

CASELLE CENTER

Caselle Torinese, Torino - Italy

Shopping centre

1 Bennet hypermarket and 30 shopping units

WLHP system

Year 2005



"Caselle Center" shopping centre is located in northern Italy, near Turin. It includes the Bennet hypermarket, the Bennet Universe consumer electronics superstore and a mall with many specialised shops.

The challenge

The Bennet group usually develops and manages its own hypermarkets and shopping centres. Therefore it is very focused on both initial and operation costs. Furthermore, it often analyses and publishes operational energy saving details when innovative solutions are adopted.

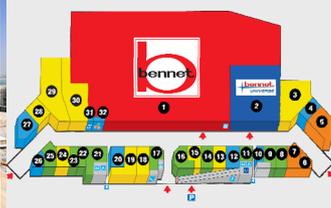
While designing the new Caselle Torinese shopping centre, Bennet technical department decided to exploit all possible options of integrating energy sources, to maximize the efficiency and decrease operating costs.

To confirm the actual performance, the plant of the new shopping centre would be equipped with energy meters and with a plant management system connected to the Bennet headquarter.

Over a 12 month period the energy consumption would be compared with a centre having the same general and operational features, but equipped with a traditional system.



Caselle Center - Main entrance and general layout



Building type

- Single-level prefabricated building

Building size

- Commercial area GLA 12,200 m²
- 1 hypermarket and 30 shopping units

Building team

- Developer Gallerie Commerciali Bennet, Italy
- Mechanical plant design Cotefa, Horus, Italy
- Works supervision Bennet Technical Dept., Italy
- Mechanical contractor Gianni Benvenuto, Italy

About Bennet

The Bennet group has operated in Italy since 1964. It owns about 60 hypermarkets and 36 malls with over 1,000 shopping units. Bennet is distinguished by a special care for innovation of its outlets and the quality offered.

For all its achievements, it pays great attention to technology and to the optimisation of the overall investment costs (design, implementation/realisation, operation and maintenance).

The solution

To achieve the goal of both integration and energy efficiency, Bennet chose the Water Loop Heat Pump air conditioning plant, based on the WLHP system from Clivet.

Each unit is served by one or more water-to-air heat pumps. Each of them has individual operation and is able to heat, cool or ventilate the premises according to the specific needs.

The heat pumps are all connected to the loop circuit. It remains at neutral temperature as to the rooms served and therefore does not require insulation, except for short outdoor paths.

The loop circuit allows the energy transfer between areas with opposite thermal requirement. This often occur in winter, when the mall has to be heated while most shops require internal cooling.

Larger environments, such as hypermarket, anchors and mall, are served by rooftop packaged heat pumps. Thanks to the automatic freecooling feature, in mild weather the premises can be cooled without the activation of the compressors.

Lower capacity heat pumps are either ceiling mounted type on shopping units, located in the warehouse, or console type in the offices. Fresh air is supplied by specialised air-to-air high-efficiency heat pumps, equipped with an innovative thermodynamic energy recovery, electronic controlled fans and double stage air filtration.

In this project the loop system also recovers the energy disposed from the food refrigeration equipment. In fact, the water of the loop operates the first stage of condensation of refrigerated displays and cold rooms.

In this way the efficiency of the refrigeration system increases. At the same time, winter heating demand from the air-conditioning system decreases.

The results

Bennet carefully recorded and processed the 2007 operation costs for Caselle Center. They were compared with another shopping centre of similar area, construction and climate. The results were presented in 2008 during a retail technical conference in Milan.

Caselle Center consumed half natural gas compared to the "twin" shopping centre (-49.5%).

The electricity consumption for air-conditioning and food refrigeration was considerably reduced to more than a fifth (-22.2%).

Although there was an increase in initial cost due to the system employing energy recovery from the commercial refrigeration and due to the differences in electrical distribution, a payback of only 3 years was achieved.

Thanks to the WLHP system adopted, over a fifteen year period the savings in operating costs will be over a million euros.

For further information about Clivet systems
www.clivet.com



Caselle Center – Recovery from food refrigeration and water-to-air Rooftop for malls

About WLHP

The Water Loop Heat Pump air conditioning system is de-centralized and based on heat pumps whose energy source is the water in the loop circuit. Its temperature is stabilized in summer from rejection devices such as evaporative towers or dry coolers, while in wintertime boilers or heat pumps can support. The system perfectly suits to integration with renewable energy sources.

The system

- Ten Clivet water-to-air heat pumps, CRH rooftop type for mall, hypermarket, restaurant.
- Over thirty Clivet water-to-air heat pumps for shopping units and offices, either ducted CH or console EQV
- Three Zephir fresh air units from Clivet, complete with integral thermodynamic energy recovery
- Clivet plant management system, including workstation and user interface pages with custom graphics.
- The system is completed by two evaporative coolers, two boilers and pumping stations.