NSW GOVERNMENT

Solar systems fact sheet for

- ✓ Households
- ✓ Businesses

July 2018

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How will this fact sheet help you?

Installing a solar system can be very rewarding for both households and businesses. Using solar power can save you money on bills and give you more control on how much electricity you consume. You can even be rewarded for producing excess electricity.

If you are a household owner or a small business owner interested in understanding more about solar systems and how you can benefit from them, this fact sheet is for you.

We have summarised key facts and useful resources to give you an overview. Armed with this information, you will be in a good position to **make the best decision for your property and energy use**.

This fact sheet will help you:

- Estimate costs and benefits of a solar power system
- Think about what system best meets your needs
- Consider how to pay for the initial investment
- Make an informed decision to install solar

For more information on solar systems, see the Clean Energy Council's website:
www.solaraccreditation.com.au/consumers

Solar power is important

1. Benefits of solar systems

Solar systems are a great solution for households and businesses that use electricity during the day.

Solar systems are affordable for many households and businesses. Different rebates and financing options can help you with the initial cost of installing a system. In addition, the rewards of producing your own clean power are many.

By using electricity created from a solar system, you could:

- ✓ Save on electricity bills and avoid buying electricity from the grid
- ✓ Get paid by retailers if you produce excess electricity
- ✓ Minimise the impact of electricity price changes on your bill
- ✓ Reduce your environmental impact
- ✓ Pair with a battery to store electricity and keep important equipment (e.g. medical equipment) running during blackouts

2. Many people are using solar power already

In May 2018, more than 410,000 households and businesses in NSW have installed a solar system.

Figure 1: Solar panels on a building's roof. Photo courtesy of Exthree.

Solar systems – key facts

3. I am considering installing a solar system – what do I need to think about?

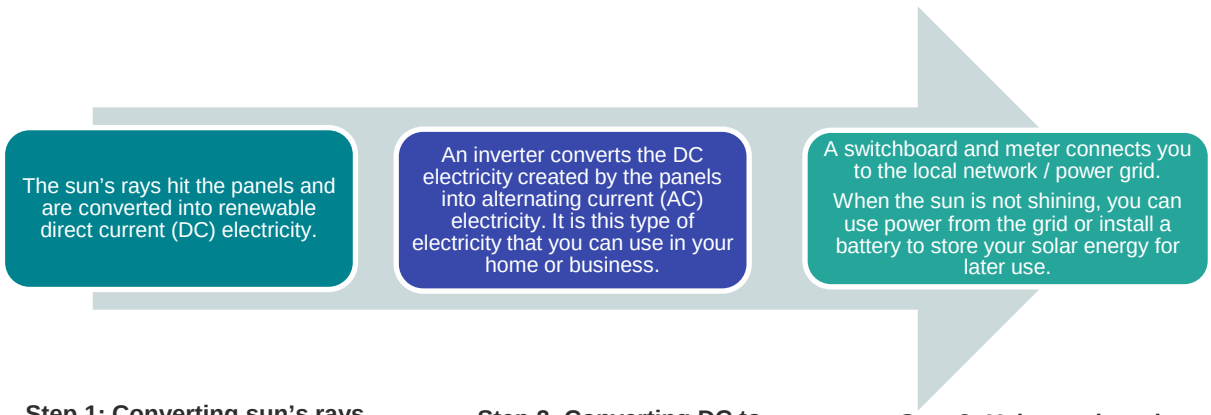
A few things influence the type of solar system to best fit your household or business. You may need to consider:

- How much electricity you use
- If you are the owner-occupier, tenant or lessor of the residence
- Financing options available to you
- Your budget
- How much roof space and shading you have
- The roof height, access, structural integrity, pitch and orientation
- Electricity tariffs, including network charges and feed in tariffs (FiTs)
- Approvals you may need from the network and/or any electrical shut downs during installation
- If the residence is heritage listed or has other building regulations that apply

For more information on a solar system that is right for you, see the Clean Energy Council's website www.solaraccreditation.com.au/consumers

4. How does a solar system work?

Solar electricity is produced by harvesting clean and renewable energy from the sun. Very simply, the process of creating solar power electricity is:



Step 1: Converting sun's rays to DC

Step 2: Converting DC to AC

Step 3: Using and storing power

To create solar power, you need to install a solar system on your house or building. There are two main parts to a **solar photovoltaic system (solar system)**:

- Photovoltaic (PV) solar panels – these are panels that create electricity from the sun's rays
- An inverter – This is a piece of equipment that changes the direct current (DC) electricity created by the panels into alternating current (AC) electricity

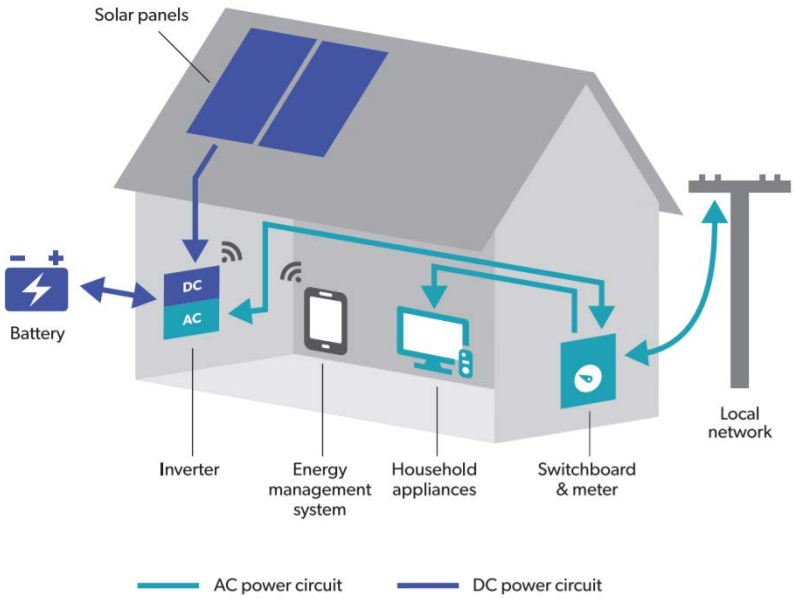


Figure 2: A household solar system showing solar panels, inverter, and optional battery and electricity management system (dashboard).

For more information and guides to installing solar, go to the Clean Energy Council's website www.solaraccreditation.com.au

5. How can I measure electricity I consume or produce?

The electricity you use from the grid or from your solar system is measured using one of two meter types. Due to national rule changes in 2017 **all new meters installed must be smart meters**[1]. However, if you installed a solar system before this rule change, your electricity consumption or production may be measured using a **net meter**.

- A **smart meter,** also known as a digital or advanced meter, takes digital measurements and automatically reports this to your retailer without needing to be manually read[2]. You will have real-time information on when and how much electricity you are consuming.
- If you have a **net meter,** it needs to be manually read by an electricity operator. Net meters records electricity used from the grid and the electricity you send back to the grid[3]. Your electricity retailer can use a net meter to tell you how much electricity you will be charged for and how much you have exported. You could be rewarded for any excess electricity you send back into the grid - see section 7 and 8.

[1] For more information see: https://www.energy.nsw.gov.au/energy-consumers/energy-providers/smart-meters-in-nsw/smart-energy,-smart-meters-for-nsw-customers

[2] Australian Energy Regulator, *Smart* Meters, Accessed at: https://www.aer.gov.au/consumers/my-energy-service/smart-meters

Different retailers offer varying levels of services depending on the type of meter and the needs of their solar customers who want information on their solar generation and usage profiles. Depending on your inverter type and the meter, some retailers also give people free **interactive online dashboards**. With these, you can log in online and see exactly how much electricity you are using from the grid and the solar system.

For information on smart meters see:
www.aer.gov.au/consumers/my-energy-service/smart-meters
and
www.energy.nsw.gov.au/energy-consumers/energy-providers/smart-meters-in-nsw/smart-energy,-smart-meters-for-nsw-customers

6. What if I produce more electricity than I use?

If you produce more electricity through solar power than you need (and many households do this), you can export this excess electricity to the grid.

Households which remain empty during the day export the highest proportion of electricity to the grid. On the other hand, businesses that operate 7 days per week, may consume up to 100% of the electricity produced.

7. Can I get paid for excess electricity I produce?

An energy retailer will pay you a **solar feed-in tariff (FiT)** for any solar electricity you can send back into the grid. Electricity retailers offer different FiT prices, normally expressed as: cents per kilowatt hour (c/kWh).

Electricity from the grid generally costs more than the FiT, so it makes sense to use as much of your own rooftop solar energy as possible, before exporting it to the grid.

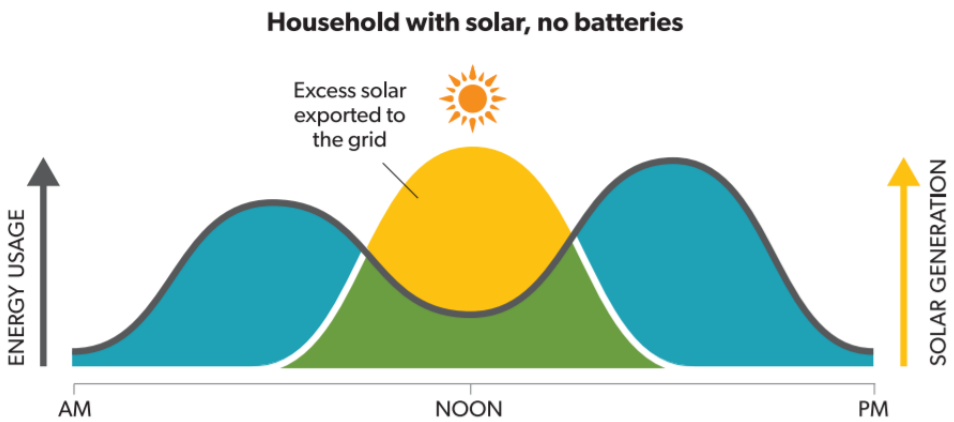


Figure 4: How a solar system generates electricity for a household's use and export.

8. What are the current Feed in Tariffs?

Each year the Independent Pricing and Regulatory Tribunal (IPART) releases a solar FiT range. This is closely related to the value of wholesale electricity prices during the day.

IPART's **recommended range of FiT in 2018-2019 is 6.9 to 8.4 c/kWh**. IPART has also established time-dependent feed-in tariffs to consider the different values of solar exports at different times of the day.

See IPART's recommended benchmark ranges www.ipart.nsw.gov.au

To compare FiTs offered by electricity retailers in your area, go to www.energymadeeasy.gov.au

9. How much will I save with solar power?

Payback is the time it will take the solar system to pay for itself. You get to this point by receiving lower electricity bills. Consuming as much solar generated energy as possible and FiT prices will influence your payback and return on investment of a solar system.

A solar system generally has a payback period between **4-7 years**.

Your specific payback will depend on:

- how much electricity you use
- the time of day you use electricity
- your electricity price
- the size of the solar system
- the solar panels tilt, orientation and shading

In Sydney and on the coast of NSW, each kW of solar panels creates approximately 4 kWhs of electricity a day. A 5kW solar system will generate 20kWh a day, for example, and this changes in summer and winter.

Figure 5 on the following page outlines a simple way to calculate a payback period. The costs used in the diagram are an indicative value for an available electricity contract to NSW customers in 2018. The indicative pricing uses a FiT of 8c/kWh and a block tariff of 25c/kWh. The small-scale technology certificates (STC) rebate in the diagram was based on 89 STCs at the July 2018 price of $35 per certificate. More information about STCs can be found in section 14.

For more information on small-scale technology certificates (STC) see the Clean Energy Regulator's website: /www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/Agents-and-installers/Small-scale-technology-certificates

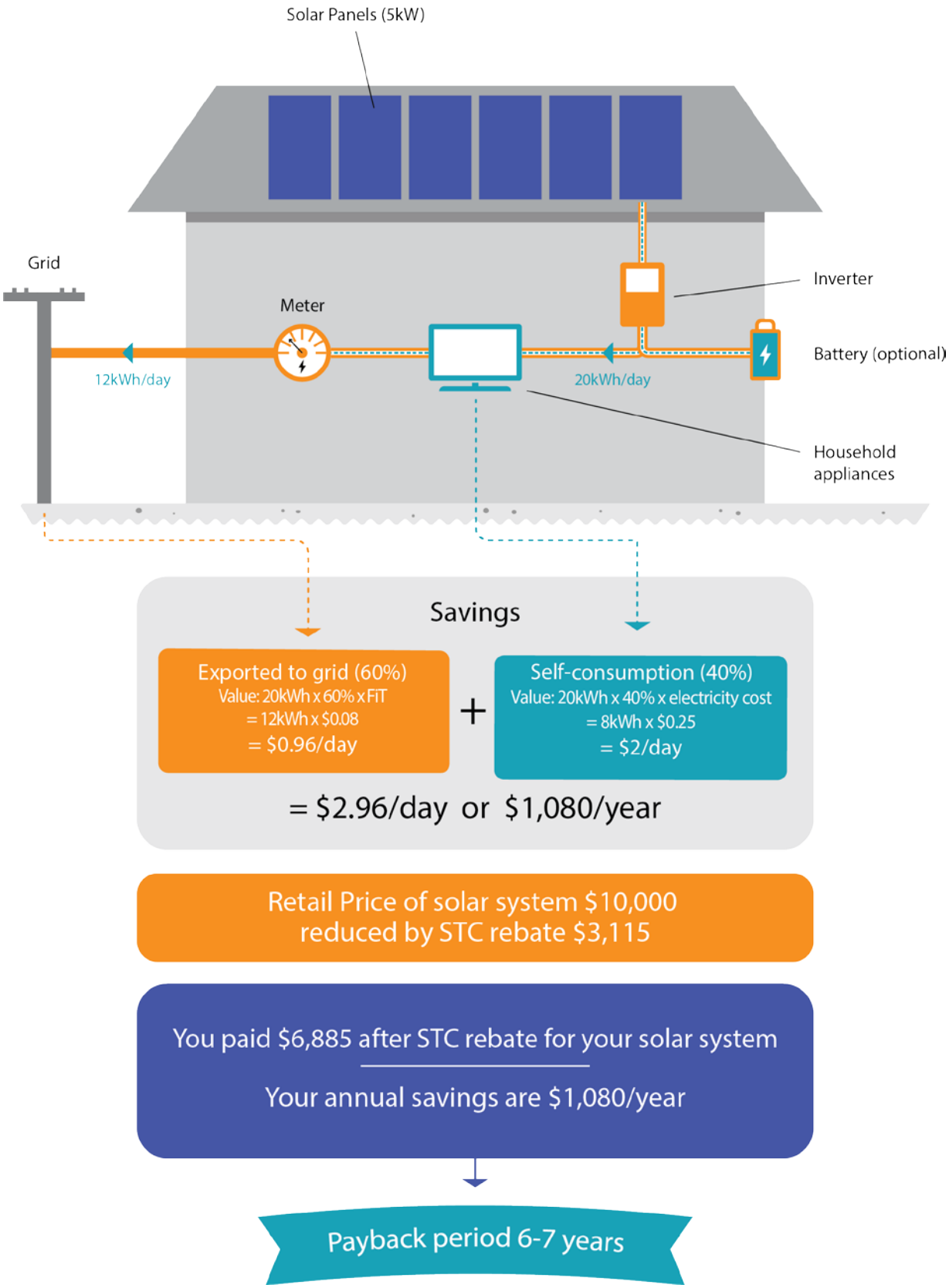


Figure 5: A simple way to calculate the payback time of a solar system.

The costs used in Figure 5 are an indicative value for an available electricity contract to NSW customers in 2018. The indicative pricing has a FiT of 8c/kWh and a block tariff of 25c/kWh. The STC rebate in the diagram was based on 89 STC's at the July 2018 price of $35 per certificate.

10. Will solar systems affect me regarding tax?

Your solar investment could have tax implications, depending on how it is financed or managed. For example, you may need to pay GST on any income you receive from the FiT.

For more information or advice on this, talk to your accountant or the Australian Tax Office www.ato.com.au

If you are lending or have a power purchase agreement (see section 13 on these agreements), you could be eligible to deduct the costs of the system from your tax.

11. How much does a solar system cost?

As of March 2018, a high-quality solar system costs roughly **$1,200 - $1,500 per kW**. This includes GST and is the price after applying Small-scale Technology Certificates. This is a type of rebate available to you (more about **rebates** in section 14).

The price per kW normally decreases as the system size increases. Larger systems may need more equipment and may have higher network compliance costs (above 30 kW).

Depending on the **age and type of electrical infrastructure** in your building, you could also be looking at some costs for building works (e.g. upgrades to meters, switchboards, extended cable).

Average solar system prices are published regularly at www.solarchoice.net.au/blog/solar-power-system-prices

Your costs and payback period will also depend on if you chose to add a solar battery to complement your solar system (see section 15 for more information on batteries).

12. What if I cannot pay for a system up-front?

If an up-front payment is not possible, there are two financing solutions with no up-front costs you could consider:

- **Leasing:** Under this arrangement the financier will pay for the solar system and you pay a flat monthly rental fee for a certain period. You will probably be given the option to purchase the system at the end of the lease. A lease system can be cost-positive over a typical year, when comparing lease repayments to reduced electricity bills from a fully owned system. A solar lease is normally 7 years, but this depends on your situation. Normally, people tend to use a leasing system for larger solar systems (larger than 30kW).
- **Power purchase agreement (PPA):** a financier will buy the solar system and you buy the power produced from the financier for a fixed rate (normally lower than current market rates). This rate is usually part of a locked-in contract with a lifetime of 10 to 20 years. At the end of the contract, you could have the option to own the system. Because the cost of the solar is locked in, you will not be affected by changes in electricity prices when you use the solar electricity.

13. What rebates or incentives are available to me?

The Federal Government has committed to a **Renewable Energy Target (RET)** of 33,000 gigawatt hours (GWh) of additional renewable electricity generation by 2020. The RET works by allowing both large-scale power stations and the owners of small-scale systems to create generation certificates for every megawatt hour (MWh)

The RET has 2 types of certificates that act as rebates available for households and businesses:

- **Small-scale technology certificates (STCs)** – these apply to smaller solar systems (<100kW). How many STCs you can get for a new solar installation depends on how much electricity it can produce before December 2030. The higher the rebate from STCs, the lower your initial cost.
- **Large-scale generation certificates (LGCs)** – these apply to large solar systems (>100kW). Your solar system will create LGCs every year up to December 2030 depending on how much electricity it produced in that year. After the RET is met, your system will continue to generate LGCs, but their value will change depending on demand for LGCs in the market.

For residential solar systems, your installer will take care of the STCs and will typically give you a rebate reduction on the purchase price. Both STCs and LGCs are managed by the Federal Clean Energy Regulator. See Table 1 below for more information on these rebates.

Table 1: STCs and LGCs for solar systems.

STC	LGC
Solar systems < 100 kilowatt (kW)	Solar systems >100kW
STCs act as up-front discounts. The buyer signs over the STCs to the installer; the STC 'discount' should appear as a discount on the installation quote	Certificates are created regularly, depending on how much electricity was created in the previous period
Certificates are created upfront when the solar system has been commissioned. They are based on how much electricity may be generated by the system until December 2030	LGCs can become an ongoing revenue stream because they are traded at the changing market price. Project owners can sell the LGCs they expect to have in the future at a discount to lower their upfront costs.
1 STC is equivalent to 1 MWh of electricity created	1 LGC is equivalent to 1 MWh of electricity created
STCs are priced on a floating market (around $35/ MWh in July 2018)	LGCs are traded on an open, floating market (around $80/MWh in July 2018)

More information on the RET can be found at www.cleanenergyregulator.gov.au/RET

14. The future of solar costs and rebates

The cost of solar systems has fallen dramatically over the last 10 years. The industry predicts the price will continue to fall, perhaps at a slower rate because of the variable renewable energy markets and the cost of manufacturing and transporting the systems.

15. What if I use more electricity at night than during the day?

You could add a **battery** to your solar system. A battery allows you to store and use solar electricity after daylight hours, making you less subject to changes on the grid. A battery works well when you need a fast backup or if you want to avoid upgrading electrical infrastructure.

Several options are available when it comes to batteries: you could consider a **hybrid-ready inverter** (an inverter with an added battery) or you could install a **separate battery**. The separate battery can also have an **in-built inverter**.

Batteries are becoming cheaper and more efficient. Many households and businesses are planning to add a battery to their system in the future.

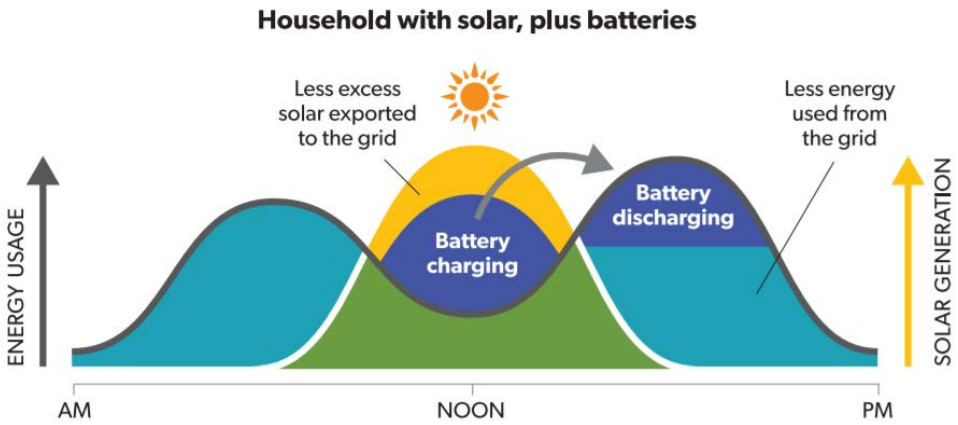


Figure 3: How a solar system with a battery affects how much electricity you use.

If you are interested in batteries, you can contact specialist installers.

For more information on batteries, see the NSW Home Solar Battery Guide:
www.energy.nsw.gov.au/renewable-energy/consumers/home-solar-battery-guide

16. I am ready to invest in solar. What should I watch out for in a quote?

The 3 main things to look for in a quote on a solar system:

1. an analysis by the installer of your roof space, type, shading and the best type of panels for you.
2. a detailed breakdown of all costs – this will show you how the installer has priced each part of the system and what is included. Some quotes do not include things like building approvals or equipment hire.
3. a forecast of financial return and savings back to you. This is predominantly driven by the percentage of solar slectricity that is self-consumed to avoid being charged for grid electricity.

A professional solar installer will look at your bills and match the system size based on your use. **The more information you can provide the installer, the more accurate your quote will be.**

17. I am ready to invest in solar. How do I select the right installer?

- ☑ **Ask suppliers to explain how they have sized and priced your system**, i.e. the assumptions that went into their calculations. For example, suppliers may assume you use 100% of the electricity you create from the solar system. This normally only happens with industrial businesses with constantly-running machinery e.g. refrigeration. Normally commercial systems don't have constant machinery on and may use approximately 60-80% of the electricity they create. This proportion can **go down to 20-60% for households that are empty during the day**, unless they are big consumers during the day (e.g. pool pumps or running a home office).
- ☑ Check if maintenance and cleaning costs are included. Some suppliers do not include these costs in their analysis.
- ☑ Ask about replacement of inverters, which tend to have a shorter lifespan than panels.
- ☑ Always make sure your installer has the right accreditations, licences, and respects standards.
- ☑ Look at a **Clean Energy Council (CEC) approved solar retailer**. They give you a 5-year Whole of System warranty, use ethical sales practices and only use CEC-accredited installers.

18. What if I want to install solar power as a business tenant on a rental property?

If you want to install a solar system on rental or leased property (as a tenant or the owner), you need to discuss this with your landlord or strata committee. There are 2 ways you can have solar on a leased property:

- As a **tenant**, you can pay and install a system yourself (you own the system). Once you leave the lease, you have the option of taking the system with you. Many landlords tend to not like this arrangement because the system is fixed to the roof and removing it can cause damage. The other option is for the landlord to buy the system off you when the lease expires.

- As a **landlord**, you can pay and install the system and then agree to a payment system with the tenant. The tenant could use all the electricity produced and pay a small fee as part of their rent. This way, the tenant will have lower bills while you receive a small revenue stream. 3rd party services can help with these negotiations, often at cheaper rates than the grid rates.

19. I am not ready for a solar system yet – what else can I do?

If you are not ready to invest in a solar system, you can also have zero net emissions by buying 100% **GreenPower** for all or part of your electricity.

GreenPower is renewable energy from GreenPower accredited renewable energy generators across Australia (solar, wind, bioenergy and mini-hydro). GreenPower lowers your emissions while helping grow the Australian renewable industry.

GreenPower electricity is strictly audited to check that the GreenPower comes from accredited renewable energy generators and fed into the grid on your behalf.

You can also reduce your energy consumption by making your house more energy efficient by using energy efficient appliances, installing double glazing and insulation.

For more information on the GreenPower visit www.greenpower.gov.au

For more information on energy efficiency visit www.environment.nsw.gov.au/households/save-energy.htm

How to look after a solar system

20. What maintenance does a solar system need?

A solar installation could have a lifespan of more than **25 years**, so it is important to **look after your solar system.**

Checking your system helps you get the best out of your system. Things to keep in mind are:

- You will need to clean your panels from leaves or dirt
- If you send a lot of electricity back into the grid during the day (e.g. in summer), you could run household appliances, such as washing machines and dishwashers, rather than at night (e.g. to take advantage of off-peak rates)
- Check how your system is performing using monitoring equipment as agreed with your supplier. Many inverters now come packaged with a simple monitoring system. You can generally access these systems online or with an app on your mobile phone
- More sophisticated 3rd party monitoring systems are good if you need more detailed reporting

Lastly, think about what would happen if you decided to **sell your property**. You could leave it in place as an asset for new buyers, or potentially take and reinstall the system on your new property, but this risks damaging your equipment and may be expensive.

21. Are there any costs to maintain the system?

Think about potential ongoing costs that you could incur:

- Your solar installer will give you a maintenance schedule to keep your system in the best shape. This means, you may have to check your system for damage or safety every 6 months – 1 year
- For electrical issues, you may need to use a CEC-accredited electrician
- For larger systems, you may need to use professional cleaners to replace cracked panels, or remove trees that create shade. Cleaners will use special equipment (e.g. purified water) to not damage the system

22. What warranties do I need to think of?

A solar system normally carries 4 important warranties:

1. **Performance warranty:** Good quality panels will reduce their efficiency by a maximum of 10% in the first 10 years of use
2. **Solar panel product warranty:** This product warranty will cover you typically for 10+ years

3. **Inverter product warranty:** A small proportion of inverters can fail so it is important to check this warranty. Most warranties will cover you for 5 years, and some manufacturers will allow up to 10 years

4. **Workmanship/ Installation warranty:** This is provided by your solar installer to reflect their confidence in their workmanship. Check warranty periods, if they offer replacements or repairs, where are their service centres and any call-out fees

Useful resources

Check out these reputable websites and calculators. These can help you make some decisions:

- **Australian Tax Office:** https://www.ato.gov.au/Business/GST/In-detail/Your-industry/GST-and-the-Small-scale-Renewable-Energy-Scheme/
- **Clean Energy Council:** https://www.cleanenergycouncil.org.au/technologies/solar-pv.html
- **Clean Energy Regulator:** http://www.cleanenergyregulator.gov.au/
- **Energy made easy:** https://www.energymadeeasy.gov.au/
- **Home solar battery guide:** https://www.energy.nsw.gov.au/renewable-energy/consumers/home-solar-battery-guide
- **Office of Environment & Heritage:** /www.environment.nsw.gov.au/topics/energy-savings-and-resource-efficiency
- **Solar calculator:** https://solarcalculator.com.au/contact-us/
- **Solar quotes:** https://www.solarquotes.com.au/energy/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