

There are two basic types of water heater - storage systems and instantaneous (or continuous flow) systems.

Storage water heaters

Water is heated and stored in an insulated tank for use when it is required. These systems can operate on mains pressure or from a gravity feed tank.

Mains Pressure:

Hot water is delivered at a similar pressure and flow rate to cold water so more than one outlet can usually be turned on without greatly affecting pressure. The storage tank is usually located at ground level inside or outside the house.

Constant Pressure or Gravity Feed:

Hot water is delivered at lower than mains pressure from a tank located in the roof of the house. Pressure depends on the height difference between the tank and the point of use. Gravity feed systems are most common for properties not connected to mains water.

Storage tanks may be made of copper, glass (enamel) lined steel or stainless steel. Copper and glass-lined tanks typically have a sacrificial anode to reduce tank corrosion, which needs to be replaced every 5 years or so, depending on water quality. Warranties offered for tanks range from 5 to 10 years and details vary considerably. We recommend that the anode be replaced every 3 years.

Instantaneous water heaters

Instantaneous systems heat only the water required and do not use a storage tank. They can operate on natural gas, LPG or electricity. Gas models are available with either electronic ignition or a pilot flame or hydro powered units.

Instantaneous systems cannot run out of hot water and can be mounted internally or externally.

Standard units can only deliver adequate hot water to one or two points at the same time but high performance gas units can supply several points at once. They also have sophisticated temperature controls.

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For most households, hot water is the largest energy cost and cause of greenhouse gas emissions.

Solar, heat pump and gas systems are usually better for the environment than electric storage.

By choosing the right system you can lower your energy bills, save money, and reduce environmental impact without compromising lifestyle.

Household size

The number of people living in your home and your water consumption patterns (i.e. whether you all shower at the same time of day; run the dishwasher, washing machine and bath at the same time) will determine the size of the system you need and help to identify the best system and energy source for your needs.

Cost

The purchase cost and operating costs of your hot water system both need to be considered. The energy used by your water heater will impact on your energy bill for years to come so consider carefully before buying.

Any extra purchase cost of an efficient water heater is usually recovered within the life of the unit. Government rebates are also available on some energy efficient systems.

Space Available

In existing homes it may not be possible to install some systems due to lack of space or a difficult layout.

Existing Water Heater

Some existing hot water systems can be easily converted to more sustainable types.

For example, the best replacement for the old style ceiling mounted gravity service is often a roof-mounted solar system, as plumbing usually requires minimal alteration.

Available Energy Sources

Your choice may also be limited by the available energy sources.

Natural gas is not available in some areas and solar energy may not be ideal in cooler climates or shaded areas.

Suggestions for the best system for your situation, considering cost-effectiveness and environmental concerns.

A small water-efficient household

Choose an instantaneous gas hot water system or a small, high-efficiency gas storage system.

A medium-sized household

Select a high-efficiency gas or electric heat pump system. If you get enough sunshine, a solar water heater may also be a good option.

If you get plenty of sunshine

And have a large household; the best option might be a solar hot water system. However, a high-efficiency gas storage system or a solar-boosted electric heat pump may also be suitable.

A multi-residential development

A large, cost-effective solar water heater can be effectively combined with instantaneous gas boosters in each unit.

Geothermal Heat Pumps or Circulating Heat Pumps

Very efficient electric water heaters and may be a cost effective option for blocks of 5 or more units.

A gas booster solar water heater

Will generate the lowest greenhouse gas emissions.

Where gas is not available, an electric-boosted solar system or electric heat pump will minimise emissions.

For most households, hot water is second only to transport as the largest cause of greenhouse gas emissions.

By installing the most appropriate and efficient water heater for your household size and water use patterns you will save money and reduce greenhouse gas emissions.

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ENERGY SOURCES FOR HEATING

Solar hot water systems depending on your climate can provide up to 90% of your hot water for free using the sun's energy. Solar systems may be less appropriate in smaller households, in cooler parts of the country, or where access to sunlight is restricted.

Natural gas water heaters generate far fewer greenhouse gas emissions than standard electric storage systems.

Gas storage systems have quicker heat recovery times and generally use a smaller tank than a comparable electric storage system.

Instantaneous systems usually use natural gas as it is cheaper for this application than LPG and electricity.

To compare energy use of gas storage and instantaneous gas water heaters, check the star rating label.

Electricity can be used for standard storage heaters, for heat pump systems or for boosting solar systems. Expensive three-phase electricity supply is needed for instantaneous systems.

Electric heat pumps are an efficient type of electric storage water heater that extracts heat from the environment to heat water. They pay back the extra initial investment more quickly in larger households.

Heat pumps that draw heat from the air use only about one third of the energy of a standard electric system and can be made even more efficient by using a solar booster. Electricity is not used to directly heat the water but to move heat from one place to another. The heat is carried by a refrigerant.

Ground source (or geothermal) heat pumps use a water body, shallow trench or deep bore instead of the air as a heat source. They usually provide both space heating and water heating. Electricity is used to pump water around a loop buried in the ground or immersed in a water body. The enclosed water absorbs heat from the surroundings. Geothermal heat pumps can produce more than 4 units of heat energy for every unit of electrical energy used.

Heat pumps can be located and designed to utilise waste heat from air conditioners and refrigerators.

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ELECTRIC STORAGE WATER HEATERS

Standard electric storage water heaters use a heating element inside the tank to heat the water, just like an electric kettle. They are responsible for the most greenhouse gases of any water heater so are not recommended.

Small electric storage water heaters less than about 160 litres usually use peak electricity & are the most expensive of all to run.

Larger electric storage water heaters generally use cheaper off-peak electricity tariffs where available, heating water at restricted times (usually overnight).

To reduce the chance of running out of hot water, tanks are often oversized and overheated, increasing energy consumption and greenhouse gas emissions. An electric storage water heater can indirectly produce as much carbon dioxide each year as the average family car.



HOT WATER & THE ENVIRONMENT

- Around 30% of household energy is used to heat water.
- More than half of hot water use is in the bathroom, a third in the laundry and the remainder in the kitchen.
- Between 25 and 50% of the average Australian household's electricity and gas bills are for hot water heating.

Here are a few things to consider:

- Setting your thermostat so that water is too hot to use wastes energy. Then you waste cold water to cool it to a useable temperature. Ask us to adjust it for you.
- Use separate hot and cold taps over sinks and basins. Mixing taps are usually left in the middle position so that every time you fill a glass or pot, you draw off unwanted hot water that just cools in the pipe. You could also add in flow regulators to save water and save.
- Install the hot water system as close as possible to the kitchen and bathroom to avoid wasting hot water in long sections of pipe. We do bathroom and kitchen renovations, ask us about the most efficient plumbing in your plans.
- Insulate all hot water pipes to further reduce any heat loss. We can do this for you.



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DESIGN AND INSTALLATION

As much as 60 percent of your hot water bill is due to heat loss from the tank and associated pipe work.

This can be reduced through careful design and installation.

Keep hot water pipes as short as possible to minimise heat loss.

In new or renovated homes, locate wet areas close together with the water heater close to all points of hot water use.

If this is not possible, locate it close to the kitchen where small, frequent amounts of hot water are usual.

Estimate your hot water needs accurately to ensure your system is not oversized or undersized for your household.

If storage system tanks are too small for the number of people in the house hot water can run out.

If the tank is too large, operating costs will be excessive.

Storage systems lose heat through the tank walls.

Reduce heat loss by wrapping the tank with extra insulation.

Ensure that the air supply to gas systems is not affected.

In cool and cold climates try and locate the tank inside as part of a drying or heating cupboard. This will save heat leakage to cold air and re-use leaked heat for drying.

Insulate hot water pipes, particularly externally exposed pipe leading from the water heater to the house and the pipe leading to the relief valve (on storage systems).

Note: Standard lagged hot water pipes are inadequate external protection in cold and cool temperate climates. Apply additional insulation or "lagging".

For storage systems consider installing a timer to ensure water is not heated when it's not needed and a switch so the system can be turned off when you go on holiday.

Design new homes with a roof pitch and orientation suitable for a solar water heater.

You may not want to install one now but it leaves the option open for the future.

A north-facing roof with a pitch of between 22° and 40° is usually adequate.

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