



GOING SOLAR

*Renewable energy
from the sun*



EnergyAustralia[®]
We're on it

Collecting energy from the sun is one of the most environmentally friendly ways to produce electricity. Electricity generated from solar doesn't create harmful greenhouse gases, unlike electricity from fossil fuels.

If saving money is your prime concern, then you should think very carefully before buying a solar system.

In this booklet we'll explain:

1. The benefits of solar power
2. How solar power works
3. Is it suitable for your home
4. How much will you save
5. How much does it cost
6. Where to find a solar power installer
7. What else you can do to reduce your energy use and environmental impact
8. Maintenance of solar power systems



The information in this booklet has been provided as a guide to solar PV systems. While every effort has been made to ensure the content is useful and relevant, the information is general. It should not be relied on without getting advice specific to your needs and circumstances from someone qualified to give that advice.

1.

The benefits of solar power

Australia is one of the sunniest locations on earth which makes it an ideal place for the generation of solar power.

The advantages of installing a solar power system include

- **Saving around \$200 a year** on the average household electricity bill for a well-located 1kW system.
- **Saving** up to 1.5 tonnes of greenhouse gas a year for a 1kW system, more than what a typical car produces in 3 months.
- **Householders with solar power can** sell excess energy back into the grid under EnergyAustralia's Solar Buy-back tariff, for customers who live in the EnergyAustralia network area.
- **Generous Federal Government rebates** of up to \$8,000 for households and \$12,000 for community organisations are now available for grid-connected systems.
- **Providing support** for the renewable energy industry.

But consider this...

- **Solar power systems** still have a high upfront cost ranging from \$4,000 to \$6,000 for a 1kW system after rebates.
- **They do not suit all homes** or sites as they require unshaded, north-facing roof space.
- **A household-sized solar power system** is unlikely to reduce energy bills to zero. Typically, a 1kW solar system will reduce average household energy bills by 25% (excluding hot water).
- **Other energy-saving measures** such as installing solar water heating systems or reducing overall household electricity consumption can result in similar greenhouse gas and cost savings.
- **Reducing electricity use** by being more efficient is the lowest cost way to reduce your greenhouse gas emissions.

2.

How solar power works

Solar energy is light or heat that comes from the sun. Solar power is generated by collecting this energy and converting it into usable electricity. It is clean, pollution free and, in practical terms, inexhaustable.

There are various types of solar power systems for your home (often called PV or photovoltaic systems). They generally consist of solar panels, an inverter and a metering system.

Solar power systems (photovoltaics) are often confused with solar thermal technology, which is usually used for water heating (solar hot water).

Most solar power systems use PV modules installed on a rooftop to create and collect energy from sunlight. An inverter converts the direct current (DC) generated by solar panels into alternating current (AC), the form of electricity conventionally used in homes and businesses.

The system is usually connected through a meter to the main electricity network, which allows the household to use traditional electricity when the sun isn't shining and sell any excess power back to the grid when it is.



Solar panels



Inverter

Solar panels:

Solar cells are produced from thin wafers of silicon. When light falls on the cells an electric current is produced. A collection of solar cells connected together forms a module.

Most homes or commercial buildings will need around 10 square metres of unshaded, north-facing roof space to mount the modules for a 1kW solar system. Ideally the modules should be tilted towards the sun at around 30 degrees to maximise the solar collection. If the roof's slope is not at the right pitch, a good designer can create a special mounting frame for the modules.

Cloud cover and shading can dramatically reduce a solar power system's output.

Inverters:

You will need an inverter to convert the direct current (DC) power collected by the solar panels into power for your home, or power to send back to the electricity grid. It can be placed inside or outside your home, but should be well ventilated and protected from the elements.

Meters and the grid:

You still need to be connected to the electricity grid to ensure that you have electricity at night-time when no solar energy is being collected. A meter may also enable you to sell back excess electricity.

For safety reasons, when your electricity supply from the grid is interrupted, your solar PV system must automatically and immediately turn off. It is possible to have a system that will provide emergency electricity when the grid goes down, with the use of a suitable inverter and battery bank, however this can be expensive.

3.

Is it suitable for your home?

Solar power systems reduce a household's energy bills and are better for the environment, but you should consider:

Is your house right for solar power?

You will need an unshaded north-facing roof to collect enough solar power to make a system efficient. Do you have the right site?

How much money do you want to save?

In the short term the money you save on your energy bills is unlikely to justify the financial investment, therefore most customers who decide to install solar do so for the environmental benefits.

Is there a better way to reduce your energy consumption without the cost of solar power? Reducing household energy use or installing solar, gas or heat pump-powered water heating systems are generally lower cost ways to reduce greenhouse emissions.

Can you participate in Energy Buy-back?

In most cases excess energy collected by a solar power system can be sold back into the grid, thereby reducing your energy bills. EnergyAustralia Retail operates a Solar Buy-back tariff for customers who live in the EnergyAustralia network area (see map inside the front cover of this booklet).

Can you cover the full cost of the system until the rebates come your way? Check the conditions of the Federal and State government rebates for solar power systems in your area – you may have to cover the entire cost of installing the system until the rebate comes back to you.

Which solar PV system is best for you?

There are various brands of solar power systems, all of which will involve solar modules to collect the sun's energy and an inverter to convert it into 240 volt electricity which is used in your home. Be prepared to do some research and use an accredited BCSE designer and installer to ensure you are eligible for government rebates.

4.

How much will you save?

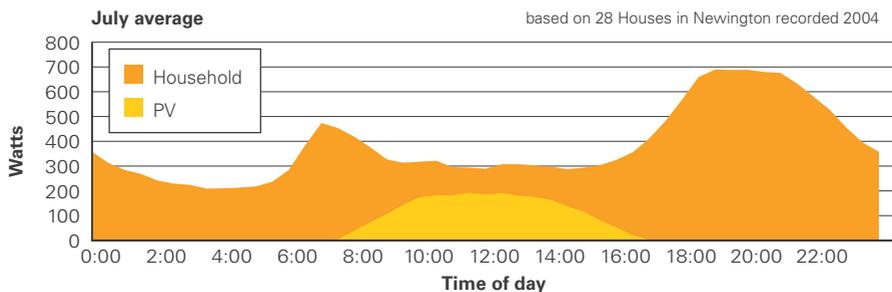
A typical 1kW solar power system in the EnergyAustralia network area provides around 25% of an average household's energy needs (excluding hot water).

This reduces energy usage by up to 1,400kWh per year, saving around \$200 on energy bills and up to 1.5 tonnes of greenhouse gas emissions.

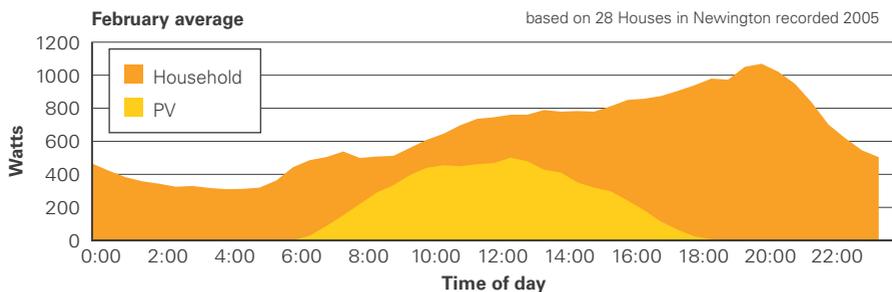
A typical home uses about 20 kilowatt hours of energy a day, or around 7,300kWh a year (including hot water).

In sunny conditions in a city like Sydney, a 1kW solar power system could generate up to 1,400kWh per year.

Winter electricity usage and production



Summer electricity usage and production



4. How much will you save?

An example of the costs and paybacks of an optimal residential 1kW solar power system can be found in the following table:

A 1kw solar power system	Results
Energy production (kWh per year)	1400
Estimated savings per year (\$)	Powersmart – \$200
CO ₂ abatement per year (tonnes)	1.5

Use EnergyAustralia’s online calculator to estimate the savings you could make if you choose solar power for your home (www.energy.com.au/calculators). Remember to choose the PowerSmart tariff if EnergyAustralia is your electricity retailer and you live in the EnergyAustralia network area.

Solar energy buy-back rates

EnergyAustralia retail customers who have a solar power system smaller than 10kW per phase and live in the EnergyAustralia network area, can participate in Solar Buy-back after installing a bi-directional meter.

In EnergyAustralia’s network area, this will be a time-of-use meter which measures energy usage throughout the day. If EnergyAustralia is also your electricity retailer you will be moved to PowerSmart (time-of-use) pricing for all of your energy usage and any excess you sell back to the grid following the installation of this meter.

With PowerSmart pricing, your electricity rates are broken down into three different time periods – Peak, Shoulder and Off Peak. This means you pay for the quantity of electricity you use, based on when you use it. A higher rate is charged during the Peak period, than the Shoulder and Off Peak periods. So your rate is less when the demand for electricity is lower, and more when it is higher. And this means you have greater control over your electricity bill.

EnergyAustralia buys back electricity at the following rates (valid from July 1, 2008 and subject to review):

Tariff		cents/kWh (excluding GST)
Powersmart	Peak (2pm-8pm weekdays)	27.5
	Shoulder (7am-2pm & 8pm-10pm working weekdays and 7am-10pm weekends and public holidays)	9.9
	Off Peak (10pm-7am every day)	5.5
Standard Domestic Tariff (single consumption rate for existing customers only)		12.7

An example of a 1kW solar power system

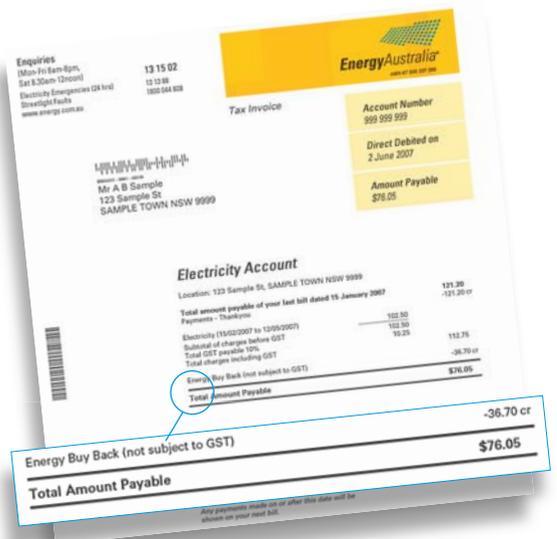


4. How much will you save?

EnergyAustralia’s existing solar customers who are on the single rate “Standard Domestic Tariff” can opt-in for time-of-use metering, which will provide a greater level of control over the price received for electricity exported to the grid. All new solar customers will automatically go onto time-of-use metering and billing and cannot go back to single consumption rates.

Note: EnergyAustralia has a “net metering” policy for customers who generate their own electricity, which may not be the case with other electricity retailers. As a result, the electricity registered on the export meter (sales) will be less than the total amount of electricity generated by the solar system. The difference between the solar electricity generated and that registered on the export meter is the amount that has been used to directly supply your home’s electricity consumption. This results in a reduction in the amount of electricity registered on the import meter.

EnergyAustralia will provide a regular bill showing the energy you consume from the grid, with another line showing the amount of energy sold to the grid. The value of the energy produced by a solar power system will be credited to your account balance.



An example of an energy account with solar buy-back



5.

How much does it cost?

The recommended way to cost a solar power system for your home or community organisation is to obtain a quote from an accredited BCSE designer and installer. You'll need to use an accredited installer if you want to claim the Federal Government rebate.

With the current Federal government rebate, expect to pay between \$4,000 and \$10,000 for a 1kW to 1.5kW system. This system would be unlikely to generate enough solar energy to power an entire home, however it will help reduce greenhouse gas emissions and save money on your electricity bills.

For more information about rebates go to www.greenhouse.gov.au/renewable/pv or call 1300 138 122.

It could be very costly to install enough solar modules to provide all of your household's energy needs. For example, it would cost around \$50,000 or more to install a system large enough system to meet 100% of an average home's energy needs.

6.

What else you can do to reduce your energy usage and environmental impact

If reducing greenhouse gas emissions, saving energy and saving money on your bills are your main reasons for installing solar power, other cost-effective options could also be considered:

Energy efficiency

Reducing overall household electricity consumption will not only save money, but also greenhouse gas emissions. Some simple ways to become more energy efficient include:

- Turning off your second fridge
- Replacing standard light bulbs with energy-saving compact fluorescent lamps
- Buying high star-rated, energy efficient household appliances, especially fridges
- Committing to turn off standby power loads consumed by televisions, computers and microwave ovens
- Installing insulation and summer shadings on west-facing windows
- Incorporating passive design techniques to reduce the need for heating and cooling
- Using gas rather than electricity for heating and cooking

Target hot water

Switching from electric storage hot water to solar water heating can save even more greenhouse emissions than installing a 1kW solar power system. With State and Federal government rebates for solar hot water installation, the average household could save up to three tonnes of greenhouse gas each year and yet could spend less than \$2,000 after rebates. Even switching from electric storage hot water to natural gas or heat pump technologies will save a similar amount of greenhouse emissions as installing solar power – and the upfront cost is less.

7.

Where to find a solar power installer

A quality, BCSE accredited solar power designer and installer will guide you through the decision-making process and help determine whether your home or building can support solar modules.

They will also help you apply for rebates and may even secure finance for a solar power system until the rebates are paid.

To organise a quote for a solar power system contact EnergyAustralia on 1300 76 06 26.

Check out the following websites for more information.

- EnergyAustralia:
www.energy.com.au
- Clean Energy Council:
www.cleanenergycouncil.org.au
- Australian Greenhouse Office:
www.greenhouse.gov.au/yourhome/
- Research Institute for Sustainable Energy:
www.rise.org.au

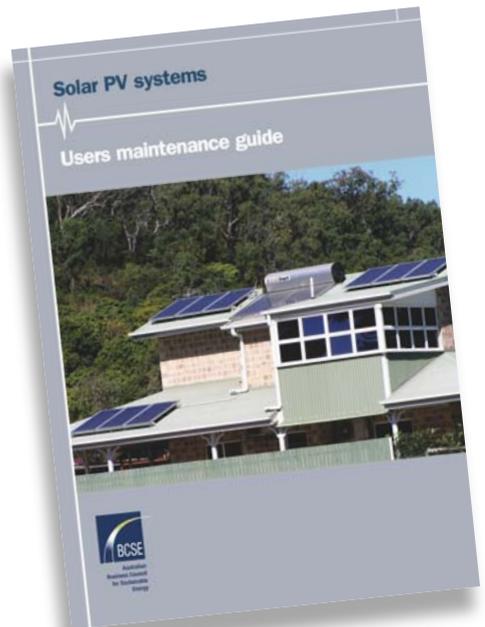


8.

Maintenance of solar power systems

After installation, you will be responsible for ensuring that your equipment is maintained in good working order. Your installer should be able to provide appropriate instructions along with maintenance information in the system manual. Safe work practices for any maintenance tasks must be followed.

For further information on the maintenance of your system please refer to the BCSE's publication "Solar PV Systems Maintenance Guide for System Owners".



Solar PV Systems Maintenance Guide for System Owners, available from www.cleanenergycouncil.org.au

For more information call us on
13 15 35
or visit www.energy.com.au



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