

How to get the best from your Solar PV Panels

Householders who have installed solar PV need to get the most out of their investment by maximising their use of the energy produced and thus reducing the electricity they have to buy. Using less electricity from the grid is also an environmental necessity in reducing our dependence on fossil fuels. Climate change is real and happening and it is vital that we curtail our fossil fuel usage. The more people that make small but effective changes in their lifestyle now, the more chance we have of perhaps delaying the huge changes that will inevitably be forced upon us in future.

For administrative convenience the FIT (Feed in Tariff) arrangement assumes that you use 50% of the power output from your panels but many people are out all day and can't make the most of their free output. At the moment the government pays you about 4.5p per unit (kWh) that it deems that you export whereas units that you buy from the grid will cost you about 15p. For those of us that are at home much of the day there is a lot we can do a lot to make our usage more efficient and sustainable.

- 1) **Get to know the energy consumption rates (kW ratings) of all your appliances** and try to use the heavier consumers only during the day, or at peak solar production in full sun. If your panels have a monitoring system learn how to use it. If not try to get an idea of what your panels might be producing under various sunlight conditions.*

(I have found no information as to whether a Smart meter home monitoring device can be used to monitor exported energy. I suspect that it can't.)
- 2) **Use your appliances sequentially rather than at the same time.** If your panels are producing say 500W on a bright but cloudy day, your pocket and the environment will get more benefit from staggered use of kettles, cookers, washing machines, dishwashers etc. as the PV output offsets your consumption over a longer period.
- 3) **Get a low wattage kettle.** If only one person or a couple live together and you are not in a hurry, a 500W travel kettle is ideal. It will take four times as long to boil water than a conventional (2kW or more) kettle for the same water volume, but on a bright, rather than sunny day (say 500W production) it is likely that the entire consumption will be free, whereas only a quarter of the energy used by the larger kettle will be. In our case our travel kettle will safely boil 550ml of water which is enough for two large mugs of coffee or tea.
- 4) **Do more electric cooking in daytime.** Most electric ovens require at least 3kW and a typical panel system is only likely to produce this output under full sun around midday or early afternoon.
- 5) If you don't have separate solar water heating **consider getting a device that diverts your excess production into an immersion heater** for your hot water rather than your using fossil fuel heat. An alternative to this is to use a similar device to divert excess energy to an electric storage heater, but this will be less effective as the heat may only be required in winter when solar output is lower.
- 6) **Consider battery storage for your excess energy,** which you can then use at night. In 2017 a local PV supplier informed Sidmouth Science Festival that he thought that when fully costed out (for replacement batteries) systems were now approaching overall financial break even.

Despite this they must be good for the environment overall in reducing fossil fuel energy imported by the household during the unit's lifetime.

- 7) **Clean your panels** if they are accessible, on a low roof or freestand. In this area seagull and pigeon droppings can be a problem, and dust, debris or leaves may accumulate.
- 8) Assuming that you have appropriate control, **trim any trees or bushes** that might grow up and give you shade when the sun is low in winter.
- 9) **Charge your electric or plug-in hybrid car.** Think about how you charge it. Do you really need to buy a fast charging unit (typically 3.6 or 7kW)? If you are working or have other busy time constraints clearly you would need a fast charger, but in my situation (retired) I only need the ordinary 13A plug-in mains charger which runs at a 2.1kW maximum. This is well within the output of my panels on a sunny day and I feel satisfaction knowing that my automotive power is largely carbon free.

*A typical 3.9kWpeak installation will produce over 3kW (3000W) output around midday in strong sun in summer but will drop to about 1kW in haze or if a small cloud passes by. In bright cloudy conditions it may only produce say 400-700W. In thicker cloud the output will be lower at less than 100W and may even shut down in heavily overcast conditions.

For more information on energy saving see also "A Beginners Guide to Energy" on VGS website

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