

How to install a photovoltaic (pv) system on your roof

Most of our electricity is generated from fossil fuels such as coal and gas which produces massive amounts of greenhouse gas, a major cause of global warming. Fortunately, there is another way of making electricity that doesn't pollute our atmosphere and that won't run out - solar energy.

We already use solar energy for drying clothes (using a clothes line), lighting houses (through windows) and keeping ourselves warm. By using photovoltaic (PV) cells it is possible to change the energy from the sun into electricity.

Photovoltaic technology has been used to power homes for many years. Sufficient sunlight falls on Australia to provide the nation's total energy needs. PV cells installed on your home offer the opportunity to generate electricity in a clean, quiet, and reliable way.

WHAT CAN I DO?

Install a photovoltaic system on your home to supply your own energy, reducing your greenhouse gas emissions and potentially reducing your energy bill to better than zero!

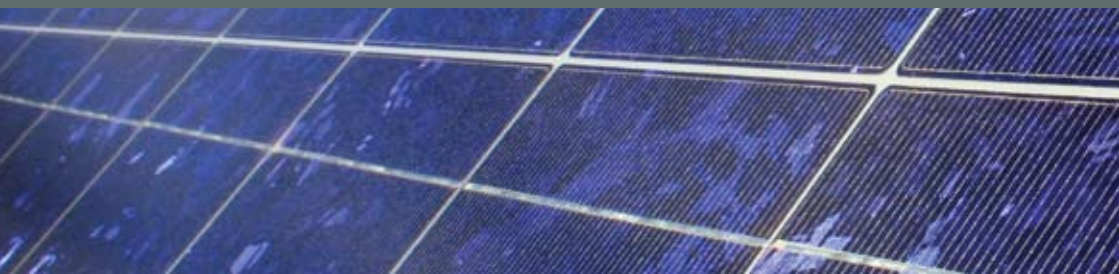
Install a 1kWh PV system
and save (each year)



TANYA HA, an expert in environmental living and the author of *Greenology* and *The Australian Green Consumer Guide* provides advice on reducing emissions of greenhouse gas from your home.



Government of **Western Australia**
Department for **Planning and Infrastructure**



HOW DO I DO IT?

What is a PV system?

Photovoltaic cells convert light energy into electrical energy. A set of PV panels installed on the roof of your home will generate power which can then be converted to mains electricity by an inverter.

How does it work?

When the sun shines on solar panels they generate electricity. During the day the solar energy feeds into the electricity grid and Synergy then pays you for the power you produce under the Renewable Energy Buyback Scheme (REBS). At night and when you are using appliances your energy comes from the grid in the usual way.

Where does it fit on my home?

A 1kWhr system needs as little as 4.6m x 1.7m of roof space. To achieve maximum output the solar panels need to be installed at a 30° angle from horizontal, on a north facing area, with no overshadowing (e.g. trees, other buildings). Panels to the east, west, or at other angles will generate power but at less than full efficiency.

Which type of PV system should I choose?

There are three main types of PV cells commonly available to the residential customer:

1. Thin film - Silicon is applied directly onto glass to produce cells that have a high shade tolerance, but require a large roof space for each kilowatt hour. They are also the lowest in embodied energy.
2. Mono-crystal silicon - Most photovoltaic cells are mono-crystal types. To make them, silicon is purified, melted, and crystallized into ingots. These types of cells are the most space efficient on the roof, but less shade tolerant.
3. Poly-crystalline silicon - Poly-crystalline PV cells are manufactured in a similar manner to mono-crystal PV cells but a lower cost silicon process is used. As a result they are slightly less space efficient, but are also less expensive.

The most important thing to consider when choosing your PV system is to make sure it will fit your roof and your budget.



How much will I need to power my home?

A typical domestic system of 1 kW will produce around one third of the annual demand of an average household or most of the power for an energy efficient home.

How much does it cost?

The cost of a complete PV system - including power conditioning equipment and installation varies depending on the size and system type. For a typical domestic installation of a 1kWh system, you could expect to pay between \$8,000 and \$12,000. New systems qualify for Renewable Energy Certificates (REC's) to reduce the cost to around \$3,000 to \$7,000.

The current REC's "rebates" under the "Solar Credits Scheme" (as of July 2009) for Perth will reduce the cost by:

- Approximately \$5,150 for a 1kWh system
- Approximately \$7,750 for a 1.5kWh system.

Solar Credits (rebate) are correct at June 2009 but are subject to change. See www.transport.wa.gov.au/livingsmart for current grants and subsidies.

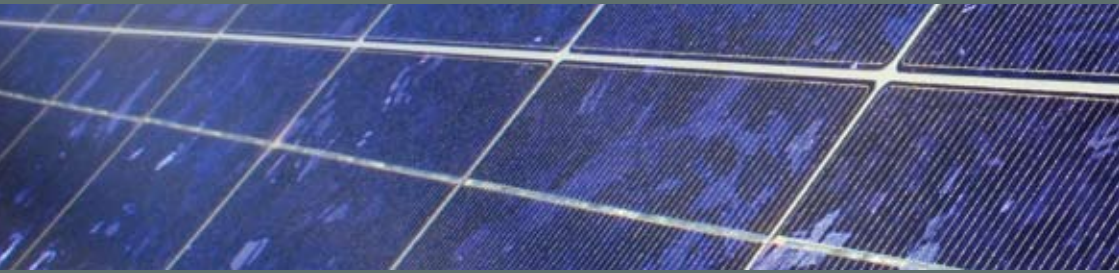
How long will it take for the system to pay for itself?

After the REC's rebate and projected increases in electricity tariffs, a 1kWh system will pay for itself in about 10 years and go on to provide free electricity (5 units a day) for another 15 years or more.

Where can I find a photovoltaic system supplier?

To be eligible for the rebate the person who carries out the installation must be accredited for design and installation of photovoltaic systems by the Clean Energy Council.

Ask your installer/designer for proof of accreditation. Local suppliers can be found by searching "Renewable Energy" on www.yellowpages.com.au



The Australian Greenhouse Office recommends applicants contact an accredited designer / installer to discuss their system requirements before commencing an application. Your installer should also arrange any Local Council planning approvals that may be required in your area.

Benefits of Solar Panels:

- Generating your own solar power will reduce your electricity bill.
- Produce clean solar power and reduce greenhouse gas emissions.
- As energy prices rise the system delivers increased financial returns with no required maintenance. Current returns are around \$300 per year of 'free' electricity from a 1kwh system at July 2009 standard tariff.
- Add value to your home.

- PV cells produce most energy on sunny days. Your PV system will add capacity to the grid during periods of high electricity demand and maximum stress on the existing electrical infrastructure.
- The Federal Government's Renewable Energy Certificates will help households save money, meaning solar power systems are now more affordable.

WHY?

Installing a photovoltaic system will pay for itself, provide you with free power in the future, reduce the emission of greenhouse gases and promote the development of renewable technology.