

Solar Hot Water

Automotive Industry Energy Efficiency Project

Solar hot water systems are a great way to reduce energy bills by using the sun's energy to heat the water your business uses. Using the sunlight to heat water means that less electricity is used when heating water up.

A solar hot water system typically includes:

- solar collectors
- water storage tank
- a gas or electric booster.

The two commonly installed solar hot water systems include:

- thermosiphon system
- split system.

Both systems have their pros and cons and suitability will depend on your business' site and needs.

How do solar hot water systems work?

Solar collectors

Solar collectors are like solar panels of the solar hot water system; however unlike solar panels of a photovoltaic (PV) system solar collectors use the heat from the sun to directly heat water and is not connected to the electricity grid.

Solar collectors are mounted on the roof, typically north facing, and absorb the solar energy available from the sunlight to heat cold water to the desired temperature.

Water storage tank

The water storage tank holds the water where both hot and cold water circulate.

Booster

In order to have hot water available all the time, including days where there is no sun, an electric or gas booster is added to the solar hot water system.

The electric / gas booster acts as a 'back up' to ensure that water is always heated, even when there is no sun. The type of booster you choose to install will depend on the energy sources available to the business.

An electric booster is generally cheaper to purchase, however the running costs can be expensive depending on the business' electricity tariff. Electric boosters are normally located inside the water storage tank, heating the cold water to 60°C if there is insufficient sunlight.

A gas booster will only activate once the water in the water storage tank falls below temperature set on the thermostat. Gas boosters can be installed either within the water storage tank or in a separate unit, heating the water as it leaves the water storage tank for usage.

A gas booster is generally the preferred option for sites that have access to main gas. It has a lower running cost and is the most efficient option as it release fewer greenhouse gases.

If possible, installing the booster between the water storage tank and workshop is the best option for minimising the amount of greenhouse gas emissions produced, as water is only heated to the required temperature at the time of use.

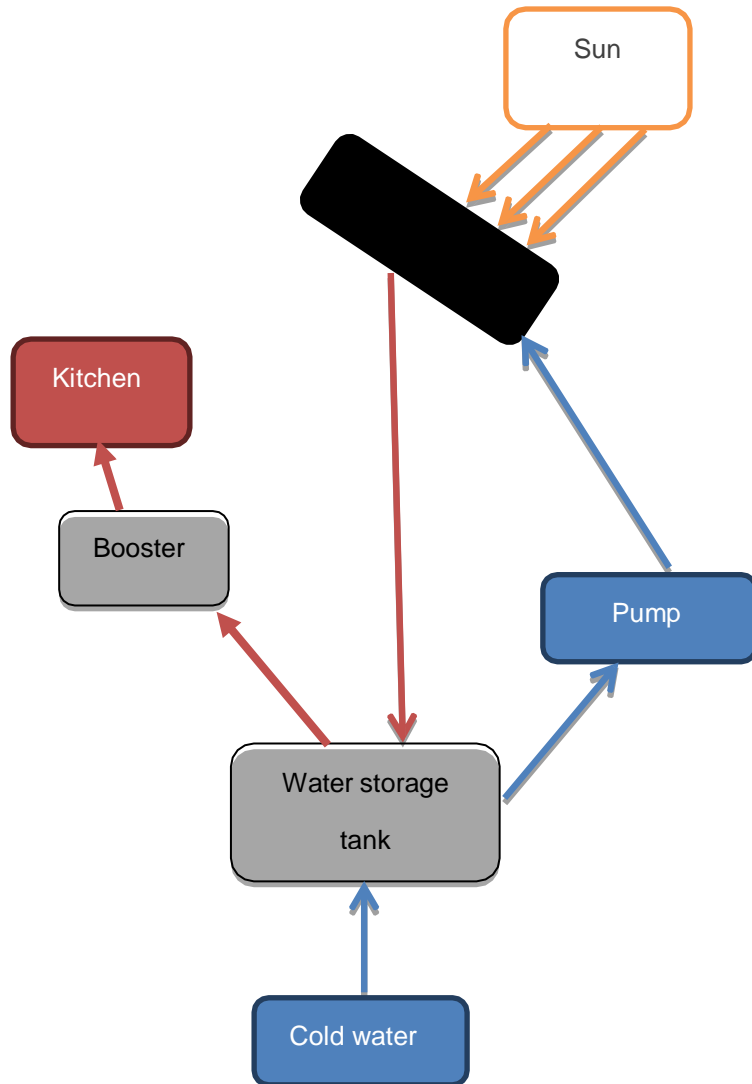
Types of solar hot water systems

Thermosiphon system

The thermosiphon system is known as a passive system, with the water storage tank and solar collectors mounted on the roof. Following the thermosiphon principle, where cold water sinks and hot water rises, the water storage tank is typically installed above the solar collectors.

The thermosiphon system is an ideal option for sites that have limited ground space available.

Below is a diagram of how a thermosiphon system works:



Split system

The split system has the solar collectors mounted on the roof and the water storage tank on the ground. Split systems can be more expensive compared to the thermosiphon system, and requires a pump to circulate the water between the water storage tank and collector.

Similar to the thermosiphon system the solar collectors use the heat from sunlight to heat cold water; however a pump is required to circulate water between the water storage tank and collectors. Domestic water is heated in the water storage tank via the solar heat exchanger and eventually by the booster if required.

Split systems may be a viable option if your business has limited north facing roof space.

Benefits of using a solar hot water system

Solar energy is an extremely efficient way to heat meet your business' hot water needs on a daily basis. It is a renewable form of energy, which means the energy source will never run out.

A solar hot water system can provide the following benefits:

- reduced electricity bills
- reduce carbon emissions.

Important considerations before, during and after installing a solar hot water system

Like any investment is it important that thorough research is undertaken before committing to any purchases and installations.

Solar hot water systems can be an expensive investment and a calculated decision needs to be made on whether a solar hot water system will provide you with the best energy savings.

The following should be taken into consideration when deciding if a solar hot water system is right for your business:

- Business' water usage by looking at previous water bills over the last year
- Quotes for solar hot water systems including installation
- Maintenance costs once the solar hot water system is installed

Other things that you should be aware of before installing a solar hot water system include:

- Warranty terms and conditions
- Using accredited installers (i.e. licensed plumber)
- Location of the installation
- What your quote includes (i.e. booster)

Maintaining your solar hot water system

The installer should provide you with clear instructions on how to operate and maintain the solar hot water system, so that you get maximum savings and benefits.

Once you have your solar hot water system installed the following should be taken into consideration:

- Ensure the thermostat on the booster is set between 60°C and 65°C; as temperatures below 60°C risks the spread of harmful legionella bacteria.
- Having your solar hot water system regularly inspected and serviced. Some manufacturers recommend once every five years.
- Refer to the manufacturer's recommendation on cleaning the solar collectors. Dirty or dusty solar collectors can reduce the efficiency of the system.