

Solar Collection & Storage

Solar Panels

Jinko Tiger Neo Satin solar panels (440W) All Black 13.2kWp/9.999kVa (30 panels).

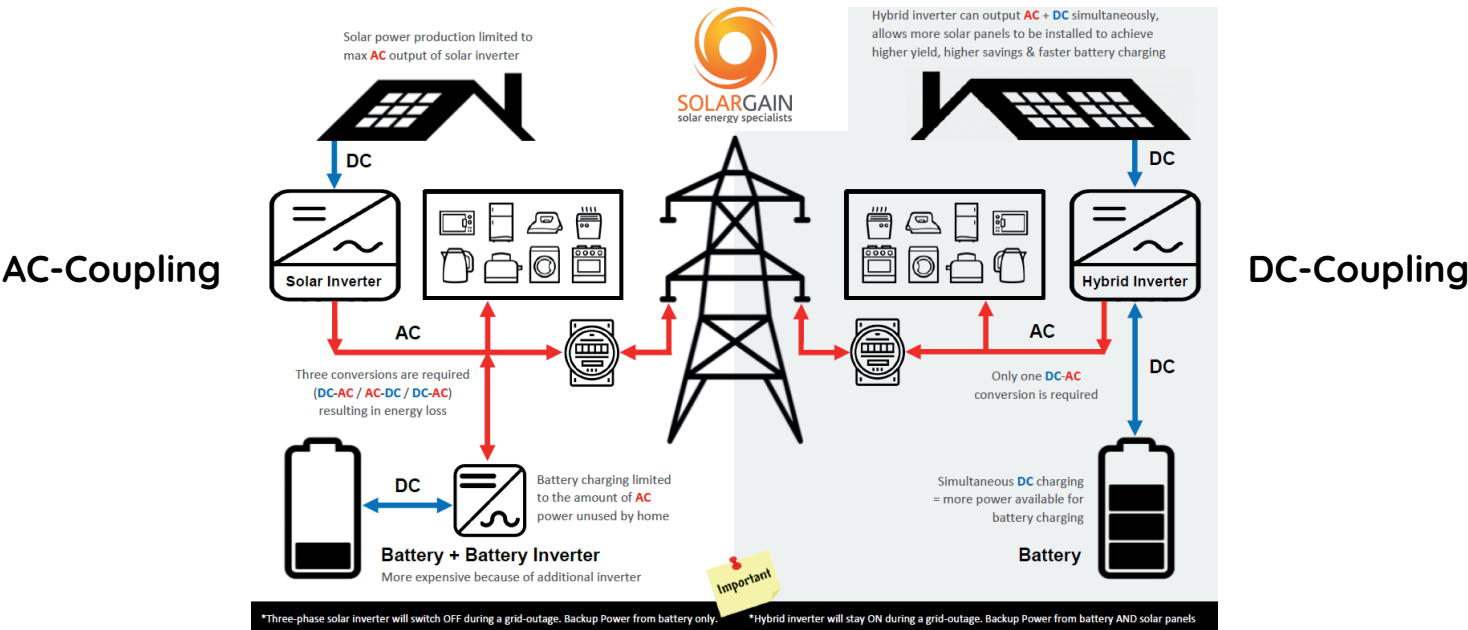
These panels achieve a cell efficiency rating of 22% (the average is 17-24%), which means they generate more power per square metre. The half-cell modules also ensure a greater energy yield in higher density areas like Catalina Green, where neighbouring homes and trees can block direct sunlight by casting shade over the roof area.



Solar Inverter

iStore 3 Phase 10kW Hybrid inverter

The iStore hybrid inverter sends energy to the DC-coupled battery at the same time as sending AC energy to the Catalina Sustainable Home. Combining this with a backup box ensures the home can run from the panels during a power outage on the grid, while simultaneously charging the battery. Having a system that can do both extends the length of time the home can keep running when the mains power is out.



Three types of solar inverters

String inverters: Converting the direct current (DC) generated by multiple solar panels connected in series (or string) into alternating current (AC) that’s used by the grid and household appliances.

Microinverters: Small boxes attached to the back of each panel, converting their individual DC output to AC.

Solar hybrid inverters: Technically a DC- and AC-coupled solution, allowing power to be stored in the battery before being converted to AC, saving on unnecessary conversions.



Solar Battery

iStore 10kW Hybrid 3P 2MPPT Battery

Solar batteries store excess electricity generated by the solar panels for use when the panels are not producing power from the sun, like during the night.



Backup Box

iStore Backup Box (3 phase).

Backup boxes work in tandem with solar batteries. They’re designed to detect power outages and automatically switch essential circuits to battery power, ensuring a continuous power supply. During outages, the backup box disconnects the battery from the grid, allowing stored energy in the battery to power the house.

EV Charger

iStore Smart EV Charger (3 phase)

Catalina Sustainable Home features a Level 2 EV Charger, designed for 3-phase power and delivering up to 22kW of charging capacity for high-performance and reliable AC fast charging.

Installed with:

- ✓ PEN fault detection: Monitoring the 3-phase electrical network and disconnecting all poles in the event of a fault.
- ✓ Solar integration: Providing optional modes to adjust the charging speed based on the solar energy available from the panels and battery.
- ✓ RFID (Radio Frequency Identification): Uses fobs to restrict access.

Three levels of EV charging

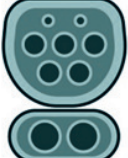
Whether you own an electric car or you’re considering an EV for your next car, it’s important to understand how and when to safely charge your EV, and how to select the charging level to suit your driving habits.

- **Level 1 EV Charger Type - AC Slow Charging (or Trickle Charging)**
For EVs that don’t go far or aren’t driven very often. For example, they might drive less than 40km a day and can spend long periods of time charging between each drive.
- **Level 2 EV Charger Type - AC Fast Charging**
For EVs that are driven regularly and often, but not long distances (up to 100km a day), and can recharge at home over 4-5 hours.
- **Level 3 EV Charger Type - DC Fast Charging**
These are generally only installed by industry and government to allow EV owners to charge their cars away from home.

EV Charging Plugs

EV plugs and ports have multiple pins. Some are for transferring electricity, others are data connections that enable the car and EV charging stations to manage electricity flow. The most common plug in Australia is the Mennekes (Type 2). Older EVs may have J1772 (Type 1). Just like household plugs, adaptors are available to connect to different chargers.

These are the four main EV plug types.

AC	 J1772 (Type 1)	 Mennekes (Type 2)
DC	 CHAdemo	 CCS2

FUN FACT

CHAdemo chargers name is a play on words: "CHARge de MOve" (charge for moving), and it's also a pun on the Japanese phrase "o CHA demo ikaga desu ka," meaning "How about a cup of tea?"—referring to how quickly the charger can add enough power to continue your journey.

What about bidirectional charging?

Not many EVs currently sold in Australia support bidirectional charging, also known as Vehicle 2 Grid (V2G). This is likely to change when more V2G chargers become available, and incentives and tariffs are introduced to encourage consumer uptake. To keep up to date, visit the [Australian Renewable Energy Agency \(ARENA\)](#).



Go to the [Synergy EV Network](#) to find your nearest charging station when you’re away from home in WA.

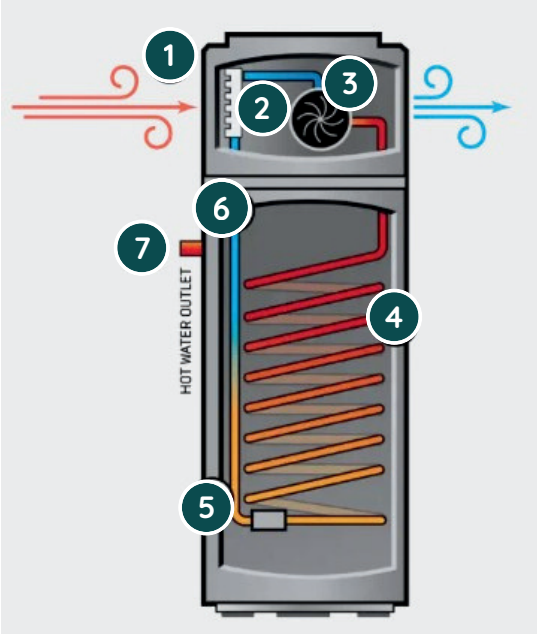
Hot Water

iStore Heat Pump PASHW015 270ld R290

Did you know, 23% of household energy is used to heat water in the average Australian home? Compared to traditional systems that require a lot of energy to heat water, heat pumps use 66% less energy to move heat from the surrounding air into the water (similar to a reverse-cycle air conditioner). Add in solar panels and batteries, and your water heating costs and greenhouse gas emissions are reduced to virtually nothing.

How does an iStore heat pump work

- 1 A fan introduces warm air to the inside, driving it through the evaporator.
- 2 The evaporator transforms liquid refrigerant into gas.
- 3 The refrigerant gas turns into hot gas as the compressor applies pressure.
- 4 The hot gas flowing in the condenser coils heats up the water inside the tank.
- 5 After heating the water, the refrigerant condenses back into liquid form and flows back through the evaporator to restart the same process.
- 6 The cycle continues until the target temperature is achieved.
- 7 The water is being used, the cycle restarts when the temperature drops below 45 °C.



HELPFUL TIPS Look for a heat pump with a high coefficient of performance (COP) value. In other words, one that generates high heat energy output from the same energy input. For example, the Solargain iStore Heat Pump stores 4kW of heat energy for every 1kW of power consumed.

Heat pumps have a fan which can produce noise when the unit is heating, so choose a suitable location that won't disturb you or your neighbours.

Useful Links & Additional Reading

- Your Home Guide - yourhome.gov.au
- Renew Sunulator - renew.org.au
- Climate Change in Australia - climatechangeinaustralia.gov.au
- eTool - Cerclos - cerclos.com
- NatHERS Nationwide Energy Rating Scheme - www.nathers.gov.au
- Western Power (PV's, Batteries and EV'S) - westernpower.com.au
- Australian Electric Vehicle Assoc. - aeva.asn.au
- Rewiring Australia - rewiringaustralia.org
- Solar Quotes - solarquotes.com.au
- PV Industries - pvindustries.com.au (recycling old PV panels)

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Visit one of the most sustainable homes in Australia.



www.catalinasustainablehome.com.au



Energy

CARBON-POSITIVE DESIGN: GENERATING, STORING AND SAVING ENERGY

Catalina Sustainable Home has been designed using passive solar design principles to reduce energy usage. With solar panels and a battery installed to generate and store energy, the home is powered by the sun even when it's not shining on the panels.

Using this renewable technology significantly reduces greenhouse gas emissions. In fact, the Catalina Sustainable Home has exceeded the benchmark for carbon-positive design, scoring an impressive 105% with eTool. In terms of carbon dioxide emissions, that's 462 tonnes less than the benchmark home.



2,772

This is the number of trees that would need to be planted to sequester the greenhouse gases saved.

Source: Carbon Neutral Australia, who estimate six trees need to be planted for every tonne of CO2e sequestered.



100

The number cars you would need to remove from the road for one year to avoid the greenhouse gases saved.

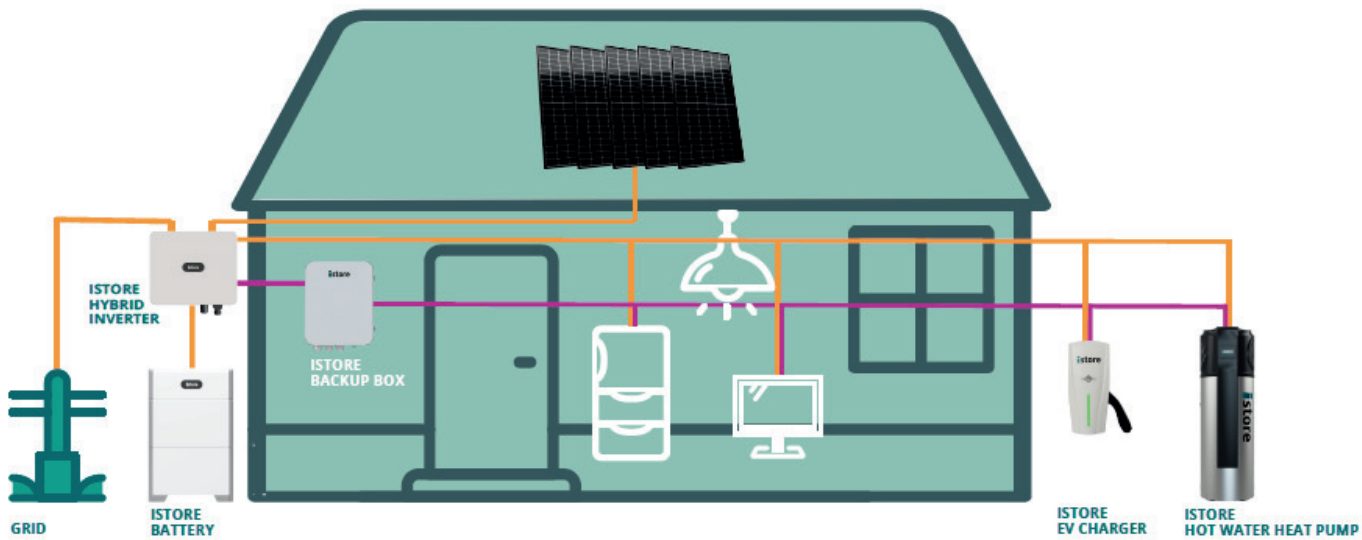
Source: US EPA estimate the greenhouse gas emissions from a typical passenger vehicle to be 4.6tCO2e per year.



89,166

The number of cheeseburgers that would need to be eaten to nullify the greenhouse gases saved.

Source: Jamais Cascio of The Open Future who estimate the carbon footprint of a cheeseburger to be 5.18kgCO2e.



www.catalinasustainablehome.com.au