



## Types of solar hot water systems offered by the Program

Would you like to tap into the sun?

A clean energy, solar hot water system can help you do just that. By installing either a split system, roof mounted system or heat pump at your home, you can make the most of our Queensland sun, and feel good about helping the environment along the way.

Solar hot water systems are a natural choice in Queensland's sunny climate. Many Queenslanders are already enjoying the benefits of a proven, reliable, solar hot water system in their home. The two most common choices are the split system and roof-mounted system.

On a typical, sunny Queensland day, a solar hot water system can easily supply any household's hot water needs using the sun's clean energy. On those cloudy or rainy days, or when your demand for hot water might be unusually high, hot water is still readily available for you to use, thanks to the back-up support of an electric or gas booster. Heat pumps do not rely on direct sunlight so will usually not require a booster element.

All systems offered under the Queensland Solar Hot Water Program comply fully with Australian standards and are listed on the Office of the Renewable Energy Regulator register of approved systems. For more information, visit the Office of the Renewable Energy Regulator website at [www.orer.gov.au/recs](http://www.orer.gov.au/recs)

### The Split System

A split system is made up of five key pieces of equipment. There are the solar collectors which are mounted on your roof. Down on 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 – especially designed to avoid energy wastage and overheating water in the storage tank – decides when the pump should run.

No one but you may even know the great choice you've made for your household and the environment. 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. Your only consideration may be installation costs, which can depend on the location of your water storage tank, and the length of pipe required to move water from the water storage tank to the solar collectors.

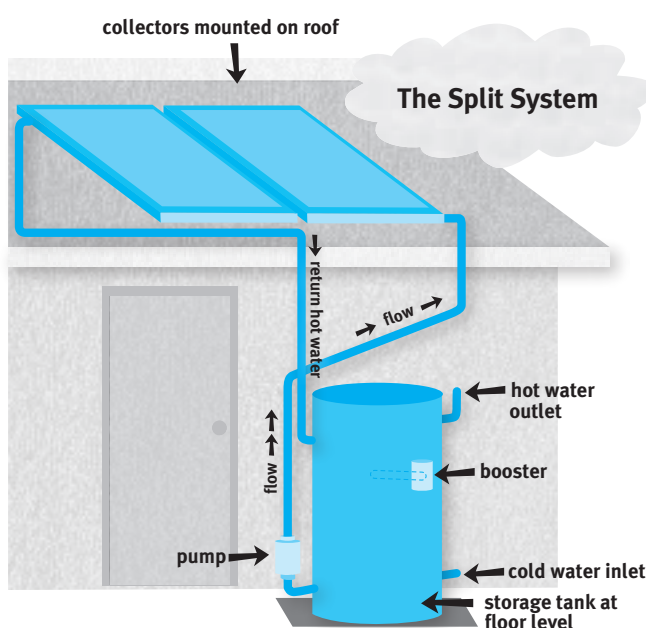
### The Roof-Mounted System

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

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 displaces cold water in the tank which then falls into the solar collectors where the process continues.

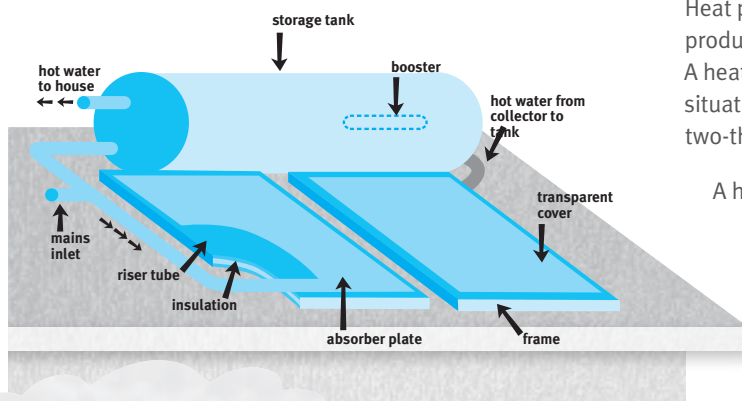
The hot water is stored in the water storage tank until it is needed for use in the home. Any unused water that cools in temperature simply returns back to the collectors for re-heating.

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.





A roof-mounted system weighs several hundred kilograms, so if you are considering this option, a professional would need to check the suitability of your home to ensure the roof will support the extra weight. Also, if you live in a cyclone prone region, your system will require increased roof fastening to withstand strong wind conditions. In some cases, a crane may be required to lift heavy components onto the roof.



## The Roof-Mounted System

## 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 adjacent 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 considered most suitable when there is insufficient sunlight falling directly on your home. This might be because your roof is shaded by vegetation or neighboring buildings, or your roof simply faces the wrong direction to make the most of the day's sun. Heat pumps are also an option if your home's design or location makes it difficult to install solar panels, or if you live in an area which has a lot of frosts. Heat pumps are also often the best 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. You might like to think of them like a reverse cycle air conditioner.

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 situation and has the added advantage of using approximately two-thirds less electricity.

A heat pump system can be installed at almost any property regardless of the roofline, the amount of sunlight it receives, or whether it can take the weight of heavy equipment. 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 so you may need to take this into consideration before deciding on where to locate it.

## Heat Pumps

