

Types of solar hot water systems

Thousands of Queenslanders are doing the bright thing by installing solar hot water in their homes and saving on their electricity costs. Whether a split system, roof-mounted system or heat pump is installed, Queenslanders can make the most of the state's sunny climate and help the environment.

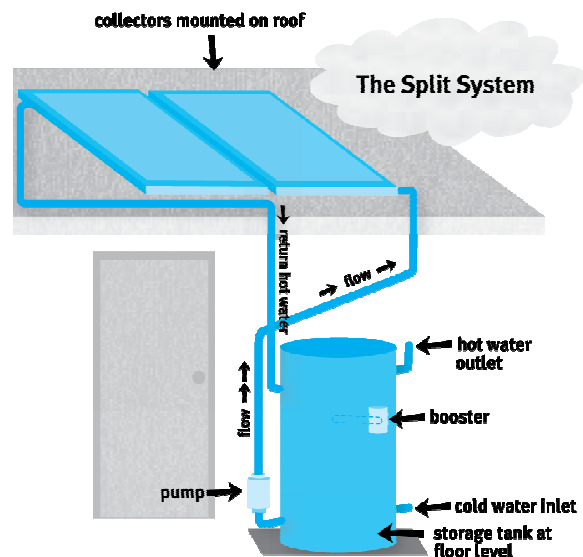
Installing a solar hot water system will help build a virtual solar power station for Queensland. Family by family, we're working together to double Queensland's use of solar energy in five years.

On a typical, sunny Queensland day, a solar hot water system can easily supply any household's hot water needs using energy from the sun. On cloudy or rainy days, or when demand for hot water might be unusually high, hot water is still readily available, thanks to the back-up support of an electric or gas booster.

The split system

A split system consists of five key pieces of equipment. There are the solar collectors which are mounted on the roof. Usually placed at ground level, a water storage tank is installed, along with a solar controller, small electric pump and an electric or gas booster.

The electric pump circulates water from the storage tank on the ground up to the collectors on the roof, where the water is heated by warm rays from the sun. It is then returned to the water storage tank, where it stays until it is needed for use in the home.



Often referred to as an 'active' solar system, the split system uses an electric pump to circulate the water through the collectors. A solar controller—which is designed to avoid energy wastage and overheating water in the storage tank—decides when the pump should run.

With the water storage tank installed discreetly on the ground, split systems have minimal visual impact, particularly when the solar collectors are mounted flush with your roof. They can be installed on any roof pitch, as the pump is responsible for moving the water through the solar collector. However, on some roofs, the panels may need to be angled with a pitch stand to maximise performance.

The roof-mounted system

The roof-mounted system is made up of solar collectors and a water storage tank. Both of these are installed on the roof.

The system's design is based on a principle called 'thermosyphon'. This simply means cold water is heavier than hot water, and so cold water will fall and hot water will rise.

The cold water in the solar collectors receives warm heat from the sun and so it rises into the tank. This heated water shifts cold water in the tank which then falls into the solar collectors where the process starts again.

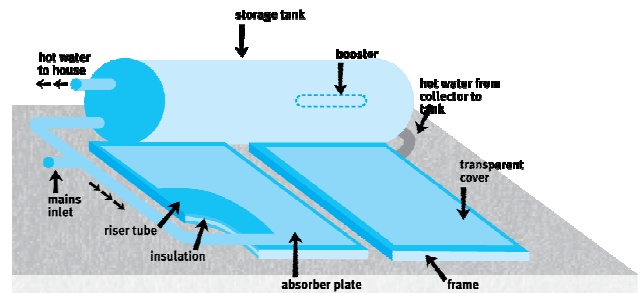
The hot water is stored in the water storage tank until it is needed for use in the home. Any unused water that cools in temperature, simply returns back to the collectors for re-heating.

Roof-mounted systems are often referred to as 'passive' solar systems because they rely on the principle of thermosyphon, rather than an electric pump, to move the water through the solar collectors.

Heat pumps

A heat pump hot water system is made up of a water storage tank and a heat pump. The heat pump is either mounted on top of, or next to, the water storage tank. The heat pump consists of a condenser located around the outside of the water storage tank, a compressor and an evaporator.

Heat pumps are another clean energy option for heating your hot water. They are most suitable when there is not enough sunlight falling directly on a home.



The Roof-Mounted System

Heat pumps are also an option if a home's design or location makes it difficult to install solar panels, or for homes in areas where there is a lot of frost. (However, for these homes there are also suitable solar technologies available). Heat pumps are also a good option for existing apartment complexes.

Heat pump hot water systems use proven technology which has been around for a long time in air-conditioners and refrigerators. They work by capturing heat from the surrounding air.

Like an air conditioner in reverse cycle, the heat pump works by absorbing heat from the air into the refrigerant gas within the evaporator. The compressor increases the pressure and temperature of the gas, and sends it through the condenser which is located in the water tank casing. Here heat energy is transferred to the water, the gas cools and then flows back to the evaporator in a continuous cycle.

Heat pumps do not require direct sunlight, and therefore produce hot water using the same method rain, hail or shine. A heat pump can produce ample hot water for any household and has the added advantage of using approximately one-third of the electricity of an electric storage hot water system.

A heat pump system is considered suitable at almost any property regardless of the roofline and the amount of sunlight it receives.

Also, because there are no parts mounted on the roof, it's easy to install. However, unlike solar collector systems, they cost a little more to run and make some noise similar to a ducted air-conditioning system or pool filter when operating. Therefore it is recommended that heat pumps are not placed near bedroom windows or the bedroom windows of neighbouring properties.

Solar hot water rebates

Under the Queensland Government Solar Hot Water Rebate, you could be eligible for:

- a \$600 rebate for a solar hot water system or heat pump
- a \$1000 rebate for a solar hot water system or heat pump if you're a pensioner or low income earner.

You can choose a supplier that suits you and apply for the rebate after your system is installed. To find out more, visit www.qld.gov.au.

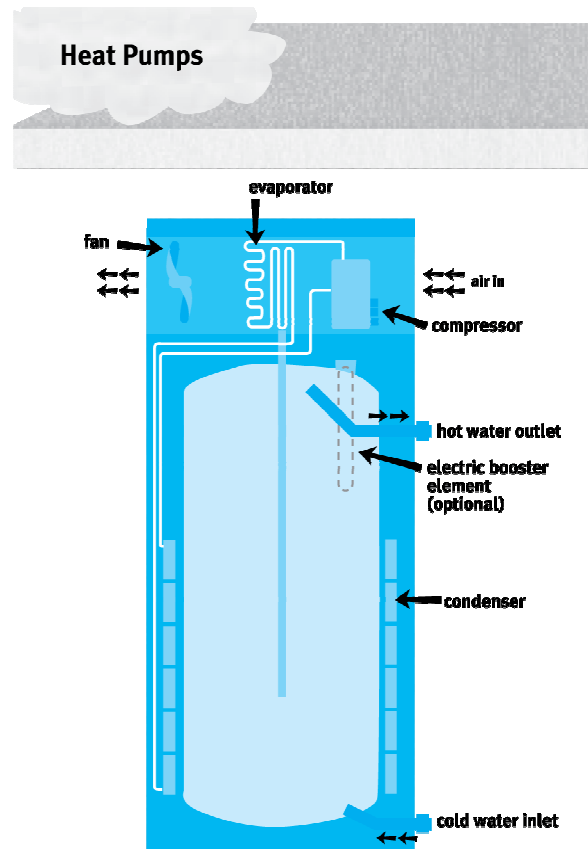
The Federal Government's Solar Hot Water Rebate offers a \$1000 rebate on solar hot water systems or \$600 on heat pumps for eligible households*. For more information, visit www.environment.gov.au

These rebates are completely independent—so Queenslanders are able to apply for both the State and Federal rebates together, saving even more money.

How do I choose an installer?

Before choosing an installer:

- get to know the market and find out more about the range of solar hot water systems and heat pumps, retailers, suppliers and installers
- once you've done your research, determine the best solar hot water system for your needs
- get quotes.



Ensure that any proposed system and installation meet the rebate eligibility criteria for the State and Federal rebate schemes.

To be eligible for the rebates, installers must hold a current plumbing and drainage licence to connect new systems to the water supply. All electrical work must be carried out by a person holding a current electrical contractor's licence and a current electrical worker's licence. Your retailer and installer must also hold the appropriate BSA (Building Services Authority) and occupational licences.

More information

For more information about the solar hot water and heat pump systems or solar initiatives in Queensland, visit www.qld.gov.au or call 13 GET SOLAR (13 438 76527).

* Please check website as incentives are subject to change.