



Solar PV

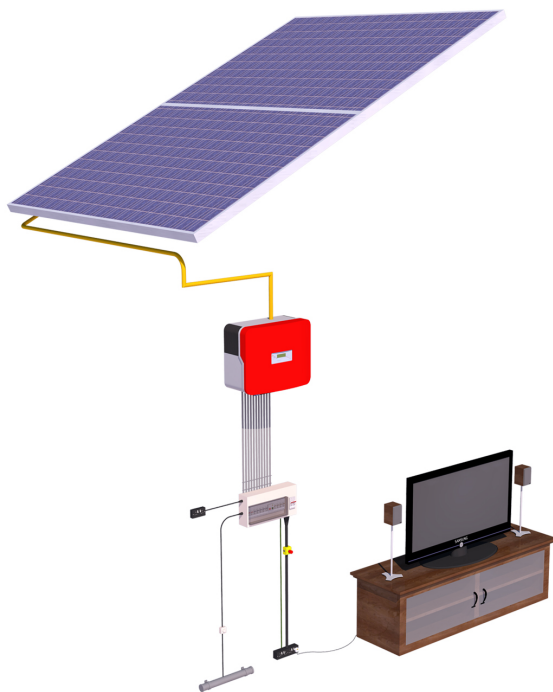
Photovoltaic (PV) panels convert sun radiation into electricity. A PV solar system orientated towards south at 30-40 Degrees above the horizon will give the most optimum electricity generation but will still generate a good amount of electricity even if fitted facing due East or West.

How it works

Solar PV panels consist of many photovoltaic cells. Each cell is made from layers of semi-conducting material, usually silicon. When sunlight shines on the cell it creates an electric field across the layers.

The power of a PV cell is measured in kilowatts peak (kWp). That's the rate at which it generates energy at peak performance in full direct sunlight during the summer.

There are 4 main types of solar PV modules on the market and they range in efficiency.



Polycrystalline (sometimes known as multicrystalline) are the most popular technology used in the UK. They have a distinctive appearance which looks like shattered glass or mosaic because each cell within the panel is comprised of a block of multiple crystals rather than just one single silicon crystal. These offer an efficiency rating of 13-16%

Monocrystalline was the first generation of solar technology and it has been used since the 1950's. The monocrystalline modules have a typically black or iridescent blue appearance and use a single silicon crystal. Although slightly more expensive than a polycrystalline module they offer between 14-20% efficiencies, enabling homes and businesses to generate a comparable amount of electricity even if the building/ground space is limited.

Thin-Film (Amorphous) Initially used in hand-held calculators but now available in much larger modules used in large integrated building installations, Thin-film is available as a standard 'panel' but as this can also be deposited onto glass, plastic or metal thin-film is available as a flexible fabric. Efficiencies range from 12-20%.

Hybrid HIT (Heterojunction Incorporating Thin-Film) incorporates two types of photovoltaic cells within one panel, by placing one material into contact with another the efficiencies are greater than a single type of crystalline. These premium solar modules offer efficiencies of 17-19%.

PV systems can be retro-fitted onto existing structures, during the build of a new property or renovation and even ground-mounted on a frame.

Advantages

Solar panel efficiencies reduce very slowly, your solar panels can generate electricity over 40 years.

PV panels have no moving parts to require very little maintenance over their life span.

Solar Panels are unobtrusive and can be designed to have little to no impact on the surrounding landscape.

There are great feed in-tariffs which are available from the government which offer guaranteed income over 20 years.

But

Outputs from the panels fluctuate, generating large amounts of energy during a sunny day and none at all at night.

To create maximum benefit, a battery system is required to store energy that can be consumed on site, via DC lighting systems, for instance.

Potential payback times have increased since the Government abruptly changed the terms of Feed In Tariffs in 2011.