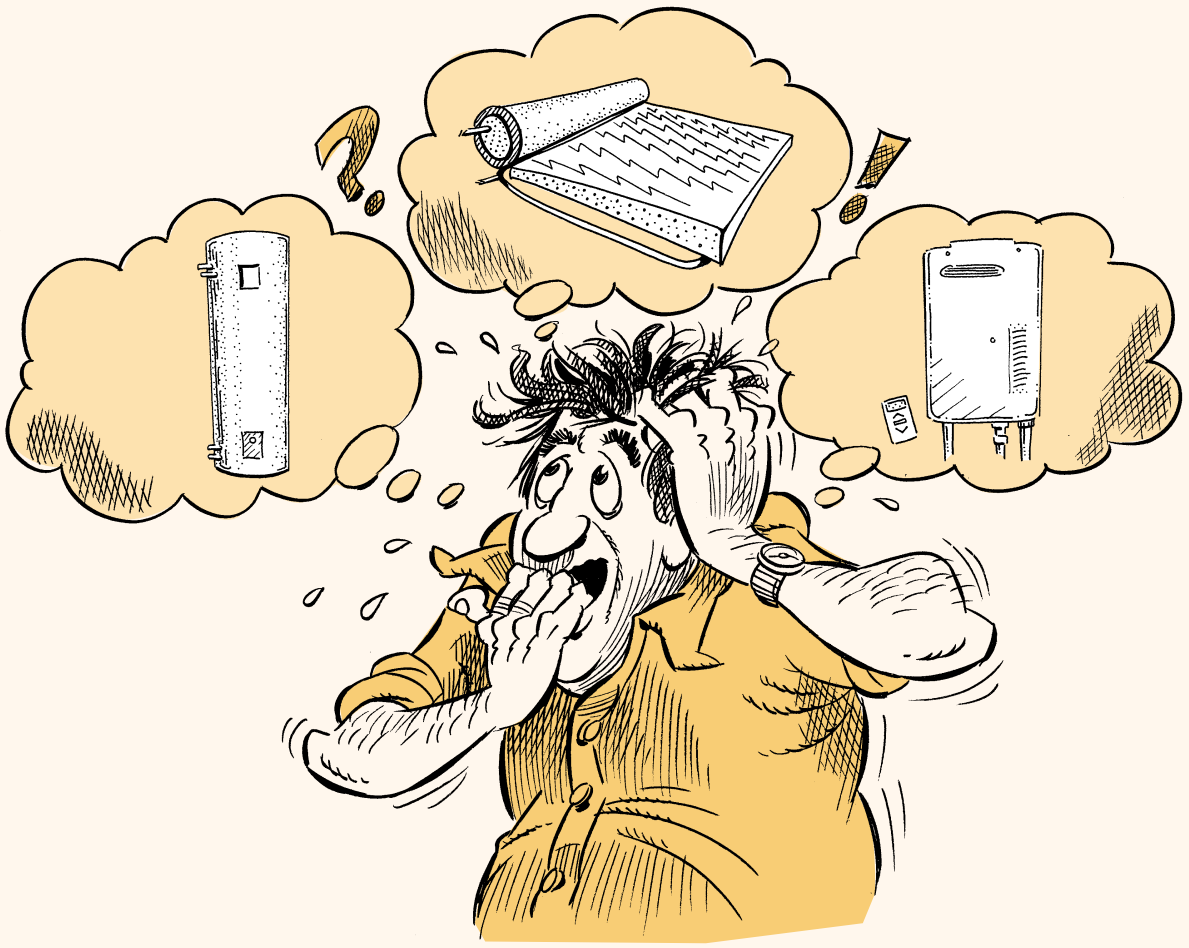
CHOOSING A HOT WATER SYSTEM



Hot water accounts for around one quarter of the average household's energy costs, so it's important to think carefully before selecting your hot water system.

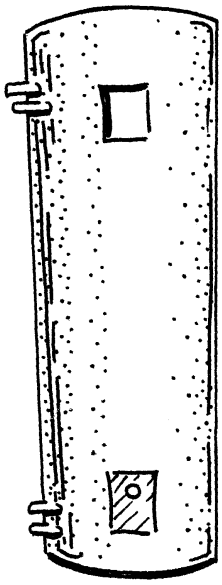
Choosing the most appropriate system for your needs, together with the wise use of your system, can considerably lower your hot water costs.

This brochure will help to identify your hot water needs, outline the types of systems available and provide a guide to their purchase and running costs.

SUSTAINABLE
ENERGY AUTHORITY
VICTORIA

Decision 1—Storage or continuous flow?

The two main types of hot water systems available today are storage water heaters and continuous flow water heaters, sometimes referred to as instantaneous water heaters. Both types are suitable for most households. However, your decision should be based on the size of your family, purchase and installation price, the unit's efficiency and running costs, and life expectancy of the unit.



Storage water heaters

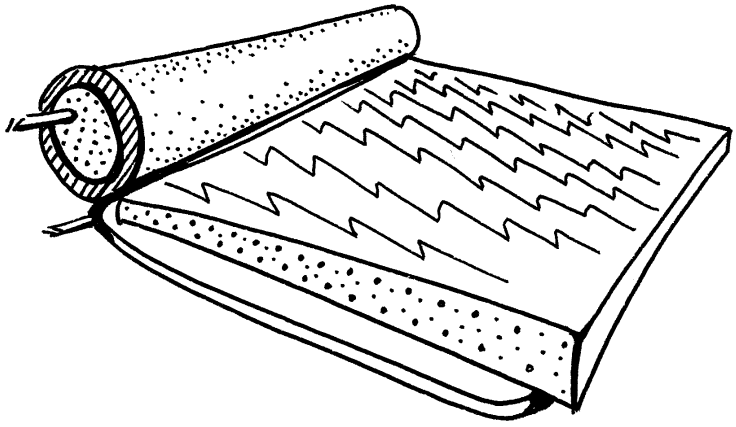
- Water is heated and stored in an insulated tank ready for use throughout the day.
- Operate most economically on solar energy, natural gas or off-peak electricity. They can also run on LPG, peak electricity or solid fuels such as wood or briquettes.
- Available as either:

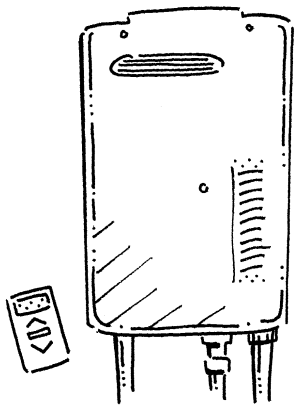
  (a) Mains pressure: hot water is delivered at a similar pressure and flow rate as the cold water. This means that more than one outlet can be turned on without affecting supply pressure. Normally located at ground level, and can be installed either inside or outside the home.

  (b) Constant pressure: hot water is delivered at lower pressure than mains pressure units. They are normally located in the roof space of a home, and the pressure depends on the vertical distance between the tank and point of use. Constant pressure units are often cheaper to purchase and have much longer life expectancies than mains pressure systems. Correctly plumbed, they will provide satisfactory service. They are also known as 'gravity feed' or 'low pressure' systems.

Continuous flow (instantaneous) water heaters

- Water is heated only when required and therefore does not require a storage tank. As water is heated instantaneously, they cannot 'run out' of hot water.
- Smaller in size than storage systems, and can be installed internally in a cupboard (gas units must have a flue) or externally on a wall.
- Connected to the mains water supply and deliver hot water at a slightly reduced pressure.
- Standard units can generally deliver adequate hot water to one or two points simultaneously.
- High powered, high efficiency units can serve larger households.
- It is vital that units are sized according to the maximum number of hot water outlets likely to be used simultaneously.
- Some units have electronic remote controls for precise temperature control from inside the house.
- Remote control systems that deliver a preset volume of hot water are also available.
- Operate most economically on natural gas, but can also use LPG and peak rate electricity.
- Gas units generally require a larger gas supply line than storage systems, potentially increasing installation costs.





Decision 2— Electric, gas or solar?

Choosing the correct energy source to heat your water can make a significant difference to running costs. The most common fuels for hot water systems are off-peak electricity (storage units only) and natural gas.

Natural gas

- Can be used for storage and continuous flow systems.
- Systems are rated for their energy efficiency with Energy Rating labels—the more stars, the more energy efficient.
- Internal and external models are available.
- Storage water heaters have smaller capacities than off-peak electric systems, as water can be reheated at any time of the day or night.

Off-peak electricity

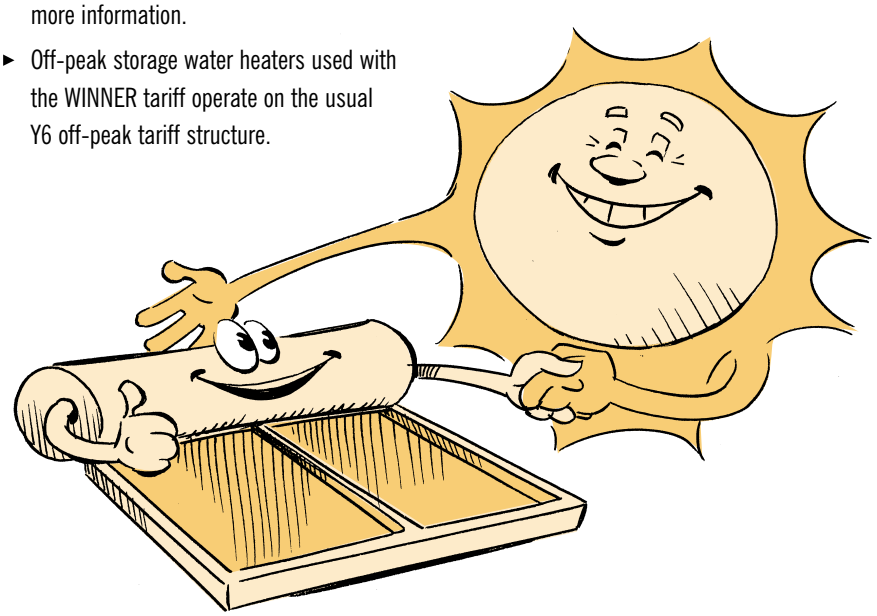
- Running costs more than natural gas.
- Only available for use in storage systems of 160 litres capacity or greater.
- Water is heated overnight (1 am–7 am [Y6 tariff] or 11 pm–7 am [Y8 tariff]) to provide adequate hot water for daily usage.
- Twin element units can operate with a 24 hour off-peak boost [YT tariff]. If hot water runs out, water is reheated automatically on the off-peak tariff. To qualify for off-peak reheat, units must be sized according to the number of potential bedrooms in the home. Check with your electricity supplier for more information.
- The Y8 tariff (11 pm–7 am) is approximately 20% more expensive. Contact your electricity retailer or electrician about the possibility of switching to the cheaper Y6 tariff (1 am–7 am).
- Internal and external models available.
- Not available for continuous flow systems.

WINNER tariff electricity

- An optional off-peak tariff where any electrical appliance used between 11 pm–7 am Monday to Friday, and all day Saturday and Sunday runs at the off-peak rate. At all other times, electricity is charged at a higher cost than normal 'peak rate' (GD tariff) electricity. Check with your electricity retailer for more information.
- Off-peak storage water heaters used with the WINNER tariff operate on the usual Y6 off-peak tariff structure.

Solar energy

- Provides approximately 60–70% of your hot water free of charge in Victoria and is very beneficial to the environment.
- Generally the cheapest systems to run, but have a relatively high purchase cost with an average payback period of around ten years.
- All systems come with a gas, off-peak electric or solid fuel booster to supply adequate hot water during periods of low sunshine.
- The panels are generally located on the roof. The water storage tank can be located on the roof above the panels, within the roof or as a pumped system at ground level.
- Mains pressure and constant pressure systems are available.
- Some electricity retailers offer a discounted off-peak tariff for solar water heaters.
- Victorian State Government rebates can significantly reduce the payback period and are now available for new solar hot water installations.



LPG

- Used in areas where natural gas is not available.
- Running costs average around 2.5–3 times the price of natural gas or off-peak electricity.
- Look for the Energy Rating label with the highest number of stars.
- Suitable for storage and continuous flow units.

Solid fuels (wood, briquettes, coal, etc.)

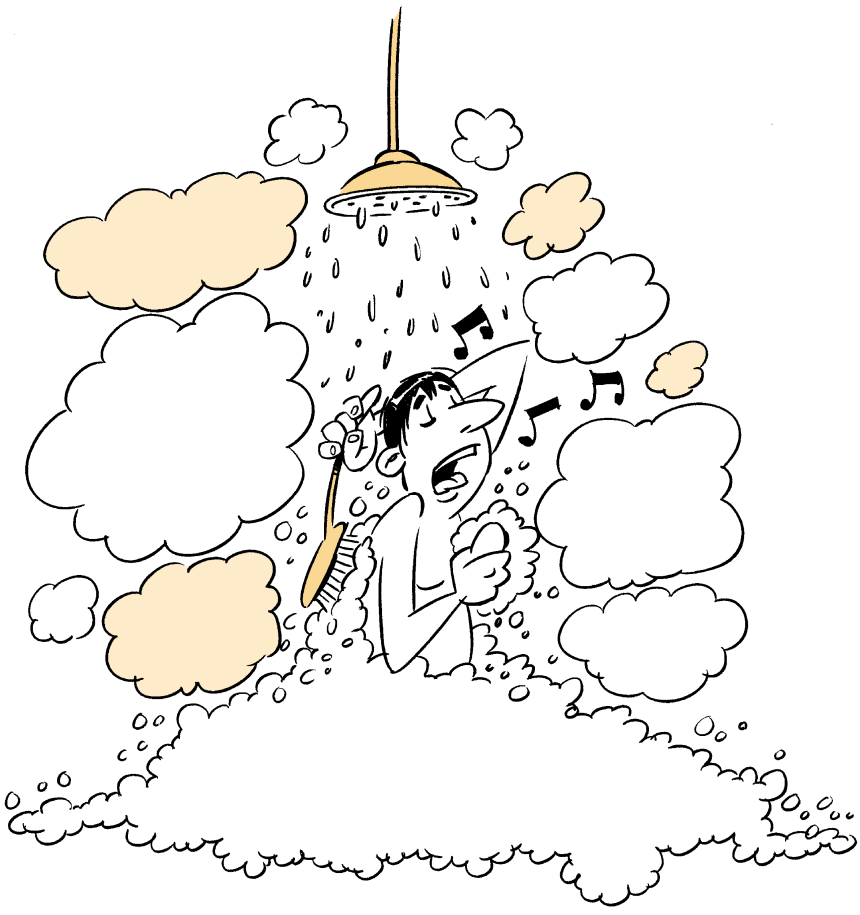
- Cost of fuels vary greatly.
- Can be used alone, or in conjunction with off-peak electricity and/or solar in constant pressure storage units.
- Water can be heated using a 'wetback' attached to a slow combustion wood heater, or a stand-alone water heater powered by solid fuel.
- Must not be used with mains pressure systems, unless a heat exchanger is used.
- Not available for continuous flow systems.

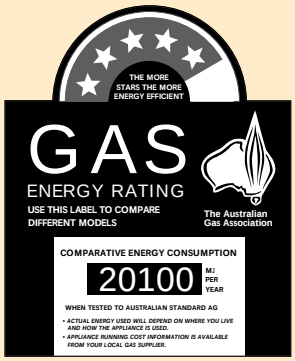
Peak electricity

- Can be very expensive to run so should only be used when other options are not possible.
- Common in flats and units, where space is limited and where flueing is difficult.
- Used for electric continuous flow units, storage water heaters with a capacity of less than 160 litres and heat pump type storage systems.

Heat pumps

- A highly efficient form of water heating which uses around 65% less energy than other electric water heaters.
- Have lower running costs than normal peak rate electric storage units because of their high efficiency, and when used in conjunction with a timer and the WINNER tariff, running costs are even lower.
- Heat is extracted from the atmosphere using a refrigerant gas and a compressor (in much the same way as heat is extracted from your refrigerator), and used to heat water stored in a tank at ground level.





Check Energy Rating labels

The more stars, the more you save!

When purchasing a new water heater, reach for the stars!

All gas water heaters and solar water heaters with gas boosters display Energy Rating labels with star ratings for energy efficiency. The more stars, the more energy efficient the water heater and the lower its operating costs. This also means reduced greenhouse impact.

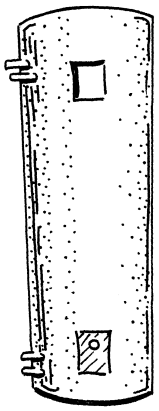
It is important not just to select the cheapest system—consider its lifetime costing. Using a high efficiency, 5 or 6 star rated hot water system can save an average family up to $50 per year on running costs, or over $500 over a system's lifetime.

Also ask for Galaxy Energy Award winning appliances. Galaxy Energy Awards are given to the most energy efficient appliances on the market each year.

At present electric water heaters do not carry Energy Rating labels but are required to meet minimum energy performance standards. These aim to reduce standing heat losses and improve efficiency of performance.

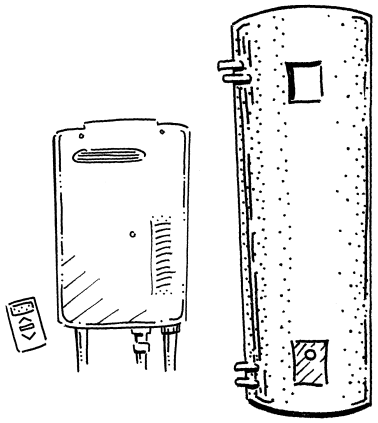
Decision 3—What size?

Hot water systems must be sized to meet your household's hot water requirements. This is typically reflected by the number of people in the household. The following tables can be used as a guide to sizing hot water systems, however, consult your supplier for specific recommendations.



Electric storage hot water systems

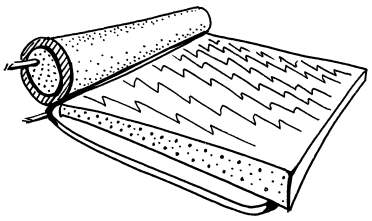
Off-peak		Peak rate	
Number of persons served	Capacity (litres)	Number of persons served	Capacity (litres)
1–3	160	1	25
2–4	250	1–2	50
3–6	315	2–3	80
5–8	400	3–5	125



Natural gas and LPG water heaters

Storage		Continuous flow	
Number of persons served	Capacity (litres)	Number of outlets served at one time*	Flow rate (litres per minute)
1–3	90	1	16
2–4	130	2	20
3–5	170	2–3	24
4–6	200	3+	32
5–9	260		

* Continuous flow systems are sized according to the required flow rate. A guide is often the number of bathrooms in the home. As always, consult the suppliers or manufacturers for specific sizing guidelines for their products.



Solar

Number of persons served	Hot water delivery (litres per day)	Approximate size of tank (litres)	Collector (m^2)
1–2	120	180	2
3–4	200	300	4
5–6	300	440	6

Note: High water usage households (e.g. those with spas or dishwashers) should select the next largest system size in the range. A dishwasher with a hot water connection should be counted as an extra person.

A guide to cost

FUEL	APPLIANCE	WATER PRESSURE	INSTALLATION	PURCHASE COST*
ELECTRICITY	Off-peak (Y6) storage	Mains	Internal and external at ground level	$800–$1500
	Off-peak (Y6) storage	Constant	In roof space	$600–$1200
	Peak rate (GD) storage	Mains	Internal at floor level (typically in a cupboard)	$500–$800
	Peak rate (GD) continuous flow	Reduced	Internal and external at ground level	$500–$1100
	Heat pump (GD)	Mains	Internal and external at ground level	$2500–$3500
NATURAL GAS	STORAGE			
	5 star efficiency	Mains	Internal and external at ground level	$800–$1200
	2 star efficiency	Mains	Internal and external at ground level	$700–$1000
	CONTINUOUS FLOW			
	5 star efficiency	Reduced	Internal and external, wall mounted	$800–$2100
	2 star efficiency	Reduced	Internal and external, wall mounted	$600–$800
LPG***	STORAGE			
	5 star efficiency	Mains	Internal and external at ground level	$800–$1200
	2 star efficiency	Mains	Internal and external at ground level	$700–$1000
	CONTINUOUS FLOW			
	5 star efficiency	Reduced	Internal and external, wall mounted	$800–$2100
	2 star efficiency	Reduced	Internal and external, wall mounted	$600–$800
SOLAR^	Solar/off-peak electric storage	Constant	Tank in roof space	$2500–$4500
	Solar/off-peak electric storage	Mains	External tank at ground level or on roof	$2500–$4500
	Solar/gas storage (5 star efficiency)	Mains	External tank at ground level or on roof	$3000–$5000

Other considerations

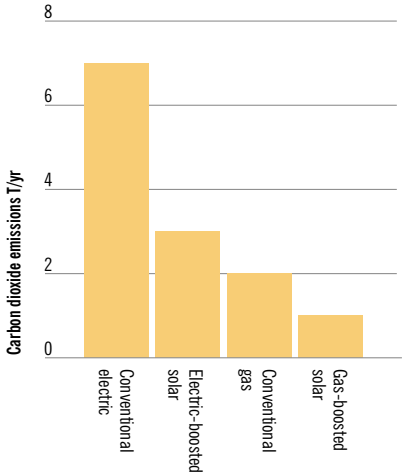
Hot water and the environment

Buying an energy efficient water heater that uses a low greenhouse impact fuel is a great start to a healthier environment.

With the exception of solar energy, every fuel that is used to heat water gives off gases which contribute to the greenhouse effect. Carbon dioxide (CO_2) is by far the main greenhouse gas, but others such as methane, nitrous oxide and chlorofluorocarbons (CFCs) also contribute.

The chart opposite compares annual amounts of greenhouse gases (CO_2 equivalents) released by hot water systems.

Carbon dioxide emissions from different water heater types



Energy use from AS4234, 60% solar fraction
(CO_2 coefficients 1.381 kg/kWh electricity, 0.055 kg/MJ gas)

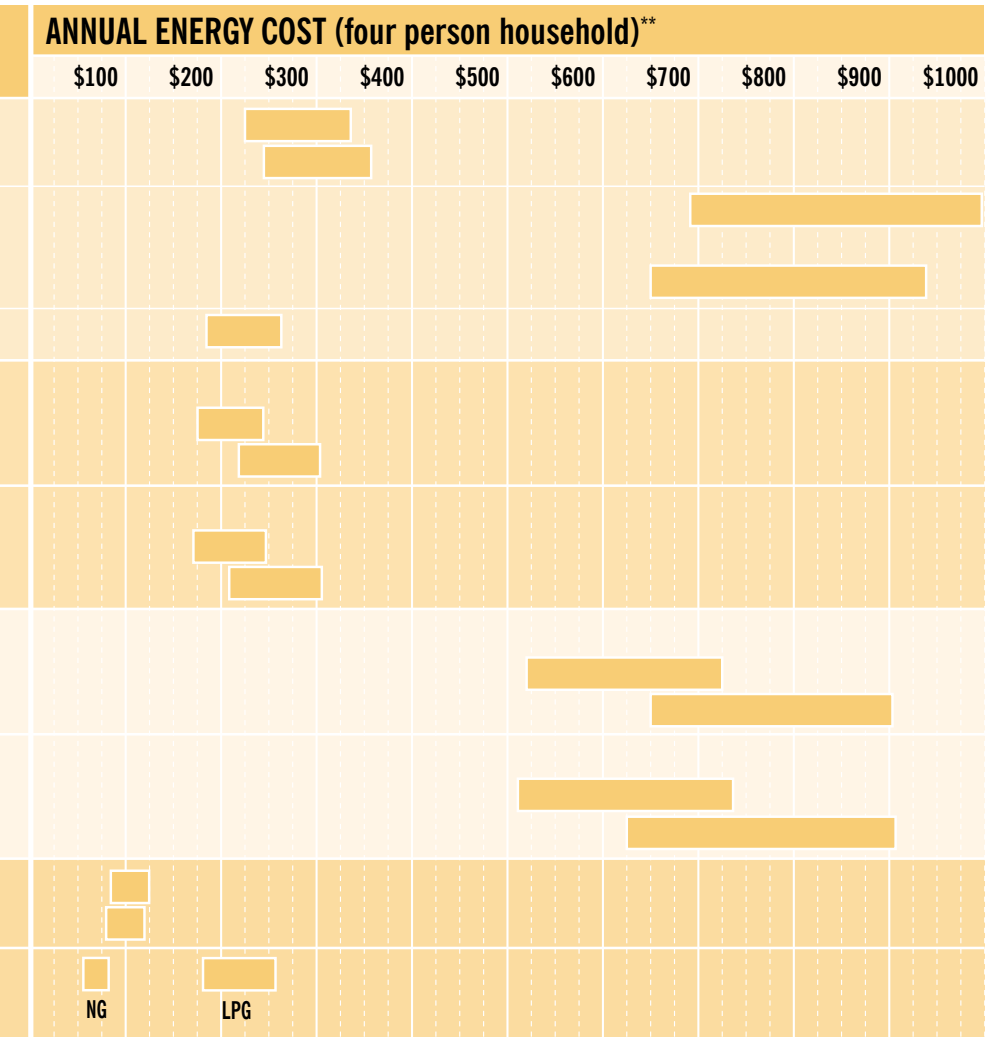
How long will my system last?

The life of any hot water system is determined by many factors, such as water quality. As tank corrosion is the main cause of storage system failure, stainless steel and copper tanks tend to have a longer life span than those lined with vitreous enamel or glass.

Warranties offered for hot water services range from five to ten years for glass (enamel) lined tanks, seven to ten years for stainless steel tanks, seven years for copper tanks and around ten years for heat exchangers of continuous flow water heaters.

Continuous flow water heaters should have a relatively long life. Major components such as heat exchangers can be replaced without having to purchase a complete new system.

Properly maintained solar collectors should outlast the life of the storage tank. When the tank needs replacing, the existing collectors can be connected to the new tank.



* Excludes installation costs.

** Cost range is based on using 180–260 litres/day. 180 litres/day is assumed for energy conscious users, 260 litres/day for high volume water users. Includes 7% pipe losses. Annual supply charges are not included. Costs are provided as a guide to running costs only. Actual costs will vary with usage, size of family and personal preferences.

*** Does not include cost of delivery and rental on gas bottles. LPG cost at 70¢ litre. LPG prices can fluctuate widely and vary geographically.

^ Cost range for solar hot water systems is based on 65% solar contribution.

NG Natural Gas

LPG Liquid Petroleum Gas

Source: Figures are based on information provided by gas supply retailers, the Australian Gas Association, electricity retailers and relevant manufacturers.

Important note

The costs in this brochure are based on electricity tariffs of 15 cents/kWh (GD), 5 cents/kWh (Y6) and 6 cents/kWh (Y8) and an average gas tariff of 0.87 cents/MJ (all GST inclusive). As tariffs will vary over time and between retailers, check with your supplier for the tariff applicable to your home and adjust running costs accordingly.

Installation and energy saving tips

The installation and use of your hot water system has a substantial influence on the running costs and life span of the system. Follow the useful tips listed below to ensure that your hot water system runs efficiently.

- Have your system installed by a registered plumber and electrician, maintain it as required and have it serviced according to the manufacturer's instructions.
- The optimum water temperature for storage hot water systems is between 60–65°C, in the tank.
- Have your system installed as close as possible to all points of hot water use. If this is not possible, locate it close to where small, regular amounts of hot water are drawn off (usually the kitchen).
- Keep pipe runs as short as possible to minimise heat loss from pipes.
- If buying a gas water heater choose one with a 5 or 6 star energy rating or a Galaxy Energy Award winner.
- Insulate hot water pipes, especially the first two metres leading from the hot water system. Closed cell rubber insulation (e.g. Armaflex, Bradflex, etc.) is recommended—ordinary lagging is insufficient. Keep the insulation dry.
- Avoid continuous flow systems with standing pilot lights.
- Install a timer on peak rate electricity storage units.
- Install a low flow showerhead, or fit a flow restricting valve to existing showerheads, to reduce the amount of hot and cold water delivered.
- For solar hot water systems, face solar collectors true north, and ensure they are inclined correctly. Make sure your roof is strong enough to support the weight of the system.
- Constant pressure storage tanks boosted by solid fuel heaters should be installed directly above the solid fuel heater to make full use of the natural rise of the heated water to supply the tank.
- Ensure your unit is correctly sized for your household.

Note: Although convenient, it is generally not cost effective to buy a second hot water heater to service remote rooms.

For more hints, see the Sustainable Energy Authority's *Hot water hints* brochure .

NOTE: Changes to new hot water installation regulations

New hot water system installations in residential dwellings must provide hot water to fixtures and appliances used primarily for personal hygiene at a temperature not exceeding 50°C, to avoid the likelihood of scalding.

This means that all taps in bathrooms, ensuites, powder rooms and similar rooms should provide hot water at a temperature not higher than 50°C.

Consequently, an approved temperature flow control valve must be fitted if either a new hot water system and/or new hot water plumbing is being installed.

The regulations do not apply if you are merely replacing an existing hot water system.

Your plumber is responsible for ensuring the regulations are followed. It is mandatory that a Certificate of Compliance is provided by your plumber for any plumbing jobs over the value of $500. A Certificate of Compliance will provide you with a ten year workmanship guarantee and certifies that the work complies with the relevant plumbing standards. For more information call the Plumbing Industry Commission on 1800 015 129.

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