ActewAGL Solar

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Consumer guide.

Your guide on how solar works, how much you can save on your electricity bills and how to choose the right provider and system for you.

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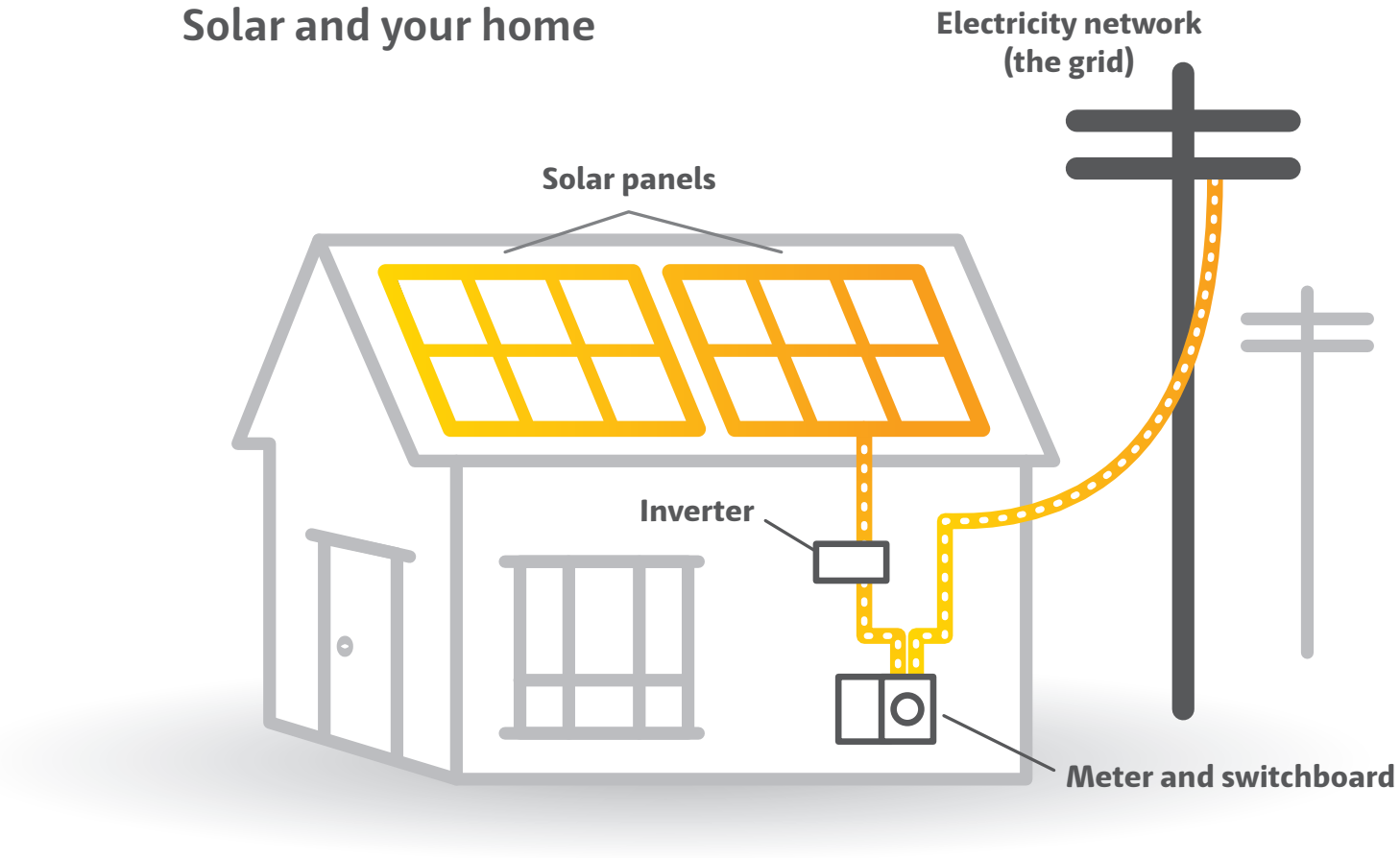
How does solar work?

Solar panels generate clean power by converting the sun's energy into electricity via the modules and special material within the panel. It's a pretty simple process that requires no moving parts.

Most homes in Australia are connected to the electricity grid, which uses alternating current (AC) electricity. But solar panels generate direct current (DC) electricity. So an inverter transforms the DC electricity into AC electricity so that the energy you generate can be used in your home (see diagram below).

Solar and your home



Why choose solar?

Switching to solar is a great way to reduce your electricity bill and protect yourself against the impact of rising electricity prices. It's also one of the most rapidly growing renewable sources of electricity. Here's why:

Financially smart: once you have installed your solar system, the savings you make will continually increase as the price of electricity rises.

Sustainable: electricity generated directly from the sun is much more sustainable than burning fossil fuels.

Emission-free: the production of solar power is completely silent and odour-free.

Renewable: while the sun continues to shine, we will never run out of solar power.

How is solar metered or measured?

New solar connections in the ACT are net metered. This means your home will use the solar electricity you generate to power things like your appliances and lights. Only the 'excess' solar energy you generate is exported to the electricity network and you'll see this as a credit on your electricity bill.

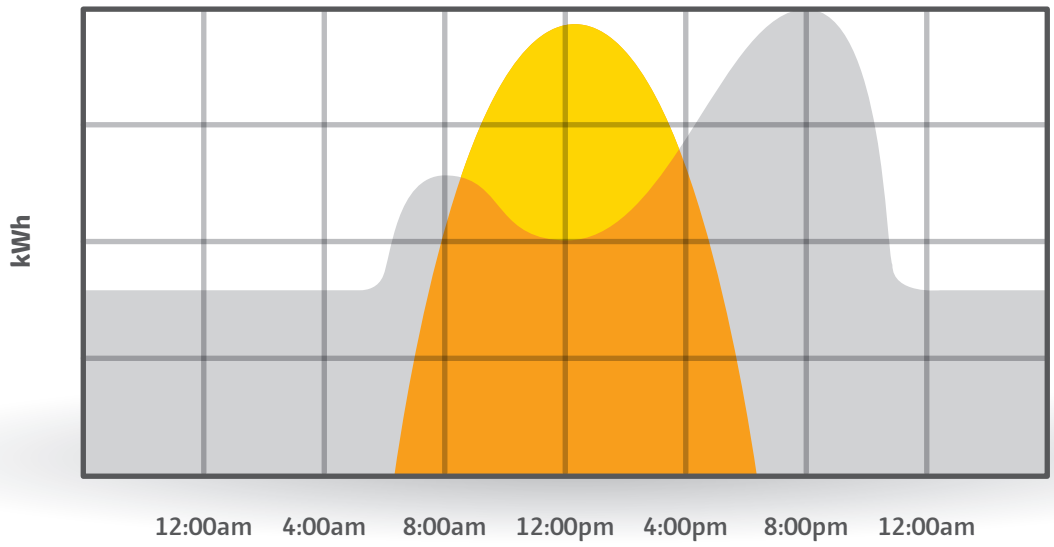
So, in other words, solar helps you save in two ways.

1. It reduces the amount of power you need from the electricity network.
2. You receive a credit on your electricity bill for the excess electricity exported from your system.

Take a look at this graph for more of an explanation about net metering.

Net metering

24-hour graph



Grey = your typical electricity use throughout the day.

Orange = the solar energy you generate and use in your home (this is electricity you'd normally buy from the network).

Yellow = the excess solar energy you generate and export back into the electricity network.

By making small changes to the way you use your household appliances, you can maximise your solar generation. For example, a typical dishwasher uses around 300 kilowatt hours (kWh) of electricity per year. By using the delay start function so it runs in the middle of the day, rather than straight after dinner, you could reduce both your exported and imported electricity by up to 300 kWh. That's a saving of around $40 per year!

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How much solar energy can be generated and what are the typical savings on an electricity bill?

The solar panels on your roof only generate power when there is sunlight. The greatest output happens during the sunniest part of the day and, it goes without saying, they produce more energy in summer than winter.

In Canberra to maximise the amount of energy your panels generate each year, panels should be installed north facing and tilted at 30 degrees to the horizon – most homes in Canberra have a typical 30 degree roof pitch.

Here is an overview of how much annual generation you can expect to get based on different panel orientations and tilt (expressed as a percentage of the maximum possible). This shows that you really need to aim for your panels to be installed facing north and tilted at 30 degrees (or as close to north as possible).

Estimated annual solar generation based on panel orientation and tilt

	Tilt relative to horizon						
Direction	0° (flat)	10°	20°	30° (standard)	40°	50°	60° (steep)
West (270°)	87%	87%	86%	83%	79%	75%	70%
North west (315°)	87%	93%	96%	97%	95%	92%	87%
North (0°)	87%	94%	98%	100%	99%	96%	91%
North east (45°)	87%	92%	95%	95%	94%	91%	86%
East (90°)	87%	88%	86%	84%	80%	76%	71%

The following table provides you with an overview of the average solar generation and potential electricity bill savings for various system sizes installed in Canberra (based on the important principles already mentioned: panels facing north and tilted at 30 degrees with no shading issues).

Your potential solar generation and savings

	Average solar energy generated		
System size	Per day	Per year	**Estimated electricity savings per year**
2.08kW	7.9 kWh	2,875 kWh	**$470**
3.12kW	11.8 kWh	4,312 kWh	**$630**
4.16kW	15.8 kWh	5,749 kWh	**$760**
5.20kW	19.7 kWh	7,186 kWh	**$890**

These estimates are based on the following assumptions:

1. Solar panels installed facing north and tilted at 30 degrees to the horizon with no shading issues.
2. Our 2016/17 ACT Electricity Prices, including our ActewAGL ACT Small-Generator Buyback Scheme and our Home plan.
3. Average annual ACT residential electricity consumption of 8,000kWh per year.
4. The Australian Energy Market Operator's profile of average customer electricity consumption in the ActewAGL Distribution network area.
5. The Clean Energy Regulator's Zone 3 rating (which means 1,382kWh of annual solar production for each 1kW of solar generating capacity).

There are a couple of things that could make your savings slightly different to these estimates, including if there are shading issues, if your panels are placed on a less than ideal area of your roof, if your panels become dirty, and differences in your electricity use compared to the average.

And if you use more electricity during the day, the savings you make on your electricity bill will be higher. That's because more of your solar generation is used on-site.

The savings you make from solar will keep increasing over the years as the price of electricity rises.

What are Small-scale Technology Certificates?

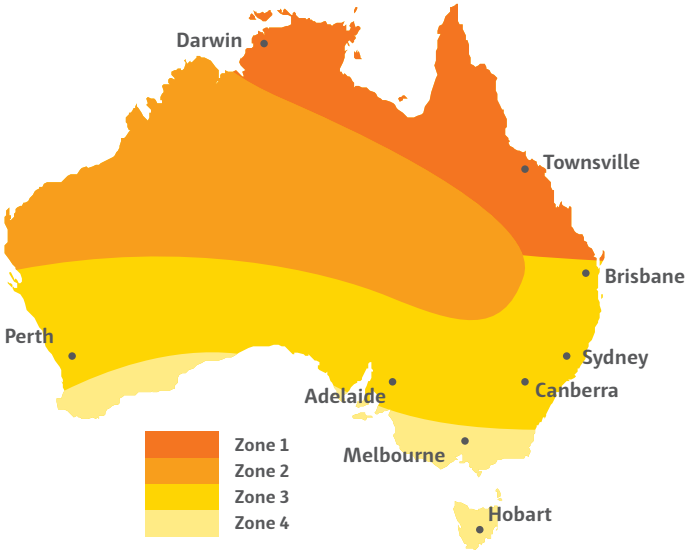
Also known as "STCs", Small-scale Technology Certificates help subsidise the cost of your solar system.

But why?

As part of the Federal Government's Small-scale Renewable Energy Scheme (also known as the RET scheme), if you install solar you are entitled to create STCs for 15 years of future solar generation. But to qualify for STCs, your solar provider/installer must be accredited by the Clean Energy Council. One STC is equivalent to 1,000 kWh of electricity generated by your rooftop solar system.

The level of subsidy you receive depends on how many STCs your system is entitled to create, along with the market price of STCs at the time. Australia is divided up into various zones based on how much renewable energy a solar panel can generate. If you take a look at the picture below, Canberra is located in zone 3. The same sized system installed in Canberra (zone 3) receives more STCs than in Melbourne (zone 4) because Canberra has more sunshine hours so more solar energy is generated.

Australian solar zones



STCs are traded on the STC market, so the price varies according to supply and demand. As at January 2015, solar providers in Canberra were generally offering between $30 and $37 for each STC. The table below gives an indication of the STC subsidy you could expect to get in Canberra, based on system sizes between 2.08kW and 5.20kW at ActewAGL Solar's STC price of $39.50.

Your STC subsidy

System size	STCs	Total subsidy
2.08kW	43	$1,698.50
3.12kW	64	$2,528
4.16kW	86	$3,397
5.20kW	107	$4,226.50

Why is Clean Energy Council accreditation so important?

The Clean Energy Council's accreditation scheme makes sure that accredited solar providers and installers have had the necessary professional training, follow industry best practice, adhere to Australian standards, and regularly update their skills and product knowledge.

It's essential that you make sure your solar provider is accredited by the CEC. This will give you peace-of-mind in knowing that you're dealing with qualified professionals and that your solar system is eligible to create STCs.

CLEAN ENERGY COUNCIL

Tips

How do I choose a good solar provider?

There are so many solar providers to choose from. So what's important when choosing your provider? Although price is always important, there are a number of other factors to really consider when you make your decision.

- **Are they local and reputable?** You're more likely to get a quick response on any potential issues from a local company. Plus you'll have confidence in knowing they'll be close-by to address any issues that may arise. Well-established companies can often pass on savings due to increased buying power, so they don't need to cut corners to reduce costs like other providers may do – it's important to do your homework.

- **Are their installers accredited by the Clean Energy Council?** Not only does this ensure you're dealing with qualified professionals and receiving quality products, but that your solar system is eligible to create STCs.

- **Have they properly assessed the best location on your roof for your panels?** Providers should assess the suitability of your roof, the shading affects from chimneys and trees and recommend the most appropriate size system for you and your budget. If there are any shading issues, the best providers will offer to do an on-site check.

- **Do they take a good look at your electricity use and consumption history?** Your provider needs to have a good understanding of your electricity use – both current and historical – when they estimate the bill savings you can expect from your solar system. Make sure they're not overstating the generating capacity of the system or applying inflated electricity prices in their calculations.

- **Do they offer high quality panels and inverters?** This is really important, because it is the heart of your solar system.

- **Do they offer a warranty?** The best solar providers will make sure you're covered by these warranties.
  1. Installation: a workmanship warranty on the installation of your solar system.
  2. Solar panels: both a 10-year product warranty and a 25-year linear performance warranty.
  3. Inverter: a 5-year product warranty.

- **Will they offer you an end-to-end service?** The best providers facilitate the paperwork associated with claiming your STCs, arrange for the distribution company to upgrade your meter and help you to facilitate a booking with your local authority to arrange an electrical safety inspection (mandatory in the ACT).

- **What do they include and exclude in their quote?** Some providers don't include the cost of the solar meter upgrade or the safety inspection fee which can add around $300 to the final price. Also, check whether their price includes the STC subsidy – and was this quoted firm or indicatively? Many providers quote an indicative value for STCs and then when you go to accept the quote you find that the STC price offered at point of sale is less 'because the STC market has dropped'.

- **Are their installers properly trained?** Working with electricity and heights can be dangerous – so make sure the installer is trained in safe work practices.

Tips

What should I look for in a solar system?

- **Quality:** the best rooftop solar systems feature high quality panels matched with a high quality inverter. If you're paying much less than other similar size systems quoted, you may get inferior quality equipment and/or installation.

- **Make sure your panels and inverter are accredited by The Clean Energy Council (CEC):** go to www.solaraccreditation.com.au/solar-products.html to make sure that both your panels and inverter are on the CEC's list of accredited products. This is a mandatory requirement for your solar system to be eligible to create STCs.

- **The manufacturer's warranty:** manufacturers offering better warranties do so because they have greater confidence in their product. Panels have two warranties – the manufacturer's warranty (also called the product warranty) and the performance warranty. Good quality panels carry a 10-year product warranty and a 25-year linear performance warranty. Make sure you look for a linear performance warranty – it provides you with a guarantee that your panels will perform at a higher output over the entire 25-year period, compared to a standard warranty. In terms of inverters, even the most expensive ones only include a standard 5-year warranty. So look for inverters that have a reputable presence in the Australian market – you want confidence that if a warranty issue arises that they'll be around to honour it.

- **Don't pay extra for ultra-efficient panels if you don't need to:** unless you don't have a lot of roof space, you don't really need to pay the extra cost for higher efficiency panels. Higher efficiency just means that panels are physically smaller for the same output. Panels offering 15% efficiency or more is enough. But you should look out for panels with a 0% negative power tolerance, which many manufacturers offer these days. It means the manufacturer guarantees the panel output will match (or exceed) the panel's rating, which indicates that the manufacturer has good quality control processes in place.

- **Panels with a performance ratio of 90%:** the specification sheet you receive for your solar panels tells you how your panels perform under lab conditions. However, once your panels are on the roof they operate in much hotter conditions. As panels heat up their performance reduces. So it's important to look for panels with a performance ratio of 90% or higher. The performance ratio indicates how your panels operate under "real world" conditions vs lab conditions. Not many panels perform at over 90%, so it's important to check that yours will.

- **Inverters with a good Euro efficiency, rather than peak efficiency:** inverter efficiency is the percentage of DC power from your panels that is converted to 240V AC mains power so it can be used in your home and fed back into the electricity network. An inverter's efficiency varies depending on how hard it's working (load). So don't just look for an inverter with the highest peak efficiency (which is likely to be between 94-98% in Australia). It is much better to choose an inverter that has higher efficiency over a broad range of load (which is Euro efficiency).

- **Waterproof inverters:** even if you choose a waterproof inverter, you should still make sure it's installed in a position out of the rain and hot sun to protect it from heat and weather.

- **MPPT inverters:** MPPT is short for "maximum power point tracker", which basically means the electrical operating point of your panels can be varied so that your panels deliver the maximum amount of power. For most solar installations a single tracker MPPT inverter is all you need. Dual MPPT inverters are recommended when panels are installed as a 'split array' and either: a. the arrays are different sizes; or b. the arrays are the same size but one of the arrays receives partial shading. A split array is required when all of your panels won't fit on one area of the roof (e.g. your north-facing roof space is too small to fit all your panels and you have to put a second array of panels on the west-facing area of your roof).

Tips

What's important in terms of installation?

- **The location of your solar panels:** this is the single most important thing that your solar installer needs to get right – you want your panels located on the section of your roof that'll maximise their generation potential considering the orientation and pitch of the roof. In Canberra, panels should be installed facing north and tilted at 30 degrees to the horizon. Panels should not be placed in shaded areas. Even a small amount of shade from things like trees, roof ventilators or antennas can have a significant impact on output, and shade on just one panel can result in lots of panels losing power. Your provider should offer to do an on-site check if there are any potential shading issues.

- **The structure of your roof:** solar panels should be mounted on high quality aluminium racking that meets Australian standards. Not only should the racking meet Australian standards, the panels should be installed in accordance with the manufacturer's guidelines to ensure they are fixed properly to your roof.

- **The quality of the parts:** only high quality components should be used for the remainder of your rooftop solar system (e.g. the wires, isolators, connectors and flashings).

- **Workmanship warranty:** your installer should provide you with a workmanship warranty that covers the installation. Some installers will only offer 12 months but good installers will provide a five-year warranty on workmanship.

We hope this guide has provided you with some helpful information and tips on important things to consider when choosing a solar energy system and provider. Further information is also available in the FAQs on our website. And if you have any questions, we're here to help.

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