Solar PV FAQs

General solar questions

How does a solar PV system work?

Solar panels generate electricity using energy from the sun. Because the panels produce energy from daylight and not sunlight they still produce energy on cloudy days. The direct current produced by the panels is converted by the inverter to alternating current for use in the building. The electricity produced is either consumed directly by appliances in the building or if more power than required is generated it is exported to the grid. At night or when the system is not producing enough energy, power is supplied by the grid in the normal way.

Do the PV panels need direct sunlight to work?

Solar PV works from daylight and not direct sunlight, but more power is produced on a sunny day as opposed to an overcast or cloudy one.

What are the effects of shade?

Shading is critical. Minor shading can result in significant loss of energy because the cell with the lowest illumination determines the operating current of the of the series string in which it is connected. It is therefore important to avoid the array facing into shade from trees, chimneys or other buildings.

What happens if there is a power cut?

Our PV systems are entirely grid connected. If there is a power cut the system is automatically switched off as a safety measure to ensure power does not leak on to the grid in order to protect personnel working to restore the power supply. There will be no power to the building during the power cut.

What happens at night?

PV panels do not produce energy in the dark and so electricity is drawn from the grid in the normal way.

Are there different types of solar systems?

There are two distinct solar systems:

- Solar thermal - for hot water production
- Solar PV—for the production of electricity

Dimplex offers kits for both types of solar system

Costs, benefits and the Feed in Tariff

How much does it cost?

The total installed cost of a system will depend on the size of the system and ease of installation and it is not possible to give a precise figure without viewing the property in question. However as a general guideline most homeowners install a system of between 2-3kWp at an installed cost of around £4000-£5000(inc VAT) per kWp.

How much energy will it generate?

There are five main factors that will affect how much energy a PV system will generate:

- Total size of the PV array
- Latitude of the location
- Direction the panels face
- Angle the panels are mounted
- Any shading

As an example a south facing roof mounted 1.44kWp system mounted in the Midlands should generate around 1000kWh per year saving around £200 per year depending on your electricity tariff.

What is the Feed in Tariff and how does it work?

It is a financial incentive backed by the Government and paid by your energy supplier to encourage you to create your own clean electricity. Every kWh generated earns a fixed income and additionally any electricity not consumed in property can be sold back to the grid. For further information see the Funding section on our website or visit the Energy Saving Trust website www.energysavingtrust.org.uk

Will the system be eligible for the Feed in Tariff

Dimplex Solar PV systems are MCS certificated and when installed by an MCS accredited installer are eligible for the Feed in Tariff.

What is the payback period for a solar PV installation?

We would expect that an average system will take roughly 10 to 12 years to pay for itself, after which it will make money for its owner for the remainder of the Feed in Tariff period of 25 years.

Installation

Do I need planning permission?

PV roof systems fall under permitted development rights and so do not require planning permission. However if your building is listed or in an area of outstanding natural beauty, please consult your local council planning department for advice before proceeding with installation.

Will I need to inform building control?

Yes, you should speak to building control about your intentions and they will advise you if you need to take any further action. Your installer should instruct you to contact building control.

Will my roof be strong enough?

Most roofs are strong enough to support a PV installation without any reinforcement but the installer will perform a site survey and make an assessment prior to installation.

Do I need to inform my electricity supplier?

For systems less than 4kW peak power your installer will inform them once the installation is complete. For larger systems, permission will need to be gained in advance from the network operator.

How much roof space will I need?

Our kits start at 1.44kW peak power and this occupies roughly 10 square metres of roof space.

How long will the installation take?

Installation normally takes 2-3 days for a domestic imstallation.

What are the optimal conditions for PV?

PV panels work best when installed at an angle of 30 to 40 degrees on a south facing roof. Panels can be installed at different angles on West or East facing roofs but will not produce as much power as an equivalent system on a South facing roof at optimal angle. A site survey will determine the best option for your property.

Does the system need batteries?

Dimplex PV systems are designed to be connected to the grid and do not require batteries. Excess electricity generated during the day is fed back to the grid.

Can I buy a system from Dimplex and install it myself?

Dimplex PV systems are only available from specialist distributors, electrical wholesalers and renewables merchants and must be installed by an MCS accredited installer, such as a Dimplex Accredited Installer. If the system is not installed by an MCS accredited installer it will not be covered by our warranty or eligible for the Feed-in Tariff.

Maintenance

Do panels need cleaning?

Usually dust and dirt washes off when it rains, if the panels are installed at an angle of at least 15 degrees. In extreme cases, dirt may cause a power reduction of about 10%.

How long do PV panels last?

Dimplex PV panels have a product warranty of 10 years, expected lifetime of around 30 years and performance of 90% for 10years and 80% for 25 years.

Solar terms and definitions

AC
Alternating Current - Electric current in which the direction of flow is reversed at frequent intervals.

AC cables
A cabling system suitable for conducting the AC produced by the inverter and connecting it in parallel with the main supply.

AC isolator
Electrical device capable of isolating the inverter from the 230v mains supply.

Ampere (A)
Unit of electric current. The rate of flow of electrons in a conductor equal to one coulomb per second.

Anti-reflection coating
A thin coating of a material, which reduces the light reflection and increases light transmission, applied to a photovoltaic cell surface.

Array
A collection of electrically connected photovoltaic (PV) modules.

Array current
The electrical current produced by a PV array when it is exposed to sunlight.

Azimuth
Horizontal angle measured clockwise from true north; 180 degrees is true south.

Base load
The average amount of electric power that a utility must provide in any period.

Blocking diode
A diode used to resist or block reverse current from flowing backward through a module. Alternatively, diode connected in series to a PV string; it protects its modules from a reverse power flow and thus against the risk of thermal destruction of solar cells.

Bypass diode
A diode connected across one or more solar cells within a photovoltaic module such that the diode will conduct if the cell(s) becomes reverse biased. Alternatively, diode connected anti-parallel across part of the solar cells of a PV module. It protects these solar cells from thermal destruction in case of total or partial shading of individual solar cells while other cells are exposed to full light.

Current
The flow of electric charge in a conductor between two points having a difference in potential (voltage).

DC
Direct current- Electric current flowing in one direction only.

DC cables
A cabling system suitable for conducting the DC current produced by the PV module.

DC isolator
A means of isolating the PV module output from the inverter.

Diode
Electronic component that allows current flow in one direction only.

Duty cycle
The ratio of active time to total time. Used to describe the operating regime of appliances or loads in PV systems.

Efficiency
The ratio of output power (or energy) to input power (or energy). Expressed as a percentage.

Electric current
A flow of electrons; electricity.

Energy meter
A meter which indicates the amount of electricity produced by the PV array.

Export meter
A meter which indicates the amount of energy exported out into the national grid and not consumed within the property.

Grid
Term used to describe an electrical utility distribution network.

Instantaneous short circuit (Isc)
The amount of current produced by an illuminated PV cell, module or array when it's positive and negative output connections are shorted.

Incident light
Light that shines onto the facade of a solar cell or module.

Inverter
In a PV system the inverter converts DC power from the PV array to AC power compatible with the AC load of the building.

Inverter parallel connection
The AC output from the inverter is connected side by side with the incoming AC supply. The inverter must automatically disconnect from the mains if there is mains power failure. The PV system cannot work standalone to produce electricity in the event of a mains power failure.

Irradiance
The solar power incident on a surface. Usually expressed in kilowatts per square meter.

Joule (J)
Unit of energy equal to 1/3600 kilowatt hours.

Kilowatt (kW)
One thousand watts. A unit of power.

Kilowatt hour (kWh)

One thousand watt-hours. A unit of energy. Power multiplied by time = energy.

Kilowatt peak (kWp)
The value of power generated by a PV panel under full solar radiation. Solar radiation of 1000 watts per square meter is used to define standard conditions

Load
The amount of electric power used by any electrical unit or appliance at any given time.

Load current
The current required by the electrical device.

Maximum module reverse current
The maximum current a module can withstand in the wrong direction without damage occurring to the module. Each module is designed to withstand at least twice its Instantaneous short circuit current (Isc)

Module
The smallest replaceable unit in a PV array. An integral, encapsulated unit containing a number of PV cells.

MPP
Maximum Power Point; the point on the current-voltage (I-V) curve of a module under illumination, where the current and voltage is maximum.

NOCT
Nominal Operating Cell Temperature - The estimated temperature of a PV module when operating under 800 W/m^2 irradiance, 20°C ambient temperature and wind speed of 1 meter per second. NOCT is used to estimate the nominal operating temperature of a module in its working environment.

Nominal voltage
A reference voltage used to describe modules or systems.

Open circuit voltage (Voc)
The maximum voltage produced by an illuminated photovoltaic cell, module or array with no load connected, measured across the positive and negative connections. This value will increase as the temperature of the PV material decreases.

Peak load
The maximum load demand on a system.

Photovoltaic system
An installation of PV modules and other components designed to produce power from sunlight and meet the power demand for a designated load.

Rated module current
The current output of a PV module measured at standard test conditions.

Resistance
The property of a conductor which opposes the flow of an electric current resulting in the generation of heat in the conductive material. The measure of resistance of a given conductor is the electromotive force needed for a unit of current flow. The unit of resistance is ohms.

Solar constant
The strength of sunlight; 1353 watts per square meter in space and about 1000 watts per square meter at sea level at the equator at solar noon.

Solar elevation angle
The angle made between ground level and the sun’s height above the horizon (0° when the sun is at the horizon and 90° when directly above)

Standard test conditions
Conditions under which a module is typically tested in a laboratory: Irradiance intensity of 1000 watts per meter square, air mass 1.5 solar reference spectrum and a cell or module temperature of 25°C, plus or minus 2°C.

String
A number of modules or panels interconnected electrically in series to produce the operating voltage required by the load.

Sun path diagram
Graphical representation of the sun's height and azimuth.

Tilt angle
The angle of inclination of a solar collector measured from the horizontal.

Volt
The unit of electromotive force that will force a current of one ampere through a resistance of one ohm.

Voltage at maximum power
The voltage at which maximum power is available from a module.

Watt
The unit of electrical power. The power developed when a current of one ampere flows through a potential difference of one volt.

Watt hour (Wh)
A unit of energy equal to one watt of power connected for one hour.

Zenith angle
The angle between directly overhead and the line intersecting the sun (90° - zenith is the elevation angle of the sun above the horizon).