GETTING IN TO HOT WATER

A guide to lower cost, more sustainable hot water for your home

If you're designing a new home, planning a renovation or trying to reduce your household's costs - this guide to water heating is for you.

We're focusing on minimising your running costs and environmental impacts from one of the most essential needs in every home - hot water.

Find out...

HOT WATER IN YOUR HOME
30% to 45% of all household energy used

REDUCE COST AND ENVIRONMENT IMPACT OF YOUR HOT WATER BY 80%
Choose technology to minimise fossil fuels and maximise energy efficiency

MAXIMISE SELF-GENERATED PV ELECTRICITY
A hot water heat pump provides five times more energy from your PV system

Apricus SOLAR HOT WATER New Zealand

RECLAIM ENERGY

Why is hot water important?

Every home needs hot water, every day. Heating water is almost always the single biggest user of energy in a home because unlike room heating (often the 2nd biggest user) water heating uses energy all year.

Having an environmentally friendly, energy efficient hot water system will reduce your carbon emissions and living costs every day, every year, for years to come.

How much energy does water heating use?

This varies a lot by household and with different people's routines. In a new home with modern appliances, good levels of insulation and efficient space heating it will be around 45% of the annual power bills.

> *"Some electricity bills have a controlled meter reading, this is usually your hot water cylinder so check your bill for your water heating energy use, if you have an electric cylinder"*

A dated and conservative figure of 30% is often used but this includes all existing homes with comparatively high energy use from inefficient heating and insulation.[1]

As an example, you can work out roughly how much energy your hot water uses. Each person uses around 50L of hot water per day, so a family of 4 uses an average of 200L per day, 73,000L per year. This requires around 3,995kWh of heating energy, or 999kWh per person per year. Multiple this by the number of people in your home for an indication of the annual energy used for hot water. Then compare this to your total annual power use for your family's hot water percentage.

[1]EECA figure of 30% is taken from a 2010 report using data from 2005 - *Energy Use in New Zealand Households, Final Report on the Household Energy End-use Project (HEEP).*

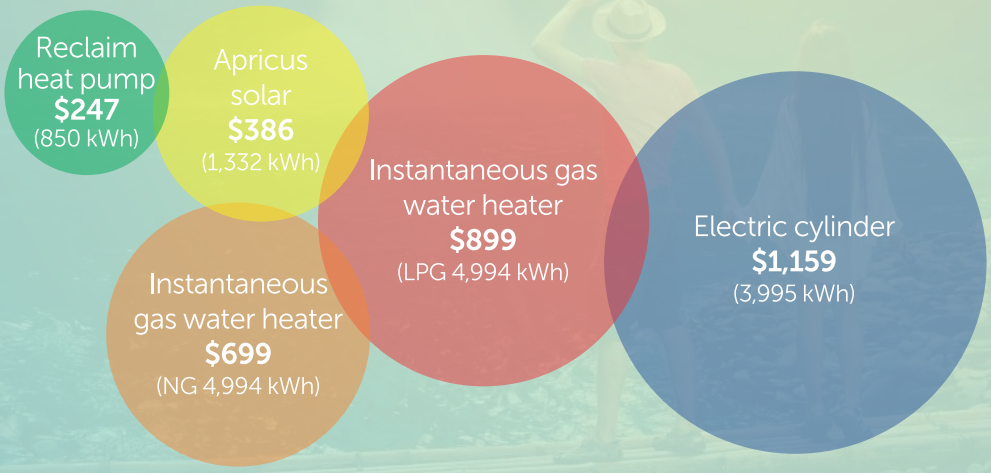
How can we reduce energy use for water heating?

Use the most efficient system available - a high performance heat pump or solar hot water system instead of gas water heater or standard electric cylinder.

> *"Electricity in NZ is already 80% renewable so is the best energy source to use with efficient technology"*

A high-performance heat pump only uses electricity to run the pump, fan and compressor, not an electric element. A solar hot water system has a small pump and only needs an electric element to provide back up heating when sun levels are low. This makes these technologies low energy and therefore low cost to run.

Compare energy use and annual running costs*



* Calculated for average household hot water use of 200L per day, requiring 3,995 kWh of heat energy. These figures are for comparison between technologies and actual real world values may vary.

How to heat water, not the planet

The energy needed to heat water has to come from somewhere. The more renewable the energy is, the less greenhouse gas emissions are created. Plus, the more efficient the technology is, the less energy that is needed.

A Reclaim heat pump or Apricus solar hot water system will provide up to five times as much heat output compared to electricity input. The associated climate change emissions therefore drop enormously.

Compare this to a gas water heater with relatively low operating efficiency and burning a fossil fuel (natural gas or LPG) which is completely non-renewable.

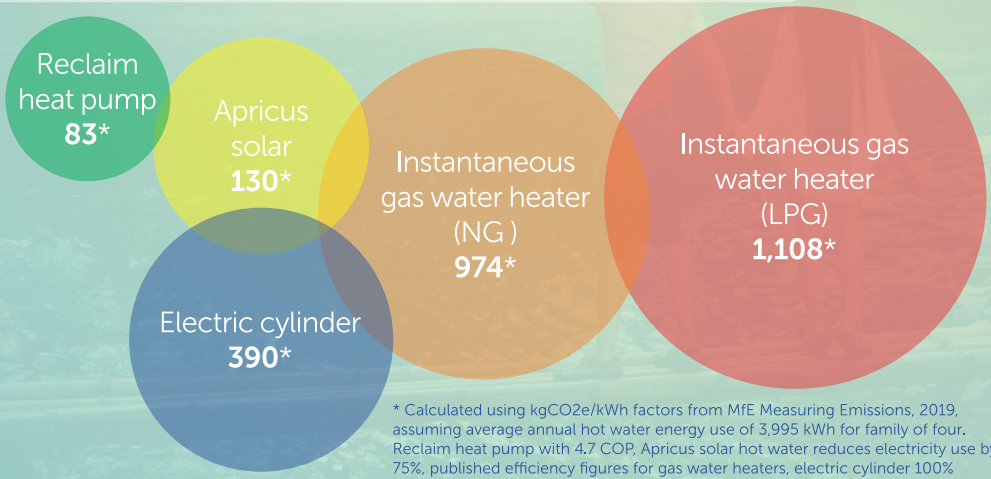
REDUCE ENVIRONMENTAL IMPACT OF YOUR HOT WATER

Choose a technology that minimises fossil fuel use

Choose a technology that has high energy efficiency

Compare greenhouse gas emissions

$kgCO_2e$/year*



* Calculated using kgCO2e/kWh factors from MfE Measuring Emissions, 2019, assuming average annual hot water energy use of 3,995 kWh for family of four. Reclaim heat pump with 4.7 COP, Apricus solar hot water reduces electricity use by 75%, published efficiency figures for gas water heaters, electric cylinder 100% efficient.

Any other environmental considerations for heat pumps and solar?

To heat water using solar energy the most efficient direct system is to have a high performance solar hot water system, like Apricus.

Alternatively, combine a solar PV system with a Reclaim CO_2 heat pump and you will get 5 times more heat energy in your cylinder from the electricity you generate. This means your PV electricity will go a lot, lot further for the same system size.

The best heat pumps available have the highest co-efficient of performance (COP). Reclaim for example has a COP of 4.7. Less energy use reduces the environmental impacts from the electricity generation.

MAXIMISE YOUR SELF GENERATED PV ELECTRICITY

Use a Reclaim system to get five times as much heat energy from your PV electricity

Run a Reclaim with less than 1kW of PV panels

In addition, heat pumps use a refrigerant to operate. All refrigerants have a global warming potential (GWP), a measure of the impact on the climate if the refrigerant is released to the air. The higher the GWP the worse the impact' so leaks during their operating life or at end-of-life disposal are an important, although hidden, environmental impact.

Carbon dioxide (CO_2) has a GWP of 1 and is the basis on which all other refrigerants are compared. CO_2 is used as the refrigerant in Reclaim Energy heat pumps and a small number of other units. Most other heat pumps use the refrigerant R134a which has a GWP of 1,300. If 1kg of R134a, a standard refrigerant load in a hot water heat pump, is leaked in to the air it is the equivalent of emitting 1.3 tonnes of carbon dioxide.

What system design and specification advice is available?

There are a number of companies that offer heat pump and solar hot water systems. A few questions that may help you to choose the best system for you.

- Ask for information on the system performance (COP) at a range of real-world operating temperatures.
- Check what the GWP is for the refrigerant used.
- Consider whether you want a cylinder indoors or outdoors and whether this is possible.
- Check what the noise level of the heat pump compressor is and whether this will disturb you given the location in your home.

> *"CO_2 refrigerant powered heat pumps offer the lowest environmental impact during use and at end of life"*

LOW ENERGY HOT WATER SYSTEMS

Reduce your costs by up to 80% - Minimise your environmental impact

Systems available from Apricus NZ Eco Energy

Apricus aim to provide the best advice and highest performance hot water systems available in New Zealand. Get in touch so we can help minimise the cost and environmental impact of your project.

Apricus® SOLAR HOT WATER New Zealand

www.apricus.co.nz
info@apricus.co.nz
07 312 3382

RECLAIM ENERGY

www.reclaimenergy.co.nz
info@reclaimenergy.co.nz
07 312 3382