

Natural Generation is dedicated to providing the most cost effective renewable energy solutions in the south west, tailor-made to your needs. We passionately believe that by taking responsibility for our environment now, we are safe-guarding future generations.

Useful solar energy resource in the UK is far greater than most people imagine, despite our climate. Photovoltaic cells can convert this incident energy that surrounds us every day, to useful and renewable electricity. Here in Cornwall and the south west we benefit from the best solar resource in the UK.

Light energy absorbed by a PV cell stimulates electrons to flow between two thin films of silicon creating DC current. PV panels, comprise many PV cells and therefore, cumulatively provide a useful output. The generated current can then be converted to AC and matched with the national grid by an inverter or used direct as DC to charge a battery storage system. Panels can be mounted over a roof, on a bespoke frame, or when ordered in the form of roof tiles may be used in place of the conventional roof covering.

A solar array is best positioned to maximise the natural light falling on it and ideally should be mounted in an un-shaded area facing to the South with a pitch angle of 20°-40°. Although the panels are usually installed on a pitched roof, they can also be supported by a specially designed frame for flat roof, ground, or façade mounting. East west arrays are viable but performance will be reduced to approximately 80%. Output is proportional to light intensity and the peak power is obtained on a bright sunny summer's day around midday. Weather conditions as well as the elevation of the sun will both impact on generated power. A good guide to average annual generation is 800-900kWh per kW_{peak} (or 8-10m² of panels). Photovoltaic panel efficiency is commonly between 12% and 20% depending on panel type and the form of silicon used, so the area required for panels is around 8 times that required for solar thermal systems for the same power output.

Grid connected PV systems benefit from a mains supply during periods of low or no generation and also a potential revenue for exported energy. However, unfortunately it is a legal requirement that any generator connected to the National grid must shut down automatically in the event of loss of mains power, therefore despite generating your own electricity you will still suffer the power cut.

Remote locations with off grid battery charging systems can benefit greatly from hybrid installations combining technologies such as wind and photovoltaics to benefit from higher wind speeds in the winter and greater sunlight in the summer. Here in Cornwall and the South West, we benefit from a good annual solar resource, so photovoltaic electricity generation works well either when combined with wind generation or where wind is not appropriate, eg. in an urban environment.

DESIGN AND INSTALLATION

Natural Generation use a wide range of BERR MCS accredited products and will work with you from conception to commissioning to ensure that we design and install the best system for your requirements. All works will be carried out by our trained and accredited installers and certified to all relevant building regulations as well as for grant approval.

The size of a PV system will depend on a number of key factors including:

- Budget and funding availability
- Electricity use and target on-site generation

- Location: space available (unshaded, south orientated if possible)
- Strength of grid connection (larger domestic and commercial systems)
- Cable routes (larger systems)
- Access for safe-working
- Structural integrity (retrofit systems)

COSTS AND FUNDING

An average cost for PV is around £5000 - £6000 per kW peak output. Government grants are available through the Low Carbon Buildings Programme (www.lowcarbonbuildings.org.uk) to some eligible parties, namely householders and not-for-profit organisations. Natural Generation are fully accredited installers under the BERR microgeneration certification scheme enabling their customers to apply for this grant. Domestic funding is £2000 per 1kW installed to a maximum of £2,500 per household while for schools and community groups 50% of the total cost is available through phase 2 of the Low Carbon Buildings Programme. In these cases often 50% match funding can be found through other organisations. There are various advisory bodies (Cornwall Sustainable Energy Partnership here in Cornwall) who give advice on the latest funding streams and schemes.

For domestic installations VAT will be charged at 5% on all prices quoted unless the PV system is part of a new build project where VAT is exempt. VAT will be charged at the standard rate on commercial installations.

TARIFFS AND ROCS

There are numerous tariffs offered by the energy companies for buying the electricity you export which need looking into carefully. You will also be credited with Renewable Obligation Certificates for all the electricity you generate whether you use it yourself or export it. These ROCs are in effect a bonus for generating renewable energy and at present are worth around £50 each. One ROC will be awarded for each 1000kWh you generate (the expected annual output of a 1kW array is around 800kWh), and from April 2009 the government will be awarding two ROCs per 1000kWh generated.

WARRANTIES AND MAINTENANCE

PV panels have warranties of up to 25 years and should last upward of 50 years. Natural Generation warrant the workmanship for a period of two years. There are no moving parts resulting in minimal maintenance and therefore none of the associated costs. Rainfall will usually clean the panels of dust and dirt on a typical roof where the pitch exceeds 30°.

PLANNING

We always recommend you consult your local planning authority early in the project. Although planning regulations are fairly relaxed for most small-scale photovoltaic projects, requirements for consent is highly location and scheme dependant. For domestic projects since April 2008 solar panels have been included in Permitted Development Rights unless you are in a listed building or your property is in a conservation area or World Heritage site.

For more specific project advice or to arrange a site visit, we would be delighted to hear from you either by phone on 01872 554144 or by email on info@naturalgen.co.uk

Microgeneration Approved Installers
Certification no. MCS 1029

