

SOLAR POWER BUYER'S GUIDE

THE MANDATORY GUIDE BEFORE YOU
SWITCH INTO SOLAR ENERGY

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Introduction

Household and commercial use of solar systems has grown significantly in Australia this decade, due to increased awareness of the risk of dangerous climate change, the reduced cost of systems and a range of government incentives to encourage use of the technology.

Solar power systems are now an affordable option for Australian households looking to reduce their power bills and generate their own clean electricity. With the increased range of products and suppliers on the market, being an informed consumer has never been more important.

This guide provides an introduction to solar PV systems so you are better equipped to make choices about a product that is right for you. In the appendix section of the guide, there are a number of authentic resources cited for your reference.

This guide is intended for people who are looking into improving their power bill by going solar.



Step-by-Step Process to Installing Your Solar PV System

1. You conduct your own research into the benefits of having a solar PV system installed (this guide is designed to be of great help for people who are considering switching to solar energy). In particular, you should ensure that you understand what will happen to your meter, your electricity tariff and your electricity bill before you agree to have a PV system installed.
2. You contact us and express your interest in getting a solar quote. We help you connect with several licensed solar installers to arrange for multiple quotes. You can receive at least 3 quotations from authorised installers in your area only by filling up one form to be found at www.comparesolarquotes.net.au, you can request for more if necessary!
3. By asking informed questions, (see 'Questions to ask your Solar Installer'), you then select an accredited solar installer.
4. The solar installer recommends a PV system to meet your requirements
5. Your installer will advise you applicable rebates (research 'what government schemes are in place to lower the cost of purchasing a solar PV system?' are available in your area)

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How does Solar PV Work?

Solar Photovoltaic (PV) panels are generally fitted on the roof in a northerly direction and at an angle to maximise the amount of sunlight that hits the panels.

Solar PV panels on the roofs of homes and businesses generate clean electricity by converting the energy in sunlight. The technology to convert sunlight into electricity was developed in the 19th century, but it was only in the second half of the 20th century that development accelerated behind the need to provide reliable supplies of electricity in remote locations – from satellites in space to outback Australia.

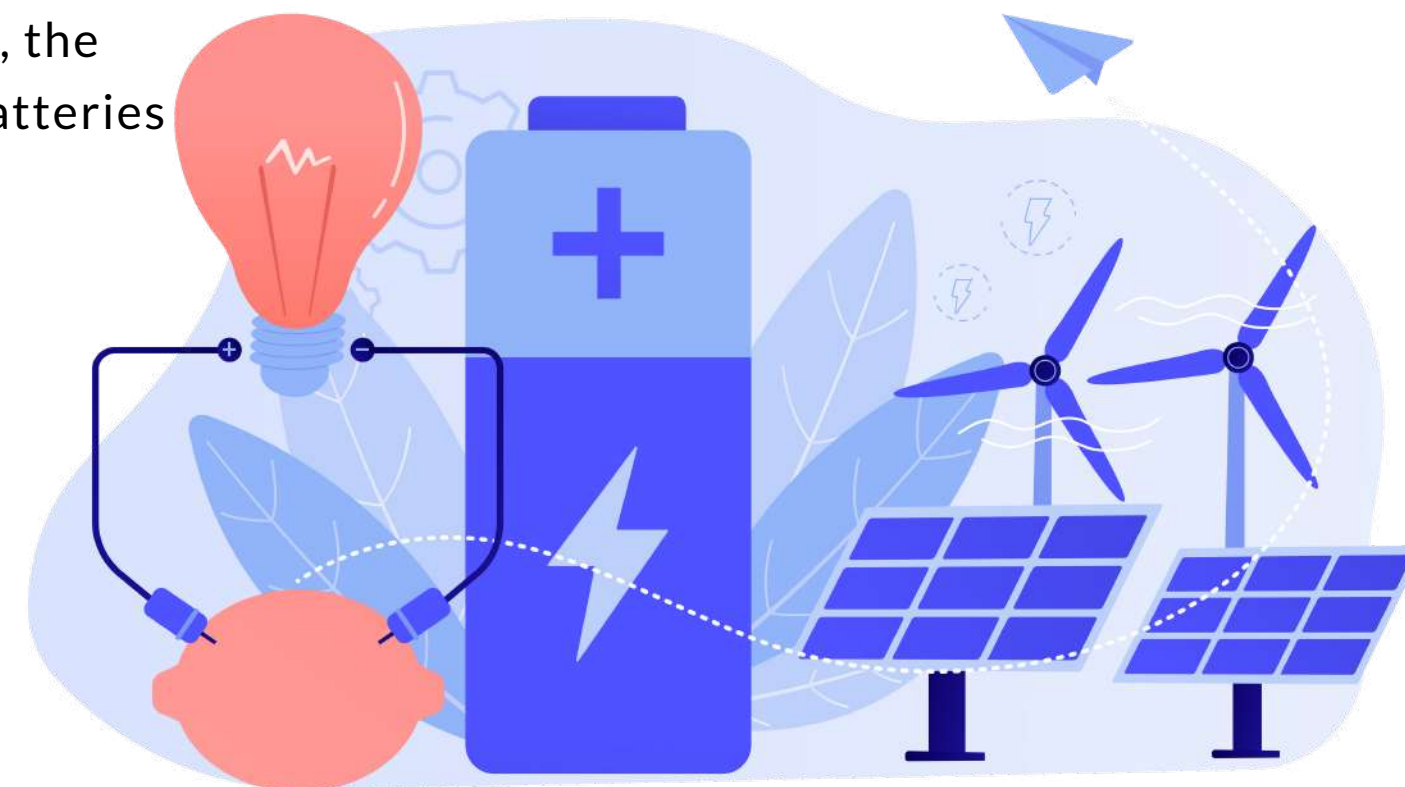
Solar panels have been installed on the rooftops of houses and other buildings in Australia since the 1970s. Currently there are more than 200,000 solar panel systems safely and reliably delivering clean electricity across Australia.



Grid-Connected Solar PV Systems

Most suburban homes in Australia are connected to the electricity grid, which uses alternating current electricity (AC). The electricity generated by solar panels however is direct current (DC). That means grid-connected (GC) solar PV systems need an inverter to transform the DC electricity into AC electricity suitable for ordinary household needs. Houses with solar systems use solar power first before sourcing electricity from the grid.

When the panels are not producing electricity at night, electricity is supplied from the existing electricity grid. For systems with a battery backup (optional), the inverter regulates the charge of batteries. The electricity stored in the batteries can be used at night or during blackouts.





COST

The cost of solar panels has continued to change over the past decade behind different government incentive schemes and increased diversity in the panels, inverters and suppliers on the market. Being an informed consumer hence is increasingly important.

The price of your solar PV system can also be affected by variables including:

- Government rebates and support schemes (these vary in each state)
- Location
- Number of panels
- Orientation of panels
- Type of panels
- Type of inverter
- System design and configuration
- Shipping costs for equipment and parts
- Contractor installation costs





COST

- Removal of trees or other shading
- Type of roofing (for example, tiled or tin)
- Height of roof
- Site preparation needs (for example, condition of roof or ground)
- Structural engineering, architectural, and other professional services (for commercial systems)

Keeping in mind the variables mentioned above, the table below shows an approximate guide on price range for grid-connected solar PV systems in the major capital cities. Below Estimated price is after deducting the Federal Government Solar Rebate and State Government Solar Rebate (where available).



Estimated Price

System Size	Estimated Price Range
4 kW	\$1,690 - 2,790
6.6 kW	\$2,290 - 3,690
9.9 kW	\$3,690 - 5,990
13 kW	\$ 4,190 - 6,990
20 kW	\$ 10,990 - 12,990
30 kW	\$ 13,990 -16,990
39 kW	\$ 14,990 - 17,990



Warranties and Guarantees

Solar PV panels generally come with a performance warranty that can last up to 25 years and a guarantee lasting minimum ten years. Additionally, panel material warranties and workmanship guarantees generally span 5-10 years.

It is important to know who is providing the warranty – the manufacturer or the importer. In the absence of a manufacturer, the importer is responsible for the warranty. However, if the importer changes their business name or sells their business, their warranty obligations towards you cease. Ask your installer who is providing the warranty.



There are currently four types of financial assistance offered for solar PV systems in Australia:

- Federal Government Solar Rebate (STCs)
- State Government Solar Incentive
- Government Subsidised Battery System
- Feed-in Tariffs (for extra Power Selling back to the grid)



Types of Panels

There are three main types of solar panel available, each with their own benefits. During the design and specification stage, your accredited designer will help you choose which type is the best to suit your needs:

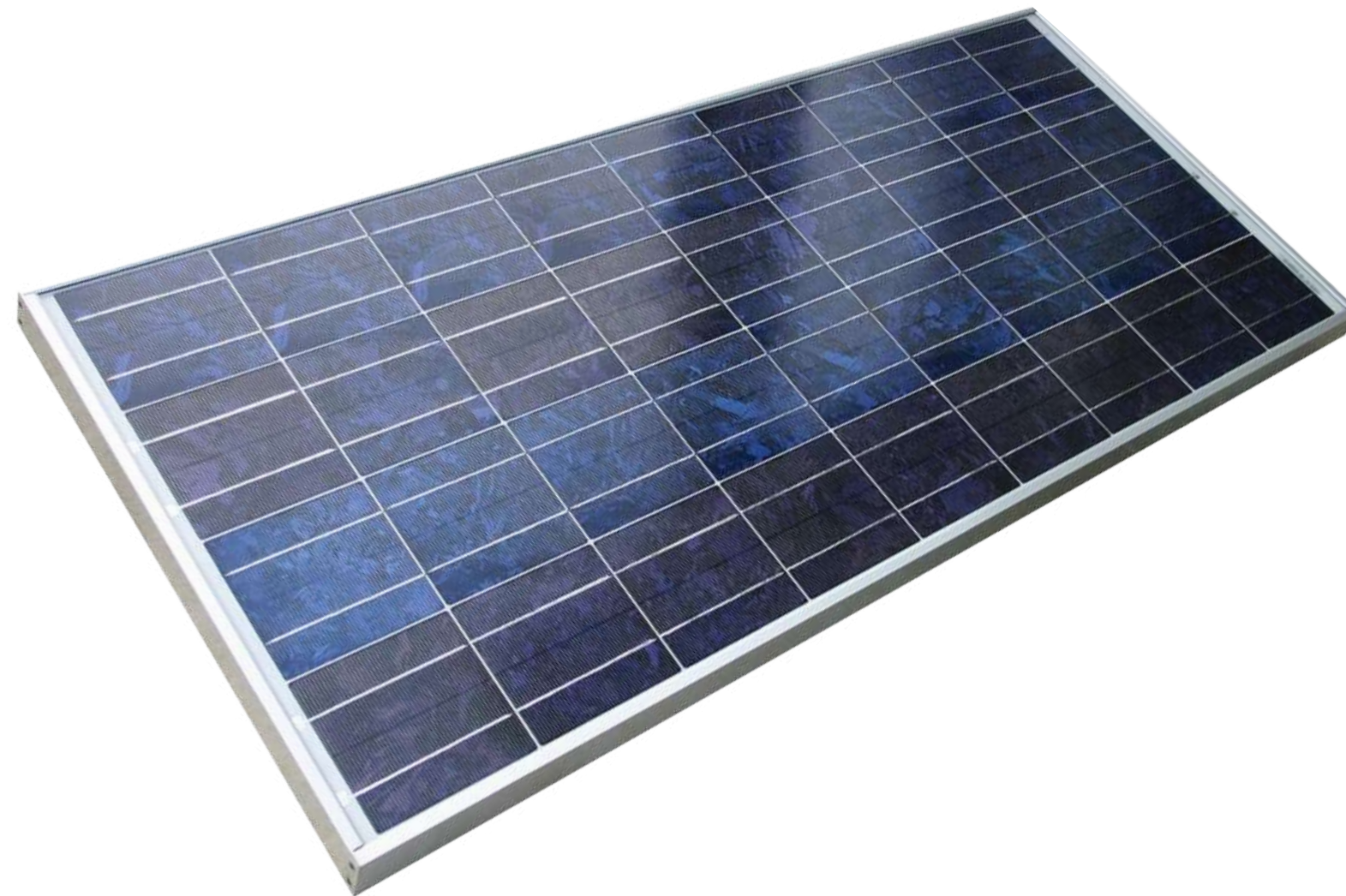
1. Mono Crystalline (monocrystalline c-Si):

These panels are a proven technology that has been in use for over 50 years. They are commonly used where space is limited, or where there are high costs associated with installing large panels. They have a very slow degradation, generally losing 0.25 - 0.5% per year.



2. Poly Crystalline (polycrystalline c-Si):

These panels are similar to Mono Crystalline panels, but the silicon used is Multi-Crystalline which is easier to make. They are comparable to Mono Crystalline in performance and durability. Slightly more panels are required to produce a given amount of electricity.



3. Thin Film:

These panels are typically nearly double the size than the other panel varieties. Research is continuing to improve the performance of Thin Film panels and to refine the manufacturing process. They respond well to slightly diffuse light and their efficiency does not drop on hot days.



For more detailed information, please visit the Desert Knowledge Australia Solar Centre at www.dkasolarcentre.com.au

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Solar Panel's Angel

Solar PV panels produce most power when they are pointed directly at the sun. In Australia, solar modules should face north for optimum electricity production. The orientation of the panels will often have a greater effect on annual energy production than the angle they are tilted at. A minimum tilt of 10° is recommended to ensure self cleaning by rainfall. For grid-connected solar PV power systems, the solar panels should be positioned at the angle of latitude to maximise the amount of energy produced annually. Most Australian homes have a roof pitch of 20° to 30° . If your roof's slope is not ideal, your accredited installer can create an appropriate mounting frame to correct the orientation and elevation of your panel. Failing this, the installer can advise you on the difference in energy output for different tilt and orientation.



Image Reference : <https://www.isolarworld.com/blog/find-the-best-angle-for-your-solar-panel/>

Sunlight

The amount of energy in sunlight that a solar PV panel receives over a day is expressed in peak sun hours. As the amount of energy generated by a panel is directly proportional to the amount of energy it receives from sunlight, it is important to install panels so they receive maximum sunlight. Your accredited designer will calculate the amount of energy generated by the solar PV panel from the peak sun hours available. Peak sun hours vary throughout the year.



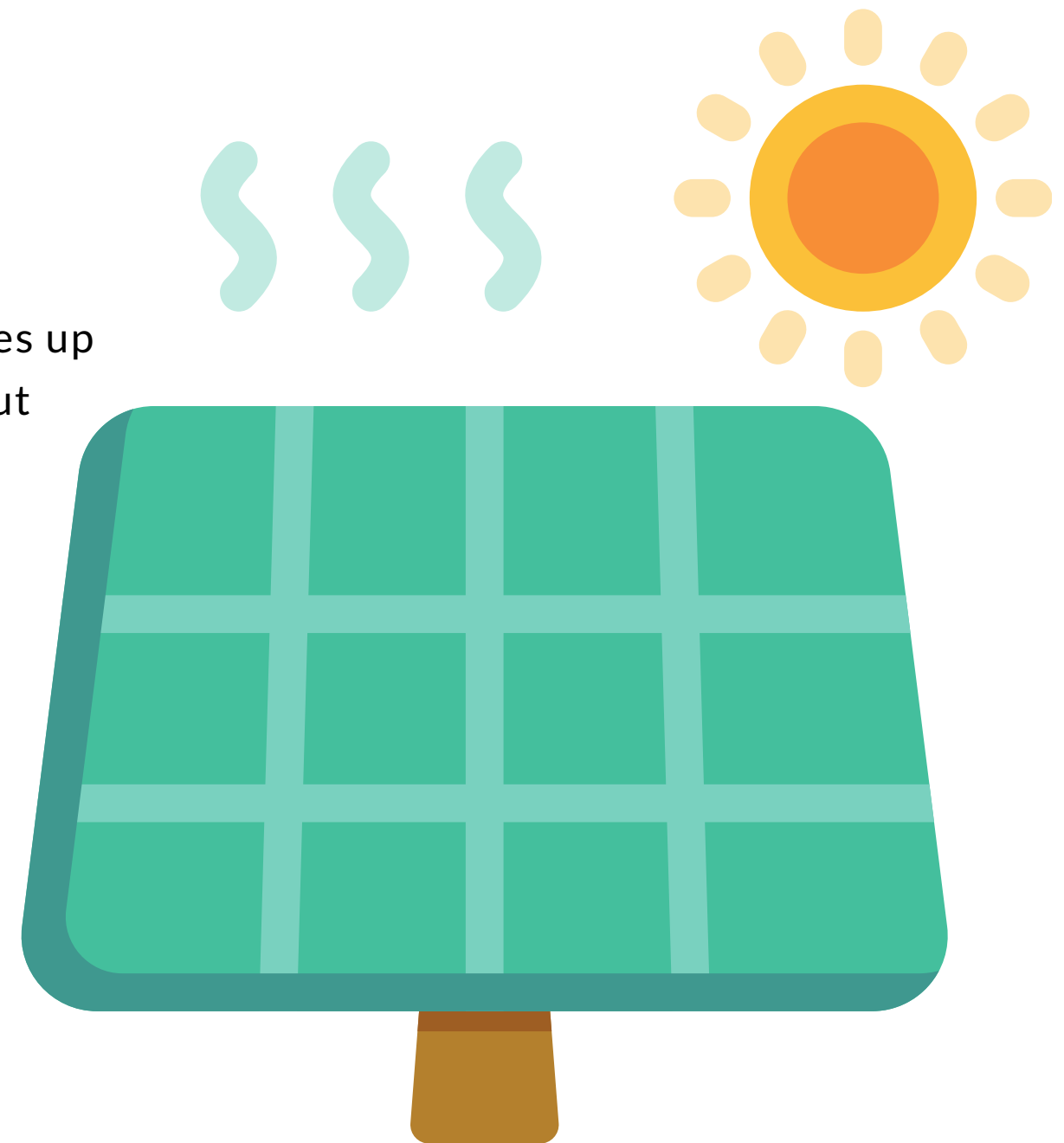
Shading / Dirt

Solar PV panels should ideally be in full sun from at least 9am to 3pm. They should not be placed in shaded areas and be kept free from dust and dirt. Even a small amount of shade - from things like trees, roof ventilators or antennas - will have a large impact on the output of a panel, as it changes the flow of electricity through the panel. Shading or dirt on just one of the cells in a solar panel results in a loss of power from many cells, not just the one that is shaded.



Temperature

The amount of electricity a solar PV panel can generate is reduced as temperatures increase. Solar panels operate best at ambient temperatures up to 25°C. However, if the ambient temperature is higher, the panel's output declines.



Inverter

Solar PV panels produce low voltage DC electricity. The inverter converts this into the AC electricity needed to supply power for standard appliances.

The efficiency of an inverter is measured by how well it converts the DC electricity into AC electricity. This usually ranges from 95% to 97.5% for most models. Check the inverter's specifications before you purchase. Inverters are sized according to the power (watts) they can supply. It is also important to ensure that your grid-connected inverter complies with Australian Standards. This is required to be eligible for the REC's and Solar Credits. Ask your accredited installer to provide proof that your inverter meets Australian standards.



Image Reference : <https://firstgreenconsulting.files.wordpress.com/2013/02/solar-power-inverter-sb-3300-3800.jpg>

Meter

When your solar PV system is installed you may need to have a new meter installed. If you have a traditional accumulation meter (with a spinning disk) this will need to be replaced with an interval meter or smart meter. This is because an accumulation meter does not record the energy you export to the grid or the electricity you import from the grid. An interval meter or a smart meter provide half hourly readings of the electricity you consume and the surplus electricity you generate. The states and territories have committed to the progressive rollout of smart metering across Australia from 2007. While a smart meter is similar to an interval meter in that it records electricity usage in 30-minute intervals remotely to your electricity company, smart meters have a range of additional capabilities. So if your new meter is an interval meter, it will need to be replaced again with a smart meter when this rollout occurs. Learn more at www.comparesolarquotes.net.au



Appendix

1. Clean Energy Council - cleanenergycouncil.org.au/cec/resourcecentre/ConsumerInfo/connecting-to-the-grid
2. Clean Energy Council - solaraccreditation.com.au/accecc/approvedproducts
3. Office of the Renewable Energy Regulator - www.orer.gov.au
4. Office of the Renewable Energy Regulator - www.orer.gov.au/sgu/index
5. Office of the Renewable Energy Regulator - www.orer.gov.au
6. Department of Climate Change and Energy Efficiency
www.climatechange.gov.au/government/initiatives/renewable-target/needret/solar-credits-faq.aspx
7. Office of the Renewable Energy Regulator - www.orer.gov.au
8. Desert Knowledge Australia – Solar Centre - www.dkasolarcentre.com.au
9. Clean Energy Council - solaraccreditation.com.au/accecc/approvedproducts/inverters





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