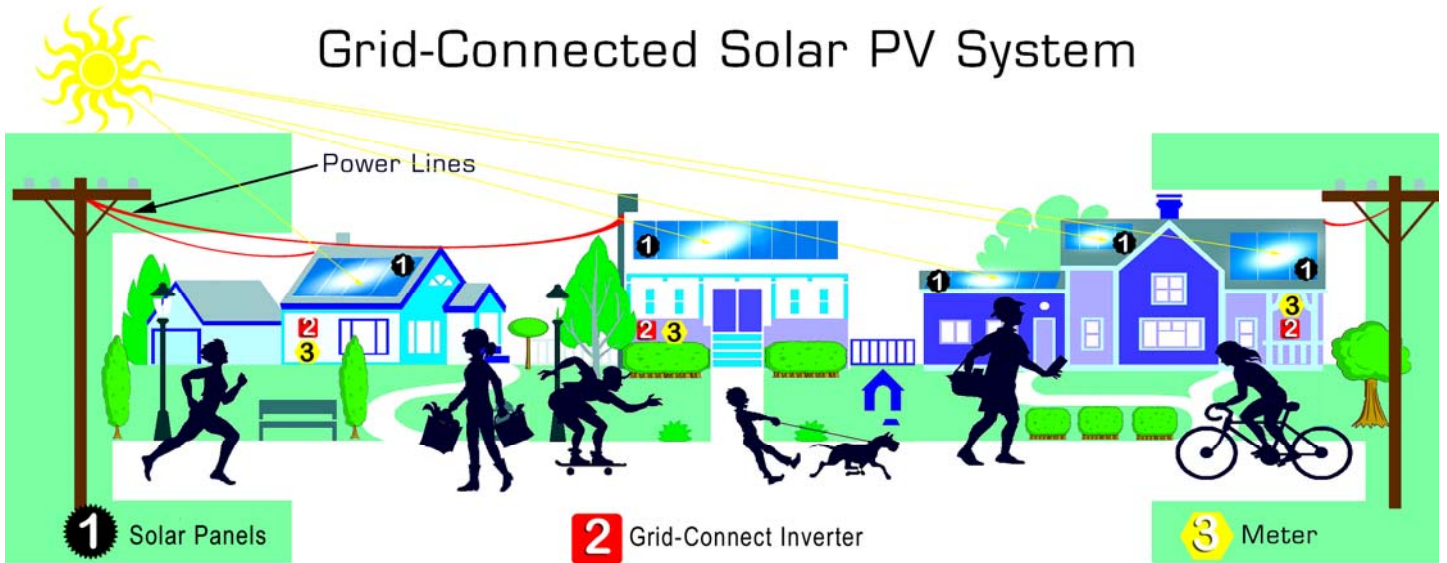


# GRID CONNECT SOLAR POWER SYSTEMS

## Frequently Asked Questions

### Grid-Connected Solar PV System



The solar PV Modules convert the sun's light rays to DC power.

An Inverter that has been connected inline with your house wiring, changes the DC power into 240V AC power which is suitable for your household appliances.

Your home uses the power from the Solar Panels first with additional demand supplied from the mains power when needed.

Any excess power is sent back (exported) to the Mains Power Line (grid).

A meter measures your electricity generation and consumption.

When you purchase a grid-connect system from Planet Earth Solar we will give you FREE of charge a POWER USAGE METER.

The Power Usage Meter will help you to track down the appliances that are consuming large amounts of your power.

Armed with this information you are able to manage your power usage more effectively.



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## **1. What is the difference between Solar Hot Water & Solar Power?**

Solar hot water systems use the heat of the sun to directly heat water.  
Solar power systems use the light of the sun to generate electricity.  
It's easy to remember.  
Heat from the sun will heat water,  
Light from the sun will light a globe.

## **2. How do solar power systems work?**

Solar power systems convert the energy from sunlight into direct current (DC) electricity. An Inverter then converts this direct current to an alternating current (AC), to make it compatible with the electricity grid. The solar panel array is usually mounted on the roof but can also be mounted on a tracker. The solar panels are oriented to the North and tilted to generate as much electricity from the sun as possible. Each zone in Australia has a different pitch degree at which the solar array should be angled. This is why it is important to use a qualified installer who will size the system correctly.

## **3. Why should I use solar power?**

1. It is quiet, clean and reduces your electricity bill.
2. It reduces the impact of fossil fuel power stations by reducing greenhouse gas emissions.
3. It can add value to your house.
4. It leaves a cleaner planet for future generations.

## **4. If I put in a grid connect solar system will I have electricity at night ?**

Solar panels do need sunlight to generate power. A standard grid connect system works together with the electricity grid. When the sun illuminates the solar panel array, power is fed direct to your house so less is drawn from the grid through your electricity power meter. At night power is drawn from the grid as usual.

## **5. Will my solar panel produce power during blackouts?**

If you have a standard grid connect system your inverter will automatically shutdown and disconnect itself from the grid during a blackout. This means your system will stop producing power. The reason for this is safety. Otherwise, your system would continue to generate power into the grid. This would create a major hazard for power line service personnel.

## **6. How do I generate my own power if there is a blackout?**

This can be done using a Solar Grid Battery system or SGB. This system uses a special inverter that connects to a large battery bank. During a power blackout, power still disconnects from the grid for maintenance personnel safety. The SGB system will continue to power selected circuits (such as lights and refrigeration) in your home from the energy stored in the batteries. If there is sufficient solar power generated, the inverter will power the selected circuits indefinitely. The system can also easily be enhanced with a small wind turbine.

## **7. How reflective are solar panels ?**

Solar panels are designed to absorb as much light as possible so as to generate the maximum amount of electricity. Therefore the panels have virtually no reflectivity.

## **8. How long will the panels last ?**

Good quality solar panels come with a warranty of up to 25 years depending on make or model. Always look for the TUV certification symbol in the product literature.

## **9. Will solar panels survive a hailstorm ?**

Yes. Solar panels are made of hardened laminated glass. TUV testing and certification requires a 1 inch solid ice ball to be fired at 50 mph straight at the solar panel without breaking the glass or damaging the solar cells.

# INSTALLING A SYSTEM

## 1. How many solar panels do I need to run my house ?

This depends on how much power you use. The average Australian home consumes about 7,400 kWh of electricity a year. At this rate you would need 30 to 40 panels. This would require a lot of roof space. Not impossible, but often difficult to achieve and generally outside the budget for most householders. Before installing a solar power system it is important to reduce your power consumption and improve your energy efficiency.

A standard grid connect system is installed to offset the cost of electricity. A typical roof top solar system of 1.2 kW requires approximately 10 square meters of roof space. This system will generate around 1500 kilowatt hours of electricity each year.

## 2. What if my building doesn't face north?

North-facing roofs are ideal for solar power. If your roof faces East or West computer modelling can closely estimate the losses compared to North facing. If the losses are unacceptable, then the option of a ground mounted array or tracking system can be used. (Tracking systems increase the amount of power generated each day).

## 3. Are they easily maintained ?

Solar panels need very little maintenance. If you have had long periods without rain you will need to clean your panels as dust can reduce their output by 5%. Bird droppings and salt deposits if you are close to the ocean also need to be removed.

## 5. Do I need permission from the electricity supplier before I install a system?

Yes. Electricity suppliers are not obliged to connect your system to the grid. Before you purchase a Grid-connected solar power system, make sure you check with your installer and local electricity supplier about connection and metering arrangements. It is also a good time to ask what the feeding tariff is for their area. At the moment the most common feeding tariff is 1 to 1. For example, if you are paying 15 cents per unit (kWh) you will receive the same amount back for your green power). Some State Governments are looking at offering 2 to 1 ( 30 cents for your green power and 15 cents for power from the grid).

## 6. Do I need home building insurance to install a system ?

No. But home and contents insurance is a good idea if you have a system installed. A solar power system is a valuable addition to your house it is important to ensure that it is included and fully covered by your policy which should include lightning damage.

## 7. Will the solar panels damage my roof?

Roofs are designed to carry a lot of weight and most roofs will hold panels without the need for reinforcement. Solar panels spread their weight over a large surface area, therefore having minimal structural impact. The weight is supported by the roof structure not the roof materials (eg tiles, corrugated iron, etc). When you use an accredited installer they will design your solar power system and take into account the roof structure.

## 8. Do solar panels produce enough energy to recoup the energy it took to make them ?

Yes. Modern solar panels will produce enough power within 4 to 5 years to recover the amount of energy it took to produce them.

## 9. What is the environmental cost of making a solar panel?

Making solar cells from silicon does use some toxic chemicals. However, these are all contained and can be recycled unlike air pollution created by burning coal.

## **COST**

### **1. Is solar power more expensive than conventional electricity?**

At the moment it is. The current market for solar power in Australia is small and therefore the price compared to coal-fired electricity is high. The average payback period for a grid connected system at the current electricity price is approximately 30 years ( 15 – 20 years after the government rebate of \$8.00 per watt). Electricity prices are currently increasing at 5% greater than CPI, and in relative terms are projected to increase dramatically in the next few years. These increases are required to account for desperately needed new generation and transmission infrastructure, and also will reflect CO2 emissions in any future carbon trading scheme. Of course, as coal fired power costs rapidly increase, the payback equation improves.

### **2. How much does it cost?**

A solar power system can cost anywhere between \$6,000 and \$60,000. This depends on the technology you choose, the size of a solar system, your roof size, and what extras you add to the system. A well designed 1 kW grid-connected using quality parts typically costs around \$6,000 after rebates. You may also need to reprogram your meter (\$100 - \$200) or have a new meter installed (around \$500).

### **3. Are there Government Rebates?**

Yes. The Federal Government has a rebate based on the total power of the installed solar panels. The rebate offers \$8.00 per watt, for new installations and is capped at \$8,000 (1000watts installed solar power). It also offers \$5.00 per watt, for additions to existing installations and is capped at \$5000 (1000watts additional installed solar power). To be eligible for these rebates a grid connect system must be designed and installed by a suitably accredited company or individual. (see download on [www.planetearthsolar.com.au](http://www.planetearthsolar.com.au) for rebate guide lines)

### **4. If I generate more energy than I use will I get money from my electricity supplier?**

This depends on your supplier. Some do offer a credit or post a cheque for the excess energy that you produce. However, it does take quite a large system to generate an annual excess of energy. Our energy market is deregulated so this means that you can shop around for the best deal. Ask your supplier what he can offer.

## **Technology**

### **1. When will the new panels I saw on TV be available?**

Sliver cell panels are not available commercially at this time. We have been advised by the manufacturing companies that they may be available in about 2 years. They have also advised us that the price of this new technology will not dramatically reduced the cost of a solar panel. One of the reasons for this is supply and demand. At the present time the whole world is trying to reduce their green house gas emissions and there is not enough silicon plants available to produce the required amount of solar panels that we need. One advantage that the new panels will have if released is size. They will produce twice the amount of watts as a standard size panel. ( A 175watt Kyocera solar panel measures 1290mmL x 990mmW x 36mmD The new sliver cell panels will produce 350watts for the same dimensions.)

Having been involved with the solar industry for nearly 20 years, we have seen many “breakthroughs” that turned out to be of little commercial value, and have ended by the wayside.

Rarely a month goes by without a new discovery in the field of solar power or renewable energy. Most of the announcements refer to laboratory experiments that set new efficiency benchmarks. Sometimes breakthrough discoveries are made that one day may be commercialised.

In reality, it takes years and sometimes decades to get a discovery commercialised and then to manufacture in large volumes. Most discoveries never see the light of day for all sorts of reasons. In any case just because a cheaper way to manufacture is found, it doesn't mean that the cost savings get passed on. Invariably they aren't, because the investors need a return.

The stock standard crystalline solar panel has been with us for over forty years. During that time the quality and cost have improved dramatically. Best of all they are reliable, and when the government subsidy to install is factored, they are available now, at reasonable cost.