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Solar PV and batteries

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Australia has the highest uptake of solar globally, with around 30% of homes with rooftop solar PV.

As of 31 January 2022, more than 3 million rooftop solar PV systems have been installed across Australia.

The process of converting sunlight into electricity using PV systems produces zero greenhouse gas emissions.

Excess electricity can be directed into the grid (delivering a feed-in payment), or it can be stored in a rechargeable battery for later use. Batteries can also provide back-up power in the event of blackouts.

A solar PV and battery system offers the potential of off-grid energy self-sufficiency. It's also a major step in the transition away from fossil fuels.

Payback time

The cost of a home solar PV system starts at around \$3500 for a basic installation. Prices are steadily coming down, as demand and mass-production increase.

Solar PV is intended to be an investment that, once paid for, will save its owner money by generating free electricity during daylight hours.

A system without batteries typically has a payback period of 3 to 5 years. Adding batteries extends the payback period.

To get a good idea of the potential benefit, use your electricity bills to [estimate the amount of energy consumed annually](#)[↗] by a typical household of your size in your area.

Plan before buying

A solar PV system is a major long-term investment. The market and technology are rapidly evolving. Offers, rebates and feed-in tariffs differ among the states and territories, and are subject to change.

A range of components and options need to be considered.

A solar PV system powers electrical appliances only, so where gas is used for heating, hot water or cooking, consider replacing them with electrical alternatives.

For hot water, an electric heat pump system is the most energy efficient type to run. For the same reason, a reverse-cycle heating/cooling system is ideal.

Find out if the system can be upgraded as technology improves, you may be able to add batteries or more panels over time.

Be aware that there are low-quality solar panels around, as well as 'deals' that may not be what they seem.

See [Scamwatch](#)[↗] for advice on avoiding scammers and how to assess offers.

Feed-in tariff

Feed-in tariff is the rate you are paid by your energy retailer for electricity that you export to the grid.

Feed-in tariffs differ among retailers as well as the states and territories, and are subject to change.

Small-scale technology certificates

Small-scale renewable energy systems may be entitled to small-scale technology certificates (STCs) which can be sold to recoup a portion of the cost of purchasing and installing the system.

See [small-scale systems eligible for certificates](#) [↗] for requirements.

Choosing the right panel

Solar panels capture the energy of sunlight which is converted into electricity. This is known as a photovoltaic system, usually called solar PV.

Panels come in a range of different wattages and power levels.

Numerous brands are available, with new technologies and efficiencies frequently emerging. Although solar panels look similar, levels of power, quality and reliability vary greatly.

A fully exposed rooftop is ideal for solar. Where that's not available, make sure the panels are installed in the sunniest location.

There is a standard 10 year product warranty for solar panels in Australia, as well as a 25 year performance warranty. Be aware that some manufacturers may no longer be in business in 10 or 20 years should you need to make a claim.

Inverters

Solar inverters are an essential component of a solar PV system. They convert the direct current (DC) output of solar panels into alternating current (AC) electricity for use in the home.

Inverters can be monitored via a computer program or device app to check energy generation, consumption and correct operation of the system.

Several types of inverter are suitable for home systems.

String inverters

The most common type for households, generally ranging from 1.5 to 5kW. They are a single unit connected to a 'string' of solar panels. More than one string inverter will be required for larger panel set-ups.

The main shortcoming is if one or more of the connected panels is in shade (even partially) it reduces the output of the entire system. This means the system will always operate at the capacity of the worst performing panel.

For this reason, a fully sun-exposed panel array is ideal for a string inverter set-up.

String inverter warranties are generally 5 to 10 years, and should cover parts and labour. Some manufacturers offer extended warranties at additional cost.

Micro inverters

These are smaller individual units that are installed on a rack or attached to each panel, ranging from 200 to 250W each. They are ideal where regular intermittent shading of panels is unavoidable due to trees or other buildings.

A micro inverter system makes it possible to monitor the performance of each individual panel.

Another advantage is that reduced output from a single panel doesn't overly affect the output from the entire array. Because there's no single point of failure, if one inverter or panel fails the rest of the system will continue to generate electricity.

A micro inverter system is significantly more expensive than a string inverter set-up.

Warranties for micro inverters tend to be 10 to 25 years; 10 years when they are racked and 25 years when attached to the panel directly.

Battery-only inverters

It's generally possible to retrofit a battery-only inverter to complement an existing string or micro inverter solar PV system. A battery inverter captures the surplus electrical energy to store for later use.

Hybrid inverters

Hybrids perform the combined function of a string inverter and battery inverter in a single unit. A hybrid inverter can be installed and used before batteries are in place, making it a good option for an expandable system.

Be sure to discuss the options, including future upgrades or expansion possibilities, with your retailer and installer.

Batteries

Rechargeable solar batteries store the 'excess' electricity generated from a panel array, boosting energy capacity and making power available for use at night time or on cloudy days.

Recent design improvements and price drops in lithium-ion batteries have made solar storage more viable than ever before.

Assess your energy needs before investing in a battery or batteries. There's no point buying more capacity than you can use—surplus electricity should instead be fed into the grid for a profit.

If all the appliances in your home are electrical, they can be powered by solar.

Battery storage systems are a serious safety risk if incorrectly installed and may have implications for insurance coverage.

Cleaning and maintenance

To maintain efficiency, panels will need to be cleaned from time to time. If any components are damaged, always contact a trained professional to inspect your system.

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[New Energy Tech Consumer Code](#) [↗] ACCC

[Photovoltaic systems](#) [↗] Your Home

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