



# Energy efficient apartments in Trent, Italy



## Modern apartments located in an old quarry with a fantastic view!

In Trento (North Italy) a new 68 apartment project has been built, part for rental and part for sale. The building is located in Monte Capuccini, an old quarry in the city of Trento. From the beginning the investor planned to use renewable technology to heat and cool the building. The apartments are installed with underfloor heating and cooling.

## Thermia heat pump – the solution for heating and cooling

Heating, hot water and cooling is provided by 4 independent ground source heat pumps operating in a master/slave mode. Each is a Robust 42 kW heat pump combined with an additional 40 kW electric heating system. An 80 kW photovoltaic system is also

in place to cater for some of the power consumption. The ground source is very stable, the temperature in the ground rises by 2°C every 100 m of depth and reaches 15.5°C at a depth of 150 m. The temperature remains constant throughout the year. With the borehole heat exchangers and the connecting lines directly below the garage floor, the circulation fluid was limited to a minimum temperature of 0°C. This ensures that the substrate remains unfrozen and the efficiency of the heat pumps is maximized on a permanent basis. The boreholes and the connecting lines were installed under the building and joined by one central located distribution unit.

It is worth noticing that heating and cooling are provided through differing methods but from the same



source – the ground. In the winter energy from the ground provides heating and in the summer “cold” ground provide passive cooling. Passive cooling is several time cheaper compared with traditional air-conditioning.

## Energy efficiency, environmental foot print and comfort

The plant's estimated power consumption with regard to hot water and heating output is ca. 113,000 kWh, i.e. 1,965 kWh or EUR 390 per year for an apartment with a floor area of 80 Sq m. Careful design of the system and in particular the combination of the heat pump technology and photovoltaic allow for both energetic and financial savings. Thanks to the use of geothermal and solar power, the Cappuccini apartments will long represent a shining example of efficiency, energy saving and environmental sustainability. On the one hand for the rejection of fossil fuels for the supply of energy, on the other for the utilization of the best energy solution for the apartments and the choice of environmentally friendly materials used in its' construction.



The heating room with Thermia Robust ground source heat pumps

### Characteristics of the building:

- heated floor space: 4,600 sq m
- number of apartments: 68 apartments, 236 people
- energy efficiency class: A
- heating energy demand: 233 MWh + hot water 164 MWh
- heat output: 160 kW
- cooling: natural cooling

### Solution:

- 32 boreholes, depth 150 m, type 4x40mm
- 4 Thermia Robust 42 kW ground source heat pumps
- 40 kW auxiliary heater
- 4,160 liter hot water boilers
- 80 kW photovoltaic system



Cappuccini apartments

## Thermia and Geoliving partnership

Geoliving strives to provide quality heat pump solutions, with a focus on low operational costs, utmost comfort and durability of the installed systems. Our knowledge, expertise and customer oriented approach guarantees the quality and durability of our installations. Geoliving srl was found in 2006 by Wolfgang Holzfeind, with the aim of distributing and providing installations of top quality heat pump solutions. Numerous projects have been implemented to date, both domestic and commercial. Geoliving can support each and every part of the investment process: planning and ground source measuring, drilling, plumbing and installations works, including the heating room, delivery of heat pumps and boilers and finally commissioning. Normally geothermal installations do not need maintenance; nevertheless we offer maintenance contracts with after sales assistance. Geoliving has already built more than 240 geothermal plants in Italy and Switzerland.

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## 90 years of experience

With more than over 90 years of history and experience in the energy sector, Thermia Heat Pumps offer renewable energy solutions for any climate, anywhere in the world. All Thermia heat pumps are designed, manufactured and rigorously tested in Sweden where one of the most harshest European climates can be found.

Ever since the beginning, the driving force behind our business has been the philosophy of our founder, Per Anderson: “The products one releases must not only be the best of their time, but before their time, over time”.

At Thermia we are driven by this philosophy and our passion to deliver. For us every day is a new opportunity to create, build and serve a bigger purpose, for a greener and healthier planet, not only for ourselves but for everybody around us. Every challenge is Thermia's opportunity to make life a little more comfortable for our customers.



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