

EXCEL POWER

# BEGINNER'S GUIDE



# Solar Power





# Contents

|                               |     |
|-------------------------------|-----|
| About Excel Power             | 3   |
| Solar PV Main Components      | 4-6 |
| Solar Panels                  | 4-5 |
| Solar Inverters               | 5-6 |
| Your Electricity Measurements | 7   |
| The Solar Rebate              | 8   |
| Rebate vs. Feed in Tariff     | 9   |
| Roof Specifications for Solar | 10  |
| Panel Direction               | 10  |
| Panel Angle                   | 10  |
| Solar Payback                 | 11  |
| Costs and Quotes              | 12  |
| Batteries                     | 13  |

## **NOTE ABOUT PRO-TIPS:**

These will appear throughout the document and are intended for people who like to get more technical. Feel free to contact our team if you have any queries about them.

## **BEGINNER'S NOTE:**

kWh stands for 'Kilowatt per hour'. It is a unit of electricity and is how the quantity of electricity used is measured.

The average Australian home uses 16-20kWh per day.



# About Excel Power

**Excel Power** have been servicing the Darling Downs region for over 25 years and are backed by Enphase Inverters and LG solar panels - two premium products leading the way in solar systems across Australia.

They are also authorised LG solar dealers, Enphase's preferred partner and Platinum installer and a Clean Energy Council award winner and accredited installer.

Their wealth of knowledge, decades of experience and quality products make them the ideal team to partner with. They're available to answer all your queries and assess your energy situation to pair you with a highly sustainable solar system that not only saves money but looks great and lasts for many years against the harshest Australian conditions.

Continue reading their Beginner's Guide to Solar to gain a better understanding of solar systems, the various options to choose from and information about choosing, purchasing and installing your new energy-efficient energy system.

# Solar PV Main Components

## Solar Panels

There are two main components to a solar system: the Panels and the Inverter. First we'll take a closer look at the Panels.

Solar Panels come in two varieties; *Monocrystalline* or *Polycrystalline* (pictured right).

The main difference between the two is Monocrystalline panels consist of solar cells constructed from a single crystal of silicon while Polycrystalline panels feature solar cells made from a number of silicon fragments, which are melted together.



### PRO-TIP:

Don't stress over solar panel technology. Mono- and Polycrystalline both perform well in Australian climates.

The inner construction of each panel type doesn't make a huge difference. What does is the brand you choose. The brand you select should last for 25 years or more on your roof without being replaced or experiencing extensive damage from the elements.

In the world of solar systems, it is true that you get what you pay for.

Cheaper systems are generally constructed from poor materials with minimal testing to ensure they can withstand the conditions they will ultimately be exposed to. Premium panels degrade much slower and often produce 5-10% more power than cheaper brands.

It's often difficult to distinguish a reliable brand from an underperforming competitor so we have provided a cheat sheet below. This chart shows 90% of the most quoted solar panel brands currently in the Australian market since 2017. It shows where they sit in terms of price and how premium they are.

If you're unsure about your inverter brand, give the team at Excel Power a call on (07) 4638 7366.



Source: [www.solarquotes.com.au](http://www.solarquotes.com.au)

Purchasing a recognised brand of quality panels like LG, not only delivers tens of thousands of dollars worth of power saving but comes with a comprehensive 25-year transferable warranty and will add value to your property. Cheaper panels tend to perform poorly the hotter the weather gets, when compared to LG NeON® panels.

**The following factors should play a huge role in deciding whether a solar panel brand is right for you:**

- Parts and labour warranty
- Is it a well-known and respected brand?
- Wind resistance and weather resistance factor
- Is this brand a locally backed entity?
- Is their technology award-winning?
- Robust standard and visual appearance
- Automated factory consistency
- How much power per square metre does each panel produce?
- Is there a local helpline or ongoing support available?

## Solar Inverters

Now we'll take a look at the Inverter.

Essentially, Inverters are the powerboxes of the solar system. Their work to convert the Direct Current (DC), that solar panels produce, into 240V utility frequency Alternating Current (AC).



Inverters range from the size of a briefcase to a paperback book. Central / String Inverters are mounted on a wall where all the solar panels connect into it.

The smaller varieties are known as Micro-inverters. Micro-inverters work well because they optimise each panel individually as they are connected into the back of each individual panel, resulting in more energy. While they are considered safer because they use lower voltages, Micro-inverters usually add about 20% to the system price.

Of the 2 components that make up a solar system, the Inverter is the most likely part to fail in the first 10-15 years. This is because they work consistently and ultimately wear out. So if you are on a limited budget, we recommend getting a premium Inverter over premium panels. The premium Inverters will last longer and are better supported if they do fail.

Here's a run-down of the 90% of the most quotes and popular Inverter brands in Australia currently, and where they sit on in terms of price and quality:



Source: [www.solarquotes.com.au](http://www.solarquotes.com.au)

### PRO-TIP:

Never mount a Central Inverter where it will get full sun. Choose a shaded spot, a cool garage, or ask the installer to build a simple shade over the inverter. Sun kills inverters, because it overheats them.

# Your Electricity Measurements

## Do you know how much electricity you use in your home and when?

Once your solar panels produce electricity, the first place it will be used is to run appliances in your home. If there's any surplus electricity left, it will be exported to the grid. Generally electricity retailers will pay around 7-20c for each kWh that you export into the grid - this is called a Feed-In Tariff'.

It's important to note that financially it pays to use the power generated from your system as opposed to exporting it. When you use your own generated solar power, you save around 30c per kWh because you don't have to buy it from the power grid when compared to your Feed-In Tariff of 7-20c per kWh.

### **PRO-TIP:**

Shop around for Feed-In Tariffs. They can vary from 0c to 12c depending on the retailer.

Households that use a significant amount of electricity during the day, or run their appliances using timers, are a natural fit for solar and can see very short paybacks of 4-5 years (20-25% returns).

For those who are home during the day or have pool pumps or other appliances that run all day, self-consumption can be up to 65% (with exports only 35%) and solar is likely to be a very good investment.

However if away from home most of the day, you will usually self-consume about 20% of the output of a well-sized solar system, meaning your payback will be around 6-8 years. This is still a 10-12% ROI.

### **PRO-TIP:**

Your bill only tells you how much energy you use every month, or 3 months. If you live in Victoria, you can ask your retailer to give you a spreadsheet of your electricity use every half hour. If you live elsewhere, you can buy a cheap (~\$100) energy monitor to collect this data for a few weeks before you get a quote. A good installer can use this data to more accurately size your solar system for optimum savings.

# The Solar Rebate

The Australian federal 'solar rebate' (technically known as the 'STC scheme') is a point-of-sale discount off the final cost of a solar power system installation.

The subsidy is currently worth an average \$550 per kW of solar panels installed, however, this will depend on where you live. As an example, a 6kW system attracts around \$3,300 in rebates.

Anyone can claim the rebate, even if you've previously 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 100kW in size
- You get it installed and designed by a Clean Energy Council (CEC) accredited professional. Remember to ask the installer on the day to provide proof of accreditation
- You use panels and solar inverters approved for use in Australia by the Clean Energy Council

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

## **PRO-TIP:**

The rebate is based on the number of panels, not the size of the inverter. This often makes adding panels over and above the inverter rating is very worthwhile.

Don't worry – it is safe and approved by the regulators (up to 133% of inverter capacity). Ask your installer about 'oversizing' your panel array. Any good installer will know exactly what you mean. Untrained commission-only sales people won't.





# Rebate vs. Feed in Tariff

Because solar energy systems have reduced in cost by 80% across Australia over the last 12 or so years, the Feed-In Tariff has also come down to 7-20c.

This varies based on location and retailer. While this looks like a dramatic decrease from the original 20-66c per kWh of energy, it's important not to confuse the rebate with the Feed-In Tariff.

The rebate is still in action and won't be reduced significantly anytime soon.

It's also important to note that the lower Feed-In Tariff incentivises solar producers to use solar generation rather than exporting it. Consume as much of your own solar as possible will provide the greatest financial benefits.

## **PRO-TIP:**

When you get solar, use the timers on your washing machine and dishwasher so they run during the day. Also put timers on your hot water and any pool pumps, and you can shift significant amounts of energy to the daytime, increasing the returns on a solar system.

# Roof Specifications for Solar

There are two factors that play a crucial role in preparing your solar system setup: Panel Direction and Panel Angle.

## Panel Direction

Because the sun rises in the East and sets in the West, East-facing solar panels will produce most of their energy in the morning and drop off in the afternoon. North-facing solar panels will peak in production around midday, therefore providing the most energy overall. West-facing panels won't produce much in the morning but will produce most of their energy in the late afternoon. It's an old myth that unless you have a North-Facing roof, then solar wasn't worth it.

Since solar system prices have dropped dramatically (around 80% over the last 7 years), it is economical to have East-facing panels, West-facing panels, or a combination of North, East and West.

The advantage of East and West panels is that they produce more energy if you use electricity in the morning and late afternoon, so you self-consume more. So if you have East and West facing roof areas, ask us about the best way to maximise on your roof space.

## Panel Angle

Check out the table below to identify the best angle for your panels. These will ensure you maximise the energy produced over the whole year based on the latitude of your location:

| Canberra | Hobart | Darwin | Adelaide | Perth | Brisbane | Melbourne | Sydney |
|----------|--------|--------|----------|-------|----------|-----------|--------|
| 35°      | 42°    | 12°    | 35°      | 31°   | 27°      | 37°       | 34°    |

This means the ideal solar panel angle for Adelaide is 35° from horizontal.

Sometimes, based on roof construction it's not possible to place panels at the ideal angle, but don't panic. For example, solar panels at 15 degrees, mean you would only lose 4% in annual energy yield compared to the perfect angle.

Whatever angle the roof is built at is fine, unless you can angle them to the figures above.

### PRO-TIP:

Flat roofs often experience water pooling and dirt build-up on solar panels. 'Frameless' panels allow excess water to fall over the edge instead of gathering and eroding the frame seal. As an added bonus, frameless panels can even be cheaper to install tilt frames on a flat roof.



# Solar Payback

Depending on the size of your solar system and how you use your generated electricity, a properly designed solar system should be paid off in around 4-7 years.

Remember you can ask your installer for a payback analysis to estimate your payback period based on the system they're installing.

It's also encouraging to note that as of 2019, 24% of all of Australia's electricity generation is derived from renewable sources.

## **PRO-TIP:**

If the installer is estimating your self-consumption without half hour usage data, then get payback calculations for worst case self-consumption and best case self-consumption to ensure you're satisfied with the payback range.

# Costs and Quotes

As of October 2020, the price of a good quality solar system, with Tier 1 panels and a quality string inverter setup, can be broken down as below:

- 3kW: \$3,500 - \$5,000
- 5kW: \$4,500 - \$8,000
- 6kW: \$5,000 - \$9,000
- 10kW: \$8,000 - \$12,000

It's important to note these prices also include the discount from the 'solar rebate' and further costs can be incurred if the house design makes installation difficult or if switchboard upgrades or other electrical work need to be carried out.

Costs will also increase by approx. 20% by choosing Micro-inverters over a Central/String Inverter. Plus adding battery storage (for an off-grid or hybrid system) will at least double the price of the system.

If you're quoted much less than these price ranges by a solar salesman, chances are they're cutting corners somewhere or using inferior quality products to deliver a lower overall cost. So, be wary!

If you're leaning towards LG solar panels and their 25-year warranty, calculate your savings via their ROI calculator here: <https://www.lgenergy.com.au/solar-calculators>

## **PRO-TIP:**

Really cheap solar costs more in the long run, from repairs and lost output. So what's the best way to save money? Avoid cheap brands and no-name brands.



# Batteries

**Battery storage is prohibitively expensive when compared with solar-without-batteries.**

A regular non-battery solar PV system has a typical payback of around 3-6 years, and will last about 25 years. This means that once you hit the point where the savings of the system have paid it off, you should have another 20 years of free electricity to collect from the system.

So - if you are buying batteries simply to save money, battery storage just isn't worth it yet.

Our advice is to wait 2-5 years for battery costs to come down before investing in them. But don't wait for batteries to decrease in price before buying solar. All that achieves is locking yourself into high bills every quarter.

By installing a solar system now, your bills will immediately be reduced. In 2-5 years you can simply add batteries to your existing system for even greater savings. And you don't need to buy any special type of system to be ready for batteries. Every grid-connect system ever installed in Australia is compatible with batteries using a special box called a 'battery inverter'. You can buy one of these when you buy your batteries, and battery installation will be very straightforward.

## **PRO-TIP:**

Counter-intuitively, most battery systems will not provide backup when the grid goes down. If you really need backup then you must specify this up front, as it is an expensive extra feature that requires very careful design.

# BEGINNER'S GUIDE TO **Solar Power**

---

Call us now for  
expert advice



See our Solar  
options online

