

## WHAT'S IN YOUR INFORMATION PACK

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Solargen Energy<sup>LTD</sup>  
SPECIALISTS IN RENEWABLE ENERGY

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Freephone: 0800-1123571



Here at Solargen we are committed to providing you with a professional and complete service leading you forward into the Renewable Energy world. We combine superior products with an outstanding team of approved, experienced advisers and qualified solar panel installers to ensure that you get the highest quality system providing maximum levels of generated energy and so in turn maximising your return. As a Solargen customer you can have absolute confidence in us, working with you, towards a brighter SOLAR future.

## UNDERSTANDING PHOTOVOLTAICS

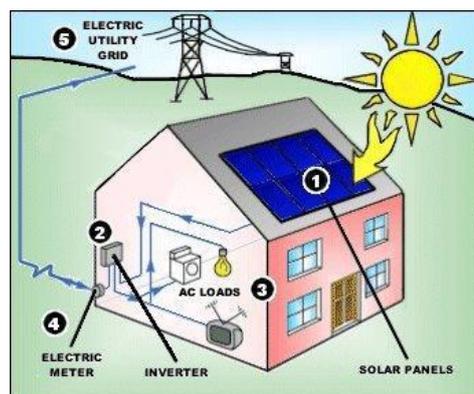
Photovoltaic cells are the cells used in solar panels to harness the sun's energy. The word 'photovoltaics' is literally translated to mean "light electricity". You will have come across solar cells before in calculators, emergency road signs, and they're even used on satellites in space. This is the same technology that we use here at Solargen to power your home in an environmentally friendly way.

## CONVERTING PHOTONS TO ELECTRONS

A Solar panel is a module made up of a group of cells connected electronically and packaged into a frame. In turn these solar panels are then linked together on your roof to form your solar panel system. The photovoltaic cells in a solar panel are made of a semiconductor, usually silicon. When light strikes the cell, some of the energy (the photons) is transferred to the silicon and loosens the electrons, allowing them to flow freely within the panel. The panels have an electric field that forces these electrons to flow in a certain direction – this is the electrical current. By placing metal conductors on either side of the cell we can draw off the current to power your home. This current, together with the cell's voltage (which is a result of its built-in electric field), defines the power (or wattage) that the solar cell can produce.

## HOW PHOTOVOLTAICS POWERS YOUR HOME

The solar panels on your roof capture the sunlight and in the processes described above transform it into a DC current. This current flows through into your loft space to an inverter where it is converted to AC current – the electricity that we use to power our homes. This electricity is then delivered to your mains circuit board where it can be fed back to the grid (which is how you acquire your F.I.T. profits) and also used within your home to power your appliances.



## THE PRODUCTS WE USE

At Solargen we believe you should have the best panels possible for your home in order to generate the most profit. We recommend the use of A grade panels, which have A grade cells rather than some cheaper alternatives which have lower quality cells. A grade cells have a longer life and generate more energy from a smaller area than other panels, meaning you can get a more profitable system even from a small amount of roof space.

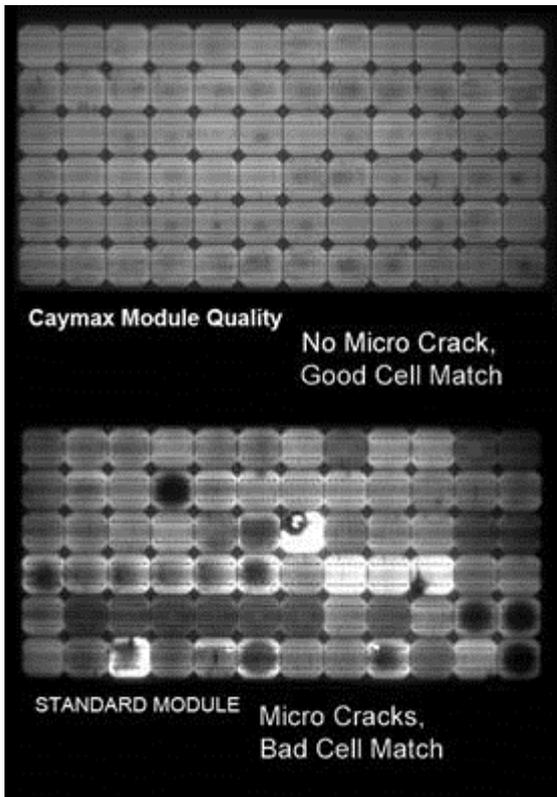
We source our panels through a reputable wholesaler and have access to a whole range of solar panels. We keep up to date with all advances in technology so we can ensure that your installation uses the best available products.

We have included product information on the next few pages of your pack.

Sola  
SPECIALI



ergy<sup>LTD</sup>  
ENERGY



### Why A Grade?

When cells are manufactured they are Graded A, B, C and D. A Grade Cells are rarely sold by cell manufacturers as they use them for their own panel production.

This is why the panels we use have MORE WATTS per Sq Meter than many of the other Mono Panels currently on the market in the UK.

This picture shows the difference between A Grade Panels and Low Grade Module Quality.

### What is Module Efficiency?

Module efficiency is a way of comparing all shapes and sizes of panels by dividing output in watts by the gross area of the panel.

Module efficiency = Panel Output (in kilowatts) / panel

gross area (in sq meters)

**e.g. A grade 250w Panel  $0.25 \text{ (kw)} / 1.6236 \text{ (sqm)} \times 100 = 15.4\%$**

### What does Module Efficiency Mean?

Higher module efficiency means more watts per square metre which is only achieved by the purest cells.

**Purer cells work better for longer.**

## **PV roof mounting**

### **Roof Mounting Solutions for Domestic and Commercial PV solution**



Roof mounting systems are uniquely manufactured using only High Quality materials to guarantee durability.

Incredibly simple to use patented systems mean that installing this strong system will considerably reduce installation time. Importantly the system has removed the number of components, which means considerably less time on continually attaching rails to hooks etc. using multiple components.

The PV mounting systems have been developed by seasoned designers and experienced consultants dedicated to providing high-quality products and all-round services. The system has solutions for many applications for PV Solar installations from simple on roof systems, flat roof in high wind areas to large Solar Farm sized projects.

Roof Mounting system solution includes on roof mounting, in roof mounting, ground mounting system and Flat roof mounting system. The most appropriate type of mounting solution will be determined once a full site survey has been undertaken.

## On Roof Mounting System

On roof mounting systems rely on simple roof hooks in order to attach the rails to the sub-structure of the roof. There are 3 main types of roof hooks which are used for U.K. roof coverings:

### Concrete Tile / Pantile / Slate roof anchor



### Installation Demo:



### **PV roof mounting anchor specification:**

All the hooks are supply with pre fixed attachments. These are a patented part of the roof mounting system. These are spring loaded units which clip into one or the grooves on the rails, and are simply tightened. This is a very quick and simple process with very easy access to the tightening screw.



The End and Mid clamps are substantial fully preassembled parts which simply clip into the channel in the rail, and the motion of tightening the screw from the top also fully locks the clamp in place. These substantial mid and End clamps are designed for use for both portrait and landscape installations with the rail installed horizontally.

### **On Roof Security**

The PV on roof mounting system is uniquely designed to protect your investment. Just as a locking wheelnut on a car – the locking bolts for the system have a specially adapted fitting to add security to the panels wherever they may be installed.

**Specifications**

Type	205-72M	200-72M	195-72M	190-72M	185-72M
Peak Power (Pmpp)	205	200	195	190	185
Open Circuit Voltage (Voc)	45.6	45.3	45.1	45.0	44.8
Short Circuit Current (Isc)	5.82	5.72	5.63	5.56	5.48
Optimum operating Voltage (Vmpp)	38.0	37.6	37.0	36.5	35.8
Optimum operating Current (Impp)	5.40	5.32	5.28	5.21	5.17
Module efficiency	16.06%	15.67%	15.27%	14.88%	14.49%
Maximum system voltage [V]	1000(IEC)/600(UL)				
Voltage temperature coefficient	-0.307%/K				
Current temperature coefficient	+0.039%/K				
Power temperature coefficient	-0.423%/K				
Series fuse rating[A]	10				
Cells	6x12 pieces monocrystalline solar cells series strings 125mmx125mm (5inch)				
Junction box	with 3 bypass diodes				
Cable	length 900 mm (35.4inch), 1x4 mm <sup>2</sup> (0.16inch <sup>2</sup> )				
Front glass	white toughened safety glass, 3.2 mm (1/8inch)				
Cell encapsulation	EVA (Ethylene-Vinyl-Acetate)				
Back sheet	composite film				
Frame	anodised aluminium profile				
Dimensions	<sup>a</sup> 1580x808x35mm (LxWxH) [62.2x31.81x1.38inch] <sup>b</sup> 1580x808x50mm (LxWxH) [62.2x31.81x1.97inch]				
Weight	<sup>a</sup> 15.6kg (34.4lbs) <sup>b</sup> 16kg (35.3lbs)				

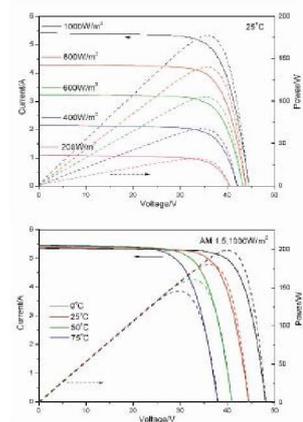


The electrical data relates to standard test conditions (STC): 1,000 W/m<sup>2</sup>, AM 1.5, 25°C.  
Performance deviation of Pmpp: ± 3%; Performance deviation of Voc, Isc, Vmp and Impp: ± 10%.  
Certified in accordance with IEC61215, IEC61730-1/2 and UL1703.

**Operating Condition**

Maximum surface load capacity	tested up to 2,400 Pa according to IEC 61215 <sup>a</sup> tested up to 5,400 Pa according to IEC 61215 (advanced test) <sup>b</sup>
Hail	maximum diameter of 25 mm with impact speed of 23 m/s (51.2mph)
Temperature range	-40 °C to +85 °C

**IV-Curves**

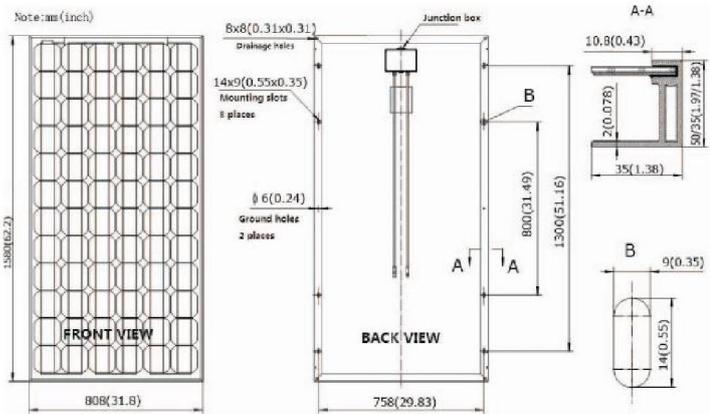


**Quality and Certificates**

- Designed to Meet the Unique Needs of Customers.
- -year hardware warranty;
- 25-year power output warranty;\*
- Certifications:



**Dimensions**



## SURVEYING YOUR HOME

The solar panels are arranged on your roof to catch the most sunlight possible. This is important as badly placed panels can lead to a reduction in your earnings. We provide free no obligation surveys to assess the suitability of your roof and give you an estimate of your returns. One of the first things we look at is the size of your roof to determine how many panels can you realistically fit on there. We offer a range of systems to fit all types of roofs – even ones considered by some companies to be too awkward and complicated – so long as there's sunshine we can provide the solar panels.

To measure your roof size we will need access to your loft area (please make sure that this will be available on the day). Once we have these measurements we can discuss with you your requirements as to what size of system you would like. We use the Government SAP calculation to determine this figure which takes into account the shading on your roof, i.e. are there any items affecting amounts of sunlight such as large trees, or other buildings nearby. These will have an effect on your estimated returns. We'll also take a look at your mains circuit board so we can assess how this is linked to the inverter.

Before surveying your property, it is important to take into account that in certain circumstances a property may require planning permission before solar panels can be installed. This may affect you if you live in a conservation area or a listed building. Please contact your local planning authority if you are in any doubt.

You will also require an Energy Performance Certificate (EPC) of Grade D or above to be sent to your supplier with your feed in tariff form, in order to claim the higher feed in tariff rate. Solargen Energy will arrange the EPC survey for you, which normally costs around £40, and this will be detailed in the quotation that we will supply to you.

If you have any questions regarding planning permission or EPC certificates, we will be happy to provide more information prior to your site survey.

## THE NEXT STEPS

### QUOTATION

After you've had a survey done, Solargen will provide you with a written quotation either by post or by email (whichever you prefer) and leave you to decide in your own time whether or not you feel that our panels would be a suitable investment. There's no pressure selling and no nasty surprises with hidden costs. Quotations are valid for a month from the date of the survey.

### MAKING THE DECISION TO SWITCH TO SOLAR

If you're happy with your quotation and want to go ahead with the installation, the next stage is to call our office on 0800 1123 571 and we will book you in for an appointment to get your contract signed and to select an installation date.

## THE INSTALLATION PROCESS

On the first day of the installation, a scaffolder will come to your property to erect the scaffold that we will use to install the panels. We won't need access to the inside of your property on this day, but please make sure there is access to all sides of the building. The installation begins on the second day. Our team of qualified, friendly electricians will arrive at 8AM with your new system. Installations can take up to ten hours on a more complicated roof, or as little as half a day for smaller and easily accessible systems. We will require access to your loft and to your consumer unit on that day. On the third and final day the scaffolders will return to take down your scaffold, and your installation is complete.



## AFTER YOUR INSTALLATION

Once your installation has been completed you'll start to feel the benefits immediately. We will fill out your F.I.T. forms with you so that you can start receiving your returns as soon as possible. We will give you your information pack with an NICEIC certificate of installation, your warranties, and information about the care and maintenance of your system.

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## ESTIMATED RETURNS OVER THE LIFE OF YOUR PANELS

Here at Solargen we provide every household with a personalised estimate of their returns. This way you know exactly how much you can expect to generate, as it varies a lot between households. For every kilowatt of energy you produce, you'll receive the tariff rate stated below. A 2kw system at peak time will produce roughly 2kw per hour. Over the course of a year those hours add up to a steady and reliable return on your investment.

As well as the returns from your feed in tariff, you'll also be saving money on your electricity. Electricity costs are constantly rising, so an early investment in solar can see your household bills drop significantly, and stay low for years to come. Please see page 15 for some useful information on how to ensure you're making the most of your solar panels.

Please see below the table of Feed In Tariff rates for 2015-2016

Description	2015/16							
	For Eligible Installations with an Eligibility Date on or after 1 April 2015 and before 1 July 2015		For Eligible Installations with an Eligibility Date on or after 1 July 2015 and before 1 October 2015		For Eligible Installations with an Eligibility Date on or after 1 October 2015 and before 1 January 2016		For Eligible Installations with an Eligibility Date on or after 1 January 2016 and before 1 April 2016	
	(p/kWh)		(p/kWh)		(p/kWh)		(p/kWh)	
Solar photovoltaic with Total Installed Capacity of 4kW or less, where attached to or wired to provide electricity to a new building before first occupation	Higher rate	13.39	Higher rate	12.92	Higher rate	12.47	Higher rate	12.03
	Middle rate	12.05	Middle rate	11.63	Middle rate	11.22	Middle rate	10.83
	Lower rate	6.16	Lower rate	5.94	Lower rate	5.94	Lower rate	5.73
Solar photovoltaic with Total Installed Capacity of 4kW or less, where attached to or wired to provide electricity to a building which is already occupied	Higher rate	13.39	Higher rate	12.92	Higher rate	12.47	Higher rate	12.03
	Middle rate	12.05	Middle rate	11.63	Middle rate	11.22	Middle rate	10.83
	Lower rate	6.16	Lower rate	5.94	Lower rate	5.94	Lower rate	5.73
Solar photovoltaic (other than stand-alone) with Total Installed Capacity greater than 4kW but not exceeding 10kW	Higher rate	12.13	Higher rate	11.71	Higher rate	11.30	Higher rate	10.90
	Middle rate	10.92	Middle rate	10.54	Middle rate	10.17	Middle rate	9.81
	Lower rate	6.16	Lower rate	5.94	Lower rate	5.94	Lower rate	5.73
Solar photovoltaic (other than stand-alone) with Total Installed Capacity greater than 10kW but not exceeding 50kW	Higher rate	11.71	Higher rate	11.71	Higher rate	11.30	Higher rate	10.90*
	Middle rate	10.54	Middle rate	10.54	Middle rate	10.17	Middle rate	9.81*
	Lower rate	6.16	Lower rate	5.94	Lower rate	5.94	Lower rate	5.73
Solar photovoltaic (other than stand-alone) with Total Installed Capacity greater than 50kW but not exceeding 100kW	Higher rate	9.98	Higher rate	9.63	Higher rate	9.63	Higher rate	9.29
	Middle rate	8.98	Middle rate	8.67	Middle rate	8.67	Middle rate	8.36
	Lower rate	6.16	Lower rate	5.94	Lower rate	5.94	Lower rate	5.73
Solar photovoltaic (other than stand-alone) with Total Installed Capacity greater than 100kW but not exceeding 150kW	Higher rate	9.98	Higher rate	9.63	Higher rate	9.63	Higher rate	9.29
	Middle rate	8.98	Middle rate	8.67	Middle rate	8.67	Middle rate	8.36
	Lower rate	6.16	Lower rate	5.94	Lower rate	5.94	Lower rate	5.73
Solar photovoltaic (other than stand-alone) with Total Installed Capacity greater than 150kW but not exceeding 250kW	Higher rate	9.54	Higher rate	9.21	Higher rate	9.21	Higher rate	8.89
	Middle rate	8.59	Middle rate	8.29	Middle rate	8.29	Middle rate	8.00
	Lower rate	6.16	Lower rate	5.94	Lower rate	5.94	Lower rate	5.73
Solar photovoltaic (other than stand-alone) with Total Installed Capacity greater than 250kW	6.16		5.94		5.94		5.73	
Stand-alone	6.16		4.44		4.28		3.08	
Export Tariff	4.85		4.85		4.85		4.85	

## **THE FUTURE OF ENERGY IS IN YOUR HANDS – SEE EXACTLY WHY TO INVEST BELOW**

One of the aims of the feed-in-tariff scheme is to encourage immediate investment in technology such as solar panels. Due to this, the generation tariff offered is dependent on when the system is installed. Systems that are installed at a later date will be entitled to a lesser amount.

You lock in to the feed in tariff that prevails on the date you install your solar panel system. If you install a small domestic system on your house now, you will lock in to the rate of 12.92p. Every year for the next 20 years you will get paid a tariff of 12.92p per kWh generated – and that's government guaranteed.

You will pay no tax on the money you earn. Both the generation tariff and the export tariff are index-linked to the Retail Price Index (RPI) so that they rise with inflation. The value of the energy used is also likely to increase as electricity prices rise. This means that your income will increase over the life of the scheme.

## **How to effectively use the energy you are producing**

Once you have chosen to have solar panels installed you must begin to rethink how you use your electrical appliances and consume energy. It is beneficial whenever possible to use your own electricity produced not that provided by your energy supplier. Using your own is a big benefit of installing your own system and increases the financial benefit from your investment.

Remember that during daylight hours you are generating electricity and to use that electricity efficiently is beneficial in many ways i.e. financial & a reduction in carbon emissions for your property. Simple things such as whenever possible use the highest KWh appliances individually i.e. do not use the washing machine, tumble dryer & shower together as the total KWh consumed will be more than what you are producing thus you are again using electricity from your energy supplier. We know this is not always possible but small changes in the way we use electricity can greatly benefit you the customer. No longer wait until the evenings and weekends for off peak rates as your own electricity is certainly cheaper i.e. it is free.

See below a brief list of common appliances showing KWh consumed over time period shown

Item	Duration	Units (kWh)
Fridge	24 hrs	1 - 2
Fridge-freezer	24 hrs	1 - 3
Fridge-freezer (American Style)	24 hrs	2 - 5
Washing Machine (40°C)	Full Load	1 - 2
Energy saving lamp (20W)	24 hrs	0.5
Fluorescent strip light (40W)	25 hrs	1
Conventional lamp (60W)	24 hrs	1.5
Security light (500W)	2 hrs	1
Television	Per year	40 - 50
Free view box	Per year	78
Games console	Per year	40
Mobile phone charger	Per year	50
Washing machine	Per year	60
Hairdryer	1 hr	1 - 2
Television (LCD)	6 - 9 hrs	1
Television (Plasma)	3 - 4 hrs	1
Games console	4 hrs	1
Mobile phone charger	1 week	1
Electric shower (8.5 kW)	7 x 10 mins	10
Kettle	7 ltrs	1
Toaster	60 slices	1
Tumble dryer	1 hr	2 - 4
Fan-assisted oven	1 hr (medium)	2
Cooker grill	40 mins	1
Cooker hood	10 hrs	1
Microwave (750 W)	1.5 hrs	1

There are many varying amounts of data regarding the average annual energy consumption in properties within the UK. The figures we use have been referenced from Strathclyde University, we feel that these are the most detailed to date. The average figure they use is 3880 kWh.

For another detailed study please got to the following link: <http://webarchive.nationalarchives.gov.uk/+http://www.berr.gov.uk/files/file11250.pdf>