **EDF Eco20:20 tariff** - which seems excellent for any working 9 to 5-ers not already on a split-rate Import tariff, not to mention PV generators like ourselves. Basically, after the weekday 7am-9pm Standard Rate period it is a 20% discount rate from 9pm-7am and at weekends.

"I enquired with my own electricity supplier whether they had any plans to introduce anything similar. Imagine my surprise to get an immediate response offering to do just that. They do know of course that I'm a PV generator who's not likely to use much daytime 'leccy over the summer, too.

"The £73.50 cost of installing my new split-rate AMR meter I expect to recoup over 18 months, and I'm having it installed a week on Monday.

"I've never had any FiT payment problems from my supplier – **Green Energy UK**. Their customer service is always friendly and ultra-helpful, as it has been with this tariff/meter switch, and customers even get a share in the company."

He added that "you do need to know your household's usage pattern first".

Another member looked into split rate tariffs but found them to be more expensive. SilverJohn posted: "I had a look at this and found that this would actually cost me more! I am on EDF Blue Plus Price Promise until April 2014 and for electricity, am paying 10.79 p per Kwh plus VAT and a standing charge of 14.0p per day.

"On the 20/20, the discounted rate is 10.58p per Kwh plus VAT with a standing charge of 18.0p per day.

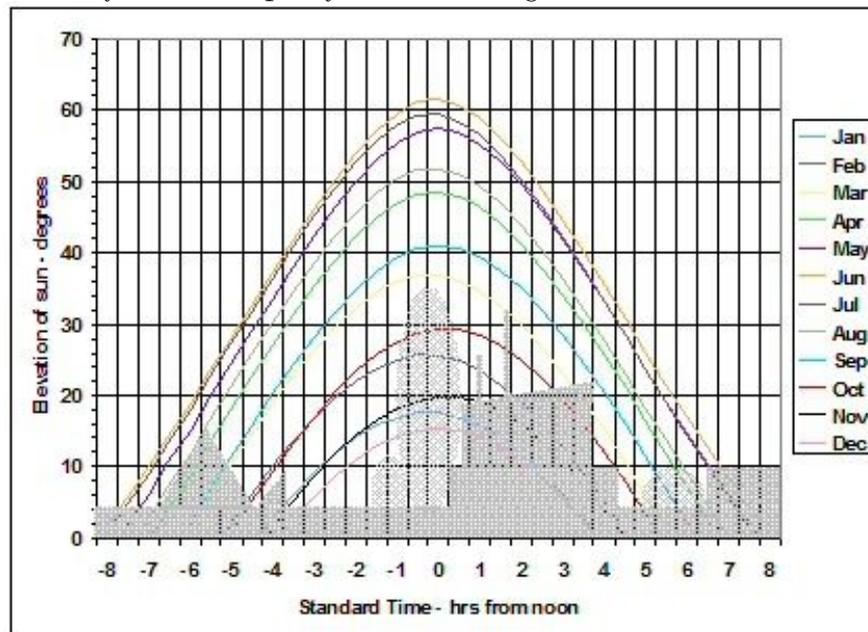
"Yes, this is cheaper on the discounted KWh rate but with my current average consumption of 15KW per day, I save only 3p and the standing charge is 4p more. Then if you add in the higher cost of the electricity during the day, this would definitely be more expensive."

This clearly shows the need to know the rates and your usage well before making a decision

Estimating your shading

One of the hardest aspects of assessing your site for PV generation is determining the effects of shading. Possibly the most accurate methods of doing this is with a sun-path diagram. The path of the sun during different seasons (shown as coloured lines) is plotted along a profile of the horizon as looked at from the location of your system. The image below is one member's sun-path diagram. You can see the profile of buildings and the far horizon in dark grey and trees in light grey.

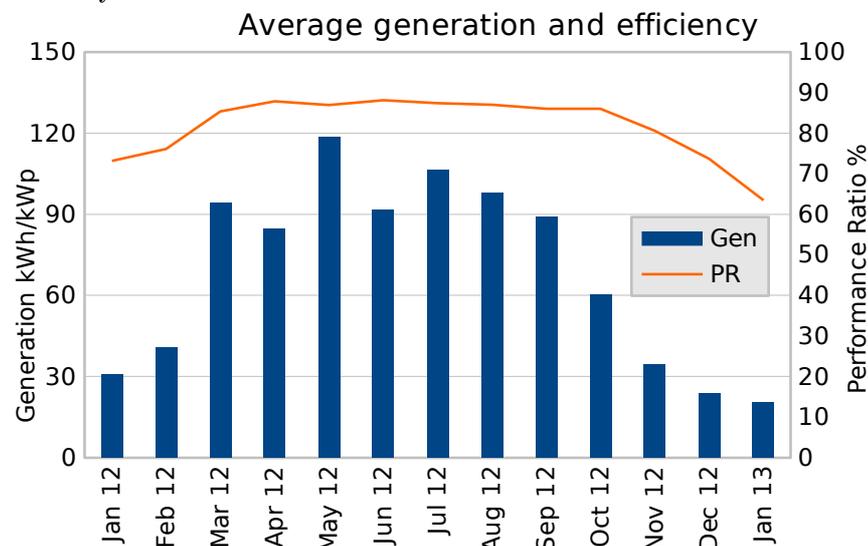
This system will suffer from significant shading between October and February, but will be pretty clear of shading in the summer.



Average generation and efficiency

The graph of generation and efficiency, shown below, reveals that January 2013 was a challenging month for generation, with an average level of 21 kWh/kWp, way below the previous year's 31 kWh/kWp.

The efficiency of systems was also way down on last year, with an average performance ratio of 63 in comparison with last year's 73%. This shows that, for some reason panels were not generating as well as they should. There are likely to be a couple of factors at play here. Firstly snow or heavy frost can significantly or completely cut generation and secondly panel performance at low light levels tends to fall away.



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and our testing operations site at: www.sheffieldsolarfarm.group.shef.ac.uk