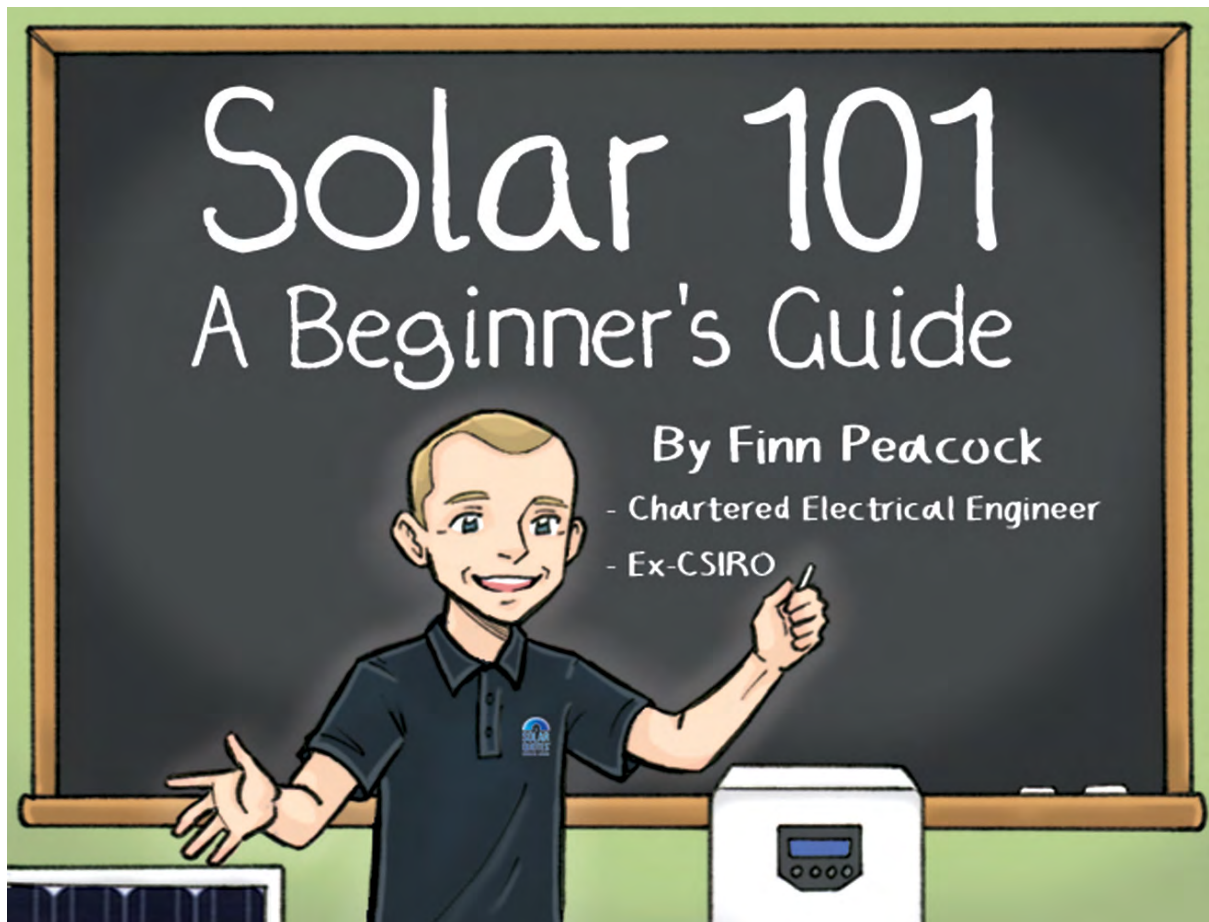




SOLARQUOTES[®]
SINCE 2009



BUYING SOLAR POWER

2022 EDITION

This cheat-sheet is for you if you are thinking of investing in solar power.

Part 1 of my [Solar 101 series](#) covered understanding solar power and the rest of this website contains lots more information on everything you could need to know about solar energy and installation. But there is so much information on my website it can feel a little like tumbling down a rabbit hole.

That's why I created this Solar 101 buying guide, which should take you about 15 minutes to read.



Pro Tip: Are you a commercial property owner? read my [Commercial Solar 101 Guide](#) – it's written specifically for businesses.

If you're feeling confident about solar power systems already and you're looking to get quotes from quality pre-vetted [Australian installers I trust](#), [click here](#).

Otherwise, here's what you should know before you get quotes for solar power and proceeding with buying a system and installation:

- 1) [The four main components of a solar power system.](#)
- 2) [A good solar installation is critical.](#)
- 3) [The basics of roof direction/angle for optimal solar electricity generation.](#)
- 4) [Understanding how your home uses solar energy.](#)
- 5) [How many solar panels should you buy?](#)
- 6) [The solar rebate: still very much alive and kicking and generous.](#)
- 7) [What price range can you expect to pay for quality solar power?](#)
- 8) [How to calculate the savings and payback of a solar system.](#)
- 9) [Batteries – do you need them?](#)
- 10) [How are you planning on paying for your system? Understanding finance.](#)
- 11) [Remote inverter shutdowns and a “solar tax” – scary sounding, but benign.](#)



Beginners Note: kWh stands for 'kilowatt-hour.' It is a unit of energy. It measures how much electricity is used over time. A typical Australian home uses 16-20 kWh of electricity per day.

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#1 The four main components of a solar power system

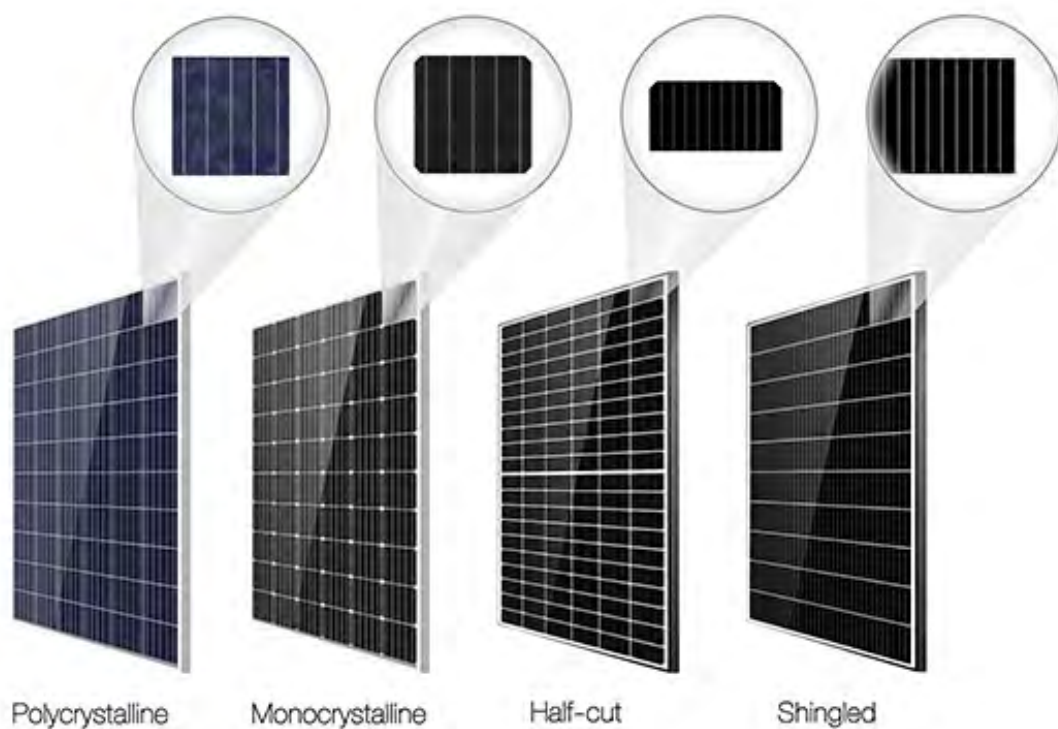
There are four main parts of a home solar power system:

- Solar panels
- Solar inverter
- Racking/mounting
- Monitoring

Let's go into more detail for each:

Component #1: Solar panels

Solar panels are simply a collection of 60 or more solar cells. Panels can use different cell types and cell arrangements:



Pro Tip: There are some benefits to using half-cut or shingled panels over conventional ones if you have shade that creeps up on the solar panels through the day. Otherwise, don't stress – any cell arrangement will work well.

They also come in two sizes: 60/66-cell “residential size” and 72-cell “commercial size”. Despite their names, you can use either on a residential roof.

Commercial size panels are a bit bigger and heavier than “residential-sized” solar panels. Their advantage is that they pump out more watts, so you can squeeze more power out of fewer panels on the roof.

The downside is that their size and weight makes them more difficult to work with. This means the installer needs to spend more time making sure the install is compliant.



Pro Tip: Don't install 'commercial-sized' panels on small residential roofs – you're asking for trouble.

It doesn't really matter if you get mono, poly, regular, half-cut, shingled, 'residential-sized' or 'commercial-sized' solar panels.

What matters most is that you get a good brand that has a solid Australian support team.

Solar Panel Brands

Now, you probably don't know a good solar panel brand from a lemon. And why should you?

Here's a handy chart of all the brands I consider to be good quality and well supported in Australia:



If you want to play it safe, stick to the brands on this chart! See the [criteria developed for the chart here](#). **Note: SolarQuotes does not take incentives from manufacturers to promote or give their solar panel brand preference.**

This list is not exhaustive – if you're not sure about a brand, shoot me an email. Be aware that my reply will most likely be, "play it safe and stick to a brand on my chart"!



Pro Tip: Find detailed reviews of each brand here: [Q-Cells](#) | [LG](#) | [Trina](#) | [Jinko](#) | [Phono](#) | [Sunpower \(Maxeon\)](#) | [Seraphim](#) | [Canadian Solar](#) | [Suntech](#) | [REC](#) | [JA Solar](#) | [Tindo](#) | [Longi](#) | [Winaico](#) | [SolarWatt](#).

To get an idea of how buying premium panels will affect your budget, going for a high-end brand such as Sunpower over a budget-end brand like Jinko can add about 30% to the total system cost.

The difference in *performance* between budget and premium brands is marginal. The main difference between the two is:

- How much their energy output will degrade over the years.
- The length of their product warranty.

For example, 370W Jinko solar panels are warranted to have 83.1% of their rated output after 25 years and have a 12-year product warranty.

Top-end 400W Sunpower Maxeon panels are warranted to have 92% of their rated output after 25 years and have a full 25-year product warranty.

But – the Sunpower Maxeon costs more than double that of a Jinko panel. Is that slower performance degradation and longer product warranty worth the extra price? That's a decision for you to make.

Component #2: Solar Inverter

The second main component of a home solar power system installation is the inverter. They come in two main flavours:

- A string inverter, which is around the size of a briefcase
- Microinverters, which are around the size of a paperback book.



String Inverter
(1 per solar system)

or



Micro-inverter
(1 per solar panel)

Microinverters cost more than string inverters, but bring a number of benefits

String inverters go on a wall, and all the solar panels connect to it. Microinverters go on the back of, or underneath/beside, **each** solar panel.

There's also a third option – 'power optimizers'. These are a hybrid between the two. An optimiser system has both a string inverter on the wall *and* optimisers on each panel.

You can read about the pros and cons of each [inverter choice in detail here](#).

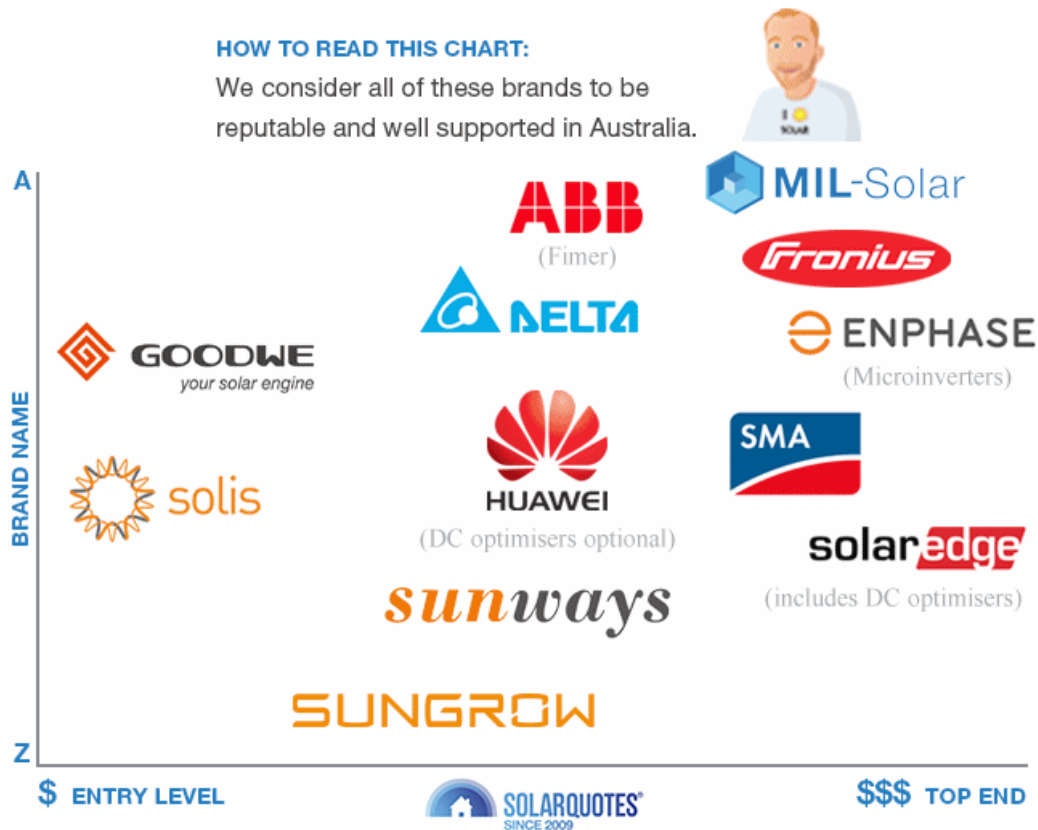


Pro Tip: Never mount a string inverter where it will be in full sun. Choose a shaded spot, a cool garage, or ask the installer to build a simple shade over the inverter. Direct intense sunlight kills inverters because it cooks them – and Australia's sun is particularly harsh. Installing an inverter where it is exposed to direct sunlight may also void its warranty.

Solar Inverter Brands

Here's a rundown of the inverter brands available in Australia I believe to be good quality and well-supported.

Again, this list is not exhaustive. But, any reputable installer has a 95% chance of quoting you one of these brands:



*These are all inverter brands I'd be happy to install on my own house. You can view the criteria we [developed for the chart here](#). **Note: SolarQuotes does not take incentives from manufacturers to promote or give their solar inverter brand preference.***



Pro Tip: Find reviews of each brand here: [ABB](#) | [SMA](#) | [Fronius](#) | [Goodwe](#) | [SolarEdge](#) | [Delta](#) | [Huawei](#) | [Sungrow](#) | [Enphase](#) | [Solis](#).

The inverter is the component most likely to fail in the first 10 to 15 years. This is because they work hard all day and they do wear out.

If your inverter fails – it will bring down your whole system unless you're using micro-inverters.

So even if you're on a limited budget, I'd recommend considering a mid-range or high-end solar inverter. I'm confident they'll last longer than the cheapest ones.

High-end inverters (like Fronius) cost about \$1000 more than budget-end ones (like Goodwe).

What about optimiser or microinverter based systems? Expect to pay about \$3000 more than what a budget inverter system would cost.

Component #3: Racking/mounting

What connects your solar panels to your roof? The **racking**.

There is a wide variety of racking brands out there. At the end of the day, racking is simply aluminium bolted together.

Most brands are much of a muchness, except for premium brands like Radiant. They provide more flexibility in the system's design and may corrode less over decades.

The chart below shows brands we're familiar with. The difference in price between a budget end brand and a premium end brand is around \$100 per kilowatt.



The main difference between racking brands is how easy they are for installers to work with, especially with difficult roofs. **Note: SolarQuotes does not take incentives from manufacturers to promote or give preference to their racking brand.**

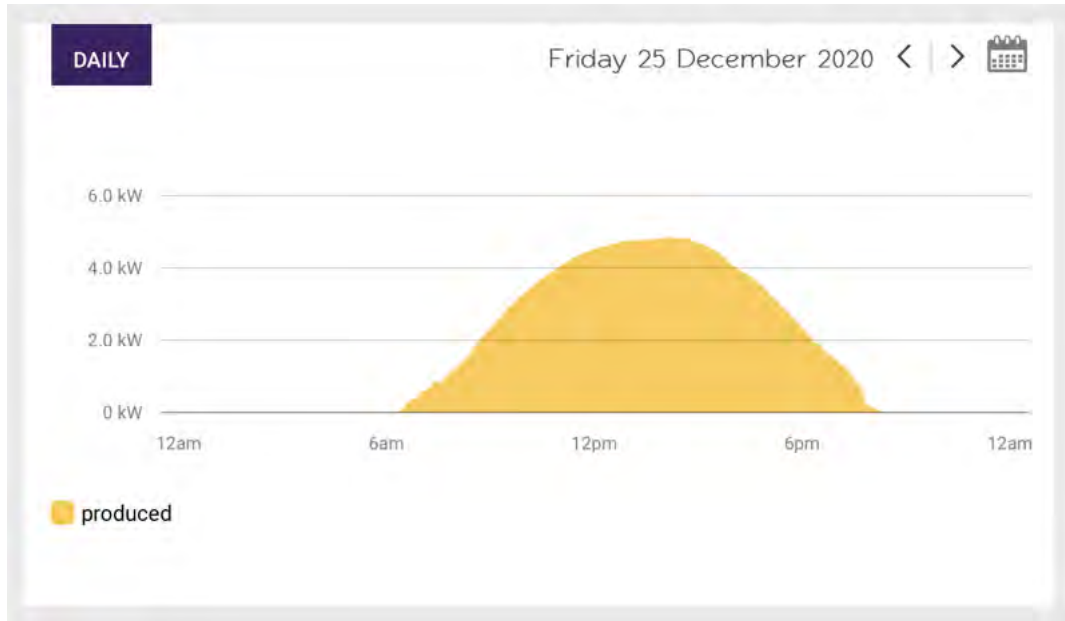
Component #4: Consumption Monitor

Consumption monitors are small devices that sit in your switchboard. They cost around \$500, and measure how much electricity is coming from or going to the grid.



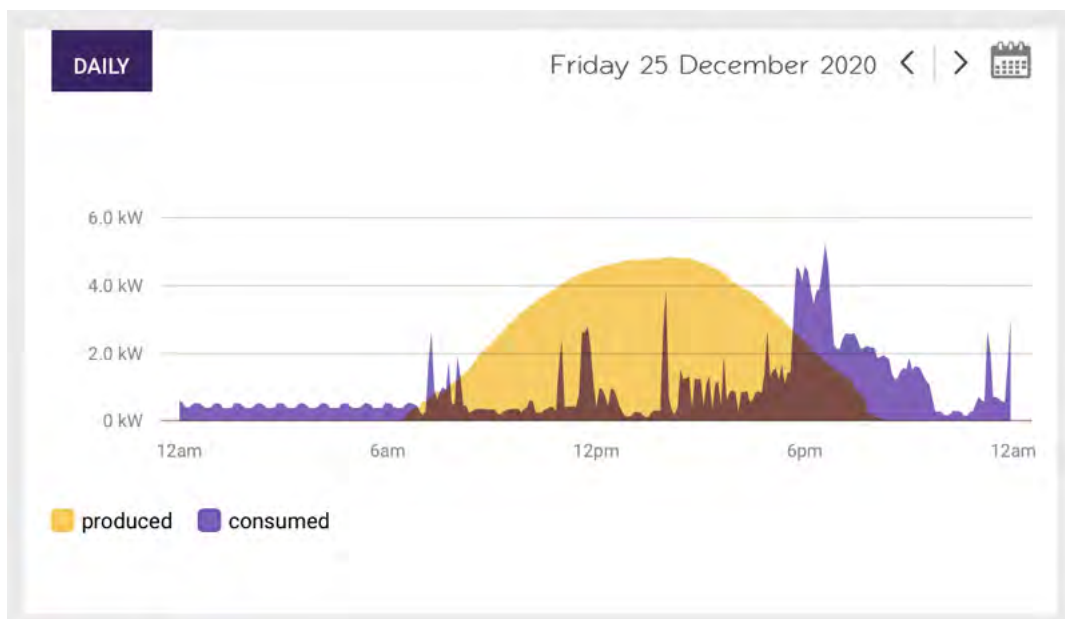
A consumption monitor in my switchboard.

To be clear – you can install a solar system without a consumption monitor. But I strongly recommend getting one. This is because inverters, out of the box, will only tell you how much solar energy your system is **producing**:



You're blind as to how much energy your home is **using** – and when.

If you invest in a consumption monitor, your monitoring app will become much more useful. It will show both production **and** consumption:



The purple area is the energy used by your home. The brown area is when your home is getting 'free' electricity from your solar power system.

This lets you easily see the best way to manage your energy use for maximum savings. I think the added insights you get from consumption monitors make them worth every dollar.

#2 A good solar installation is critical

A bad installer can take good brands – like the ones above – and make a dog's breakfast of the installation.

Such systems not only look crap but can be unreliable, under-perform and be unsafe. Remember home solar systems can have up to 600 volts running through them. The install quality is critical.

To get a better understanding of how a [great solar power system installation looks](#) – [click here](#).

If you are sourcing your own quotes, weed bad installers out by:

- Checking **multiple** review websites. Some reviews websites are easier to game than others.
- Look at the **1-star** reviews. These tell you a lot about the true culture of the company. All companies make mistakes – but some companies make lots of really bad mistakes. Avoid them.
- Looking for **consistency** in ratings across Facebook, Google, SolarQuotes and other review sites. Look for a difference of less than 0.2 stars on their average ranking. Inconsistent average scores is a red flag they are gaming one site.

#3 The basics of roof direction/angle for optimal solar electricity generation.

Panel Direction

First – the absolute basics. The sun rises in the east, and sets in the west.

This means:

- East-facing panels will generate more power in the morning.
- West-facing panels will generate more in the late afternoon.
- North-facing solar panels will generate the most energy overall, but less in the morning and late afternoon compared to east and west-facing panels respectively.

East and west-facing panels will produce about **15% less energy per year** compared to north facing.

But – a working household can self-consume more solar energy with east and west-facing panels, because they produce more energy before and after school/work, accelerating their system's payback compared to a north-facing one.

Sadly, I've spoken to more than one homeowner with a massive east or west roof ripe for harvesting solar energy who thinks it just isn't worth it if their panels can't face north.

It used to be true if you couldn't install panels on a north-facing roof, then a home solar power system wasn't worth it.

Now that prices of solar power systems have dropped so much, you can get a fantastic return on investment from east or west-facing panels, or a combination of north, east and west.

Hell, despite what many well-meaning installers may claim, you can even get a good return with south-facing solar panels!

I am about to install panels on my south-facing roof because I have a battery and two electric cars, and need as much generation as possible to recharge them.

Panel Angle

The ideal panel angle to maximize the energy produced over the whole year depends on your location:

Canberra	Hobart	Darwin	Adelaide	Perth	Brisbane	Melbourne	Sydney
30°	37°	18°	29°	28°	24°	32°	31°

So, for my house in Adelaide, the ideal solar panel angle is around 29° from horizontal.

If you're not able to install your panels at the ideal angle, don't worry too much. The solar panels in my own installation are at 15 degrees, and I only lose 4% in annual energy yield compared to the perfect angle.

Generally, unless your roof is flat, the ideal angle is whatever your roof is built at.

If your roof is flat, you can still install the panels flat – but you need to be aware that you'll lose about 10% of your total annual generation, and you'll need to pay someone to clean them frequently (around 3-4 times a year), as you need at least 10 degrees tilt for rain to reliably run off the panels and clean them.

I recommend using tilt frames for a flat roof to avoid the lost generation and hassle of cleaning them.



Beginners Note: The best angle to mount your solar panels is the angle that your roof has been built at. The exception is flat roofs. If you have a flat roof you must either mount them on tilt frames so they self-clean in the rain, or mount them flat and be prepared to get them cleaned multiple times per year.



Pro-tip: If you have a flat roof and decide to use tilt frames, then consider East/West tilts. These allow you to fit more panels than north facing tilts and the structure can be simpler and cheaper.

Panel Orientation

Most rooftop solar panels installed in Australia are mounted in portrait orientation (the narrower sides top and bottom) for two reasons:

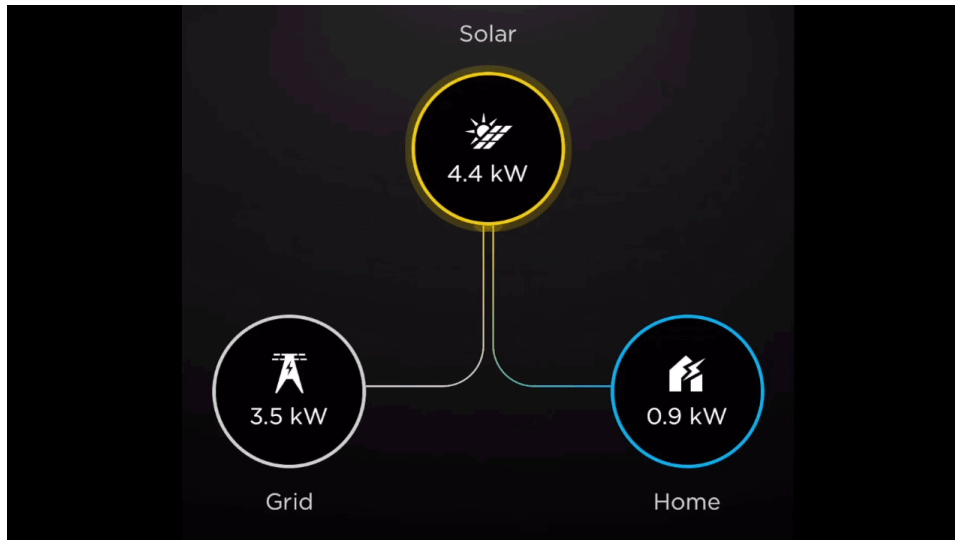
- It's quicker
- It's cheaper

Quicker and cheaper doesn't always mean better, and that can apply here. Depending on your rooftop, it may be possible to install more capacity if the panels are installed in landscape orientation – but this will cost more and not just for the extra panels. I explain the pros and cons of [portrait vs. landscape solar panel orientation here](#).

#4 Understanding how your home uses solar energy

Your home's solar system installation will only ever operate in one of 2 modes:

Mode #1 Your system is generating more solar power than your home needs.



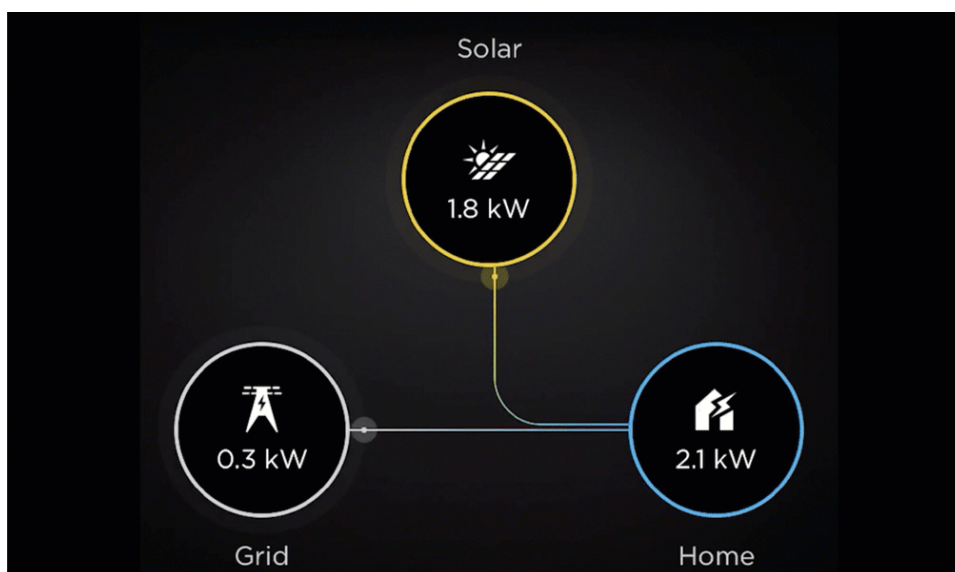
Credit: Tesla App

Here, my solar power system is producing 4.4 kW.

0.9 kW is going into my home, with the surplus 3.5 kW simply going into the grid.

My retailer pays me a 'feed-in tariff' for each kWh of solar energy that I export. Here in SA at the time of writing, I'm getting 14 cents per kWh of energy exported.

Mode #2: Your home is using more power than your solar system is generating



My home solar power system importing grid electricity because I'm not generating enough solar at this point in time.

Here my home needs 2.1 kW of power, but my solar power system installation is only generating 1.8 kW. The grid simply tops up my home with the extra 0.3kW required. Obviously, you have to pay for any imported energy.

In Adelaide, I pay 36 cents for grid electricity and get 14 cents for exported solar energy. This means self-consumed solar power is more than twice as valuable as exported solar electricity.

This is why I have my appliances set to run when the sun is out and don't feel guilty when I switch on my aircon to pre-heat or pre-cool my house during the day, for a comfortable temperature at night.

#5 How many solar panels should you buy?

My answer to this question has changed considerably compared to just a few years ago. This is because home solar installation prices have fallen considerably and electricity prices have risen.

The only limitations now are your budget, what your roof can properly fit, and the amount your local electricity network (DNSP – Distributed Network Service Provider) **allows you to install**.

For most homes, the minimum you should consider buying is **6.6 kW of panels** (approx. 18 in total) with a **5 kW inverter**.



Pro Tip: You can, and should, install up to 33% more panels than the inverter is rated at. For example, if you install 6.6kW of panels with a 5kW inverter, you'll get 33% more **solar rebate** and lots more power in winter, mornings and evenings. It's a very efficient use of the inverter. Also, in many areas, the smaller the inverter, the easier it is to get permission to connect to the mains electricity grid.

If you use a lot of electricity or you're likely to add an electric car and/or battery to your home in the next few years, you should consider going larger than a 6.6 kW installation.

I don't think I've ever heard someone complain that they put too many solar panels on. But people do regret installing too few panels – because it's expensive and complicated to add panels to an existing system at a later date.

I've written about this **topic in more detail here**.

#6 The solar rebate: still very much alive and kicking – and generous.

The famous Australian federal solar rebate, technically known as the STC scheme, acts as a point of sale discount off a solar installation's final cost.

All the prices you see advertised will already include this discount. It's worth about **\$447 per kilowatt of solar panels installed in 2022**, but this will vary slightly depending on where you live.

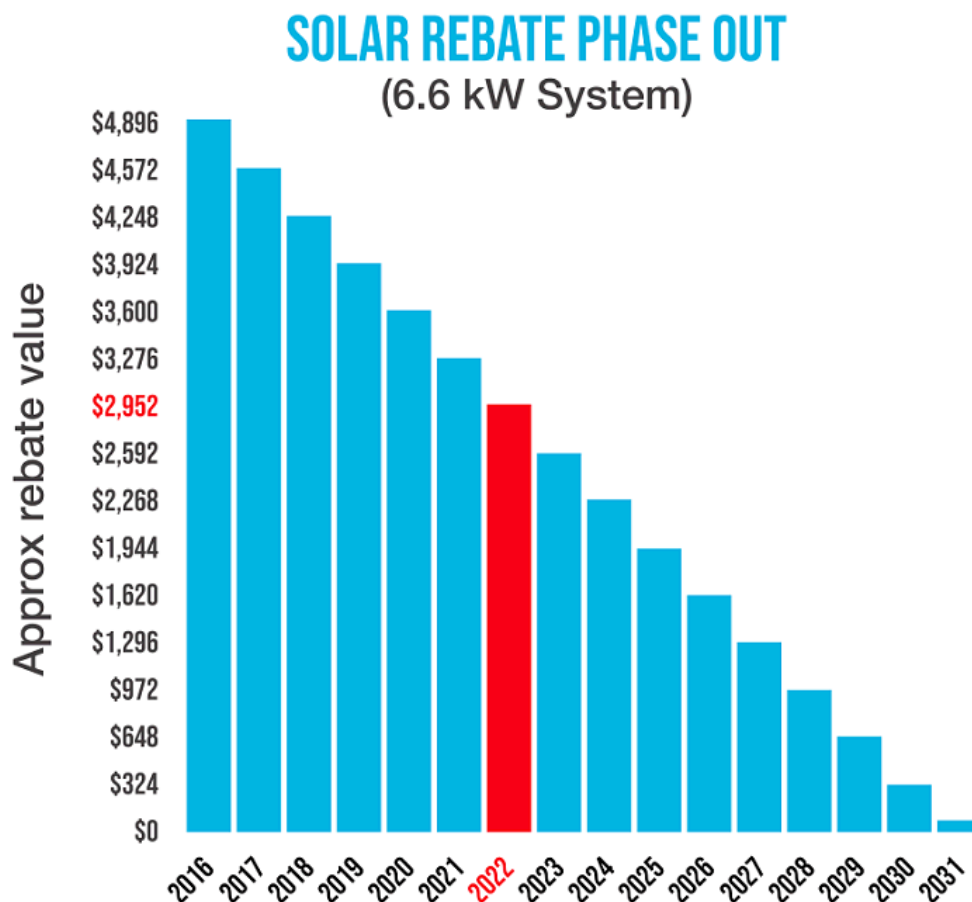
So, for example, 6.6 kW of panels attracts around \$2,950 in rebates.

Anyone can claim the rebate, even if you've already bought solar power systems in the past and want to buy a new system.

The only restrictions on claiming the rebate are:

- Your system installation must be less than 100 kW in size (which is bloody big!).
- You get it installed and designed by a Clean Energy Council (CEC) accredited professional (you can ask the installer on the day to provide proof of accreditation!).
- You use panels and solar inverters approved for installation in Australia by the Clean Energy Council (such as those I mentioned in my chart above).

The federal solar rebate is slowly being phased out. It reduces by one-ninth of today's value every January until it goes to zero in 2031.



For Victorians, the Labor government introduced a **state-level rebate** that offers eligible recipients (up to) an extra \$1,400 off the cost of a home solar system installation at the time of writing.



Pro Tip: The 'federal rebate' is based on solar panel capacity, not the inverter's size. This often makes adding panels over and above the inverter rating very worthwhile.

#7 What price range can you expect to pay for quality solar power?

As of January 2022, approximate **prices for good quality solar panel systems** in Australia, including full installation, are in the range of:

- **6.6kW:** \$4,500 – \$8,000
- **10kW:** \$8,000 – \$12,000

To be clear – the upper end prices are for top-end system installations (e.g. LG/SunPower panels), installed by a solar energy 'craftsman'.

Note the above prices also include the discount from the solar 'rebate'.

However, for those of you in Victoria, the above prices do not include the **state-level rebate offered by the Victorian government** (which provides a further rebate of up to \$1,400).

If you want to downgrade to a reputable budget inverter (e.g. brands on the left-hand side of the inverter chart higher up this page), **you may be able to save around \$800** on these prices.

Costs can increase if you need a switchboard upgrade or other electrical work is required to make your home suitable for a solar power installation, or if the design of your home makes the installation more difficult.

If you decide to install micro inverters or an optimiser-based system over a string inverter, costs will also increase by approximately 20%.

Installing battery storage (for an off-grid or hybrid system) will at least double the system's price.



Pro Tip: Really cheap solar energy systems cost more in the long run, from repairs and lost output. I tell my friends to avoid these systems. It breaks my heart to see cheap solar panels go to landfill after a few years.

#8 How to calculate the savings and payback of a solar system

Exactly how much money solar power will save you depends on a few things:

- The size of your system, in kW
- The output of your home's solar power system (which, when annualised, is very consistent!)
- Your 'self-consumption ratio'. This is how much solar electricity you use in the home vs exports to the grid.
- Your feed-in tariff. These vary from retailer to retailer and state to state.
- Your usage tariff. This what you pay for grid electricity.

The main way home solar power saves you money is by offsetting your grid electricity usage.

Let's say you pay 36 cents per kWh, as I do in Adelaide, and your solar power system generates one kWh to offset that. You've just saved 36 cents.

But what if your system generates a kWh when your home does not need it? It's sent to the grid, and your retailer pays you a feed-in tariff.

Using my own plan as an example, I'm paid 14 cents as a feed-in tariff by my retailer, AGL.

14 cents is less than half of 36 cents. So self-consuming my solar power saves me more than twice as much as exporting it does.

Now, imagine being somewhere like Perth. In Perth, you can only get an averaged 4 cent feed-in tariff and pay 28c for grid electricity.

So in Perth, self-consumed solar energy is worth seven times as much as exported solar electricity!

Here are some payback calculation examples for a 6.6 kW system. They're taken from my [solar calculator](#) using its default settings as at late January 2022.

- Sydney: 4 years, 7 months
- Brisbane: 4 years, 9 months
- Canberra: 4 years, 11 months
- Perth: 5 years, 11 months
- Melbourne with VIC rebate: 4 years, 2 months
- Melbourne without VIC rebate: 5 years, 5 months
- Adelaide: 4 years, 6 months
- Darwin: 5 years, 4 months
- Hobart: 6 years, 2 months



Pro Tip: Your circumstances will vary – make sure you [calculate your own estimates](#) if the payback is important to you.

Supercharging your return from home solar power

Want to save as much money as possible from your solar panels? Maximise your self-consumption.

Think – what's running outside of daylight hours that you can put on a timer? Washing machines, dishwashers and pool pumps are some of the easiest wins.



Pro Tip: Avoid any solar energy company that calculates your solar system savings based on 100% self-consumption. Make sure you see the savings for more realistic scenarios such as 20% and 50% self-consumption.

#9 Batteries – do you need them?

Solar batteries are great for energy security. The peace of mind from knowing that you will still have lights, refrigeration and other essential circuits no matter what happens to the grid can be priceless.

Batteries are also great fun. Seriously! There is something extraordinary about seeing your house run off nothing but battery power.

Batteries also provide a form of insurance against the risk of electricity prices going up and feed-in-tariffs going down.

A properly sized, correctly installed and configured solar battery can reduce your grid use by up to 95%, making you almost immune to electricity and feed-in tariff changes. To be clear – no-one knows which way electricity prices and feed-in-tariffs will go. But if you have a battery, you won't care!

But these benefits come at a cost.

For example – without a battery rebate – it will cost around \$10,000 to add a decent amount (around 10 kWh) of quality energy storage to a home solar power system in Australia. Take 30-50% off this price if you live in VIC, ACT or SA and are eligible for your state's battery rebate.

The typical payback period of an unsubsidised battery of that size is at least 15 years. Most batteries have a 10-year warranty, and it's anyone's guess how long they'll last past that.

Compare this with a solar energy installation without batteries. A regular non-battery solar power system has a typical payback of around 3-6 years and will last about 25 years.

So – if you are buying batteries **only** to save money, unless you can access a state-based battery rebate or game a time-of-use tariff, installing a battery isn't likely to be worth it for you. My advice is to wait for battery costs to come down before investing in one.

Certainly don't wait for batteries to come down in price before buying a solar power system, because that is locking in more years of high energy bills every quarter.



Pro Tip: You don't need to buy a special type of solar system to be ready for batteries. Every grid connect system ever installed in Australia is compatible with future batteries using a technique called 'AC coupling'.

But if you **want a home battery** for energy security, insurance against changing electricity prices, and for the exciting technology, go for it. I've got one on my home, and I love it.

A note about state battery rebates: In South Australia, some postcodes in Victoria and ACT you can now get a solar battery subsidy which could halve the cost of a battery installation, **potentially giving a sub-10-year payback**.

A note about Virtual Power Plants (VPPs): A recent phenomenon in the world of batteries is the Virtual Power Plant or 'VPP'. In a nutshell, you can get a cheaper battery if you agree to let the VPP control it.

They will then be able to charge and discharge your battery at will to profit from electricity price fluctuations. In some states, there are generous VPPs that can bring battery payback below 10 years – but you do have to crunch your own numbers.

Don't take the VPP's word for it! These VPPs are very new – so buyer beware! My personal take is if you want more control of your energy use, then don't relinquish control to someone else.



Pro Tip: Counter-intuitively, some battery systems will not provide backup when the grid goes down. If you want backup, you must specify this upfront, as it requires careful design and some rewiring of your switchboard.

#10 How are you planning on paying for your system? Understanding finance.

Most Australians buy solar power systems with cash. If you are debt-free and have cash looking for a place to go, investing in a home solar system is worth serious consideration.

A solar power system installation currently generates a tax-free, reliable return that is far higher than bank interest rates or government bonds at the time of writing.

However, some of us don't have the luxury of easy access to thousands of dollars. Many solar installers offer "no interest" finance – and if that sounds too good to be true, it's because it probably is.



Pro Tip: If you see a deal that claims 'no interest', your BS detector should be going off. All finance has a cost. The "no interest" solar deals often charge the installer a fee of around 15-25% on top of the 'cash' price. That extra cost is ultimately paid by you.

Now – don't misunderstand me. Plenty of reputable solar installers, not just the ripoff merchants, offer "no interest" finance because many customers demand it.

But in my experience, you can get a much better deal overall by [shopping around for a low-interest finance provider](#) and avoiding the easy-sign-up, 'no interest' deals.

#11 Remote inverter shutdowns and a "solar tax" – scary sounding, but benign.

In South Australia, it's been a requirement since October 2020 that your solar system can be 'shut down' remotely by the electricity network.

Why should non-South Australians reading this care? Because this will likely roll out nationally.

I've seen a lot of hysteria in the media about this. If such remote shutdowns happened more than 2-3 times a year, for more than a few hours at a time, I'd be surprised.

Meaning – the financial impact of a shutdown is likely to be around \$20 per year. Not exactly world-ending stuff.



Pro Tip: Some solar inverters will turn off when given the 'remote shutdown' command. Others will continue to power your home, but won't export to the grid. Ask your installer to provide an inverter that can still supply your home in the event of a 'remote shutdown'.

The solar "tax"

Attracting even more hysteria from the media than remote shutdowns is the so-called 'solar tax'.

From 2025, power companies will be able to hit you with a small surcharge if you export solar energy when the grid doesn't need it. That's not great – but what the mainstream media won't tell you is that this goes hand-in-hand with **being paid more for your exports** at other times.

They also won't tell you that this is an optional scheme. Electricity companies will always have to offer a plan that **doesn't have this surcharge**.

For the savvy solar owner – and this comes back to what I mentioned previously about maximising self-consumption – they should be able to come out ahead.

So, don't panic about a 'solar tax' making solar systems not worth it anymore, as they will most certainly be still worth the investment.

The next step

So there you have it, my '101' guide to solar power for your home.

If you have any burning questions about the information in this guide, my contact details are:

Email: finnpeacock@solarquotes.com.au

Tel: 08 7200 0177

Snail mail: 3/39 Grenfell St, Adelaide, SA 5000 Australia

If you're considering installing solar panels or batteries for your home or business, SolarQuotes can help you get quotes from high-quality, trusted installers quickly and easily:

[GET UP TO 3 FREE QUOTES FOR SOLAR FROM PRE-VETTED INSTALLERS >>](#)

Happy Solar Power Hunting!



Finn Peacock, founder of SolarQuotes.com.au

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