

Earth Energy
accessible
reliable
renewable

HEAT PUMPS



This renovated Christchurch home uses groundwater for heating.

Well Water Heats Renovated Christchurch Home

Well water and ground source heat pump technology provided the heating and domestic hot water solution for Colin Megaw's renovated Christchurch home.

Colin undertook extensive renovations on his 50-year-old family home in 2008.

The renovations extended the home to almost double its original size, added underfloor, wall and ceiling insulation, as well as double glazing to second story windows.

However, as an older home it was still not as efficient at retaining heat as a new build. The original heating system was diesel-powered, hot-air central heating, which proved costly to run.

“With the old diesel system, we only heated a couple of rooms in the house, it was just too expensive otherwise. Our renovations improved the levels of insulation, but also made the house much bigger so we needed a better way to heat that space.

“Burning diesel is also not the most environmentally friendly way to heat your home, and we wanted to do something about that too,” says Colin.

KEY BENEFITS:

- Heat gained from well water already supplied to the home
- No visual or audible impact
- Maintains high heating efficiency year round

KEY FEATURES:

- System installed 2008
- Open loop single well heat pump and soak pit
- 24 kW system providing hot water to 15 radiators for domestic use
- Heated area: 300 m² (approximately)



Warm water generated by the heat pump is circulated through radiators.



Quiet and unobtrusive, the heat pump unit is stored underneath the stairs.

Central Heating New Zealand came up with a solution to use well water to heat the home using ground source heat pump technology. This is a system they have used elsewhere on lifestyle blocks where a well is needed for potable water supply.

“I had heard about ground source heat pumps, but there weren’t many around in New Zealand at that time.

“From a friend in the UK I knew that they were economical and had a low environmental impact.”

Water supplied by the well is used in two ways; to fill a tank with cold potable water for general household use, and to supply a ground source heat pump unit, located in a cupboard under the stairs, with heat energy.

The heat pump is able to access low levels of heat energy held within the well water.

As the well water passes through the heat pump, heat energy is extracted, concentrated, and used to supply hot water for domestic use and home heating.

The cooled well water exiting the heat pump is discharged into a soak pit, where it ultimately returns to its source.

Generally, the most efficient method of using a heat pump is to combine it with under-floor heating, where warm water supplied by the heat pump is circulated through pipes installed within a concrete pad foundation.

As this heat pump was installed as part of a renovation of an older home, water-filled radiators were a more practical choice.

The home has 15 radiators located throughout. These are supplied with water heated to 60°C and are controlled automatically by indoor and outdoor temperature monitoring.

“With this system we are able to heat the entire home for about the same energy cost as heating two rooms with the old system,” says Colin.

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Colin Megaw

Home owner

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New Zealand requires reliable, renewable energy sources into the future. The Government is supporting GNS Science in fostering increased use of renewable resources. By 2025, the Government’s Energy Strategy aims for direct use of geothermal energy to account for more than 12 PJ/year.

For more information visit our website:

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