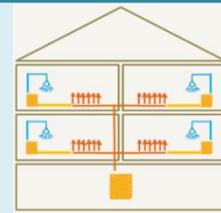


## Barl'lo, Belgium

### Heat pumps in harmony with nature

The project demonstrates how heat pumps can be used for both heating and cooling in buildings that are (almost) energy neutral



F2.1

### Key facts

#### Buildings

Location	<i>Bornem, Belgium</i>
Construction	<i>2007</i>
Heat distribution	<i>underfloor heating</i>
Heated space	<i>8400 m<sup>2</sup></i>
Structure	<i>3 flat blocks (4 story each, 58 apartments total)</i>
Level of insulation	<i>very good</i>

#### Heat pump and source for heating

Number of	<i>1 per block</i>
Operation mode	<i>Monoenergetic</i>
Heat source	<i>groundwater</i>

#### Heating system

Heat demand	<i>420 kW</i>
Heating temperature	<i>35°C</i>

#### Heat pump and source for domestic hot water

Type of system	<i>individual</i>
Max. temperature	<i>55 °C</i>
Source	<i>Clivet geothermal heat pump</i>

#### Other information

Coefficient of Performance	<i>4.5</i>
Refrigerant	<i>R410A</i>

#### Lessons learned

- The installation of groundwater heat pump can be a part of accomplishing even the highest ecological building requirements
- The Natural Cooling function can sufficiently cool apartments by using groundwater



In northern Belgium, between Brussels and Antwerp, lies the commune of Bornem. In 2021, a new block of apartments was built there, in the middle of a leafy green park.

The 'Barl'lo' complex consists of three sustainable four-storey blocks with flats of various sizes covering a total of 8,400 m<sup>2</sup>, designed by architectural firm Binst Architects.

As the energy requirements for new buildings are very strict in Belgium, comfort systems play a key role in the overall rating, thus value, of the property.

**Barl'lo, Belgium**

*WSH-XEE  
40.2  
geothermal  
heat pumps  
with water  
change  
over*

**Description of the technical concept**

Guido Hendrickx, business development manager at Clivet distributor Thercon Belgium, explains:

"The three blocks of flats are equipped with geothermal heat pumps, underfloor heating and high thermal insulation. The heat pumps provide heating in winter and cooling in summer by exploiting groundwater. Thanks to the Natural Cooling function, groundwater is used in summer to fully fit with cooling needs without activating the refrigeration circuit."

To maximize the efficiency of the system, the water temperature for underfloor heating is set at 35°C.

Domestic hot water is produced separately in each flat with water-to-water heat pumps using the Clivet heat pump as the source.

**The results**

Thanks to his system, the complex has achieved one of Flanders' highest ecological levels, BEN 'Bijna-energieneutraal', meaning the building is almost energy neutral and the energy it still uses is green.

The complex is therefore sustainable in terms of both the landscape, with its green roofs and biodiversity gardens, and the environment.