

# Rooftop solar photovoltaic (PV) systems

Solar PV systems are now more affordable than ever, and across Australia, almost 200,000 households and businesses have had a solar PV system installed. In Alice Springs, there are over 400 systems installed on homes and businesses (as of January 2011).

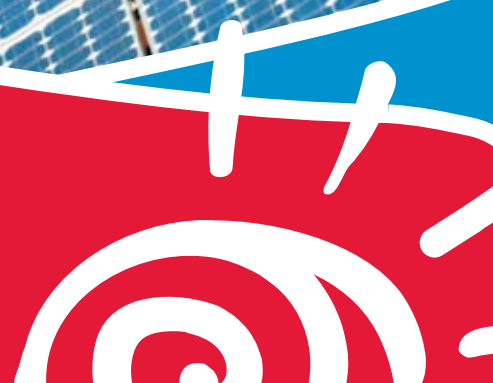
## Why install a solar PV system?

There are many reasons to have a PV system installed.

- You will be generating clean, renewable energy, reducing the need to burn fossil fuels.
- You will save on your power bills, as the PV system will meet some or all of your power needs.
- The electricity generated by your PV system can be sold to Power and Water and appears as a credit on your electricity bill.
- As solar power is generated during the day when the community's power demands are typically at their highest, your PV system will help reduce the load on the local electricity network.
- The value of your home may increase as demand for sustainability features in homes increases.

## What is a solar PV system?

A solar photovoltaic (PV) power system is a technology that converts sunlight into electrical energy. By installing a solar PV system on the roof of your home or business, you are effectively turning your roof into a mini-power station. PV systems should not be confused with solar hot water systems, which are sometimes also referred to as 'solar panels'. In a solar hot water system, panels on your roof use the sun's energy to heat water, which is then stored in a tank. The picture on the following page shows both technologies.





## How does a PV system work?

In a typical system, there are two main components - the solar panels (also known as photovoltaic modules) and a device called an inverter. The set of solar panels (also called an 'array') are installed on the roof of your home or business, however ground mounted systems are also possible if installation on the roof is not feasible. The solar array should face north, though other orientations can also be suitable. When the sun hits the panels, electrical current is generated (as DC) and fed to the inverter, which produces electricity at 240 volt AC (the same as the electricity grid) and feeds it into your local electricity network via the electricity meter. The meter records the electricity produced, and this information is used by Power and Water to provide a credit on your power bill.



## How much power can a PV system generate and is my house or business suitable?

The amount of energy generated by a solar PV system is directly related to the size of the system installed – the bigger the system the more electricity will generally be produced per year. For example, a typical household system may involve the installation of 12 X 165 watt panels. In this case, the system is 1980 watts or 1.98kW. The rule of thumb in Alice Springs is that for every 1kW of solar panels installed, around 1,600kWh/year of electricity will be produced. Therefore a typical 2kW PV system, with an optimal roof, will produce around 3,200kWh/year.

There are site specific factors that can reduce the amount of electricity that a solar PV system will produce, including having a less than optimum roof orientation and pitch. Similarly, shading from nearby trees or other buildings or structures can also have an impact on output. The amount of available roof space can also be a limiting factor in terms of what size system can be installed. The amount of roof space required varies between 8 – 12m<sup>2</sup>/per kW installed, plus necessary clearances.

To get a more accurate estimate of output, solar installers can carry out a roof top inspection to calculate the expected output of a PV system, taking into account the impact of any shading.



## Can I run my house or business off a solar PV system?

The answer to this question will depend on how much electricity you use and what size solar PV system you install. If you installed a 2kW system, it would produce around 3,200kWh per year (depending on the system installed and the site specific factors mentioned previously). The average household electricity consumption in Alice Springs is around 8,000kWh/year (an 'energy champion' household could use as little as 4,000kWh/year). Therefore, assuming your consumption was the same as the Alice Springs average, you would be meeting around 40% of your energy needs over the course of a year. When investing in a solar PV system, it makes sense to also look for opportunities to improve your home or business' energy efficiency to reduce your electricity demand. It is also important to note that installing a solar PV system will not provide you with electricity during power outages or blackouts. Solar PV systems are required to shut down immediately when an interruption in the electricity supply from the grid is detected, as a safety mechanism for electrical linesman.

## What financial incentives are available?

An Australia wide funding scheme is in place for small scale renewable energy technologies, including solar power systems. The scheme allows the owner to sell the renewable energy certificates (RECs) that their system 'produces' (RECs are also known as Small Technology Certificates or STCs). This funding is normally provided as a point of sale discount on the purchased cost of the system. The value of the RECs rebate varies from time to time, but represents a significant discount off the cost of the system. Solar PV installers generally quote the after RECs price as the final cost. It is not compulsory to 'sell' your RECs at point of sale, however the full retail cost of the system is payable if you choose not to. For a full explanation of the pro's and cons of selling your RECs, contact Alice Solar City.

Owners of solar power systems also 'sell' the electricity produced by the system to Power and Water, under a Power Purchase Agreement. Currently, householders sell the electricity generated to Power and Water at 19.23 cents/kWh (this is equivalent to the standard tariff rate for consumption in 2010/11). For example, if a householder has installed a 2kW solar system, the estimated financial return (assuming a roof with good solar access) will be 3,200kWh X \$0.1923, or around \$615/year. Commercial customers will also typically be paid a rate equivalent to the tariff rate for consumption.

For more information about connecting to the grid and applicable buy-back tariffs for homes or businesses, visit [www.powerwater.com.au/business/renewable\\_energy/solar\\_buyback\\_program](http://www.powerwater.com.au/business/renewable_energy/solar_buyback_program) or phone Power and Water on **1800 245 092**.

## Questions to ask your solar PV installer

Purchasing a solar power system is a major investment for your home. Alice Solar City encourages householders to undertake an appropriate amount of research to ensure that they choose a quality system, at a cost effective price. The following are questions householders or business owners considering installing a solar power system should ask any proposed installer:

- What brand of solar panels and inverter will be used - are these guaranteed to be used, or will the supplier substitute equipment according to availability of supply?
- If product substitution does take place, will the householder be informed in advance or given the option to withdraw?
- Where does the installer intend to install the inverter? As inverters do produce a 'humming' noise, it should be located away from day time living areas. Depending on the inverter, this may be outside, ideally out of direct sunlight.
- Does the installer undertake a formal assessment of expected performance of the proposed system and provide a written quote to the householder which includes information on warranty, performance etc?
- What is the length and type of warranty? 5 year warranty on inverter; 10 year product warranty and a 25 year (at 80% output) warranty is recommended as a minimum for solar panels.
- What is the track record of use *and* servicing in Australia of the major components to be used?
- What is the track record of the company itself (ask for references) and who will they use to carry out the installation — are they local or 'fly in'?
- Does the installer do a formal inspection of the site, assess expected output and provide a written quote before asking for a deposit or a commitment from the householder? Alice Solar City highly recommends site inspections prior to accepting a quote or paying any deposits.
- How does the installer propose to provide local support for warranty and service claims?
- Where package prices are advertised, are there extra costs involved? For example meter installation, grid connection, building permit costs, two storey buildings, or any upgrades to the meter panel or switchboard. Alice Solar City strongly encourages householders to arrange a site inspection and formal quote to ensure that the full cost of the system installation is known upfront, i.e. prior to accepting a quote or paying a deposit.
- Does the installer manage the process of connecting the solar system to the electricity grid or obtaining any applicable building permits?
- Does the installer require a deposit and what is the timeframe between paying a deposit and installation?
- Does the company provide a point of sale discount through the purchase of Renewable Energy Certificates (RECs) and if so, what price is paid for each REC?



### How to find an installer

An accreditation system for solar installers is in place across Australia and there are a number of accredited PV installers in Alice Springs. Alice Solar City can provide contact details for the suppliers who are providing fixed price package deals for solar power systems.

Visit the Smart Living Centre at **2/82 Todd Street** or our website **[www.alicesolarcity.com.au](http://www.alicesolarcity.com.au)** for more information.

**Phone: (08) 8950 4350**



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## What are the steps involved in 'going solar'?

- 1** Speak to one or more accredited solar installers to arrange a site inspection and quote (Alice Solar City can provide names of installers). The site inspection is required to confirm that the house is suitable, provide an estimate of expected output, and to identify any additional work required to be undertaken as part of the installation, including any upgrade required to the meter panel or switchboard.
- 2** As part of your decision on which installer or package to proceed with, refer to the *Questions to ask your solar PV installer* on the previous page.
- 3** Installing a PV system may require a building permit; your installer will provide information about any building permit requirements that may apply and the process and costs involved.
- 4** Once you have accepted a quote and paid any applicable deposit, your installer will schedule an installation date. If a building permit is required, this should be obtained prior to installation.
- 5** You should complete the necessary Agreements with Power and Water (Network Connection Agreement and Power Purchase Agreement) and pay the applicable fee. Power and Water should approve the connection prior to the installation commencing.
- 6** Installer carries out the installation (usually completed in less than 1 day) and will require full payment. The installer should provide you with a system manual, commissioning sheet and Certificate of Compliance.
- 7** Installer provides relevant documentation to Power and Water. Subject to the documentation being correct and the installation being in compliance, Power and Water will install the new electricity meter and the system is 'turned-on'. Delays in turning the system on can result if the completion advice provided to Power and Water is incomplete or the PV installation is sub-standard.

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