



SOLAR POWER

&

BATTERIES

Information sheet

HOW SOLAR POWER WORKS

Solar energy is light or heat that comes from the sun. Solar power is generated when this energy is collected and converted into usable electricity.

Solar power systems are often referred to as PV or photovoltaic systems and generally consist of three main components: solar panels, an inverter and a meter.

Other system components include electrical wiring, protection devices and switches, mounting frames for panels and monitoring systems.

Solar is still quite new and there are a lot of suppliers out there so it's important you know your rights as a consumer when it comes to solar. Helpful information can be found on the below websites:

- [Consumer Information](#) (Clean Energy Council)
- [Home Battery Scheme](#) (Government of SA)
- [Solar panels buying guide](#) (Choice)
- <https://www.sa.gov.au/topics/energy-and-environment/energy-efficient-home-design/solar-photovoltaic-systems>
- Australian Competition and Consumer Commission's (ACCC) website

SOLAR PANELS

Most solar power systems use PV modules (or panels) installed on a rooftop to create electricity from sunlight. There are different types of PV modules, but most consist of a collection of solar cells made of thin wafers of silicon. When light falls on the cells an electric current is produced.

Most homes or commercial buildings will need around 12 to 15 square metres of unshaded, north-facing roof space to mount the modules for a 1.5kW solar system.

Ideally, the modules should be tilted towards the sun at around 35 degrees to maximise the solar collection. If the roof's slope is not at the right pitch, a good designer can create a special mounting frame for the modules. Cloud cover and shading can dramatically reduce a solar power system's output.

Installers will put solar panels on the side of your roof that gets the most sun, so you can create as much DC power as possible. (DC means direct current and you can't use this without changing it to AC or alternating current.)

INVERTER

An inverter converts the direct current (DC) electricity generated by solar panels into alternating current (AC), the form of electricity conventionally used in homes and businesses. The inverter can be placed inside or outside your home and should be well ventilated and protected from the elements.

The conversion of the electricity to AC enables your system to feed whatever electricity you don't use into the Distribution Network.

Most inverters have indicator lights to show whether the system is producing electricity and a simple electronic display that shows how much solar electricity has been generated. Some inverters may have additional monitoring features such as wireless in-home displays, but these are usually at an extra cost to the basic inverter system. Speak to your solar installer for more information.

For safety reasons, when your electricity supply from the Distribution Network is interrupted, your inverter must automatically and immediately turn off. It's possible to have a system that will provide emergency electricity when the Distribution Network goes down, with the use of a suitable inverter, battery bank and appropriate change over switches, but this can be expensive.

The inverter being installed as part of the solar or battery storage system must be compliant with AS/NZS 4777.2 and the Clean Energy Council publishes an approved product list on their website.

SOLAR AND BATTERY Q & A'S

A system installed at your home or business and connected to our electricity network needs to be installed by a Clean Energy Council-accredited solar or battery installer following relevant rules, standards and guidelines.

Your installer or licensed electrician can advise on system size and help with submitting the connection application.

We strongly encourage doing your own research and seeking expert advice on which solar or battery power system is right for your circumstances. The cost of installing a system can also vary widely so we recommend getting quotes from several different suppliers.

What size solar or battery system can I install?

Solar energy systems are available in a range of sizes; a typical system is 1.5-3kW.

CleanPeak limits the size of solar or battery systems connected to the Tonsley Distribution Network to 5kW.

The size may be also restricted by the space available on a property's rooftop for solar or the space around your house. Your accredited solar installer will be able to advise you.

Will I need a new meter?

No. All meters fitted for customers at Tonsley are bidirectional (i.e. they both import and export electricity) and are therefore suitable for solar power installations.

How much electricity will my system generate?

The amount of electricity your solar system will generate depends on the size of the system; the amount of solar energy it receives; the orientation and tilt of the panels; and the reliability of the system.

HOW BATTERY SYSTEMS WORK

Solar batteries work by storing excess solar power that can be used by customers at other times, for example at night.

Battery storage systems generally consist of three main components:

- a battery which contains individual battery cells wired together, capable of discharging and being charged with DC voltage. There are a range of different battery technologies, for example Lead Acid and Lithium Ion.
- inverter-charger unit which is capable of converting DC electricity from the battery to AC electricity and converting AC to DC for charging the battery from mains power.
- balance of system components such as wiring, battery management systems and other measurement and control components such as meters and switches. For battery systems capable of running standalone from the Distribution Network, extra components such as change-over switches are required.

Battery manufacturers and suppliers offer a range of different products that may require different levels of system integration and installation work.

Examples include:

- battery only systems - some manufacturers of battery systems only provide the battery and you will need to have a battery installer integrate the battery with a compatible inverter, control system and potentially a new or existing solar system.
- battery storage system with inverter - some manufacturers provide a fully integrated battery storage system with battery, inverter-charger and control system that can be installed at your home on its own and is a separate system to your solar system which still has its own inverter.
- solar and battery storage system - some manufacturers provide an integrated solar and battery storage system, where there is a single unit that contains the inverter-charger and battery, and the DC side of the solar system is connected to this all-in-one system.

INSTALL AND CONNECT

To install a solar power or battery storage system at your home the installer must be a licensed electrician and a Clean Energy Council accredited solar installer.

Apply for a Connection

Before installing a solar power or battery system you must complete and submit solar and battery application form which can be found on our website.

Only after the connection application has been approved by CPE Tonsley, can your accredited solar installer proceed with the work.

In addition your accredited installer must follow the relevant rules, standards and guidelines.

When the installation is completed your accredited solar installer must submit the completion paperwork to CPE Tonsley and to you.

Billing

Because Solar power or battery storage system connections require bi-directional interval metering this will mean a change to your pricing plan. Once CPE Tonsley have received the completion documentation from your accredited installer they will inform your retailer and they will update your account details. You will know this has been done when you get your next bill which will show bidirectional values.

You should contact your electricity retailer to discuss the available pricing options are available.

Installation and Connection Steps

- Get quotes from accredited solar installers and select your preferred installer.
- Complete and submit the application form (which is available on the website) with the assistance of your installer. See next section for the information required for the application form.
- Most applications will be straightforward and will be approved based on the details provided on the application form. Others may need further investigation or additional information, we will inform you if that is the case.
- Once CleanPeak have all the information required they will review and, provided all requirements are met, will approve the application.
- Your accredited solar installer will liaise with us to co-ordinate the installation
- Once the installation is complete the installer will provide you and us with the completed documentation
- We will notify your retailer that you have a solar installation
- Your retailer will update your account details
- New price plan details will be shown on your next bill

Information required for the application

- The customer's name, address, contact details and ABN (if relevant)
- Installer's contact and business details including ABN
- meter number
- A valid installer CEC accreditation or REC licence number
- DER devices
 - Fuel source – primary (i.e. solar)
 - Make, model and manufacture
 - Maximum capacity (kW)

- Storage capacity (kWh)
- Installer
- Inverter
 - Make, model and manufacturer
 - Whether the installer has changed the inverter default manufacture settings (Y/N)
 - Maximum capacity (kW)
 - Date of installation

Safety Inspections

The installer's electrician must certify that the work on the solar or battery installation has been done safely by providing you and us with completion documentation including, where relevant, a Certificate of Compliance for the electrical work.

From time to time CleanPeak carries out audit inspections of solar and battery installations connected to our network to make sure they are safe. Our inspection covers the work at ground level, including the wiring, metering and inverter (unless it is inaccessible).

If any system is found to be unsafe, we will disconnect it immediately. The installer receives a defect notice and we leave a card at the house to advise the customer their solar or battery system has been disconnected that day. The installer is then required to fix the system and provide new completion documentation including, if relevant, another Certificate of Compliance to the you and us for the rectification work. Because battery systems are reasonably new technologies, CleanPeak will inspect every battery installation.

If you have any concerns, please contact your installer for assurance that it is safe. In particular, you should ask them if you have a Direct Current (DC) circuit breaker installed and if so, that it was wired correctly.

It is important that you do not operate any of the switches on your solar system until you have reassurance from your solar installer that it is safe.

Maintenance of your Solar or Battery Storage System

After installation, you will be responsible for ensuring that your equipment is maintained in good working order. Your installer should be able to provide appropriate instructions along with maintenance information in the system manual. Safe work practices for any maintenance tasks must be followed.

Check with your solar installer about the length of warranty on the equipment and keep in mind that solar inverters and batteries generally have a shorter life than the solar panels. Many systems need inverter repair or replacement around 10 years after installation.

For further information on the maintenance of your system please refer to: [Clean Energy Council Maintenance and Warranties](#).

IMPORTANT TECHNICAL INFORMATION

CPE Tonsley has a large solar generation system located on the roof of the MAB which is connected to the Distribution Network and enables power to be generated and stored at Tonsley. We also have a bi-directional connection to the SA Power Networks (SAPN) distribution system which allows for any excess electricity generated on the Distribution Network to be fed back into the SAPN distribution system.

There are limits on how much electricity can be generated and stored on the CPE Tonsley electricity Distribution Network overall and it is the responsibility of CPE Tonsley's Embedded Network Manager to manage the levels of generation and storage to ensure the Distribution Network as a whole meets the technical requirements and generation limits imposed by SAPN and the Energy Regulator.

Clause 36AC of the Electricity Act 1996 (South Australia) defines a small photovoltaic generator as a photovoltaic system with capacity up to 10kVA for a single-phase connection and up to 30kVA for a three-phase connection. This means the maximum PV inverter size for a single-phase connection is 10kW. However, CPE Tonsley has set a limit for solar and battery inverter capacity per residential lot of 5kW/13.5kWh. This is to ensure the overall site limitations set out in our electricity generation licence are met.

These include the following limitations:

- The total Site Generation Capacity must not exceed 4.96 MW (AC)
- The total Site Generation Export Capacity must not exceed 4.00 MW (AC)

Note: Generation "Capacity" in this case includes all solar inverter capacity and battery inverter capacity connected to the Distribution Network (including private installations).

For more information on CPE Tonsley's supply standards please refer to the Electricity Service and Technical Installation Rules and Solar and Battery Guidelines.