

Choosing between solar and heat pump hot water systems

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Solar hot water

Solar hot water is the type of hot water system most commonly recommended by Beacon. A good installation - well sized, well installed, with a good controller - should deliver up to 75% of your hot water, for free, year round.

There are two types of systems – one where the solar panel and cylinder is on the roof (a thermosiphon system) and one where the hot water cylinder is inside the house (an active system).

Solar hot water cylinders are larger than conventional hot water cylinders (normally around 300 litres) but, in colder areas, it is recommended that you get a system with the cylinder inside, or there will be more need for boosting.

Boosting can either be done by gas or electricity, and in areas with low winter sunshine a combined solar/wetback system can give year round hot water.

Solar hot water is most easily incorporated into a new house, and they can be expensive in retrofit situations.

Where solar works well

- An area with higher solar radiation intensity (not an issue in Auckland)
- Good solar access: There is sufficient area of roof exposed to northerly sun year round. South facing houses, or those shaded by trees, buildings or hills might not get enough sun to make solar hot water worthwhile.
- There is a high demand for hot water, for example, more than 3 occupants . Generally the more people in the house, the more cost effective solar hot water is. It's particularly good for high hot water users or houses with four or more people.
- Demand for hot water is highest in the evening (after the sun has heated the water).
- Low running costs important
- Quiet operation important

Heat pump hot water

Heat pump hot water systems are a relatively new form of efficient hot water heating, with 2-3 times the efficiency of an electric hot water system, depending on the system. They are most suitable for warmer climates, in circumstances where solar hot water isn't feasible, or is too expensive, as they tend to be cheaper to install in existing homes than solar. They operate best when it's warm – at temperatures greater than 6-7°C - and some of the more commonly installed systems have very poor efficiency at low temperatures.

There are two types of systems – all-in-one (e.g. Quantum, Seibel Eltron) or split systems (e.g. Econergy). The all-in-one systems are a combined heat pump hot water cylinder which is normally located outside so it's important that hot water pipes are insulated, and they are located near to where the hot water is needed. Split systems have the heat pump part located outside and the hot water cylinder (which can be a modern electric cylinder) located inside the house. These systems can be noisy so think of yourself and your neighbour's night time rest when locating them. Split systems have the heat pump box outside and the cylinder inside, and can be installed on an existing modern electric hot water cylinder.

Because, on average, about a third of your electricity bill is hot water costs, you should see a reduction in your electricity bill. However, with the larger hot water cylinder size, it's easy to end up using more hot water – and therefore losing any electricity savings.

Because these are a relatively new technology, it's worth choosing your system carefully as they are not all as good as each other. Consumer (www.consumer.org.nz) has tested some of the main systems available and found that the most efficient clearly outperformed the other systems. This was particularly the case at lower temperatures.

Where heat pump hot water works well

- Temperate to warm climates. They work most efficiently at warmer temperatures (above 6-7°C) at which they are up to 2-3 times better than standard electric hot water cylinders; however, they may not be suitable for very cold climates.
- Where solar is not appropriate (e.g. where there is a shaded roof or installation of solar would be difficult; areas of lower solar radiation)
- Low operating costs mean that they are a good investment.
- Lower demand pattern
- Daytime demand pattern

Considerations for both solar and heat pump hot water

- Both considered renewable.
- Both have significant capital cost, though heat pumps are usually cheaper.
- Both will save about 60-75% compared with electric or gas.
- Both need competent system design and installation.
- Both are compatible with gas or wetback boosting.

For more information:

- See Fact sheets on
 - Solar hot water
 - Saving with hot water
- Visit www.beaconpathway.co.nz/further-research/article/choosing_the_right_renewable_energy_source_for_your_site for a checklist which will help you decide if your site is right for solar hot water.
- Visit www.energywise.govt.nz/products-and-appliances/water-heating for more information on buying and installing solar and heat pump water heating