

What is a grid connect solar power system? Grid connect systems, often located in built up areas, supply solar electricity through an inverter directly to the household and to the electricity grid if the system is providing more energy than the house needs. When power is supplied back to the mains grid, the home owner usually receives a credit against their power bill for that electricity.

What can affect the amount of solar energy received? The strength of the solar energy (radiation) available depends on the time of year, the time of day, and the geographic location of the system. The amount of energy generated can be further affected by the amount of dust and water vapour in the air, the amount of cloud cover and any shading of the solar modules. You can learn more about solar radiation levels for your area in our solar power system builder.

Does roof orientation really matter? Yes, to a point. A system with solar modules facing in a westerly direction will generate less than one with a northerly aspect; however these losses are modest up to about 60 degrees from North.

What is a feed in tariff and how much will I get paid? A feed in tariff is whereby a grid connect system owner is paid for the electricity their system generates by a utility or government agency. There are two different types of tariffs, gross and net. A gross feed in tariff pays a premium on all electricity produced whereas a net feed in tariff only pays on surplus energy created by the system. The amount paid is usually above market rate, but this varies from state to state. There is no feed in tariff available in WA currently; however one is expected next July.

What size system will I need to run my home? We don't normally worry about running a whole home because the advantage of a grid connect system is that it can make a contribution rather than power a specific amount of appliances or rooms. For comparisons though, the optimal system size depends on your energy usage, your geographical location, and of course your budget. A 1kW system is considered to be an entry point for grid connect solar power. It will cover between 20 and 30% of the energy consumption of a average household, whereas a 2.5kW system will cover 100% of the energy consumption of a medium energy use household. Naturally the bigger the system, the bigger the benefit. All Renewablelogic systems actually produce electricity at a cheaper rate than you can buy from the grid over their warranty period!

Is my building suitable for a solar power system? Several aspects will need to be evaluated to determine if your home is a good solar site, such as orientation, space available, shading, and of course your current electricity usage. The best site will be one with adequate north-facing roof space that has very little or no shade. Most suburban Australian homes have few problems when assessing their solar potential.

How long will my grid connect solar power system last? All Renewablelogic solar modules carry a performance guarantee of 25 years. The inverter should last 10 -15 years.

What type of warranty is supplied with the system?

- Solar Modules: 25-year performance guarantee to produce 85% of rated output (manufacturer)
- Inverter: 5 year warranty. Can be extended to 10 years for an additional charge (manufacturer)
- Framing: 10-year product warranty (manufacturer)
- Workmanship: 12-month warranty on workmanship (Renewablelogic)

Should I choose monocrystalline, thin film or polycrystalline solar modules? There isn't a lot of difference between monocrystalline and polycrystalline except that a polycrystalline panel is slightly larger than the equivalent wattage in monocrystalline module. Thin film modules are larger again and there are other issues to consider such as system complexity, output degradation, and framing and wiring requirements. We generally recommend monocrystalline for most situations.

What can affect the costs of installing a grid connect system? A base installation rate includes the grid connect system being installed on a pitched metal roof facing north with appropriate surface area available. Additional costs may be applicable where there are additional hazards such as working at heights, working on asbestos switchboards, or for where the installation is a more difficult than standard.

Can I insure my grid connect system? Most insurers will allow you to include the system under your home and contents insurance, but check with your insurance company first.

If my energy requirements increase, can I upgrade the system? Additional solar modules may be added to increase generating capability if you install a larger inverter when installing the system initially. Because solar module specifications change, we do not highly recommend upgradeable systems except in certain circumstances.

What happens on cloudy days? In a grid connect system, as you are still tied to the mains power supply, any deficit will come from the mains grid.

How reliable will my system be? As the Renewablelogic systems are designed to Australian Standards, the reliability of components and consistency of power supply will be more than adequate for the loads specified. Most inverters produce a cleaner output than what you might experience on the grid!

Carbon dioxide emissions and climate change

What about the energy it takes to produce a solar power system? Although solar electricity is pollution-free, PV systems require a certain amount of energy, which must be 'reimbursed' before they can be considered as renewable and clean. This is known as "embodied energy". An assessment from the International Energy Agency concluded in mid 2006 that roof-top solar PV systems recover their energy content (from manufacturing and recycling) within 1.6 to 1.8 years in Australia. Once they have reimbursed their initial energy input, roof-top PV systems can avoid the emission of 40 tonnes of CO₂, depending on their location and on the local electricity mix available. Roof-top PV systems in Australia during their 30 year lifespan are expected to produce around 17 times the amount of energy needed for manufacture, installation and dismantling.

How much of a reduction in carbon dioxide emissions will I achieve? Using a comparison to a car, the average vehicle in Australia travels 20 000 km per annum, which is equivalent to 3.3 tons of carbon dioxide discharge annually. A 2kw grid connected system will prevent 3.3 tons of carbon dioxide being generated through coal fired power generation - so it's the equivalent of taking a car off the road each year.

Solar power system components

What does a typical home solar power system consist of? A simple grid connect system consists of six or more solar modules and an inverter which converts the DC electricity into AC. The inverter is connected to the power grid through the electricity meter.

Is there any maintenance involved? With a grid connected system, there is very little maintenance required. Electronic components should be maintenance free. Renewablelogic systems come with complete instructions for maintenance.

We do recommend maintenance at regular, although infrequent intervals because solar system arrays are subject to great variation in heat, sunlight, and rain.

Electrical and installation

Is a solar regulator necessary in a grid connect system? No, the inverter handles the incoming charge and converts it to AC electricity for use in your home

How does electricity get stored for use after the sun goes down? Grid connect systems direct excess electricity produced during the day back into the local electricity grid. This turns your electricity meter backwards in the process. You then receive a credit for any power that your system supplied to the grid. During the night when your system does not produce and electricity you draw your power from the grid and your electricity meter measures your consumption.

What happens with grid connect systems during a blackout? The grid connect inverter will automatically shut itself off within a few milliseconds of a blackout. Therefore even though you have a solar system, during a blackout you will not have power available to operate it. If you want to keep on having electricity available during a blackout then you would need to have back up batteries installed as well, which will add to the cost of the system. The reason that the system shuts down is so that if linesmen shut down the grid for maintenance, that there are no nasty surprises.

Can you retro-fit battery backup into a grid connect system? Yes, battery backup systems require additional components, and these systems are expensive.

How does a solar system connect into current house power? The solar system is wired into your existing fuse box via a circuit breaker.

Where do you place the inverter? Usually the inverter is placed alongside fuse box. The inverter does produce some noise which can be compared to the noise as made by a refrigerator. It also has a display to show the electricity generated and other data options such as total electricity generated since installation, are available.

How much roof space is needed & what is the weight of the solar system on the roof? A 1kW system needs approximately 8m², a 1.5kW system needs approximately 12m² and so forth. The system weighs approximately 15-20 kilograms per square meter.

Do I need council approval? In most circumstances, no you don't. However, if your home is heritage listed or you are concerned that it is, please contact your local council for further information.

For more information please call Renewablelogic on 1300 39 10 77 or email your enquiries to info@renewablelogic.com.au.