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HEAT PUMPS



This architecturally designed home is heated with a horizontal ground source heat pump.

Heated Pool, Warm Home – Thanks to Ground Source Heating

Richard Markham-Barrett wanted to economically heat his new Kapiti Coast home and indoor swimming pool and ground source heating provided the perfect solution.

The new home is on an elevated rural property overlooking the Kapiti Coast and Kapiti Island.

“We have magnificent views from here and we built the house with this in mind,” says Richard.

“Another important feature for our new home was to include a heated indoor swimming pool.”

To make the most of the views, large areas of glass were installed without blinds or curtains. Even though the home has high levels of insulation throughout and the glass is double glazed, Richard admits that the large areas of glass make the home more difficult to heat

Add in a heated swimming pool, and Richard was facing the prospect of costly energy bills.

“We are rural, so there is no gas line to our house. Our options for heating were limited to bottled gas, diesel or electricity.

KEY BENEFITS:

- Slinky coils require less space than straight pipe installations
- Economical way to heat swimming pool and home
- Maintains high heating efficiency year round

KEY FEATURES:

- System installed 2009
- Horizontal ‘slinky’ pipe close loop system
- 16 kW 3 phase system providing hot water to underfloor heating and indoor swimming pool
- Heated area: 400 m² + pool

“THANKS TO GROUND SOURCE HEATING, WE HAVE THE BIG LUXURY OF A HEATED POOL, WITHOUT THE BIG ENERGY BILL.”



The slinky coils are installed in a network of trenches.



The 'slinky' pipes laid in the trench.



The indoor pool, heated with energy from the earth.

“Using conventional heating solutions, all of these options would have been extremely expensive for us. We decided that a heat pump was the only way we could economically generate the heating energy we need.”

“We chose a ground source heat pump, because of the efficiency advantage they have over air source heat pumps. A ground source heat pump remains efficient no matter what the outside air temperature is, and with our heating needs, this means a real cost saving for us.”

Richard worked with Central Heating New Zealand to design and install the system which is a horizontal 'slinky' coil ground source heat pump. It consists of seven trenches, each 25 meters long, 1 metre wide and 2 metres deep.

The trenches are joined at one end by a header trench. A network of coiled slinky pipes is laid in the trenches and connected with a heat pump unit mounted on an external wall of the house.

The slinky pipe installation allows for a lot of pipe to be installed in a small area. The same system installed with straight pipes would need longer trenches to gain the same heat energy from the ground.

“With the slinky coils, you can have shorter trenches. I decided that I could save money on digger time with this installation method. I built and laid the slinky pipes myself using designs and advice from Central Heating New Zealand, who then completed the installation and commissioned the system.”

The system provides hot water for underfloor heating and keeps the indoor pool heated to 32°C all year round.

The house is large, with approximately 400 m² of heated area. Only the garage isn't heated. One third of the floor area is tiled, which means the warmth of the underfloor heating can be felt directly.

The bedrooms are carpeted, and Richard says: “While you don't get quite the same 'warm feet' feeling as with the tiles, the bedrooms are still very comfortable and warm.”

The system is also capable of running in reverse, cooling the floor in the summer.

“To be honest though, we have never used it in cooling mode. The house has been designed so you can open it right up for good air flow. On a hot day we open it up and it cools down quickly.”

Richard has spent a lot of time fine tuning his system for maximum efficiency.

“One thing I would definitely recommend is a triple feed meter. This allows you to take advantage of cheaper electricity rates at off-peak times.”

“I have my system set to only come on during off-peak times which is late at night, when electricity is roughly half the cost of peak time. The pool and concrete pad don't lose much heat during the day, and are just topped up at night at the cheaper rate.”

At the time of installation, this was still a new technology in New Zealand, and Richard was “pushing the envelope of the knowledge and skill base available”. This meant that he had to be flexible, as did the installer, but Richard is happy with the process.

“We are very happy with the final result. Central Heating New Zealand were great to work with, and made sure that everything was done correctly and to internationally recognised standards. Our house is warm and comfortable in winter, we have a heated indoor pool, and we pay less for our electricity bill than a friend of ours with less space to heat and no pool.”

Richard Markham-Barrett

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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