



FACTSHEET

Home Energy Advice Team



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SOLAR HOT WATER

A Smart Choice

Water heaters are one of the largest users of household energy in Australian homes. In the ACT they are second only to home heating and consume between one quarter and one fifth of all home energy. That costs a lot of money and generates a lot of greenhouse gases. A smart way to reduce both cost and CO₂ is to install a solar water heater or heat pump. Solar water heaters first use the sun's rays to heat water and then use electricity or gas to boost the heat if the sun cannot deliver enough energy to heat all the water you need, such as on very cloudy days.

Although a solar water heater costs more to buy and install than a conventional water heater, the savings in ongoing energy consumption can pay back the higher purchase cost in as little as eight years. There are also rebates by the Federal Government to encourage you to switch to solar.

Gas is cheaper than electricity for boosting, and is also a greener choice (one quarter of the carbon dioxide emitted by electricity per useful energy unit).

Solar water heaters work very well in Canberra because of the high number of clear, sunny days throughout the year. Moreover, because of our lower cold water temperatures, especially in winter, more energy is required to heat the cold water up to the required delivery temperature than in either Sydney or Melbourne. Solar energy can supply most of this extra energy, therefore the cash savings on either electricity or gas costs are also more in Canberra than in other major cities.

Canberra's frosty winters pose no threat to the modern range of commercial solar water heaters. All commercially available models sold in the Canberra area should include frost protection features and manufacturers' warranties on performance.



Government Support

Government rebates may be available to assist you to replace your electric storage hot water system with a more energy efficient system. Visit the Australian Government's Living Greener website at www.livinggreener.gov.au and the ACT Government's ACTSmart website at www.actsmart.act.gov.au for current information about rebates.

If you install a solar water heater or heat pump to replace an electric heater, you will also be eligible for a subsidy in the form of Renewable Energy Certificates (RECs). These certificates are issued under 'licence' from the Australian Government and are then 'bought' back from you by your solar water heater retailer in the form of a price reduction. The number of Certificates that are issued for a solar water heater is based on the estimate of the amount of electricity displaced, so high efficiency systems earn more RECs. Most household systems earn between 20 and 40 RECs.

The value of each Certificate depends on the circumstances of exchange, (e.g. the amount a solar water heater retailer is willing to purchase them for), and currently varies around \$40 per Certificate.

Further information on RECs may be found through the Office of the Renewable Energy Regulator, either at www.orer.gov.au or by phone on 6159 7000.



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Types of systems

There are three main types of solar water heater systems. The first is the active type where the tank is lower than the collector, usually at ground level, and the hot water generated in the collectors is pushed down to the tank by a small temperature-activated pump.

works like a fridge or air conditioner in reverse to 'pump' heat from the outside environment into the hot water tank. It provides good consistent low energy hot water but is subject to lower efficiencies in cold Canberra winter mornings, so choosing a high performance heat pump is important for our climate.

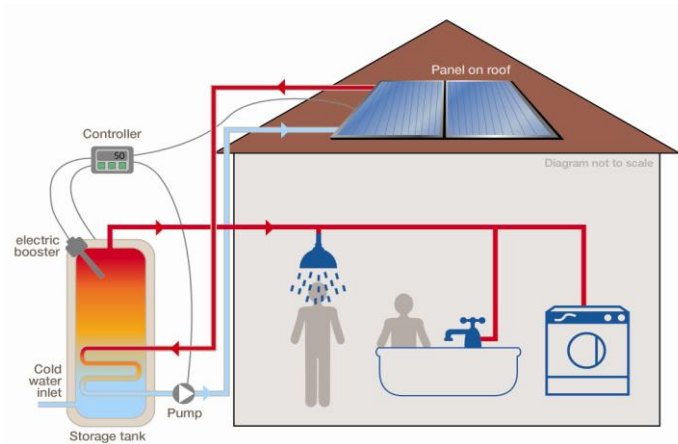


Figure 1: Flat plate, electric boost

The second is the passive type where hot water flows using the thermosiphon effect from the collectors to the storage tank which is mounted horizontally, and higher than the collectors, in the 'close-coupled' formation.

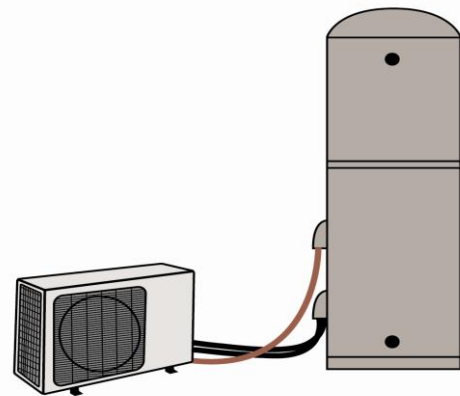


Figure 3: Heat pump with evaporator separate from water tank

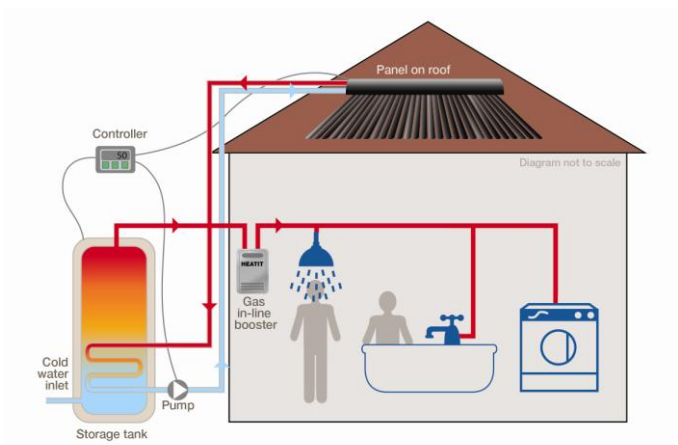


Figure 2: Evacuated tube, in-line gas boost

The third type that qualifies as a solar system has no panels. Instead it is a high efficiency heat pump that



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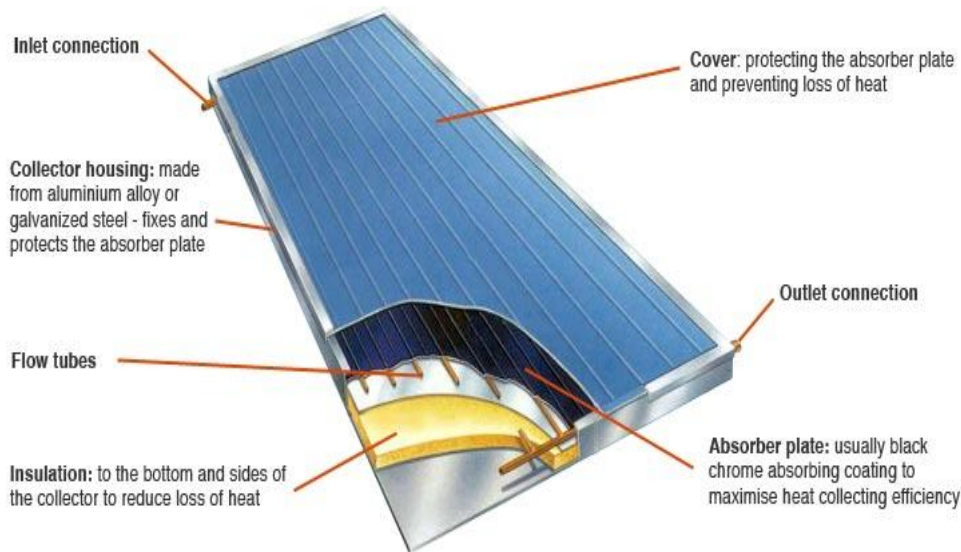
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Types of Collectors

Solar collectors are now divided into plate and newer more efficient evacuated tube collectors.

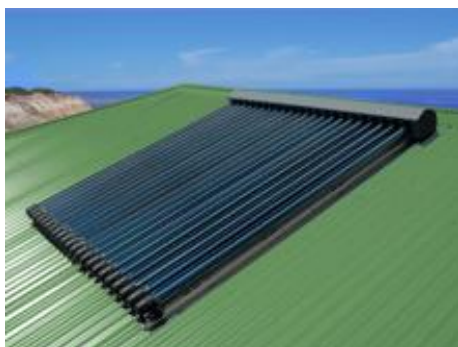
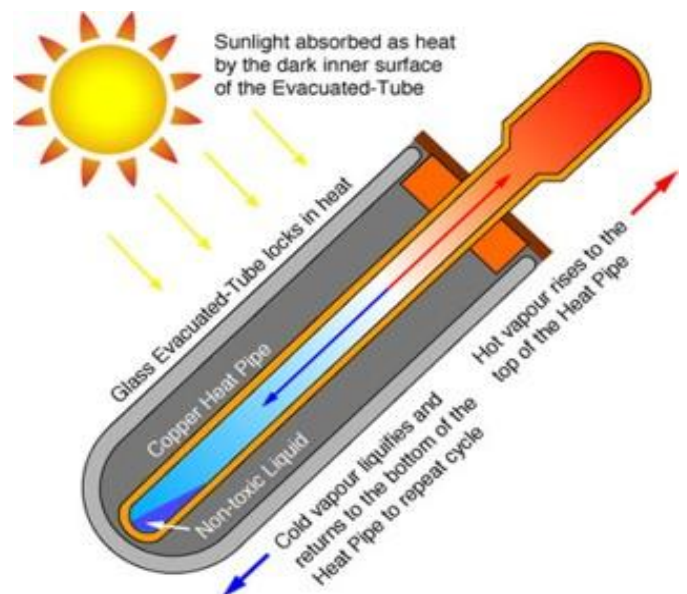
Flat Plate Collector

This is the conventional collector which typically uses a black chrome absorber plate to collect the heat from the sun. Its performance drops significantly in cloudy or cooler conditions.



Evacuated Tube Collector

These are a series of evacuated tubes with a heat collector inside each. The vacuum reduces their heat losses so they can perform well in poor sunlight conditions, achieving higher temperatures than flat plate collectors in most conditions. This means that they don't need as large a collector surface area to produce the heat needed for the Canberra climate, but they cost considerably more than flat plate collectors.





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Manufacturers

There are several different manufacturers of solar hot water heaters servicing the ACT region.

Conventional flat plate manufacturers include Beasley (Rinnai), Chromagen, Dux, Edwards, Solahart, and Solitaire. The Edwards and Beasley (Rinnai) systems use stainless steel tanks; the Solahart/Rheem systems and most other manufacturers use an enamelled (glass lined) mild steel tank with a sacrificial anode to further defend against corrosion. The Edwards gas boosted system uses an instantaneous gas heater outside the tank.

Evacuated tube hot water systems are now provided by Apricus, Endless Solar, GreenLand Systems and Hills Solar and an expanding number of companies.

Most hot water service companies now sell heat pumps to replace electric storage hot water services. These include manufacturers such as Siddons, Quantum, Rheem, Solarhart and Dux.

ACT and region suppliers

There are a vast number of suppliers in the ACT and region at the time of writing this fact sheet. Please check the Yellow Pages or do your searches on the web to find a supplier. We would like to suggest that you always get more than one quote for supply and installation of any product.



Comparison

A simple means of comparing the various types of solar water heaters is to look at the ORER database of all products and compare the exact brand and model name at www.orer.gov.au/swh/. The higher the RECs, the better the performance. Canberra is in Zone 3. Go to the Register of Eligible Solar Water Heaters and download the PDF.

References

Some images for this fact sheet are courtesy of Landcom (NSW) from Jay Rutovitz (2009). "Options for water heating in single dwellings in NSW - Review of lifecycle greenhouse emissions and costs". (Internal report to Landcom.)

More Information

This fact sheet has been produced by the Home Energy Advice Team (HEAT) to provide you with some basic information on solar hot water.

If you would like to find out more information about this or any other topic to do with saving energy in your home, please contact us for a FREE technical consultation.