



AusPac Solar

**AusPac Solar's guide to choosing
your solar and battery setup**

We are AusPac Solar, Australia's experts in on and off-grid energy solutions. This brochure is designed to help you choose the best solar and battery setup to meet your needs. Within you'll find answers to the most common questions that consumers want to know when planning their solar and battery setup. Our head electrical designers and engineers compiled the brochure in a frequently asked questions format to help ease your journey in picking an energy solution. While solar-only systems are common, and we will reference solar as a key part of an energy-generating system, this brochure will focus more on an energy ecosystem for both on and off-grid solar and battery systems, including a reference to generator sizing and design. If you have any further questions, please reach out to our expert team. We'll also be more than happy to help you set up your dream system when you're ready to make an order.

AusPac Solar team



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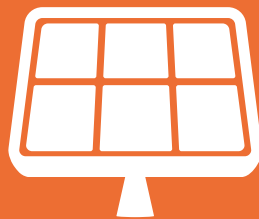
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Who is AusPac Solar?

AusPac Solar is a proudly Australian-owned and operated company founded by brothers Joshua and Lewis Fleming. We deliver high-quality solar and battery solutions for homes, businesses, farms and off-grid communities across Australia and the Pacific. Over 15 years in the industry, AusPac Solar has installed more than 7,000 systems for satisfied customers. We combine expert design, rugged equipment built for tough conditions and seamless installation to provide reliable, long-term energy savings. AusPac Solar is a New Energy Tech Consumer Code (NETCC)-accredited company and a licensed electrical contractor. Additionally, our principal Energy Designer is accredited with Solar Accreditation Australia for grid, battery and off-grid installation and design.



15 YEARS
OF SERVICE



7000+
PROJECTS



NETCC
ACCREDITED



How does an AusPac Solar energy specialist design a solar and battery system?

There's a lot to consider when designing a solar, battery and inverter system, especially when coupling it correctly to the energy needs of a home or business.

Here are some of the key points our specialists will consider to ensure that you get a system tailored to your needs:

- PV during the day covers the usage and fully charges the batteries.
- The inverter is required to run the loads. The larger the inverter, the more loads that can be covered instantly if required.
- The battery needs to discharge overnight, ideally until sunlight. If you are charging an EV, this will need to be considered when sizing your battery storage capacity
- Pumps and other surge ratings need to be allowed for, as startup currents can be high on pumps. They can operate around three times the nominal rating of the pump for up to 10 seconds.

Did you know?

Solar panel and inverter output is measured in kW (instantaneous power).

Battery output is measured in BOTH kW (power) and kWh (energy) as it stores power over time.

For example, a 16 kWh battery can only instantly output 9.6 kW in power, even though it can store 16kWh total in energy. This means that to deplete that battery, even at maximum discharge rate (9.6kW) it will take about 1.5 hours to completely discharge all 16kWh of storage.

In an off-grid scenario, if the load in the evening (no solar) was to exceed 9.6 kW, the system will turn off, and the generator will start up (if available).

Frequently Asked Questions (FAQ)

Should I choose site backup with grid supply or an off-grid setup?

While it's tempting to get off the grid and free yourself from grid fees forever, there are some considerations here before you make the leap.

When an off-grid setup is better

If you need more phases than the grid can supply or you don't have any grid supply, then an off-grid system is the way to go. An off-grid system as the primary energy supply with a solar/inverter/battery system should be coupled with a backup supply, such as a generator.

When designing an off-grid solar system, we need to design to a 'worst case scenario' for solar production and battery power output, or we need to assume we need to use the generator, which will cost money for fuel and is a hassle to constantly refuel and requires additional maintenance

A correctly designed PV energy system, is a setup that covers all four seasons, including the winter months which has the least light in the southern hemisphere.

Inverters and batteries are typically required to output more power than a site backup, as they will need to output both the required instantaneous power requirements, as well as the energy of the site's loads, until the solar can produce power again.



When a site backup with grid supply is better

If you currently have the grid connected with the correct phase supply, you will be better off with a whole site backup solar and battery solution which utilises the grid (instead of a generator) as a backup supply. You will also have the additional benefit of being able to export unneeded energy back to the grid for a small payment. The payment may be enough to cover your supply charges.

When designing a site backup solution, we can afford to apply a 'best case scenario' for solar production and battery power output. For example you'll typically have enough sunshine to supply our system in spring, summer and autumn. In winter you may be a bit short. During times where there's not enough sunshine, you can then simply purchase some power from the grid for a small amount. If the battery isn't able to output the instant power requirements of the loads, then the grid will pick up the extra power requirements and you just pay a little more for what you used.

Did you know?

When going off grid, there are 2 conditions for the federal battery rebate to qualify.

It must cost MORE than \$30,000 to connect to the grid
OR The property must be more than 1km from the connecting transmission lines. The good news is that you don't need to meet both conditions, but rather only 1!



A grid connection is generally more stable, less work and more cost effective than maintaining a generator. A case in point is that if your generator battery is flat, your generator won't start up, and the fuel lines may seize. There's a number of reasons why running an off-grid generator setup can be even more painful than dealing with the grid. A generator also consumes fuel, so whether you pay the grid or pay for fuel, the source of that energy can be expensive.

It's worth noting that installing a whole site backup is an important precaution. The nominal voltage in Australia is 230 V per phase, while the grid network legally should provide between 216 V and 254 V AC. If you have a whole site backup installed, your inverter will automatically enter off-grid mode and 'cut' the grid supply if the voltages are outside of the allowable range. This will effectively protect your equipment and personnel onsite from electric shocks or brown outs, which can destroy equipment such as pumps and air conditioners. It will continue to supply a stable 230 V to your equipment, and will only reengage with the grid when the voltage range is corrected.

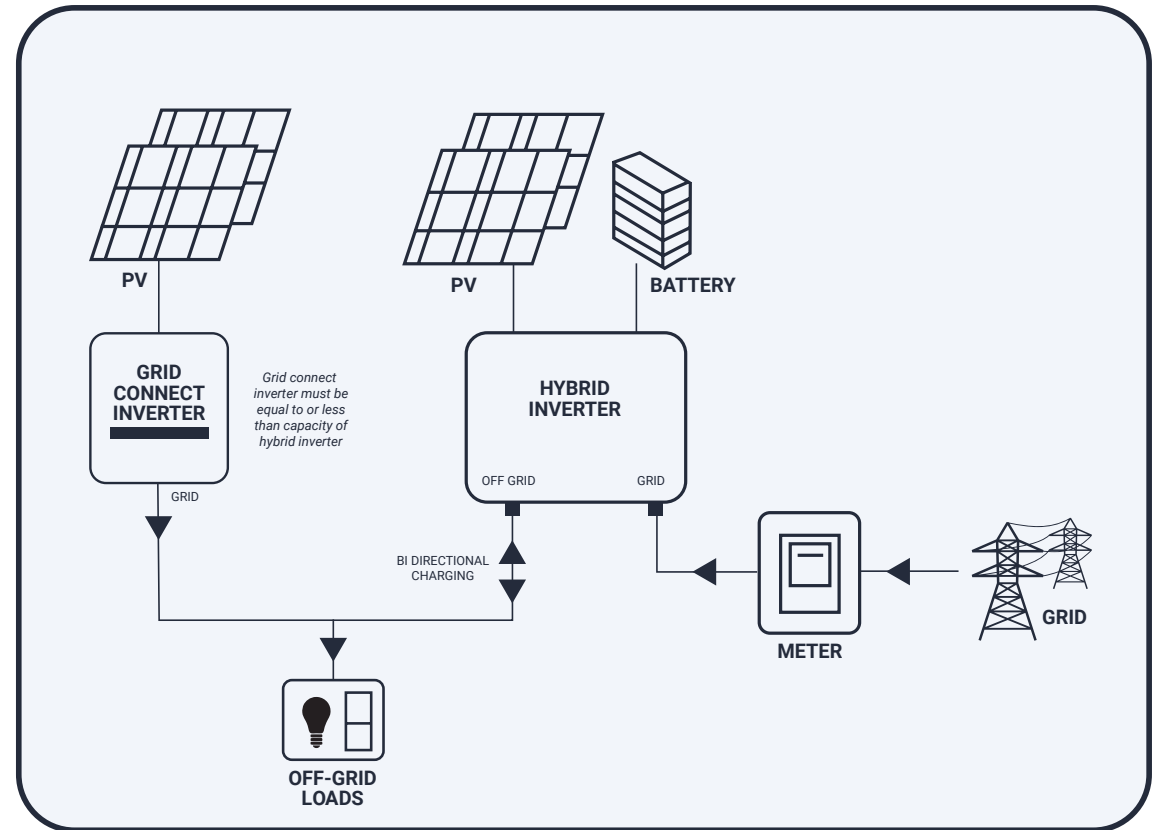


Best practices for generator design rules:

1. It's advantageous to hardwire a generator directly through the inverter.
2. No export is allowed from the inverter to the generator if hardwired.
3. A correctly-sized generator should be at least 1.1 to 1.5 times bigger than the inverter.
4. A generator is most efficient at a 100% loading. Hence , inverter/ battery systems can put a load on the generator to charge the batteries, making the generator more efficient. This will reduce the generator battery, so the generator will start up when automatically signalled to. After all, starting a generator at 2 am in winter is not ideal.

Can I integrate my existing solar setup into a new battery/PV system?

Yes, you can. However, you should get a system check first, as you can't assume your system is fully functional. If you purchase a new hybrid inverter, and the inverter's capacity is more than the export of the already installed grid-connected inverter, then you can export in AC power backup into the hybrid inverter's backup/off-grid terminals. Here, you're essentially creating an off-grid ecosystem. Please see the diagram from a Sungrow 10 kW one phase hybrid inverter installation manual which shows how this can be achieved.



What is the minimum battery size I need for an on-grid plus solar setup?

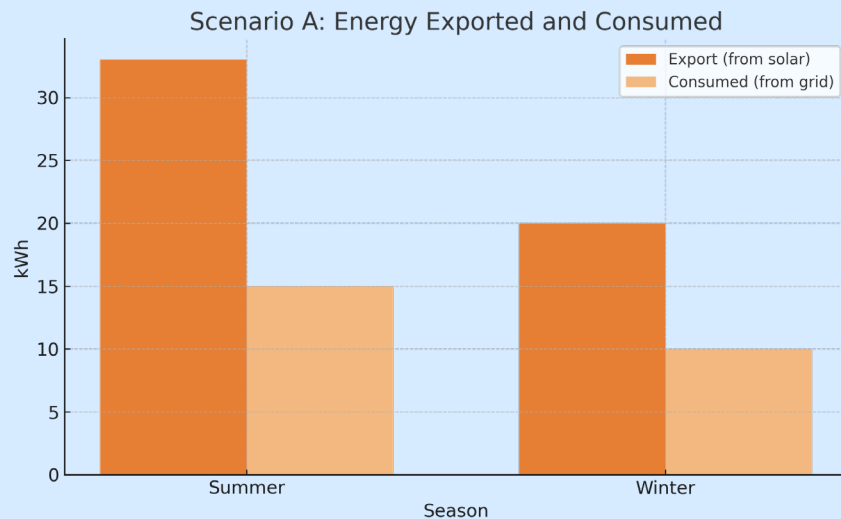
As there are large solar and battery rebates available from the federal government, a lot of unqualified sales companies (offshore included) have entered the market and are selling large battery systems for cheap. But is putting a battery in when you already have solar really the answer?

The truth is, it's not.

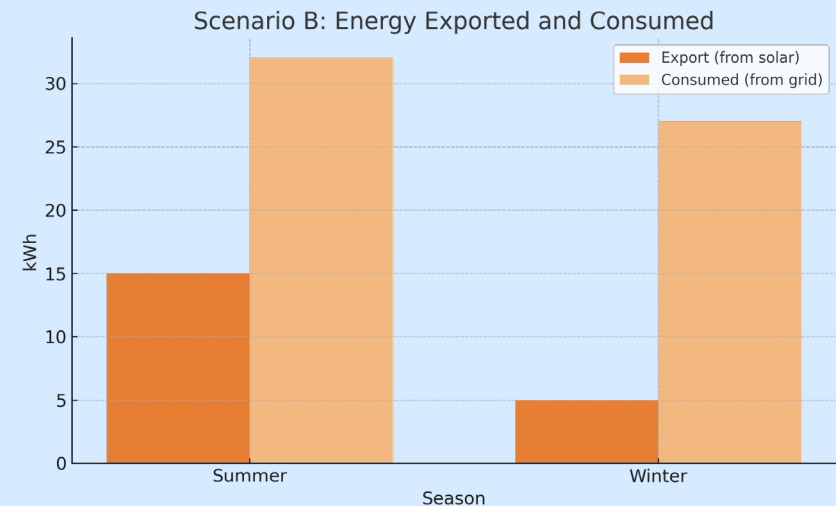
How do you easily find out what you will need? First, get a January and June electricity bill. This will show you summer and winter grid consumption and solar production. On your bill you have a section that will state what you're exporting to the grid, and what you're using from the grid.



To help give a picture of this, let's look at two scenarios with tables of typical household scenarios.



In this scenario you're exporting more in summer (33kWh), while in winter (20kWh) you are still consuming (10kWh) less than what you're exporting. If this is the case, then adding a battery is beneficial. How big should the battery be to meet the minimum usage? You determine this from your summer figures, in which you're consuming 15 kWh per day on average. However, considering that you're exporting up to 20 kWh in winter, you may decide to install a 20kWh battery to future-proof your site.



In this scenario, you're exporting (15kWh) less than what you're consuming from the grid (32kWh), and that situation is even worse in winter. You can install a battery, but in summer it will reduce your daily consumption by only 15 kWh, and in winter, you'll only get a 5 kWh saving. Hence, it would be recommended to install more solar (at least another 6 kW) and a battery system of more than 25-30 kWh (assumptions applied).

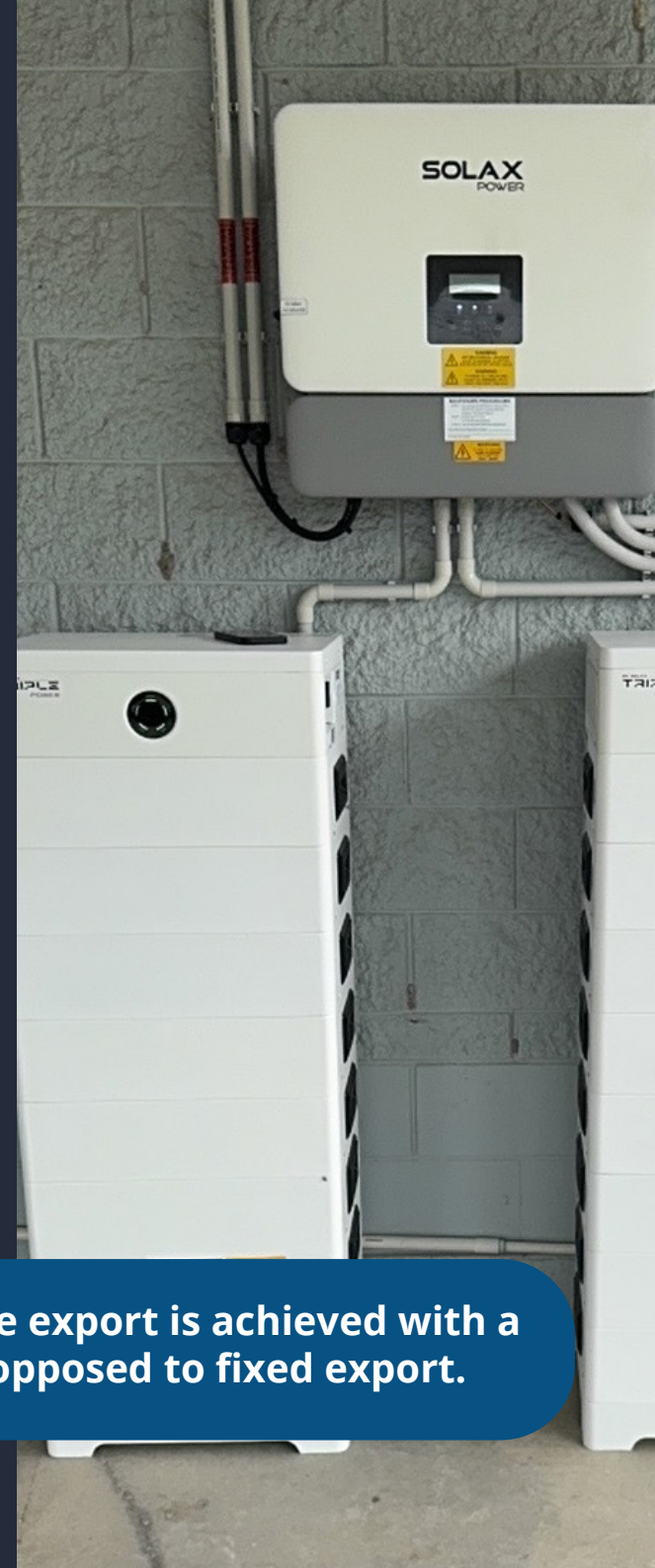
What are the limitations of fixed vs dynamic export allowances?

When connecting an inverter to the grid, the amount of exported energy, which is controlled by your inverter, can differ depending on which state, distributor network service provider (DNSP) and even the transformer you're supplied from. Single wire earth return (SWER) lines make it difficult to export a lot of energy. Connecting to the grid may also be required, as an overflow of stable power can be required from your equipment, even if a solar/battery system is required. These limitations only apply to the inverter, so if you have a larger amount of panels or batteries, this is not relevant. Fixed export is where you can only export up to the amount determined by the DNSP, calculated by the transformer allocation, or by the default allowed, which is typically around 5 kW per phase.

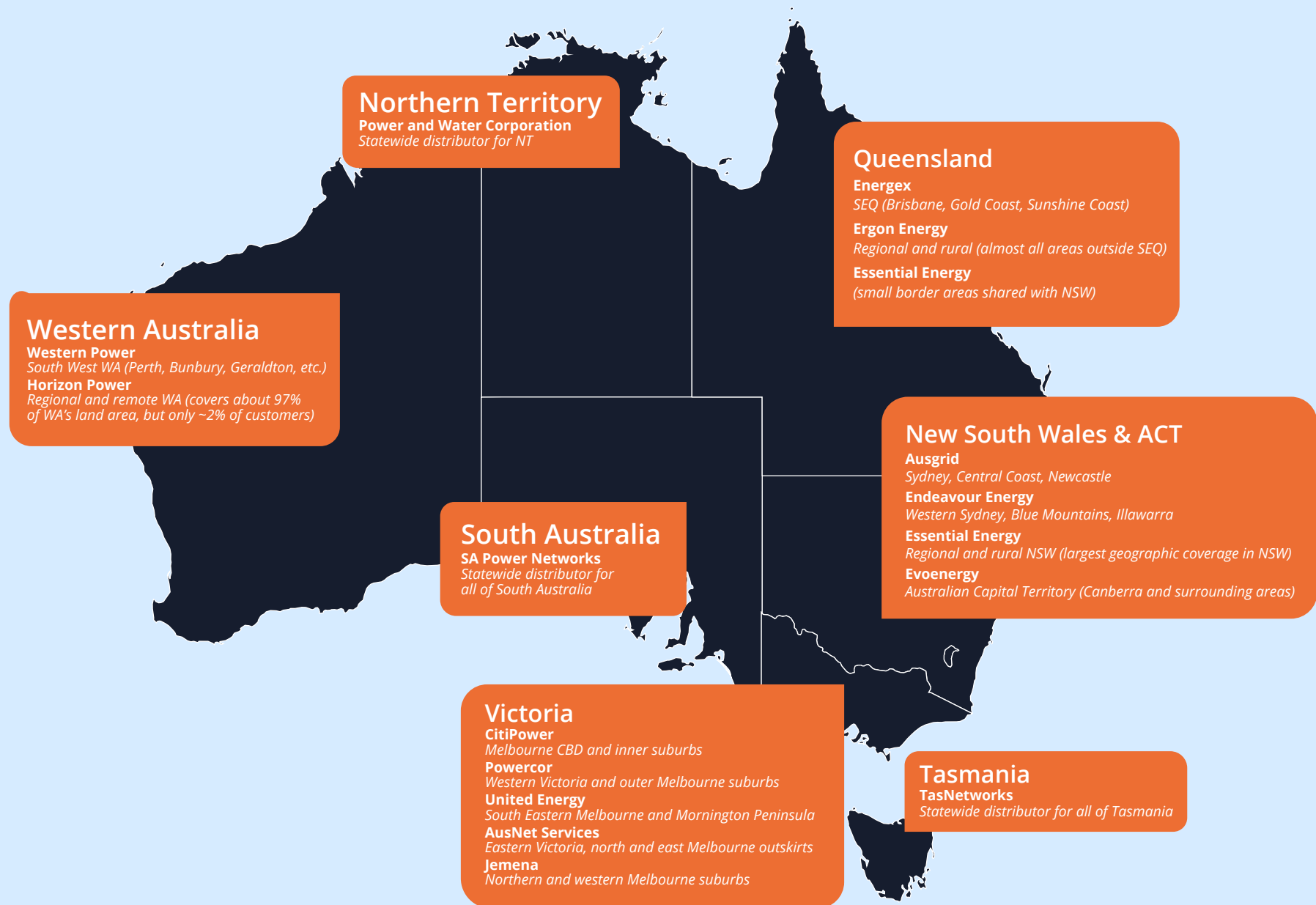
A new, dynamic export is being introduced, and is dependent on the following factors:

1. The inverter is compatible with the DNSP for remote control of the inverter.
2. The inverter is connected to the internet at all times.
3. The inverter has the ability to read output and input, with a device like a CT or a smart meter combo.
4. The inverter is set to 1.5 kW export if the internet is disconnected. This will still cover your loads with the CT/smart meter, but will default to 1.5 kW export to the grid until the internet connection is restored.

Ergon Energy (Queensland DNSP) estimated between 98% up to 566% more export is achieved with a 10kW 1 phase system size that exports with a dynamic export setup, as opposed to fixed export.



Distributor network service provider by state



What's the largest inverter you can connect to the grid?

	1 Phase Fixed (kW)	1 Phase SWER (kW)	1 Phase Dynamic (kW)	3 Phase Fixed (kW)	3 Phase Dynamic (kW)
QLD - Energex/Ergon	5	2	10	15	30
NSW - Ausgrid	10	N/A	10	10	N/A
NSW - Endeavour/ Essential	5	5	10 (trial)	15	30 (trial)
VIC - CitiPower/Powercor/ United Energy	5	5	10 (trial)	15	30 (trial)
VIC - AusNet	1.5	1.5	5	15 (down to 4.5/1.5 1P)	15 (trial)
VIC - Jemena	5	5	10	15	30
TAS - TasNetworks	10	N/A	N/A	15	30
SA - SA Power Networks	5	1.5	10	30	N/A
WA - Western Power	1.5	1.5	N/A	1.5	N/A
WA - Horizon Power	Subject to release. 5 or less	Subject to release. 5 or less	Subject to release. 5 or less	Subject to release. 24 or less	N/A
NT - Power and Water	5	5	N/A	7	N/A

How will electricity prices change moving forward?

Power prices are constantly changing and plans differ dramatically. Previously fixed charges were the norm, so regardless of when you used energy, it was the same cost. However, now with smart meters and four million homes with solar, time of use (TOU) charges are being rolled out. TOU charges are already in place in many areas, and will be mandatory by 2030 for most areas.

What do the changes in electricity pricing rules mean for me?

Let's look at how electricity pricing can affect you with a sample case for Ergon Energy, the exclusive energy retailer for regional Queensland. If you were on fixed charges, you were paying approximately 30c per kWh in 2024. However, if you have solar, you are required to get a smart meter. A smart meter enables Ergon to see when you're using power during the night or day. Typically you had a peak (7 am-9 am/4 pm-10 pm), shoulder (9 am-4 pm) and off peak (10 pm-7 am). The rates would change according to the time you use your power. If you had solar, it would be exported at around 12c per kWh, which is one of the highest rates in Australia.

However, as of July 1, 2025, that has all changed. First, solar has dropped from 12c by 50% to 8c per kWh exported.

TOU charges are now as follows: -peak (4 pm-9 pm) is 57c/kWh with solar or 48c/kWh without solar, -shoulder (9 pm-11 am) is 26c/kWh, and -off peak (11 am-4 pm) is 7c/kWh.



Did you know?

You can couple an EV charger with the inverter so that you can operate in green mode. If you run green mode, the solar will run your loads, charge your battery and will only take power once those two previous conditions are met. This way, you can avoid charging with power you need to buy from the grid.

How do rising electricity prices affect what setup I should choose?

The pricing has gone up exponentially if you have solar, at sundown, so a battery is the most useful element to add. If you don't have solar, then the penalty isn't as harsh. However, it's still high, and it is best to use your power during other times if possible. The price of electricity over the last five years has exploded to the point that for businesses it's now the second highest cost behind staff wages. The price is not likely to go down in the next five years either.

If you're paying **\$4000** annually for your electricity bill, and we assume that this rate will increase by 10% annually, then in 2030 for the same energy usage, your electricity bill will be **\$6,404!** That's **\$30,862** in electricity costs! If you're a business or homeowner and the figure is different, then take what you're paying this year and multiply that figure by 1.1 five times.

Now put that amount as a figure to invest to own your energy generator in five years, producing free energy.

Sample Case

The customer's ground mounted solar and battery systems cost \$66,000 in total, including \$6000 GST. The total panel and battery rebate came to \$18,000 (\$6000 panels, \$12,000 battery). The GST value of \$6000 was able to be claimed instantly with an instant asset write-off. The instant asset write-off is only available up to \$20,000, including GST per invoice, so how can this be done? The rules for solar and battery systems are that each invoice and equipment associated with that invoice must be able to operate independently of each other.

Here's how that would look with the remaining \$48,000 required to pay:

\$20,000 for the solar panels and the inverter.

\$10,000 for the equipment delivery, removal of existing system and additional switchboard electrical works.

\$18,000 for the purchase of the batteries to add to the existing already wired and installed solar panels and inverter.

I have an ABN and pay GST. How can I save money when installing a solar system?

As of July to December 2025, there are huge battery and solar panel federal rebates available to customers installing large solar and battery systems both on and off-grid. These rebates will reduce the cost of the system by around 30%. However, if you have an active ABN that pays company tax and GST, you may be surprised at how much more you can save on a solar system.

Now you would be able to claim \$6,000 in GST on their next BAS in 2025. With the remaining \$42,000, with a business tax at 30c/\$, the company can now reallocate the tax amount of \$12,600 (which would be otherwise paid to the ATO) and put it towards the solar system cost. So the final amount, after federal rebates and tax incentives, will reduce a \$66,000 solar/battery setup to \$29,400. That's a 55.5% reduction in costs! You can put this on a financed loan from 5.99% over 10 years, up to \$100,000, and the interest is tax deductible.

Ask the AusPac Solar team to learn more about this offer.

How can AusPac Solar help?

We hope that the information in this brochure has helped you in your journey to understand your energy needs and how best to fulfil them. It's important to us to provide high quality information about solar, as we don't want to see anyone fall for the sales pitch of an unqualified sales person who is only interested in closing the deal.

At AusPac Solar, we're a team that prides ourselves on giving the straight facts to customers, with an in-depth analysis of your requirements, including your budgetary needs. Our goal is offer value not just from an equipment perspective, but also including the necessary quality of install demands, all the way through to the financial benefits, together with a dedicated after sales support program.

If you have any questions about the above information please contact us as sales@auspacsolar.com.au. If you would like to start your journey to installing a quality solar system that suits your needs from a National Solar Retailer that you can trust, please submit your details on our website www.auspacsolar.com.au, email us at sales@auspacsolar.com.au or call one of our friendly staff in Australia on 1300 197 237. Thank you for your time and we wish you, your family and your business all the very best!

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