SunPower installation
using T20 trackers >

System Snapshot

Alice Springs experiences more than 200 sunny days on average every year making it an ideal location for solar installations such as the Uterne Solar Power Station.

See some quick facts about the power station >

SYSTEM RATING:	969.264kWp
PANEL TYPE:	SPR-318E-WHT-D
PANEL RATING:	318Wp
NUMBER OF MODULES:	3,048
TRACKER:	SunPower T20
NUMBER OF TRACKERS:	254
INVERTERS:	Satcon PowerGate Plus 500kW
NUMBER OF INVERTERS:	2
SITE AREA:	Approximately 47,750 m^2
ANNUAL OUTPUT:	2300MWh
EQUIVALENT TO:	288 average Alice Springs homes a year
CO_2 SAVED PER ANNUM:	1,564 tons

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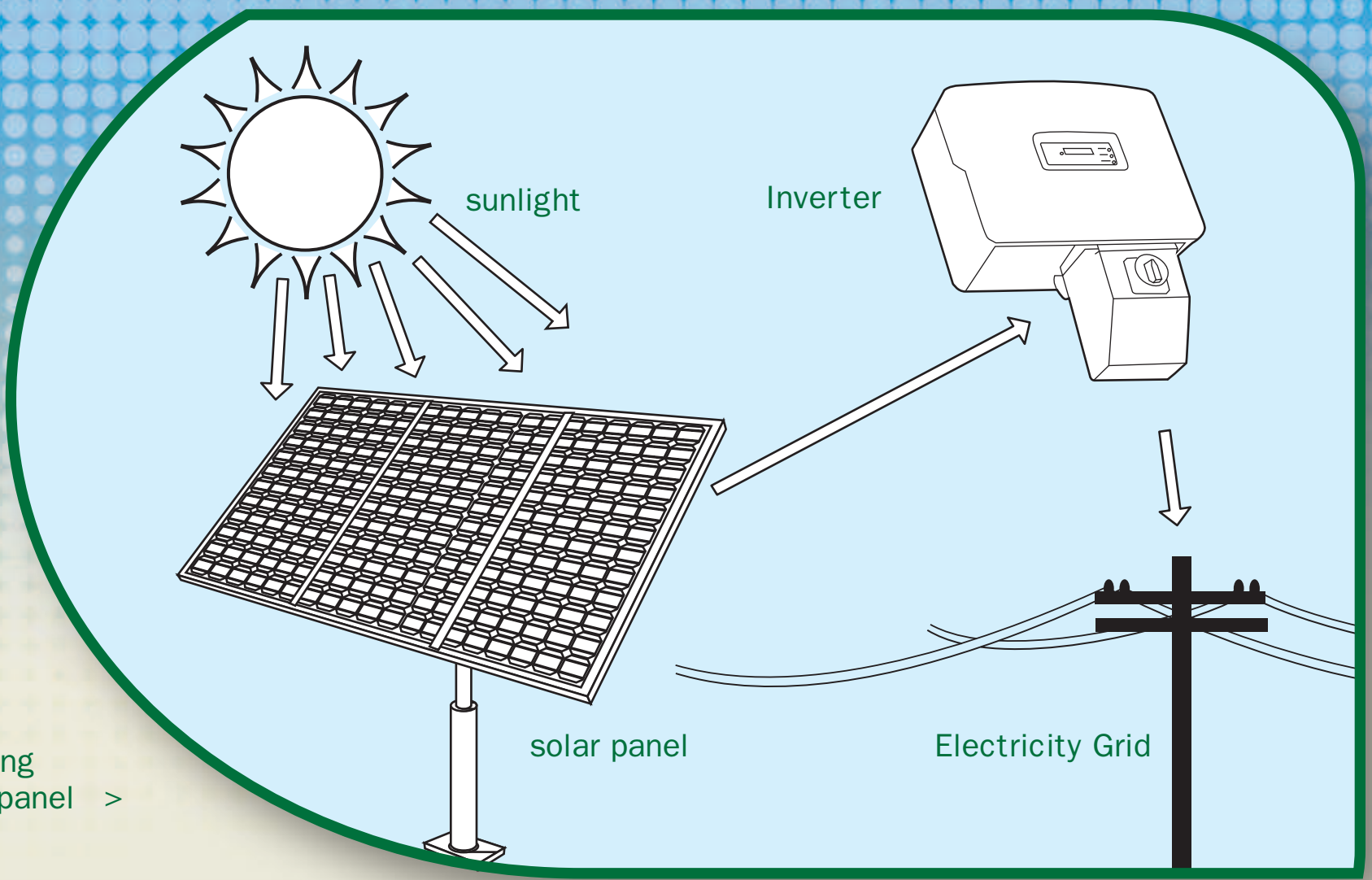

Graphic demonstrating operation of a solar panel >

How a PV panel works

Solar panels convert the energy in sunlight from solar energy to electrical energy by using materials that experience an internal flow of electrons in response to light; this type of material is called photovoltaic. Each solar panel or module is made up of 96 individual solar cells that are composed of mono-crystalline silicon wafers with electrical contacts for the electricity to flow through; the wafers are joined. The SunPower panels used at this site have electrical contacts located on the back surface to increase efficiency. These solar panels have an efficiency of 18.4% meaning that of the total amount of solar energy that falls on a panel 18.4% of it is converted into electricity.

When sunlight hits the panels, electrons flow from the panel through cabling to a central location where they pass through an inverter and other power conditioning equipment before flowing onto the electricity grid.

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How the tracking system works

By using a tracking system the energy generated by a solar power system can be increased by up to 30%. Single axis tracking means the panels remain at an angle of 20 degrees (close to the optimal angle for Alice Springs) and each tracker, which incorporates nine modules, follows the sun from east to west across the sky each day.

Set up in building blocks of trackers, each block is controlled by a single drive unit and is mechanically independent of other blocks. Each block has a system controller that determines the optimum tracking angle for the array based on current time, date and geographic location using built-in Global Positioning Signal (GPS) to monitor time precisely and ensure that each block tracks the sun according to its individual latitude and longitude.

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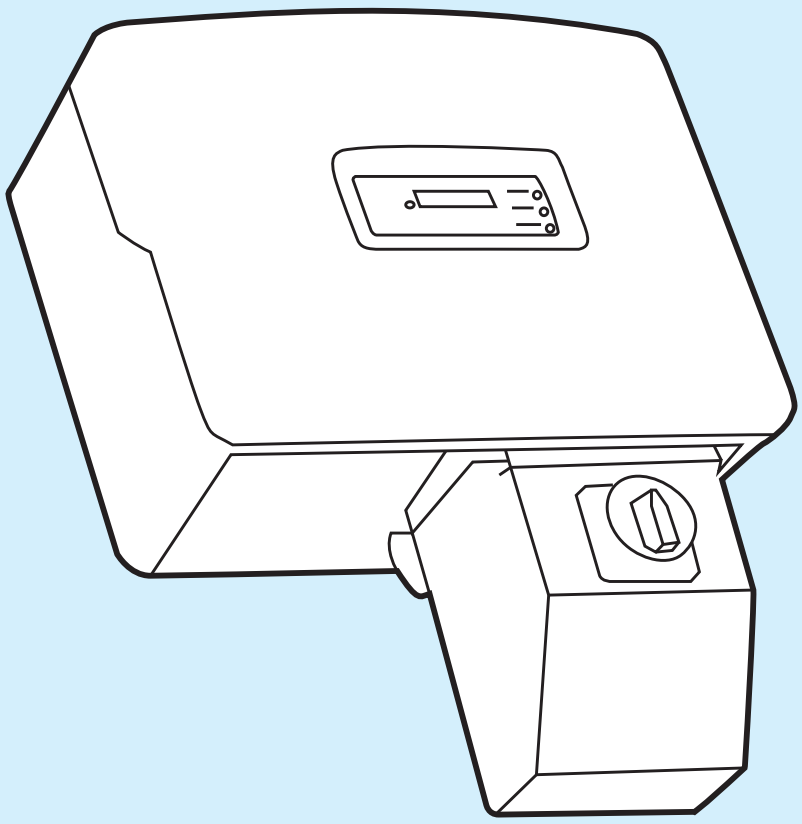

A grid-interactive
Inverter >

How the system works with inverters

Electricity generated from photovoltaic panels is DC (Direct Current) power that must be converted to AC (Alternating Current) before it can be fed into the electricity grid.

A grid-interactive inverter converts DC power into AC power and must do so while synchronising its frequency and voltage with that of the grid. In the event of a blackout the inverters are designed to disconnect from the grid protecting the safety of line workers.

You can see the shelter which houses the two Satcon PowerGate Plus 500kW inverters required by the system on the northern side of the site, near the boundary fence (towards your left) from here at the interpretive shelter.

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Distribution network in NT >

Energy Distribution

After being converted from DC to AC by the inverter energy flows through additional power conditioning equipment to ensure that the quality and reliability of the electricity grid is maintained. Once the electricity has left the solar farm it goes through the normal distribution network of power poles and cables to reach the end consumers in their homes and offices.

The Power and Water Corporation is accredited as a GreenPower provider through the National GreenPower Accreditation Program and provides consumers with the option to purchase a proportion of their electricity needs from Territory GreenPower. By purchasing Territory GreenPower householders can reduce the impact of their energy use on the environment and support and encourage investment in renewable energy project like the Uterne Solar Power Station.

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