



## UK SDA – Solar Electricity

Industry Briefing Note provided by Mark Group

... solar electricity, usually known as solar PV (photo-voltaic), uses energy from the sun to create green electricity without producing greenhouse gases; if connected to the mains, any excess power generated can usually be sold back to the national grid under a variety of schemes that have been set-up for this purpose ...

UK Sustainable Development Association

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## Solar Electricity ...

Solar electricity, otherwise known as solar PV (photo-voltaic) uses energy from the sun to create electricity that can be used to run appliances. A solar PV systems requires only daylight to generate electricity, so it still generates electricity on a cloudy day.

There are three main elements in a solar electricity system for domestic applications:

- ☀️ Solar PV panels that use light energy and convert it to DC electricity
- ☀️ An inverter that converts the electricity from DC to 240V AC
- ☀️ System connections, which include safety switches and a display to monitor the system



## How it works ...

A solar PV system uses a panel of photovoltaic cells to convert light into electricity; the PV cell consists of two layers of a semi-conducting material, usually silicon. When light falls on the cell, it creates an electric field across the layers, causing electricity to flow. The greater the intensity of the light, the greater the flow of electricity.

PV cells are rated in terms of the amount of energy they generate at a solar radiation of  $1000\text{w/m}^2$ , know as kilowatt peak (KWp)

## Benefits ...

Solar PV generates green electricity, reducing both electricity bills and carbon emissions in the process. Solar PV produces no greenhouse gases and each KWp of system installed can save around 455kg of  $\text{CO}_2$  per year; this can add up to about 11-tonnes of  $\text{CO}_2$  over a system's lifetime (*Source – Energy Saving Trust*). Any power being produced that is excess to immediate requirements can also be sold back to the national grid, under arrangements that vary locally.

Most domestic systems are usually between 1.5 and 3-KWp, and produce savings of about 1.1-tonnes of CO<sub>2</sub> per year; this could mean electricity bill savings of around £200 per year, depending upon household usage, local tariffs, and the value of any energy exported back to the national grid.

### **Practical implications ...**

The fitment of solar PV is a “permitted development” which means that approvals are fast-tracked through the planning system. A Planning Application nevertheless needs to be submitted, including the details required by the Local Authority.



Although most of the installation work takes place on the roof, the technicians will also require access to the loft and electricity distribution board. A typical installation should take approximately two days to complete and will involve the erection of scaffolding to give access to the roof.

This work involves a bare minimum of disruption to the household routine, provided the simple precautions recommended by the installers are taken.

Once installation is complete, the system should have a life span of more than 20-years and require very little maintenance. The panels need to be kept clear of the shade of trees or other obstructions, and the wiring and components of the system checked periodically by a qualified electrician.

### **Further information ...**

Further information on this technology may be obtained from UK-SDA member company Mark Group (see [www.markgroup.co.uk](http://www.markgroup.co.uk), or ring 0116-236-6523)