

## FACT SHEET:

# SOLAR PHOTOVOLTAIC PANELS (SOLAR ELECTRIC)

### What are they?

Photovoltaic or Solar Electric Panels is usually referred to as 'Solar PV' and converts sunlight into electricity. They are typically panels of approx  $2.16\text{m}^2$  ((h)1.8m x (w) 1.2m) but there are many sizes, models and wattages (currently 395-565w) available.

### What do they do?

The sun produces an abundant source of clean, renewable energy, which can be converted into electricity with PV panels. A typical installation should generate around 150-215 units (kWh) per year for every  $\text{m}^2$  of panels, depending on panel type, orientation from south, pitch and shading.

### How do they work?

Sunlight is turned into electrical energy using the PV panel's layers of semi-conducting material. The electricity leaves the panel as direct current (DC) and passes through an inverter that converts it to 240V alternating current (AC) so that it can be used in the building.



### Understanding kWp and kWh

- Solar PV systems are rated in kilowatts peak (kWp).
- A typical installation could be 0.15-0.26 kWp per  $\text{m}^2$  of panels.
- The electrical energy produced by solar panels is measured in kilowatt hours (kWh)
- You can expect to generate between 700-900 kWh per 1 kWp per annum.
- The amount of electricity produced over the course of a year will be determined by the orientation of the system (i.e. which way the panels face), if there is any shading and how sunny the location is and the size of the system in kWp. And it obviously varies a great deal from season to season.
- Example: If you had  $10\text{m}^2$  of space for solar PV panels, you could expect a system size of 1.3-2.26 kWp that could generate between 910-2,034 kWh per annum (depending on the above variables).

### Where do they go?

Solar PV panels generate more electricity the more sunlight they receive. They can be installed on a roof or ground mounted. To get the maximum electricity generated, the panels would be best south facing with an optimum 35-40 degree slope/angle and preferably no shading. A west or east facing system produces approximately 20% less potential generation.

For a flat roof installation to minimise ballast and optimise space, they are usually mounted at an angle of 10-12 degrees to the horizontal, as opposed to the 'UK optimal' angle of 35-40 degrees. Also, in order to self-clean, the panels need to be

mounted at an angle of at least 10 degrees. This helps to keep the array clean as rainfall will remove surface dirt that could reduce panel efficiency.

### New-Build Regulations and Solar PV Panels

During the design process an early SAP calculation / BREEAM assessment can be undertaken which could outline the need for Solar PV panels to demonstrate compliance with building regulations etc. Solar PV panels are possibly required where there are special planning conditions that require an additional reduction over the TER or a percentage of energy to be generated from renewable sources.

### Solar PV mounting solutions for all



IN-ROOF SLATE



IN-ROOF PANTILE



ON-ROOF



SOLAR AWNING



FLAT ROOF TRAY



FLAT ROOF FRAME



TRAPEZOIDAL



STANDING SEAM



GROUND MOUNT