NSW GOVERNMENT

Hot Water Guide for

- ✓ Households
- ✓ Businesses

July 2018

July 2018

Disclaimer

While every reasonable effort has been made to ensure this document is correct at time of printing, the State of NSW, its agents and employees, disclaim any and all liability to any person in respect of anything or the consequences of anything done or omitted to be done in reliance or upon the whole or any part of this document.

Copyright notice

Table of contents

How this fact sheet will help you

In New South Wales, water heating is usually the largest energy-using appliance in households, followed closely by space heating and cooling. Typically, you will use more than half of all hot water in the bathroom, a third in the laundry and the remainder in the kitchen.

Altogether, heating water can make up close to 30 per cent of your household's energy use.

This guide has been prepared to provide households and small businesses with information to select the best hot water system for your specific circumstances and needs.

This guide is especially useful if:

- Your current hot water system is near the end of its life, or not functioning correctly
- You're building a new house and need a hot water system
- You need to upgrade because your household or small business has grown
- You're looking for a more cost-efficient way to heat water

Use this guide to:

- Learn about different hot water systems
- Learn about how you can use hot water more efficiently
- Understand how you can save money on hot water use
- Choose the right hot water system for your needs

What you need to know about saving hot water

1. How can I save money on hot water?

New and improved technologies offer better energy, water and cost-efficient options, which will help you save money.

For hot water systems, energy efficiency is about both the system you choose and the way you use it.

1. You can save water heating costs today by adopting more water-efficient practices and using low flow controls.
2. When choosing a hot water system, you want one that can provide your household or small business with enough hot water for everyone when you need it, taking into account the initial cost as well as running costs.
    - Increasingly hot water systems based on renewable energy sources like the sun or the heat in the surrounding air and gas-fired systems can save you the most money over their working life.
    - Renewable energy systems are a better option when considering your carbon footprint.
    - If you are replacing a gas-fired system and you are not using gas for other purposes, choosing an electric or solar-boosted electric system may allow you to save more money in gas network costs.
    - **Installing continuous electric hot water systems is rarely the most cost-efficient solution** unless your home doesn't see much sunlight and you don't have a gas connection.

2. How can I reduce my hot water use?

Conserving water is important and will help you with saving costs.

Changing your hot water system is not the only way to reduce water usage. The section below highlights some of the methods you can use to conserve hot water as an individual, a household or a small business.

- **Make sure your hot water system is the right size for your household or your business**. A system that's too large will unnecessarily increase your energy costs.
- **Install low-flow showerheads and fixtures**. Three-star rated showerheads have a flow rate of 9 litres per minute, compared to the conventional 18 litres, which halves water consumption for showers.
- **Shortening shower time** even from 10 minutes to 7 minutes will reduce water consumption by 30%.
- **Consider having a shower rather than a bath**, which uses much less water.
- **Try not to leave the tap running** while brushing, or shaving.
- **Fix leaking storage tanks** to reduce energy consumption and waste water. Check your warranty to see if you can get it replaced. If it is out of warranty or near the end of its life, consider changing your system.

- **Fix leaking taps**. A leak of one drip per second can waste up to 33 litres of water each day.
- **Turn down your hot water thermostat** to below 60°C. This not only reduces your water heating bill, it also reduces the amount of cold water needed to cool water to the ideal temperature.
- **Insulate your water tank** where possible to reduce heat loss.
- **Insulate hot water pipes** up to a meter from the tank outlet to help retain heat. The closer your hot water system is to your point of hot water use (bathrooms), the lower the heat loss in pipes.
- **Water efficient products and appliances are better**. Look for the Water Rating Label to compare products.
- **Use the cold cycle for washing clothes or dishes** as it will reduce energy and hot water consumption.
- **Switch off the hot water system** when going away on holiday for more than two weeks**.**

.

What do I need to know about hot water systems?

3. Types of water heaters

There are two basic types of hot water systems:

1. **Storage** - a storage hot water system functions by heating water from an energy source and then storing it in a tank ready for use.
2. **Instantaneous** - an instantaneous system heats water only when required and does not need a storage tank.

4. Different ways water is heated

Electric hot water systems

Electric hot water systems have instantaneous and off-peak tariff options. Instantaneous electric hot water systems heat water on demand at any time, so electricity rates are the same as for any other appliance.

Instantaneous electric hot water can be very expensive if your household uses a significant amount of water, so these systems are uncommon.

Off-peak storage systems are cheaper to run, as off-peak tariffs are lower than general supply tariffs for electricity.

Off-peak electric hot water functions by heating your water outside peak times, which then gets stored for when you need it. To be connected to an off-peak tariff your hot water storage tank will need to be at least 100 litres. For electric storage systems of 100 litres and above, controlled load tariffs are an option which are typically two to three times cheaper than the continuours or anytime tariffs.

Gas hot water systems

Gas hot water systems can be both storage and instantaneous. They can be installed inside or outside your home or business. Gas instantaneous systems are smaller which is great if you have limited space, and are generally more efficient than a gas storage system.

You can easily compare the efficiency difference between gas units using the energy-rating label. Higher efficiency models will have cheaper running costs, but will usually be more expensive to buy.

Gas is supplied in a pipeline as natural gas, or in bottles as LPG. Natural gas is not available in all locations, so if you want to use gas, you may have to buy LPG, which can be more expensive.

Heat pump systems

Electric heat pump systems run on electricity and are roughly three to four times more efficient than a conventional electric water heater and more efficient than a gas hot water system.

This means that for the same hot water delivered, one third to one-quarter of the electricity is used compared with a standard electric hot water system.

You can think of a heat pump as similar to your refrigerator. A refrigerator extracts heat out of your food to keep it cool. A heat pump extracts heat out of the surrounding air and transfers it into your storage tank to heat water. Like a refrigerator, heat pumps work by using refrigerants. Some refrigerants are powerful greenhouse gases, but some heat pumps use carbon dioxide (CO_2) as a refrigerant, which produces less emissions than other refrigerants.

Two types of heat pump systems are available.

1. **An integrated system** has the heat pump on top of the storage tank, which is ideal when limited space is available.
2. **A split system** has a heat pump and a storage tank separately. Different brands and models have different noise levels (humming sound), so make sure to select a quiet one if this is a key concern.

Please note that heat pumps may be less efficient in areas where the ambient air temperature falls below 5°C.

Various tariff options are available for heat pumps, so make sure to discuss with your retailer what tariff will suit you best.

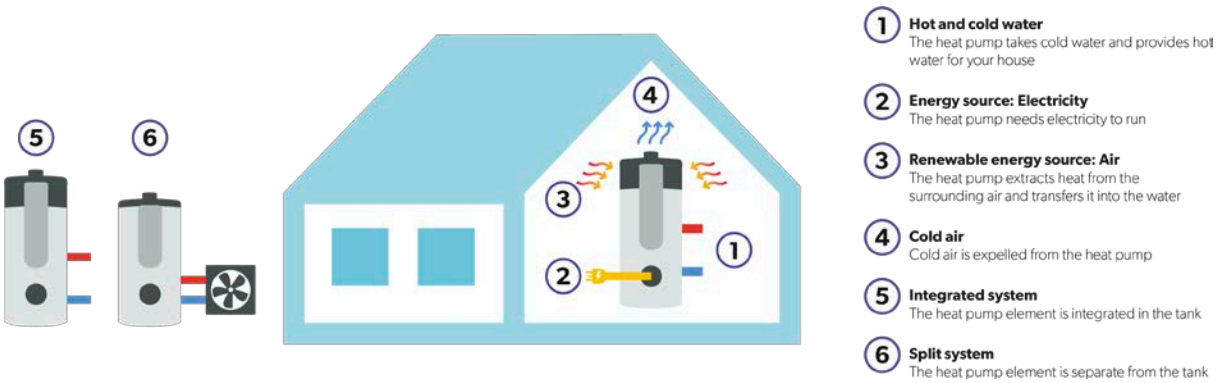

Figure 1: How heat pumps work

Solar hot water systems

Solar hot water systems work by having cold water from the mains enter the solar collector on the roof. As the solar collector captures heat from the sun, it transfers this heat to the water. The hot water is then transferred into your storage tank.

All systems come with a gas or electric boost system that will produce hot water on overcast days or during the night. There are also controlled load (off-peak) tariffs available as well. If your household prefers to take evening showers, the booster element will be used more often as opposed to taking showers in the morning, where you give the sun a chance to warm up your water instead.

Flat plate collectors and evacuated tube collectors are the two main types of collectors used for solar hot water systems. With flat plate collectors, your tank can either be on the ground or integrated in your roof system. Due to being round, evacuated tube collectors have a greater surface area for capturing sunlight and thus require less roof space than a flat panel. Evacuated tube collectors can also be used in subzero climates.

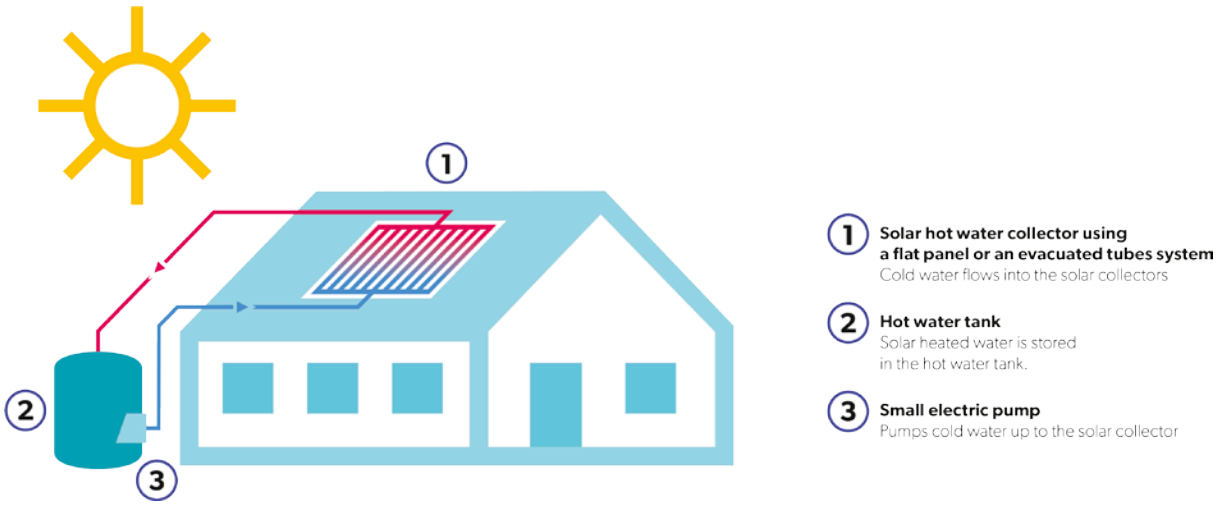

Figure 2: How solar hot water works

Solar diverters

Another option is to heat your hot water with the surplus electricity you generate from your solar PV system, using a diverter.

Your current electric hot water system will most likely be compatible with solar diverter products available in the market, so you may be able to use your existing tank and water heater.

If you have solar photovoltaic (PV) panels on your roof, any electricity that is not being used is normally exported to the grid where you get reimbursed with your solar feed-in-tariff. A solar diverter may be able to reroute this excess power to your electric element hot water system. In this way, your hot water tank is working as a battery to store your surplus power.

If your electric hot water system is on the same general supply (flat or time-of-use tariff), it will reduce the running cost of your hot water system. When combined with smart controls and time-of-use tariffs this may be able to produce significant energy savings.

However, if you are currently on controlled load hot water, you cannot divert power connected to another supply to the controlled supply. You would first have to change your hot water from controlled supply to your general supply with the associated higher rates, so there is a risk that the cost savings would be small. In this case, it may be better for you to stay on the controlled tariff, as solar feed-in-tariffs are similar in price to controlled load tariffs.

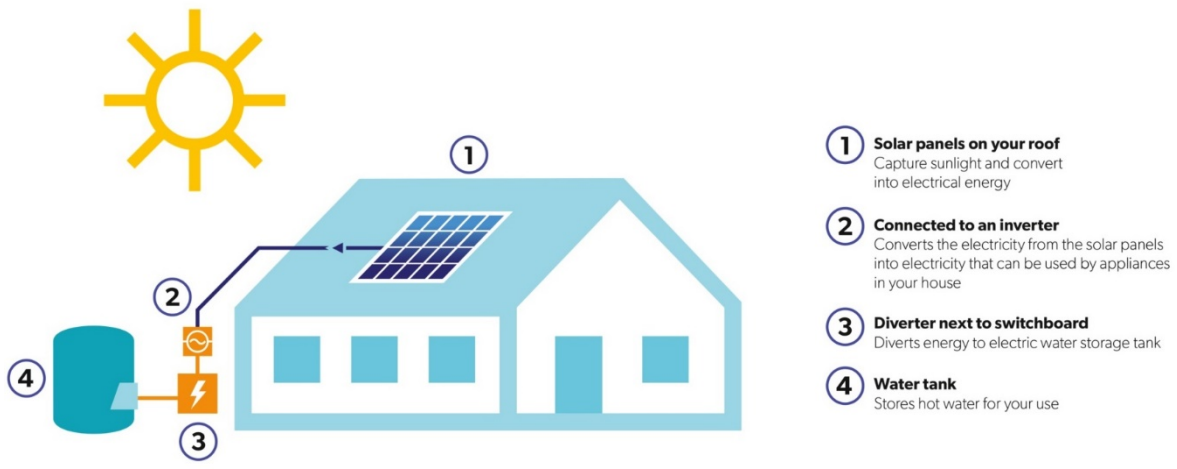

Figure 3: How solar diverters work

Choosing the right hot water system for my use

5. What factors do I need to take into account when deciding on a hot water system?

It is important to make a well-informed decision when considering changing your hot water system.

Making the right decision can save your household or small business thousands of dollars over the lifetime of the unit. You could also reduce your impact on the environment with your selection.

Most hot water systems are electric storage (continuous or off-peak), or gas (storage and instantaneous). Solar hot water makes up around 10% of systems. Heat pumps and using solar PV panels to heat water have an increasing share of the market.

Policies and incentives by governments to reduce emissions and reduce the cost of energy mean that new systems can use solar and gas rebates.

For more information on gas rebates visit www.energy.nsw.gov.au/energy-consumers/financial-assistance/rebates/nsw-gas-rebate.

For more information on solar rebates, specifically Small-scale technology certificates (STCs) visit www.rec-registry.gov.au/rec-registry/app/calculators/swh-stc-calculator-t

Your key concerns in selecting a system are:

- Running costs for gas and electricity
- Availability of controlled load tariffs
- Improvements in technologies

So which system will provide the best solution? The answer is rarely straightforward. It is a good idea to know what your needs for hot water are and to talk through them with at least two suppliers, so you get comparable quotes for different options that will meet your needs.

The main things that need to be looked at include:

- **Energy tariff options** – your current one as well as other options that may be available. Tariff options are where the biggest savings can often be made in conjunction with your choice of hot water system.
- **Your hot water usage and patterns** – for instance, how many showers, when you usually take them, whether you use hot water for clothes washing, and whether you use water flow controls.

- **The space in your home or business** – for instance, can you host hot water systems that require solar (i.e. roof space, orientation and shading), or in the case of heat pumps and gas systems, is the space well ventilated?

These factors can help you rule out systems that won't suit your situation and help you with selecting systems that can be installed. The information in the tables following can help you to narrow down your options.

6. Is financial assistance available?

The **Renewable Energy Target (RET)** is an Australian Government scheme implemented to encourage renewable sources of electricity generation. Solar power, solar hot water and heat pump systems are renewable sources of energy that are eligible for **Small-scale Technology Certificates (STCs).** Your hot water system retailer or electricity retailer will usually take care of the certificates and will give you a rebate on the purchase price.

There is also financial assistance available under the No Interest Loans Scheme (NILS) that provides families and individuals on low incomes aid to buy energy-efficient appliances. You may also want to check with your local council to see if there is any financial assistance available.

Some customers will also be eligible for the **NSW Gas Rebate**, which helps households to pay their gas bills. To check if you are eligible and to learn more about the Gas Rebate, visit www.energy.nsw.gov.au/energy-consumers/financial-assistance/rebates/nsw-gas-rebate.

There are also several **energy rebates** available in NSW that can help eligble customers to pay their electricity bills. To check if you are eligble and to learn more about the available rebates, visit www.energy.nsw.gov.au/energy-consumers/financial-assistance/rebates.

7. What do I need to know about warranties?

Warranty is an important consideration and extends to all components involved with providing hot water. You should ask about warranties for parts, which can include components like heating elements, sensors, thermostats and potential accessories. You should also find out about the warranty given on labour. For storage systems, the suppliers should also let you know about warranties associated with your water tank. For solar systems, you need to enquire about warranties associated with your solar collector system, booster element, as well as the tank.

8. Things to consider when choosing an electric hot water system

Electric hot water systems	Storage	Instantaneous
Cost to supply and install	Low cost	Low cost
Total cost over 15 years – purchase price plus running costs	Moderate for off-peak where the system only runs at night Moderate off-peak tariff that allows day operation as well as night Highest of all systems for continuous operation	High cost as they run on a continuous tariff
Location	Indoors or outdoors	Indoors or outdoors
Configuration	Stand-alone tank, floor or wall mounted, direct connection to cold water supply and your water users	Stand-alone unit; wall mounted, direct connection to cold water supply and your water users
Tank size	2 persons: 50L-80L for continuous 4 persons: 125-160L for continuous 2 persons: 160-250L for off-peak 4 persons: 250-315L for off-peak Smaller for fewer people, larger for more people	Not applicable Heater size or number of heaters needed will depend on the number of hot water outlets
Minimum standards and/or labelling	Water heater is subject to Minimum Energy Performance Standards (MEPS) Voluntary energy rating labelling by industry	No
Government incentives	None	None
Noise impact	Negligible	Negligible
Greenhouse gas emissions (assuming you are on standard grid power)	Very high for continuous operation, high for off-peak	High
Other considerations	If off-peak tariffs are not available, this may be the most expensive option over the life of the hot water system	Multiple users simultaneously can limit effectiveness
Best suited to	Small households or businesses with low hot water demand	Small households or businesses with low hot water demand

9. Things to consider when choosing a gas hot water system

Gas hot water systems	Storage	Instantaneous
Cost to supply and install	Low cost	Low cost
Total cost over 15 years – purchase price plus running costs	Moderate cost	Moderate cost
Location	Usually outdoors for venting	Usually outdoors for venting
Configuration	Stand-alone tank; floor mounted, direct connection to gas, electricity for controls and possibly pilot light, cold water supply and your water users	Stand-alone unit; wall mounted, direct connection to gas, electricity for controls and possibly pilot light, cold water supply and your water users
Tank size	2 person: < 135L 4 persons: 135-170L Smaller for fewer people, larger for more people	Not applicable. Heater size or number of heaters needed will depend on the number of hot water outlets
Minimum standards and/or labelling	Water heater will have a Minimum Energy Performance Standards (MEPS) Voluntary energy rating labelling by industry	Water heater will have a Minimum Energy Performance Standards (MEPS) Voluntary energy rating labelling by industry
Government incentives	None	None
Noise impact	Negligible	Negligible
Greenhouse gas emissions (assuming you are on standard grid power)	Moderate due to gas consumption, currently no ‘green gas’ option	Moderate due to gas consumption, currently no ‘green gas’ option
Other considerations	If gas is not used elsewhere in the home, then there may be a cost saving by switching to or choosing an electric-powered system LPG is an option if natural gas is not available, but is likely to be much more expensive to run	Multiple users simultaneously can limit effectiveness
Best suited to	Most house and small businesses where there is a gas connection and other gas-using equipment	Most households and small businesses where there is a gas connection and other gas-using equipment

10. Things to consider when choosing a heat pump or solar hot water system

Heat pump and solar hot water systems	Heat pump	Solar hot water
Cost to supply and install	High	Typically, the highest cost water heater
Total cost over 15 years – purchase price plus running costs	Moderate cost, comparable to gas and solar hot water in many cases	Often the lowest cost system overall due to low running costs
Location	Outdoors	Outdoors
Configuration	May be a single unit with integrated heat pump and storage tank or separate units, typically ground mounted	Roof mounted panels, roof for hot water storage in a thermosiphon system, ground mounted storage tank for split systems. Electric or gas boost connected to energy supply
Tank size	2 persons: < 270L 4 persons: 270-315L Smaller for fewer people, larger for more people	2 persons: 180 L 4 persons: 300-360L Smaller for fewer people, larger for more people
Minimum standards and/or labelling	None at present	None at present for solar components. Storage tanks for gas-boosted systems must have an efficiency label
Government incentives	Yes, eligible for Small-scale Technology Certificates (STCs) as an upfront rebate	Yes, eligible for Small-scale Technology Certificates (STCs) as an upfront rebate
Noise impact	Low, compressor and fan on the heat pump are similar to an air conditioner	Negligible
Greenhouse gas emissions (assuming you are on standard grid power)	Low as the heat pump extracts renewable energy (heat) from surrounding air to heat water	Low to very low depending on the location. Carbon emissions are only associated with operation of the gas or electric boost.
Other considerations	Operation in warmer climates and in daytime maximises carbon savings. Efficiency is reduced in colder regions and at night Heat pumps that use carbon dioxide (CO_2) as a refrigerant produce even more greenhouse gas savings	Around 4 m^2 is needed for a 4-person house, more if the orientation and shading limit the effectiveness of the panels
Best suited to	Medium to large households	For most households this may be the cheapest system in the long term

Answers to common questions and further help

11. Frequently asked questions

When should I replace my old system?

If your current system isn't providing your household with hot water when you need it, or in circumstances where the hot water system is near the end of its service life, you should consider changing your system. If your system is relatively new and not functioning properly, check if your warranty can cover the problem.

Where do I need to install my water heater?

The location of your hot water system will depend on the system you pick. Heaters can be installed indoors, outdoors and on the roof, or a combination of these. You may also be able to use existing plumbing and choose to keep the water heater in the current location.

How much will the water heater cost?

Any hot water system will have a unit cost, installation, maintenance, and running costs associated with it. The running cost will depend on the type and size of system, the number people in your household, and the amount of hot water used.

What has the least impact on the environment?

Hot water systems based on renewables like heat pumps, solar hot water and solar electric panels with a diverter reduce your carbon dioxide (CO_2) emissions the most. If you can't use renewable based systems, you can buy 100% GreenPower for all your electricity purchases, which will include your hot water consumption.

Who is my best point of contact?

It's important to do your own research to find what meets your circumstances and needs. Depending on which system interests you the most, contact reliable suppliers for the specific technology to find the best option for you.

How readily available are the technologies in NSW?

The traditional water heating methods (electric/gas storage, electric/gas instantaneous) are readily available in NSW, as are heat pump hot water systems and solar hot water systems. Also, an increasing number of suppliers of solar diverters are entering the market.

Do I need to get my hot water system serviced?

For most systems, it is recommended to complete minor maintenance works on your system, which can include easing the lever on the temperature pressure relief valve. Major work is generally required to be conducted every 5 years by a qualified professional. Refer to your manuals for the recommended maintenance schedule.

12. Further help

The following information can help you with your decision.

For information on Small-Scale Technology Certificates (STCs) go to www.cleanenergyregulator.gov.au/RET

For information on rebates go to https://yourenergysavings.gov.au/

For information on noise regulations for your council go to www.environment.nsw.gov.au/noise

For information on water and energy saving in your home go to www.environment.nsw.gov.au/households/index.htm

For information on choosing a hot water system got to https://www.choice.com.au/home-improvement/water/hot-water-systems/buying-guides/hot-water-system


NSW
GOVERNMENT