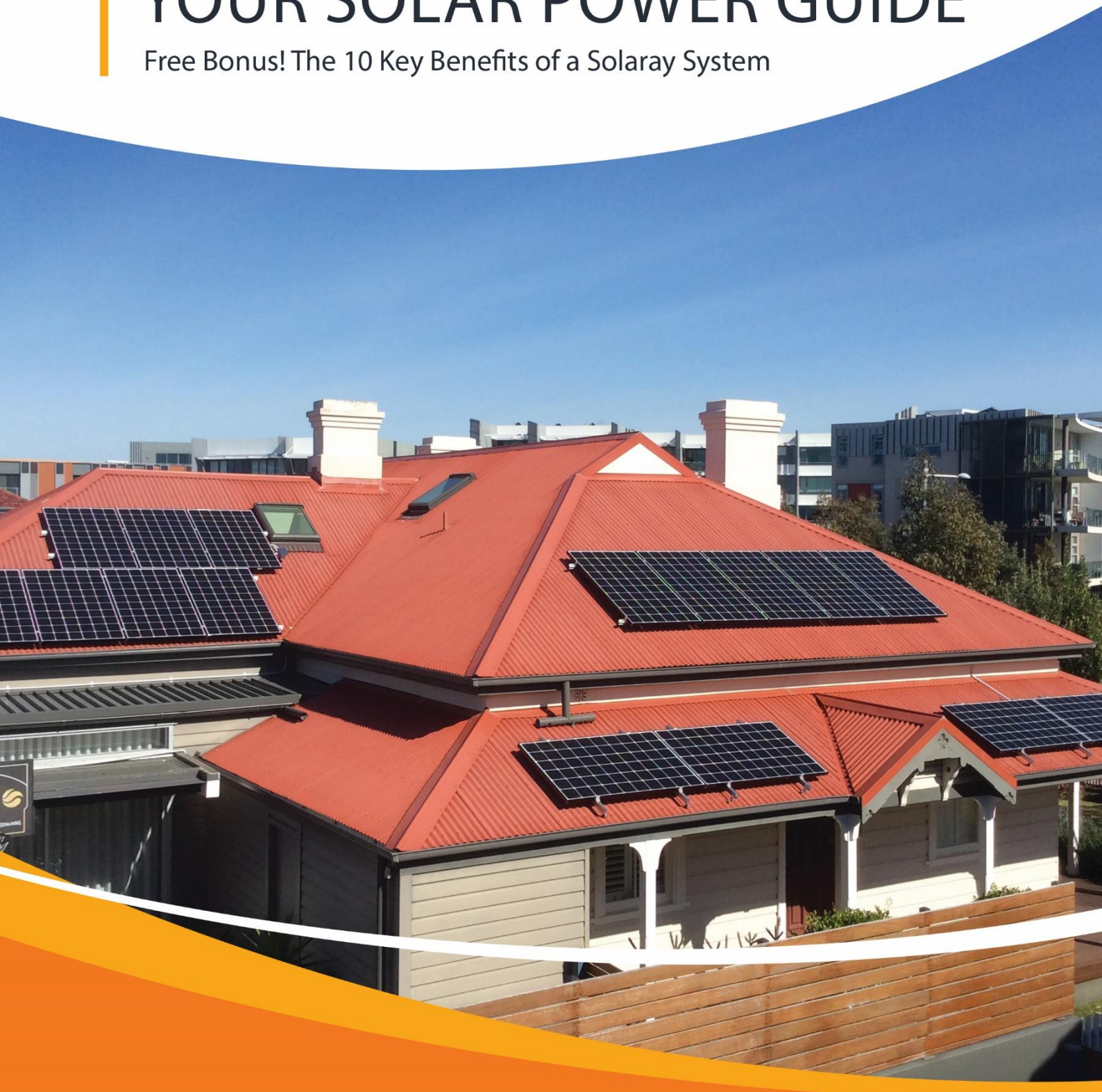
SOLARAY ENERGY

RENEWING OUR FUTURE

SOLARAY ENERGY
YOUR SOLAR POWER GUIDE

Free Bonus! The 10 Key Benefits of a Solaray System



CLEAN ENERGY COUNCIL MEMBER

www.solaray.com.au

Ph: 1300 221 586

A clean, reliable, and affordable energy supply for all is finally here

"Disruption… Smart solar power, solar storage, and home automation are redefining the status quo in Australia's Energy Market, placing power firmly back in the hands of the household. Over the last 12 months, Solaray has been at the forefront of one of the most exciting transitions in the history of the solar industry."

Jonathan Fisk, Director of Solaray Energy

The Solar & Storage Experts
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RESIDENTIAL SOLAR POWER

Why you should install solar power in 2019

Good quality solar power systems have never been so affordable and in 2019 we will see many households include battery storage with their system to store excess solar power that can then be used in the evening. 365W solar panels are now available, a huge improvement from the standard 250W panel we were installing only two years ago. If you have been considering solar, 2019 is the year you should seriously consider getting a solar power system installed.

Solar power has never been this affordable

As power prices continue to rise, a good quality solar power system can typically pay for itself in as little as 3 to 5 years. A solar power system can save you tens of thousands of dollars on your power bills over the life of the system, add value to your home, and significantly reduce your carbon footprint.

Improvements in technology

Nearly all our systems now include panel level output, which means that each panel outputs power independently from the rest of the array. This increases output in partial shade, it allows us to use multiple roof sections, and it allows you to take advantage of positive power tolerance.

Smart Solar Systems (from Enphase and SolarEdge) now come with sophisticated monitoring systems that are connected to the internet, provide real-time performance data, status reports and automated alerts if one of the panels is underperforming. Consumption monitoring is also available to help you monitor how much power you are using in your home. Previously, system owners had to keep an eye on system performance manually or book regular service calls. We can now monitor your system in real time, and we can even remotely reset firmware if there is an issue with one of the panels. This next generation solar technology ensures little to no downtime.

Safety is also a key issue. Gone are the days of high-voltage cable runs through the house. Smart Solar Technology allows us to run a safe and easy AC cable from the panel array directly into your meter board, significantly reducing electrocution and fire risks.

How does solar power work in NSW?

Firstly, the benefit of solar power in NSW is that it reduces your power bill, so if your bills are only $200 a quarter, at best you may be able to save a few hundred dollars a year. We generally recommend you have a quarterly power bill of at least $400 to be able to get any significant saving. Furthermore, solar power is generated during the day between around 7 am and 7 pm in summer (less in winter), so you should be using at least 8 kWh a day during the daytime hours.

If you are planning to install battery storage, you can consider your daily (24 hour) usage, which may translate to a larger solar array, to both run your home during the daytime and to charge the batteries. Solar batteries allow you to store excess solar power to then be used in the evening as needed.

If your power bill is more than $500 a quarter, a solar power system will almost certainly be of great benefit, and generally the larger your power bill, the more money you can save from solar power.

Solar power is fed into your home to power everything that is connected to mains power (not off peak hot water). If you don't use the solar power as it is generated, it is automatically fed out to the grid and you may be paid a feed in tariff by your energy retailer. This is generally around 5-12 cents per kWh and is paid as a credit on your power bill. If you are using more power than the solar system is generating, you will automatically buy power from the grid at your contracted rates.

To get the most benefit from solar power, you should aim to use most of the solar power at the time it is generated. To do this requires some analysis of your current and future usage patterns - as well as preferably some knowledge about how solar power works. Talk to the Solaray Team today for more information:

solaray.com.au/quote

What size system do I need for my house?

The right size solar system depends on what you want your system to do. For many households, it is about making sure it pays for itself in as little time as possible, for others it is to reduce their power bill by the greatest amount or reduce their carbon footprint to do their bit for the environment.

Roughly sizing up a solar system is easy; solar power can save you around $100 per kW (approx. 4 panels) per quarterly bill, and a solar system will output around 4 times its size as a daily average.

For example, a 3kW system will output an average of around 12 kWh a day and it can save you up to around $300 every quarterly power bill.

For many households, this rule of thumb is good enough. As solar power prices continue to fall, getting the maths exactly right isn't as important as it used to be. Many of our customers get a rough sense of what they need and then add on a few more panels to future-proof their investment.

Paying back your investment as quickly as possible requires sizing up a system to match your daytime energy usage. In a perfect situation, you would use all the solar power that is generated.

For example, if you install a 5kW system for $6,000 and it generates around 7000 kWh every year, if you pay on average 30 cents a kW for your power you could save over $2000 every year off your bills. This would result in a return on your investment in less than 3 years! It is difficult to use 100% of the power a solar system generates, however if the system is sized correctly you should be able to use around 80% or more.

The reason returns diminish when you have a larger system is that instead of saving money from your bill by using the solar power instead of buying power from the grid, you are selling excess solar power to the grid at your contracted feed in tariff rate (often around 5 cents per kWh). This issue can now be avoided by storing excess solar power in a solar battery to then use in the evening.

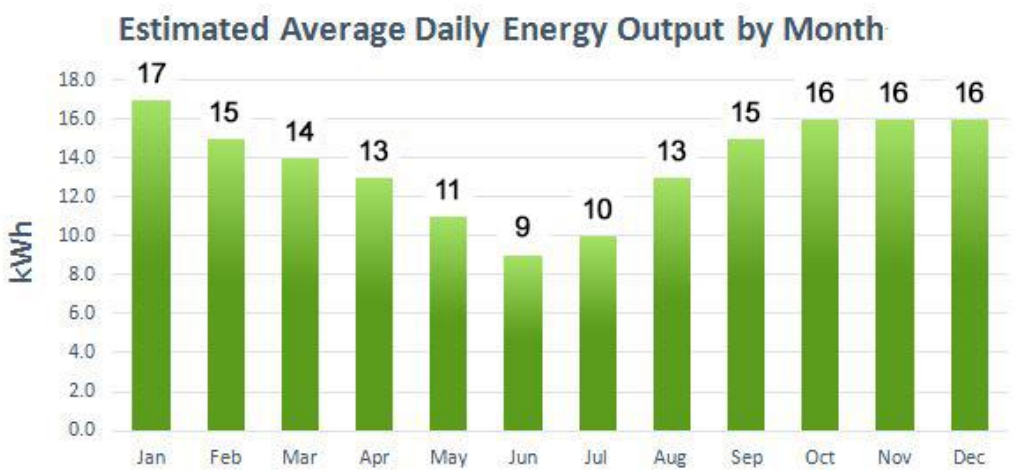
If you are environmentally motivated, your roof space and budget are all that are stopping you! The bigger the solar system the better, as you are reducing your reliance on polluting industries such as coal and gas and helping to produce clean, renewable energy. Buying a solar system is one of the biggest steps you can take as an individual and a household to help build the renewable energy sector and reduce our reliance on old and polluting technology. There are now over 1,600,000 solar systems in Australia, and as this number continues to grow our voice becomes louder - governments are starting to listen!

How much power will my solar system generate?

This depends on several factors including your roof orientation, the angle of the panels, the weather, the season and the size of your system. Because of this we use averages along with the guidelines from the clean energy council.

The Clean Energy Council advise that a solar system in Sydney should output an average of 3.9 kWh of energy per day for every kW of solar installed. Considering the seasons and the weather, on any given day this figure could be extremely different.

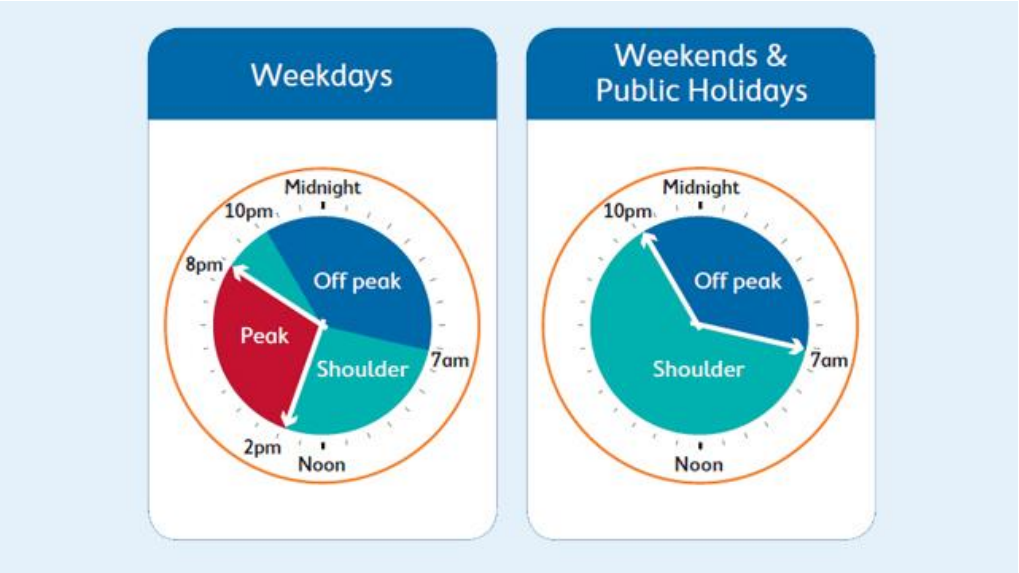
As an example, a 3kW system should output an average of 11.7kWh per day, producing more in summer and less in winter:



How much will solar power save me?

Solar power is fed into your home to use as it is generated, and so it reduces your bill by how much you pay for your power.

If you have time of use billing, you are much better off generating solar power in the afternoon during the peak billing period when power can cost over 50 cents per kWh. If your panels face west of north, you will push the output of your solar system into the afternoon, and during summer output will continue up until 8 pm, which can help you cover most of your energy usage during the peak billing period.



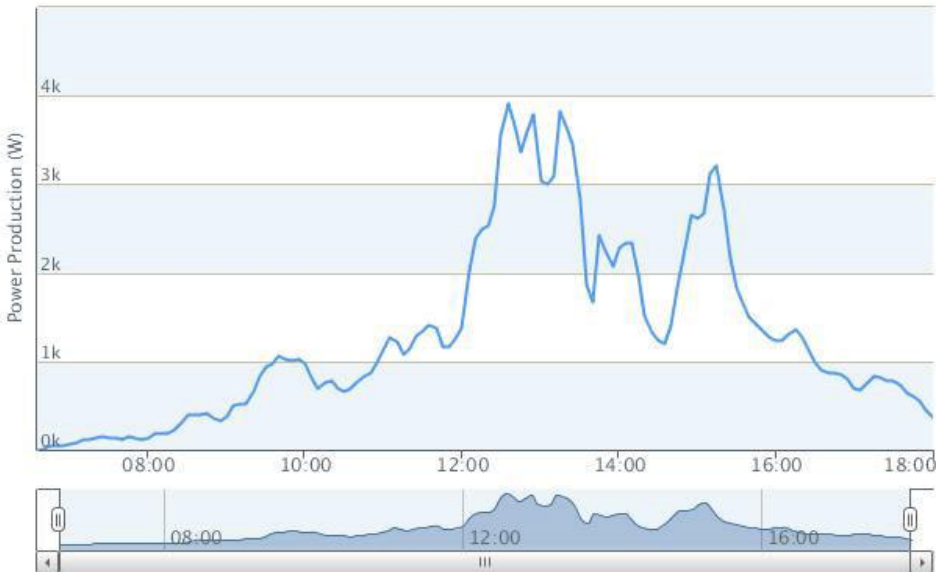
If you have time of use billing, we normally say to take an average of 30 cents per kWh when estimating the potential benefit to your power bill, which is around the average of your shoulder and peak rates.

If you pay a flat rate for your power, this is how much solar power can save you per kWh, typically around 25 cents per kWh.

Does Solar power work on cloudy days?

A solar system does not only work at maximum capacity. In low light conditions such as early in the morning or when it is overcast, solar panels will still convert light into power for your home, just at a reduced rate.

For example, a 4kW system may only be outputting 2kWs of power on a cloudy day. There is a point where the energy produced is no longer strong enough to power the inverter and the system will turn off. This happens every evening and perhaps during an especially dark storm.



Above is an example of one of our high performing [Enphase Micro Inverter systems] on an overcast day. As you can see, output can change minute by minute as the sun comes out and disappears again behind the clouds. This system is orientated just west of north so the peak solar output occurs from late morning through to around 4pm in the afternoon. This is an early spring day (September) so the peak output period will increase in length over summer, and be a little shorter in winter.

What direction should my solar panels face?

Solar panels will generate the most energy over the course of a year when they are facing north. This is especially important in winter when the sun is lower in the northern sky. A Solaray consultant can use specially designed software to demonstrate the sun and shade that your roof will have in winter, summer and at any time during the year.

If you house has a north- south roof line, we can install panels on either the eastern or western roof depending on what time of the day you use the most power. Many households will use more power in the afternoon when the kids are home from school and the air conditioner and pool pumps are running. If this is the case we would recommend installing solar panels on the western roof.

The other point that can influence this decision is time of use billing. In this case you may want to have some panels facing west to cover the peak billing period.

It is important to understand that panels installed on a roof facing south of either east or west will generate significantly less power than a solar system facing north. In most cases, we would advise against using any south facing roof as your financial returns may be below an acceptable level.

Do I need a new digital meter?

Yes! All solar systems require the replacement of your meter to a new digital meter that can monitor how much power you are sending to the grid as well as how much power you are buying from your energy retailer. If you have a digital meter you will still need to get it replaced as it will not have the correct programming in it, unless you or your builder have specifically installed a solar digital meter. This is rare for houses that have not had a recent renovation.

What maintenance does a solar system require?

Very little. Solar panels are passive, however they can collect dust, bird poo and other particles that can build up over time. Luckily the rain washes most of this off. If there is a period of many moths without rain, by all means safely wash your solar panels by spraying them with a hose, but we don't recommend that you go up onto your roof and wash them by hand.

What happens if there is a blackout?

For safety reasons, your solar system switches off in a blackout. It should automatically turn on again once the power is restored. If it doesn't please call us on (02) 8090 4399 and ask to speak with one of our support staff. We can help you switch your system on again or book a service check for you to make sure everything is ok.

GOVERNMENT REBATES IN NSW

Rebates are available to qualifying residential and commercial premises in Australia that install Solar Panels. These rebates can mean significant reductions in the cost of Solar Systems and have been designed to encourage Australia's use of renewable energy.

The rebate program, which is part of Australia's Renewable Energy Target, means that when you install a solar system, a number of Renewable Energy Certificates are created. These Certificates are then purchased by Energy Companies as part of their Renewable Energy commitments.

The number of STC's depends on the size of the system. There are currently great rebates available on all our solar systems and the larger your system the greater the rebate:

System Output	Rebate*
3kW	$1,600
5kW	$2,800
10kW	$5,600

* Numbers are rounded estimates based on an STC price of $35 for a solar system installed in NSW in 2019.

Solaray make it simple for our customers by offering a number of easy options for obtaining cost reductions with STC's. Typically, we just deduct the value of the STC's from the purchase price of your system.

A 5kW Case Study

"The payback of a 5kW solar system has become so good, it is now possible to get a top of the range system to pay for itself within 3 to 5 years, with possible savings of up to around $50,000 over the life of the system."

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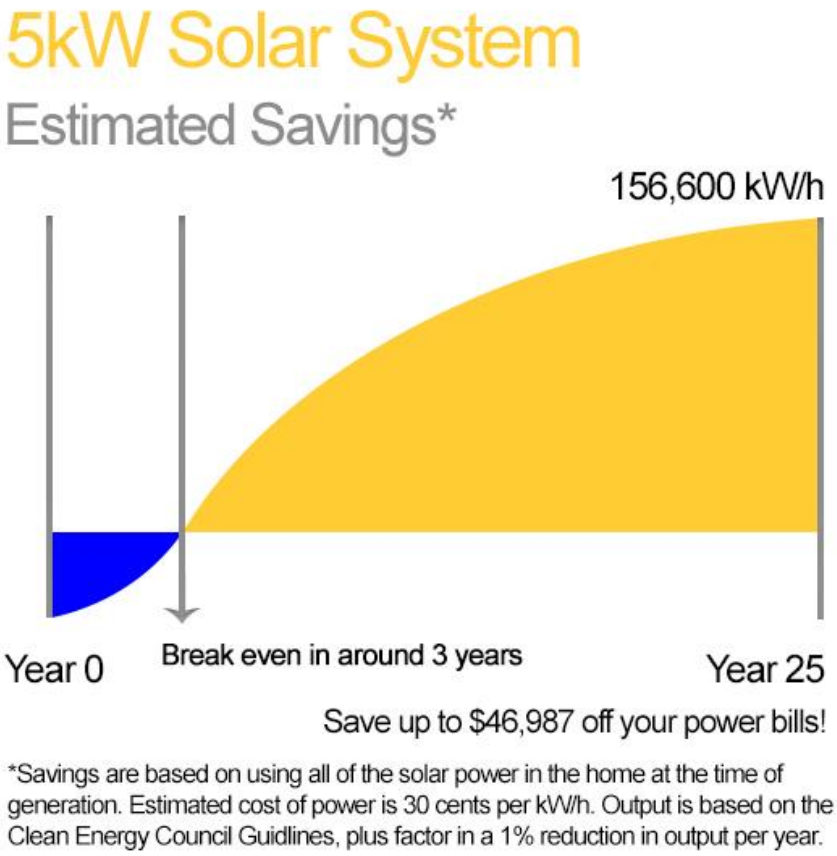
A 5kW Solar Power System

The payback of a 5kW solar system has become so good, many people are surprised to find out it is now possible to get a top of the range system to pay for itself in as quickly as 3 to 5 years, with a possible total profit of up to around $50,000 over the life of the system.

What's more, you are taking around $50,000 off the books of Australia's coal industry, creating a huge impact on the future of Australia's Renewable Energy Industry. This is why buying a solar power system is the single most effective action you can take to not only reduce your power bill but to vote for a clean energy future in Australia:



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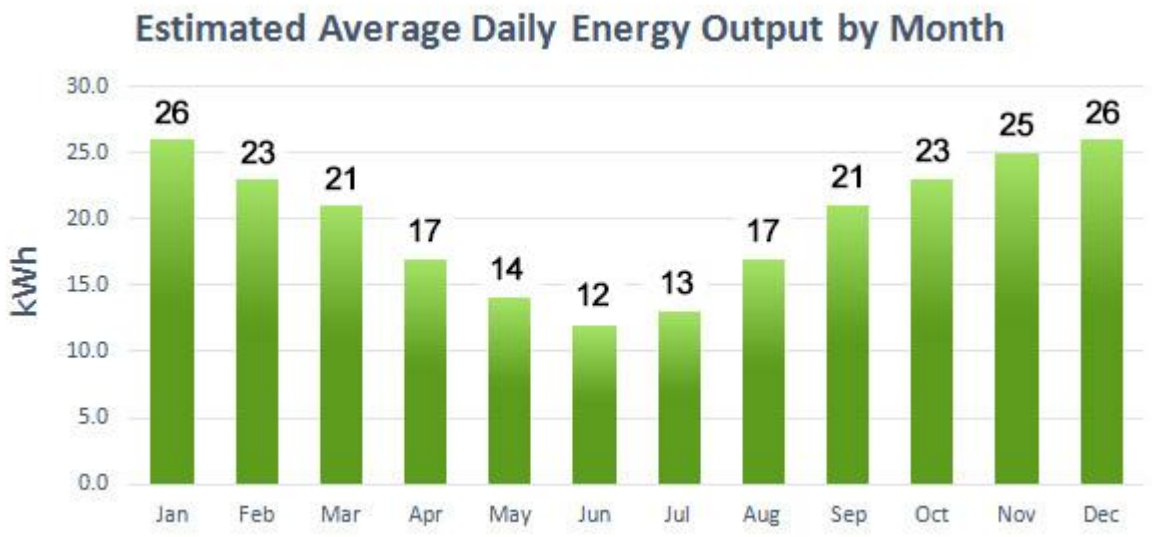
The output of a 5kW system varies significantly depending on several factors including the orientation of your roof, the angle of your roof, shade, the quality of the brands you select and the standard of the installation. The Clean Energy Council Guidelines state that a 5kW solar system in Sydney will output around 19.5 kWh a day. Importantly, this is not distributed equally across the year:



This annual output figure of 7117kW/h from the CEC is considered to be a conservative estimate, and from our own data it is common to see 5kW systems significantly outperform this. On average, our internet connected Enphase systems with 24/7 back to base monitoring output 110% of their predicted output, reinforcing the importance of buying quality brands.

Have a look at your power bill to see how much you pay for your electricity. If you have time of use billing, the average benefit of a solar system is around 30 cents per kWh. If you have a flat rate it tends to be around 25 cents per kWh.

Using this number and multiplying the estimated system output by how much you pay for your power, you can see that with an investment of around $6,000 for a 5kW solar system you can save up to an impressive $47,000 on your power bills over 25 years! This number can be even greater if you are using most of your solar power during the peak billing period of 2pm to 8pm, or if you chose top quality panels such as the LG NeON R 365W module, as they are built to last longer and output more power over time.

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Free Bonus: 10 Key Benefits of a Solaray System in 2019

"Solaray are a provider of smart energy management technology, incorporating cloud-based monitoring, future-proof solar power systems, back to base system status alerts, home automation, and of course, battery storage."

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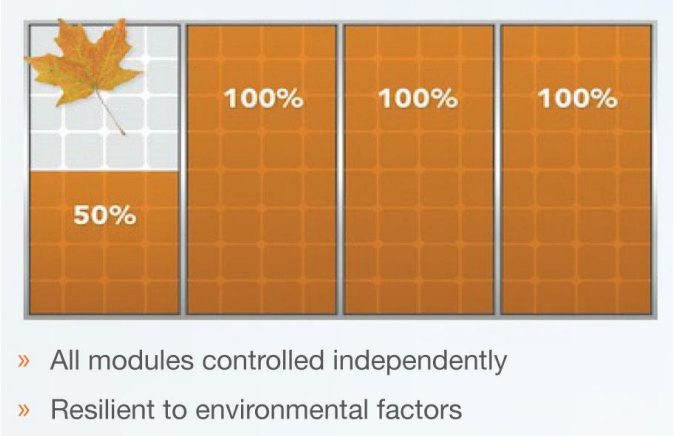
1. Increased Output

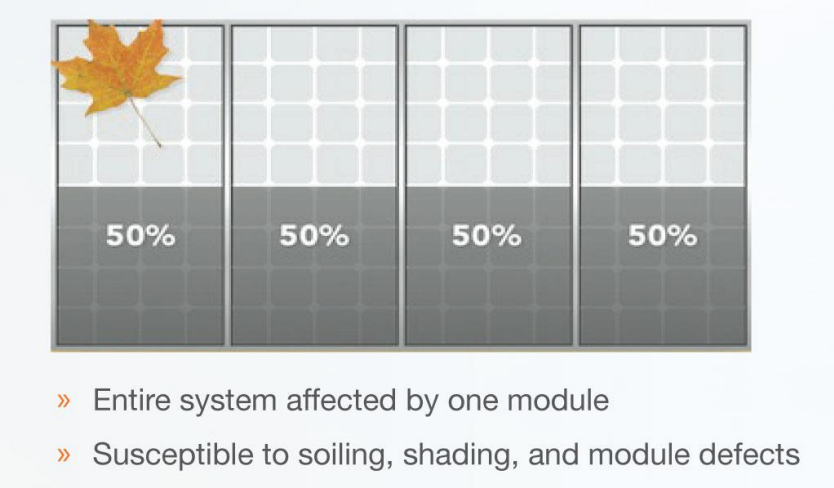
Smart Solaray Systems (from Enphase and SolarEdge) feature panel level output that allows each individual panel to output power independently from the other panels, significantly increasing system performance.

According to Renewable Energy World, shading of as little as 9% of a solar system connected to a central inverter, can lead to a system-wide decline in output by as much as 54%.



The below image is a great example of how a Solaray System can significantly increase output. In this image, the Solaray System will be working at a significantly higher level compared to a standard system in the patchy shade, because each panel is independent from the rest of the array.

vs. String Inverter



One of the biggest limitations with standard string inverter systems is that the panels are installed in series, meaning that each string in the system will always perform at the rate of the worst performing panel. This means that partial shade on even just one panel can have a large impact on the output of a system.

It is not just shade from trees that can affect solar output. Bird droppings and dust as well as chimneys and power lines can all affect solar output. Additionally, solar panels have a +- tolerance during the manufacturing process. For example, LG NeON 330W panels have a +3% tolerance, so they will range in output from 330W to 340W. Your system won't be able to take advantage of this unless each panel is outputting power independently from the other panels.

2. Increased Flexibility

Innovative solar technology now allows our technicians to design a panel array across multiple roof areas – both across different orientations and angles. If you use most of your power in the afternoon, it can be beneficial to have panels facing both north and west to distribute the output of solar power across the day. This avoids having a big peak of solar power in the middle of the day, making it easier to use a large percentage of the solar power as it is generated, and hence increasing the effectiveness of your system.

3. System Monitoring

Solaray Systems come with full online monitoring, free for the life of your system. A gateway connects your system to the internet to transfer live data on system performance, status alerts and critical issues. As your installer, Solaray receive automatic emails alerting us to any technical issues, making it simple to conduct system checks remotely from our head office in Glendenning, or even when our technicians are on the road. System owners can keep up to date with system output and check the system's status.

Solaray system monitoring also comes with the option for panel level output insights and consumption monitoring that allows you to keep track of how much power you are using in the home. This energy monitoring platform is regarded as one of the best in the industry.

4. Home Automation

This is what so many homeowners have been waiting for, so it is with great excitement that home automation is now available. You can now be sitting in the office, and with the touch of a button on your mobile phone turn on your air conditioner to run on excess solar power to cool down your house before you come home. You can also program appliances such as the pool pumps, a hot water system or even under-floor heating to run on excess solar power when it is available, turning your solar system into a complete energy solution. The future of renewable energy has arrived!

5. No single point of failure

In the unlikely event that something goes wrong with one of the panels, the rest of the system that is unaffected can still be operational. This allows for less down time, and allows you to continue to generate solar power during a warranty claim or service check.

6. Remote Technical Support

As your installer, the Solaray Support Team have access to live, real time monitoring of every panel. In the event of a fault, Solaray receives an automated message that alerts us to the issue. In most cases, the firmware can be updated and the problem fixed remotely. This can save you days of downtime and the frustration of having to call out a technician.

7. Easily Expandable

Solaray Systems are truly expandable, limited only by your roof space. Solaray can install as many additional panels as you like, and we don’t need to match the new panels to your existing array. This allows you to take advantage of any technology gains over the next few years.

This is in stark contrast to older systems, where we needed to match the inverter

size to the panel array to ensure high performance. This means that adding panels normally requires replacing the inverter. The other limitation is that we need to match the panels when adding panels to a string. This limits the upgrade window to around a year or so, as trying to find old stock is close to impossible due to fast advances in technology.

8. System Safety

Solaray Systems avoid the need for high voltage DC cable runs, increasing safety for the home owner. If a string inverter system was invented today it would probably be deemed illegal due to the need for a high voltage cable run through your home. There is also power leakage on longer DC cable runs, making safe and easy AC cable runs the preferred option whenever possible.

9. Longer Warranties as Standard

Solaray service a 10-year warranty as standard on Enphase systems and 12-years on SolarEdge systems.

As a part of our Platinum Service Package, Solaray service full replacement warranties so you are not out of pocket in the event of a failure. This, along with our free technical support is one of the main reasons Solaray ranks in the top 5 Solar Installers in Australia.

10. Battery Ready

Solaray systems are battery ready and are fully compatible with the leading brands on the market, including the Enphase AC Battery, Tesla Powerwall 2 and sonnenBatterie.

Solar Batteries can be installed with your system or added to an existing system. We connect the batteries directly to the meter board, where we install a control hub that manages power consumption and storage in the home.

Solaray Systems have been designed to be modular, expandable, easily installed and can be tailored to each customer's usage profile. A household or business are then able to monitor their usage, solar generation and peak times, and install more battery capacity knowing that it will pay for itself in the quickest possible time.

The Installation

"As the leading independent solar installer in NSW, Solaray is the best choice to ensure a smooth and expertly configured installation."

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How much roof space do I need?

Solar panels are all approximately 1.7 meters high by 1-meter wide. If you have a flat roof you should allow a minimum of 2 meters per row because of additional shading from the panels after they are tilted.

For example, a 5kW system can be installed in 2 rows of 8 panels with a footprint of around 4m x 9m using 330W LG NeON 2 Panels, allowing 1.7 meters for each row plus a little buffer, and 8 meters in length. The panels in a row sit flush and they are just under a meter wide, so allowing one meter per panel works out to be quite accurate.

Our Solar Experts can draw proposed panel diagrams on the computer such as the one above. Because we use aerial maps that do not consider the pitch of your roof, our estimates are not exact to the centimetre, but we can get pretty close. If it looks like a tight fit we will send an installer out before the installation day to confirm everything for you.

Once I sign the paperwork, what happens next and what is the lead time for my installation?

After booking an installation with Solaray, we will welcome you to Solaray and immediately submit your grid application to the relevant energy distributor. For solar systems up to 5kWs this is a formality, for larger systems it can take up to around two weeks. Once we receive approval, your installation will be managed by our installation coordinator, who will book an installation date for you. This is generally booked Monday to Friday, weather permitting.

We endeavour to have your system installed within 2 weeks unless you request us to hold for whatever reason. Due to our strict safety policy, we do not install solar systems when it rains. In the event of inclement weather we will rebook your installation as soon as possible. We will always work with your requests if you have a preferred day or date, and we recommend that someone be home on the day of installation.

What happens on the day of installation?

On the day, the install team will arrive on site and meet with you to discuss the installation, confirm their plans are all in line with your expectations (e.g. panel and inverter location, conduit paths etc.), and answer any questions you may have.

They will install the panels on the roof, run cabling to the inverter, mount the inverter on the wall and connect it to your meter box. Where necessary, they will also install isolation switches on the roof, next to the inverter and in your meter box.

Finally, they will test the system, demonstrate it to you and check everything is to your satisfaction. You will be asked to sign some paperwork to do with the system and the STC (rebate) application. If we are replacing your meter for you, sometime soon after the installation (usually about 3 to 10 days later) a level 2 electrician will replace your meter with a new digital meter.

Is it difficult to go solar?

We make going solar one of the easiest decisions you can make to help reduce your power bill and your carbon footprint. We take care of all the paperwork, including your grid connect application, help you to claim your rebate, and arrange your installation. Once you give us the go-ahead, we do the rest.

How does the mounting system work?

We have custom mounting kits depending on your roof.

For tile roofs, we use brackets that fit between the rows of tiles and mount firmly onto the frame of your roof. We do not need to break or remove any tiles.

For Colourbond roofing, we take out the existing screws and replace them with strong and stainless screws to ensure that the system is firmly mounted to the frame of your roof. Normally we only make one penetration through the roofing to run a cable, and this is fully waterproof - guaranteed.

For Kliplok roofs, we generally do not penetrate the roof because doing so voids your warranty. Because of this we use special clips that grip the ridge of the Kliplok to hold the panels firmly in place.

We then mount 2 rails per row of panels and mount the panels to the rails. This results in the panels sitting slightly off your roof.

Why Choose a Solaray Installation?

Installing any product on your roof is a job that needs to be treated with care. At Solaray, we pride ourselves on the quality of installation and workmanship. The quality of the installation can potentially determine both the performance and the longevity of your system. We apply years of project and implementation experience to our installation process and we are proud to set the standard for the industry for quality installations. All Solaray installations include:

- Installers are trained and supervised by our Operations Team to rigorous standards
- Installers are Clean Energy Council Accredited
- Installers have a track record of quality installations
- We do not contract installations to unknown or 'cheap' contractors
- Installers are given enough time to complete every job properly
- All installations are planned using our industry leading project management methodology
- Customers are kept up to date and informed at every step of the process
- Naturally, our teams always clean up after themselves and are available to answer any questions.

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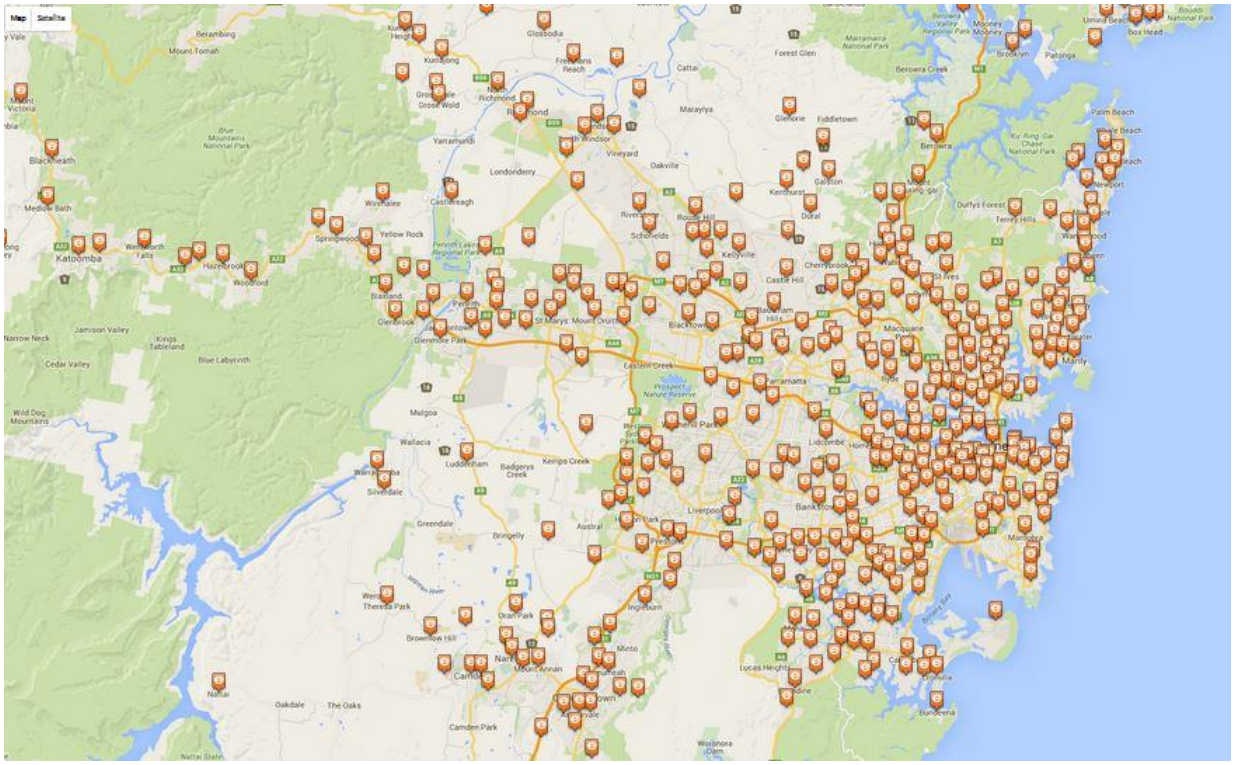
Solaray is based in Glendenning, situated in the heartland of Western Sydney, with offices in Sydney, Melbourne and Brisbane. Solaray has provided the best available solar technology, industry leading installation standards and customer support for the best part of a decade, ranking in the top 5 solar installers in Australia based on customer feedback.

Recently, Solaray recognised the solar industry was about to be tipped on its head, making the strategic decision to transition from a solar power installer to a provider of smart energy management technology, incorporating cloud-based monitoring, future-proof solar power systems, back to base system status alerts, home automation, and of course, battery storage.



(Publicly shared Enphase Systems installed by Solaray Energy – we have hundreds more. We have installed around one in three of every Enphase installation in Sydney)

Solaray is the leading independent installer of residential solar & storage systems in Australia, and was recently recognised as a key market player in the Microinverter and Battery Market from 2015-2023 by Transparency Market Research.

Over the last 12 months, Solaray has installed several highly-publicised solar storage installations including the first Enphase battery storage system in Australia, a number of the first Tesla Powerwall 1 batteries, the largest residential Enphase battery system in Australia with 12 x AC modules, and The Stucco Project; a groundbreaking 42.3kW solar storage solution for a student housing complex in Newtown, Sydney.

The next few years are set to be an exciting time for Solaray Energy as Australians recognise the potential of smart solar power, solar storage, and home automation as an effective way to reduce their power bills and their carbon footprint.

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Request a Solaray Quote Today

As the leading independent Solar & Storage Installer in Australia, Solaray are the best choice to ensure a smooth and expertly configured installation.

All Solaray Systems come with a comprehensive service and support package and we offer full replacement warranties at no additional cost.

Solaray are proud to be at the forefront of Australia's Energy Revolution. For more information, please call the Solaray Team today:

Ph: 1300 221 586

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