Solar PV Synopsis

A solar PV panel works by allowing photons, or particles of light, to knock electrons free from atoms, generating a flow of electricity.

They are available in many different sizes and power ratings and are used to provide energy to a myriad of small devices through to large commercial solar farms providing megawatts of energy to the grid.

Common types of solar PV panels are …

Polycrystalline – are the most common type of panel and are widely used for rooftop solar PV
Monocrystalline – are slightly more efficient than polycrystalline panels but cost more to manufacture
Amorphous – are lighter and smaller than traditional panels but are rarely used for rooftop solar PV

Solar PV panels actually comprise of many, smaller units called photovoltaic cells that are linked up to make a complete solar PV panel.
Each PV cell is basically a sandwich made up of two slices of semi-conducting material which in most cases is usually silicon.

To work, PV cells need to establish an electric field and this is achieved by doping the silicon with other materials, giving each slice of the sandwich a positive or negative electrical charge.
Specifically, they seed phosphorous into the top layer of silicon, which adds extra electrons, with a negative charge, to that layer.
Meanwhile, the bottom layer gets a dose of boron, which results in fewer electrons, or a positive charge.
This all adds up to an electric field at the junction between the silicon layers.
Then, when a photon of sunlight knocks an electron free, the electric field will push that electron out of the silicon junction.
Metal conductive plates on the sides of the cell collect the electrons and transfer them to wires where they flow like any other source of electricity.
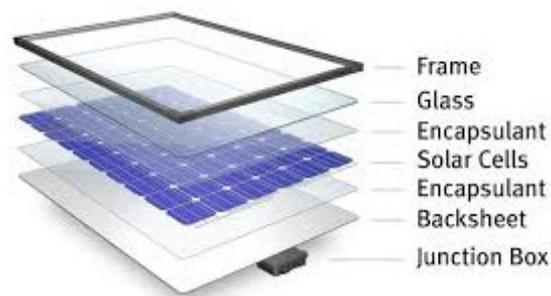
The DC electricity produced by a solar PV panel can be used to charge batteries and be used for off grid and on grid applications when converted to AC power via an inverter.

For connection details please download the Off Grid Connection and On Grid Connection details from this website.