



# SOLAR BUYERS GUIDE

Welcome to the Solar Buyer's Guide brought to you by Penrith Solar! As you embark on your journey towards harnessing the power of solar energy, we understand that you may have questions and uncertainties. That's why we've crafted this comprehensive booklet filled with essential information to guide you through every question you may have to be confident in what solar investment to do.

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**We know, you've got a few questions right now ....**

**Trust us, we get it!**

- ✓ How much will I save with solar?
- ✓ How Does the Rebate Work?
- ✓ How many solar panels do I need?
- ✓ Which installer should I trust?
- ✓ How much can I expect to save off my power bill?

*and much more...*

Welcome to your essential guide to solar in Australia.

Our goal is to ensure you feel confident and informed as you future-proof your home.

As the saying goes, if it's worth doing, it's worth doing right the first time.

From learning and understanding your energy needs all the way to installation, we'll guide you through every step, ensuring you have the information needed to make the best long-term decisions for your home and energy future.

Blue Skies,

Penrith Solar Centre

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# ARE THERE GOVT REBATES AVAILABLE FOR SOLAR ON MY HOME?

What is commonly confusing for a solar rebate is the federal government's program where households are incentivised financially to install rooftop solar systems. The rooftop solar systems are evaluated and awarded virtual units of measurement called Small-scale Technology Certificates (or STCs for short) based on how many megawatt hours they will produce.

Calculating the STCs considers the following:

**Size of the solar system:** The larger the system, the more megawatts it will produce.

**Location of the solar system:** The sunnier your region, the more STCs your system will receive.

**Year of installation:** Every year, the value of an STC goes down by 1/15 until the end of 2030 when it will reach zero. So the sooner you install your solar system, the better your rebate.

The STC system is a pretty sneaky way for the government to compel big bad polluting corporations to pay you for installing solar panels. The government doesn't pay you the cash, the corporations do.





## HOW MUCH WILL SOLAR COST YOU? (CHEAP VS VALUE SOLAR)

The payback period for a solar system is not a fixed timeline. The cost of electricity is increasing, and the cost of solar technology is going down. Your energy needs are constantly in flux as your life evolves and changes. All these variables (and a few others) contribute to when your new solar system will pay for itself.

## MICROINVERTERS

A solar system with microinverters offers several key advantages over traditional string inverters. With microinverters, each panel operates independently, ensuring no single point of failure—if one panel underperforms, the rest continue working efficiently.

Microinverters also provide enhanced safety by converting power to AC at the panel level, reducing high-voltage risks.

Plus, panel-level monitoring allows you to track the performance of each panel, ensuring optimal efficiency and easier maintenance and ability to detect faulty panels for warranty claims.



## ELECTRICITY CONSUMPTION ESTIMATES

Let's assume that you can self-consume 40% of your total electricity with 1,000 kWh of total energy usage per month.

40% of 1,000kWh = 400kWh of self-consumed solar energy per month.

You're using 600kWh of electricity from the electrical grid. Which costs: \$0.38 per kWh. (600 x \$0.38 = \$228)

Plus your daily supply charge which hovers around \$0.90-\$1.10 per day.

So you'd be looking at around \$30 in fixed charges plus \$228 in usage for a total of \$258 per month in this example.

Assuming that as the monthly average for the year and you're already over \$3,095 per year on electricity from your retailer with a solar system that can contribute 40% of your energy needs.

This quickly becomes a game of maximising your self consumption that you can provide more energy for your home from your system. This is the role of battery storage to absorb your excess solar and reallocate it to the sundown periods.

## HOW MUCH CAN I EXPECT TO SAVE OFF MY POWER BILL?

The payback period of a solar system depends on the upfront cost and how much money you are saving per year by not spending it on your energy bills. Let's assume that you're being charged \$0.32 per kilowatt hour for electricity.

Let's also assume that your household is using 1,000kWh of electricity per month. That's kind of a lot, but round numbers make the math easier.

So, your electricity bill per month will be 1,000kWh x \$0.32 = \$320 per month (\$960 per quarter).





## HOW MUCH CAN I EXPECT TO SAVE OFF MY POWER BILL? (CONTINUED)

How much are you saving per year in electricity usage because of your solar system? Well,  $400\text{kWh} \times \$0.38 = \$152$  per month. Multiply it by 12 and you'll get \$1,824 per year in savings.

Let's say you need around 33.3kWh per day and your solar system contributes 13.3kWh per day if you self-consume and your electricity retailer contributes 20kWh per day.

In order to produce 13.3kWh per day when you need it, your solar system would need to output a little over 5.0kW.

At Penrith Solar Centre, for a microinverter solar system, you would need about 12 solar panels on your roof for a total cost of around \$10,300.

The payback period is calculated with a simple formula: Initial cost of system / annual cost of electricity = your solar payback period  
 $\$10,300 / \$2,304 = 4.5$  years.

And that's assuming a lot of variables that will be different for everyone. The cost of electricity will vary. So will the amount of electricity a household uses every day/month/year. You must keep in mind that these estimates and calculations assume that electricity will remain at \$0.32 per kilowatt hour over the coming years.



## IN-HOUSE INSTALLER ADVANTAGE

There are so many advantages to in-house installers when it comes to expertise and quality assurance, but that peace of mind comes at a price. An in-house installation company spends money to recruit, train, and keep those skilled installers working for them. The money spent on professional expertise is reflected in the cost of those solar installations.

## IN-HOUSE INSTALLERS VS SUB-CONTRACTORS

There are in-house installers who are a end to end inquiry to installation solar service all under one roof. They handle your questions and installation from the moment you reach out to them for a quote to the moment they set up the consumption monitoring app on your phone (and after that too, when it comes to fulfilling warranties). Penrith Solar Centre is one of these types of companies.

There are also subcontractors who are electricians who install solar. They are not a sales company, but instead independent contractors who work for solar companies that sell solar systems. This installation type is a little more common for string inverter solar systems – which are more popular in Australia because of their low price point.

In-house teams often have an extremely high level of expertise in what they do because they are able to focus their entire business around fewer products and processes.

## SUB-CONTRACTORS

Having a subcontractor install your solar is cheaper than an in-house installer. The parts and labour simply cost less.

Because subcontractors get paid by the panel on a job, they'll get your installation done really fast. That might be something that you value, especially if you're trying to fit in an install to a very busy schedule.

Because the subcontractor is hired by a solar sales company, there's a service triangle you'll need to navigate should your solar system need repairs or warranty fulfilment. The subcontractor will direct you to the sales company that hired them, the sales company will blame the subcontractor, and you'll be caught in the middle. This situation is particularly challenging when it comes to getting warranties fulfilled. Obviously, this isn't everyone's experience, but it happens often enough that you might want to be aware of it.



# WHAT CAUSES PRICE VARIATIONS IN SOLAR QUOTES?

**Your installer** - In house employed and trained electricians or subcontractors.

**Inverter type** - Microinverter vs String

**Roof type** - tile, tin roof, terracotta etc

**Roof pitch** - Angle of roof, for safety reasons we may require scaffolding, edge protection, scissor lifts to carry out the installation safely.

**Two storey homes** - can impact install costs depending on system size and access to roof.

**Number of panels and roof faces** - System design is important to maximise panels on your roof for the labour for the day.



# HOW DO I CHOOSE THE RIGHT SOLAR INSTALLER?

In-house installers are a top to bottom, inquiry to installation solar service. They are certified by the Clean Energy Council. They will handle your questions and installation from the moment you reach out to them to the moment they set up the consumption monitoring app on your phone.

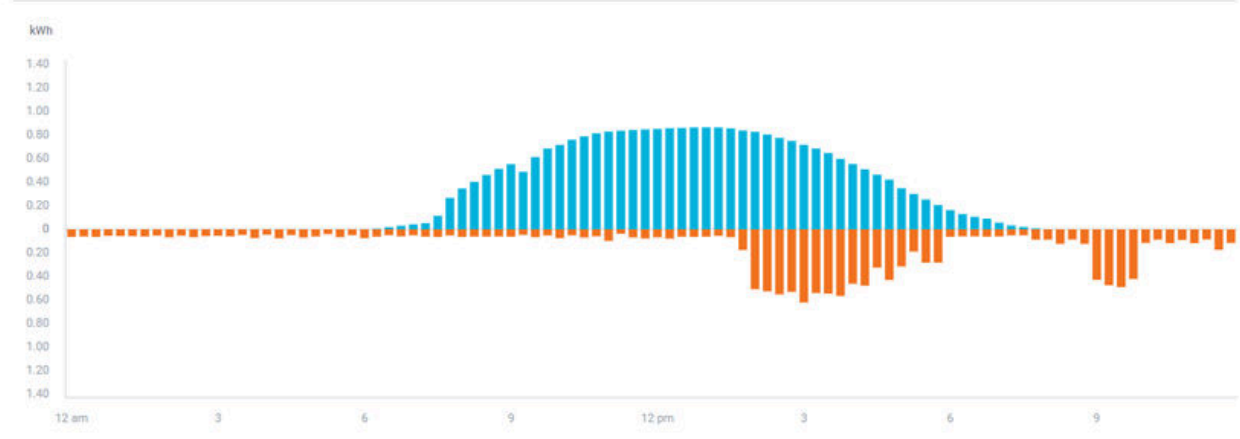
Subcontractors are individual electricians who are also certified by the Clean Energy Council to install solar. They are not a sales company, but instead independent contractors who work for solar companies that sell solar systems. They're commonly referred to as "subbies."



DAY WEEK MONTH YEAR LIFETIME CUSTOM

**Total Energy**  
Updated 17 hrs ago

< August 08, 2021 > 20°C



**Energy Independence**  
65%  
Measures your independence from the u

**Currency Equivalent**  
Set currency conversion facto

**Solar Equivalent**  
< 27.3 kWh = 23  
Solar Produced 100w

**Graph Controls**  
 Produced  
 Consumed  
 Imported/Exported

# SOLAR MONITORING

Consumption monitoring is a combination of software and hardware that tracks how much electricity you use in your home. It tells you when and how much electricity you use. It should also tell you how much electricity you are exporting back to the electrical grid and how much you are importing.

Your energy retailer charges you more for electricity during peak hours. Peak hours are typically in the early to mid-evening when people are back from work and at home. Consumption monitoring gives you options around how you use electricity. You can choose to use electricity earlier in the day before work or when solar production is high (or invest in a solar battery).

Consumption monitoring also gives you information about repairs. A good system will inform you whenever any part of your solar is malfunctioning.

It also makes your solar system safer. The monitoring system can detect when equipment is close to failure or is about to break down. When equipment is close to failure or only partially working, it's more likely to malfunction and possibly lead to electrical issues.





## WHAT SOLAR PANEL SHOULD YOU CHOOSE?

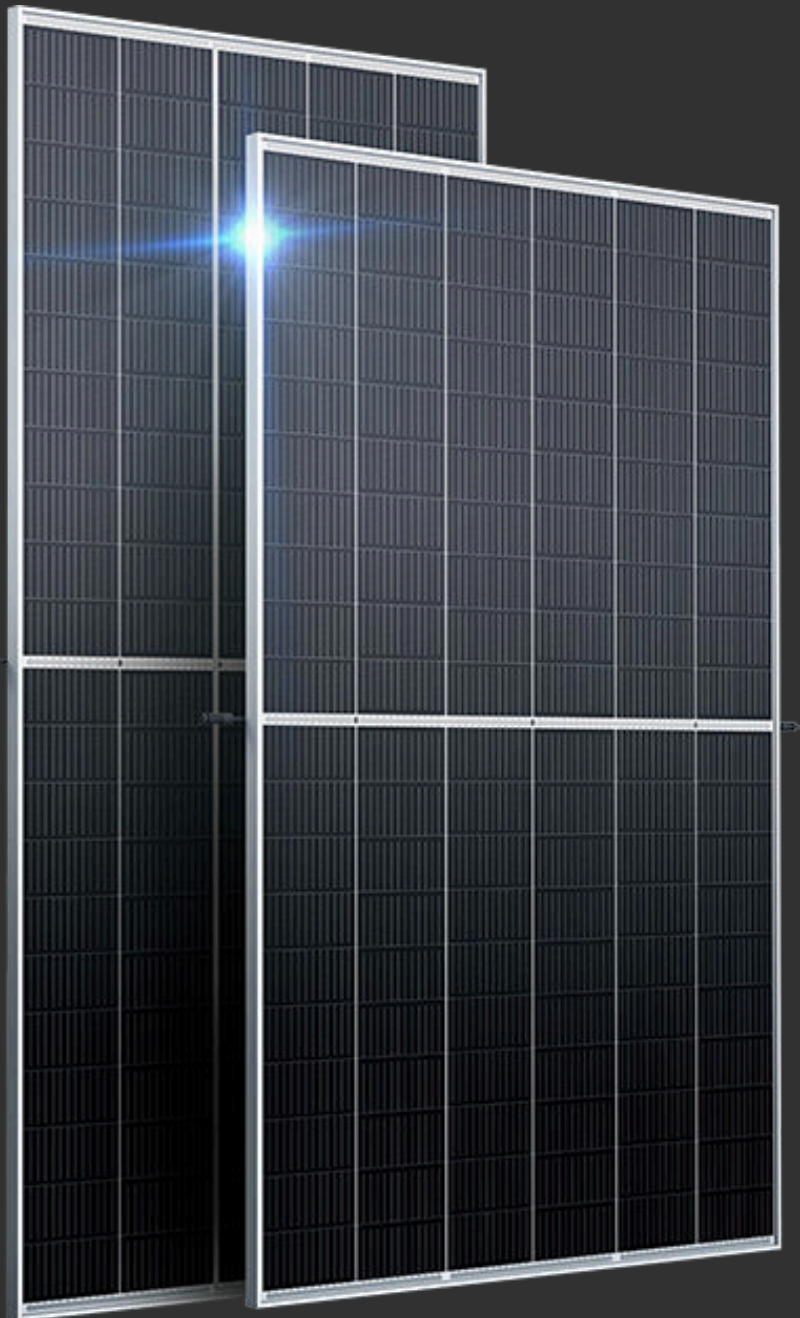
There's very little difference between the efficiencies of different panels from multiple price brackets. The gap has closed between what we would call cheaper panels versus more expensive panels.

The technology for solar panels has become commonplace since they became fixtures on roofs nationwide.

The highest priority we have for our customers when it comes to selecting solar panels is a matrix of efficiency, upfront cost, and warranty. Because solar panels are all getting remarkably efficient, and because the cost keeps decreasing as technology becomes more affordable, we really focus in on what company stands behind their warranty.

You'll want a product warranty that is 20 – 25 years.

You'll also want to invest in solar products that have offices in Australia, which makes fulfilling the warranty with them so much easier than negotiating with an overseas company.





String inverters are another type of inverter used in solar systems. Unlike microinverters, string inverters are centralized devices that convert the DC energy from a group of panels (a “string”) into AC energy for the home.

Batteries are only capable of storing DC energy. An AC-coupled solar battery will have an inverter in it that converts the AC power it’s receiving back into DC power for storage.

The hybrid inverter was developed and manufactured to solve an issue of incompatibility between string inverters and solar batteries. If you have a string inverter, it’s only able to convert the DC power from the roof into AC power for the home to use. It can’t send AC power to a battery without it being converted into DC power.

## INVERTERS - STRING VS HYBRID VS MICROINVERTERS (WHICH INVERTER SHOULD YOU CHOOSE)

Solar panels are only capable of outputting direct current (DC) electricity. All the electricity in your home is alternating current (AC) electricity. The conversion is necessary to make that power usable. Inverters transform the power your panels produce into usable electricity. There are different types of inverters.

In a microinverter solar system, a microinverter is mounted beneath each solar panel to convert the electricity immediately before sending it down to the home.







## WHY DO YOU USE THE PANEL YOU'VE QUOTED ME?

The most important factors to consider when looking at solar panels are cost, performance, and warranties.

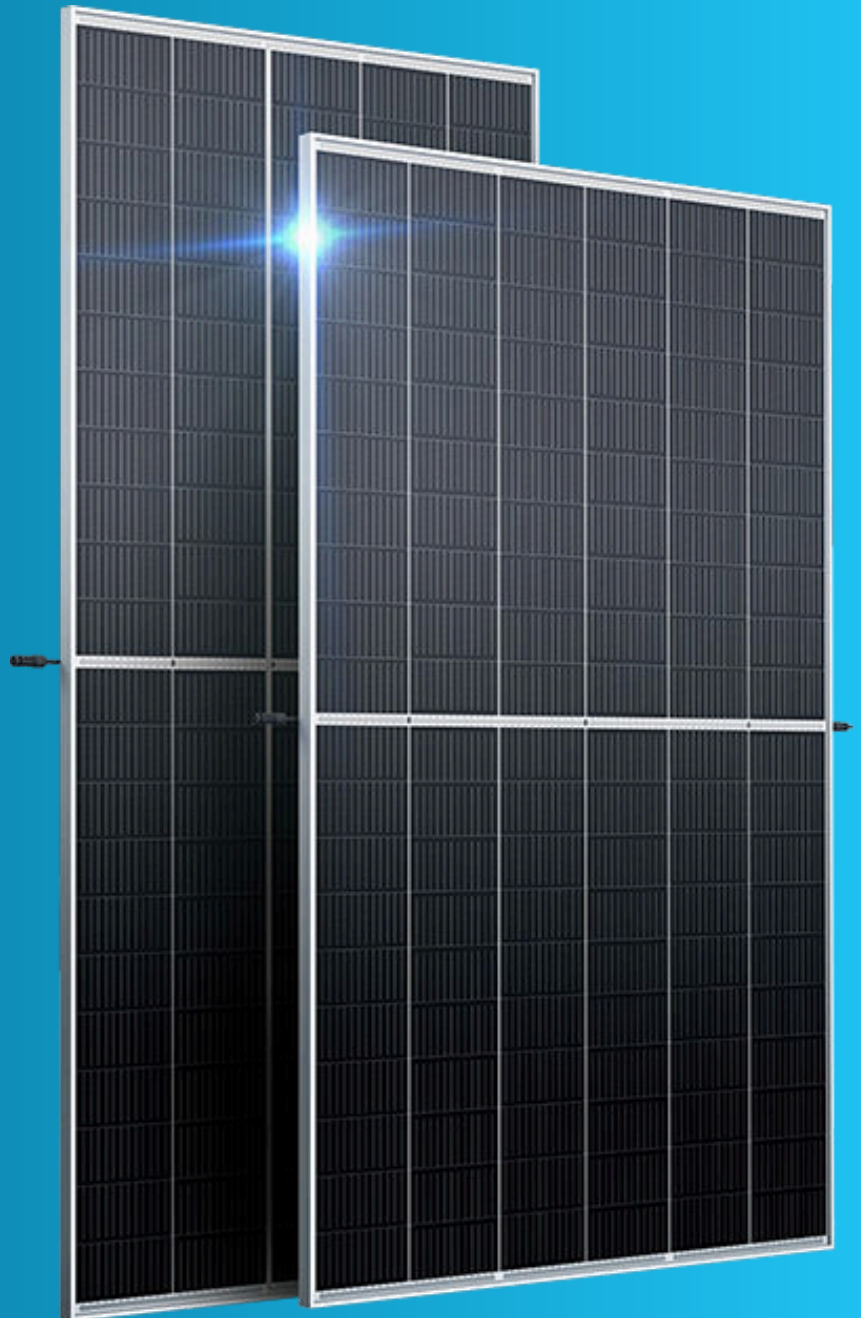
Many years ago, solar panels cost quite a bit more than they do today. Because the price of “high-quality” panels has dropped to almost the same price as cheap panels, there’s no reason to really weigh these panels against one another.

We like the Trina Vertex S+ for its value. It’s an efficient panel with a lot of bang for a low price. It’s the Toyota of solar panels. It’s economical, reliable, and offers a great value. And it lasts.

Solar panels perform at their best when it isn’t too hot or too cold. Trina’s panels have an impressive temperature coefficient of around 0.36%. This is crucial because for every degree Celsius over 25°, the panel’s performance decreases.

Over time, solar panels deteriorate incrementally. They have a projected lifespan of 25 years or longer, and the degradation rate varies from panel to panel. Trina Vertex S+ solar panels have a degradation rate of 0.4% per year.

Securing panels with the best warranty is a primary concern of ours. It’s also smart to work with a manufacturer who has offices in Australia. Otherwise, getting a warranty filled can be a challenge. Trina has offices here and they’re a lovely company to work with.







## HOW MANY PANELS SHOULD YOU BUY?

It depends.

What are your energy consumption habits? Who is your solar installer? What are your goals with solar? What's your budget? How big is your roof? How big is your quarterly electricity bill? What direction does your roof face? Where do you live in relationship to the Equator? Are you going to add a solar battery? Is your home single-phase or three-phase? Who is your energy retailer? Your DNSP? What are the rules they have around export limits?

Once you answer these questions, you can talk to your installer about how many solar panels you'll need. Our recommendation is to ask lots of questions and keep an open mind. There's a lot to learn if you want to maximise your savings.

## PANEL SHADING

Microinverters have a clear advantage in shaded conditions compared to string and hybrid inverter systems. They optimize the power production of each panel, ensuring maximum energy from the entire array. If one panel is shaded or partially shaded, only that specific panel is affected, unlike string or central inverters where shading on one panel impacts the efficiency of the entire system.

There are all kinds of shading environments to consider beyond a beautiful tree stretching skyward for nutrients from the sun. Examples could include a telephone pole that hits the solar panels in the morning in the winter months when the sun is low in the sky. There is also cloud cover to consider. It's an incredibly common shading issue that drops panel performance. Without microinverters pumping away at their maximum capacity, cloud cover could cripple your energy production.

The benefits of microinverters extend beyond shading. Various factors, like panel mismatch, degradation, electrical issues, and other external factors like soiling, can impact the overall performance of a solar array.

## HOW MUCH SOLAR CAN YOU ACTUALLY USE?

Every home and energy usage pattern is unique, influenced by factors like size, family size, and daily routines. In Sydney, electricity usage typically peaks in the morning and evening due to work and school schedules.

Assess your typical daily routine to identify peak usage times – often in the evening. Consider appliance usage patterns and seasonal variations in heating and cooling needs. Tailor your energy system accordingly, aiming for scalability to adapt to future changes, especially amid ongoing energy challenges.



## IDEAL ROOF DIRECTION

The sun is north of Sydney most of the year as it makes its journey from the eastern horizon to the western horizon every day. The angle of sunlight hitting the solar panels will always vary because the sun's position in the sky changes every season.

Where a home is in relation to the Equator is an important factor when determining how to place solar panels on your roof. Keep in mind that the sun shifts seasonally from north to south. In the summertime when Sydney is closer to the sun because of the tilt of the earth's axis, the sun is higher in the sky. In the wintertime, the sun is closer to the northern horizon.

Year-round, a northern-facing roof will get the best sunlight consistently throughout the day. The sun ranges from close to the northern horizon in winter to right above us in the summertime. That range of the sun's angle in relation to your solar panels guarantees maximum absorption of the sun's rays year-round.

But the sun isn't just to the north and above us during the day. It's also near the east in the morning and in the west in the afternoon. Which is why we often recommend an east/west placement for your panels in addition to a northern-facing options.



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