Solar Photovoltaic Energy

Renewable electricity from the sun

The earth receives more energy from the sun in just **one hour** than the world uses in a **whole year.**

Used with other renewable energy sources, like **windpower, tidal generators, heat pumps, bio-mass** and **solar thermal, solar photovoltaics** will provide a vital part of our country's future energy.

If **every suitable roof** in the UK was covered with a solar energy system, photovoltaics would **generate more electricity** than we use today.

Solar photovoltaics work using **daylight**, not just direct sunlight, so they even produce energy on cloudy, overcast days.

Solar photovoltaic modules can be used as **solar cladding panels** on the sides of tall buildings. Often less expensive than marble or granite cladding, the solar panels generate energy from an otherwise unused surface.

Street lights can be designed using solar photovoltaic panels to generate energy during the day, which is used to power the lights at night.

New solar photovoltaic technology can be easily built in to all sorts of different materials, allowing solar energy to be used in new and exciting ways. Curved walls and roofs and even bags and clothes can all generate clean solar electricity.

1. HOW A PHOTOVOLTAIC SYSTEM WORKS

Solar photovoltaic roof tiles replace normal roof tiles and slates, keeping the roof water-tight and generating clean electricity at the same time.

Solar photovoltaic louvres do two things. They generate clean energy from the sun and shade the building, helping to keep it cool in summer and reduce the need for air conditioning.

Bus shelters, bike sheds and other smaller buildings can use solar photovoltaic panels to provide energy for lighting, **without having to connect to the electricity network**.

Solar photovoltaic modules can be easily mounted on frames on **existing buildings** to generate clean energy from daylight.

2.
DC (direct current) from the tiles flows to a small box called an inverter which converts the electricity to AC (alternating current) for use in the house.

3.
The AC electricity is used in the house just like normal electricity.

4.
Most buildings with solar photovoltaic systems are connected to the electricity network. This allows any excess energy generated during the day to be sold to the network, and when the panels are not generating energy at night, electricity can be bought from the network in the normal way.

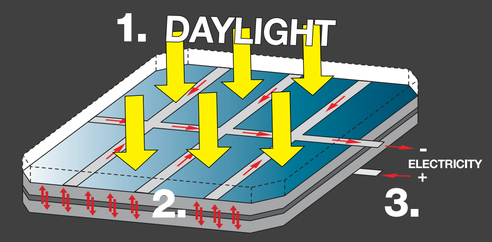
An energy efficient house with a solar photovoltaic system can provide all its electricity from solar photovoltaics.

How Photovoltaic Cells Work

All of the photovoltaic systems shown on this poster work in similar ways, there are three parts of the process:

1. Photons in daylight pass through the protective layer, hit the solar cell and are absorbed by semiconducting materials, such as silicon.
2. Electrons (negatively charged) are knocked loose from their atoms by the photons allowing them to flow through the material to produce electricity.
3. An array of cells connected together forms a panel, converting solar energy into a usable direct current (DC) electricity.

As there are no moving parts, this whole process happens silently.



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