ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT CONCEPTS

OBJECT OF THE DOCUMENT

The techniques used for the 'La Belle Chanson' project will enable the purchaser to reduce his heating costs by around 50% compared to a traditional building. For an apartment of 110 m², therefore, we estimate that the annual cost for the gas used for heating purposes – around € 380 – will be reduced to € 190 thanks to the techniques employed.
This document aims to explain the techniques used within the conception of the building in order to achieve these results.

TECHNIQUES EMPLOYED

The project embraces a series of elements designed to limit the consumption of various energy producers (gas, electricity, water…) in favour of renewable sources.

The project in particular provides for:

- Centralised hot water production using collective condensation boilers
- The use of solar panels for the production of hot water for sanitary purposes
- A dual flow ventilation system
- The recovery of rain water.

The different elements and their advantages are briefly explained below.

ESTIMATION OF ENERGY GAINS

The economic and environmental advantages can be appreciated via the following results.

Centralised hot water production using collective condensation boiler

The results in figures for this element are as follows:

- For an apartment of 110 m², savings in gas usage represent € 15 per annum.
- For all of the apartments, CO2 emissions are diminished by 7 tonnes per annum or 175 tonnes throughout the lifetime of the installation.

The use of solar panels

The solar panels will enable 35% of water requirements for sanitary purposes to be supplied.

The results in figures for this element are as follows:

- For an apartment of 110 m², savings in the usage of gas represent € 25 per annum.
- For all of the apartments, CO2 emissions are diminished by 11.8 tonnes per annum or 295 tonnes throughout the lifetime of the installation.

Dual flow ventilation

The results in figures for this element are as follows:

- For an apartment of 110 m² the consumption of gas required for hygienic air is reduced by 70 to 80% and the savings represent € 150 per annum.
- The global consumption for heating and ventilation will be reduced by around 45%.
- For all of the apartments, CO2 emissions are diminished by 71 tonnes per annum or 1775 tonnes throughout the lifetime of the installation.

Recovery of rain water

The roof area is relatively small compared to the water needs of the apartments, and the economic significance of this element is not high.
Nevertheless, a small rainfall tank of optimal dimensions will enable the available resources to be used.

The combination of all these elements will allow for total consumption of gas (heating, ventilation and the production of hot water for sanitary purposes) to be reduced by 50% for each apartment.
For an apartment of 110 m², total gas consumption is estimated at € 190 per annum.

COLLECTIVE CONDENSATION AND HIGH OUTPUT BOILERS

The production of hot water for heating and sanitary purposes is achieved using a central heating unit located in the basement.
This central unit is equipped with a condensation boiler and with a high output boiler. The temperature of the original water varies depending on the outside temperature, which allows the unit to work with the lowest possible water temperatures required to meet needs, and maximum advantage to be taken of the condensation of combustion gas.

There are double savings achieved through condensation:
Condensation of steam from the smoke and recovery of latent energy for heating water use.
Reduction in smoke temperature and significant recovery of heat for heating water use.

The annual energy savings for a condensation boiler compared to a traditional boiler are estimated at 10 to 15%.
The annual energy savings from centralised production compared to a battery of individual boilers depend on the type of material used, with industrial rather than domestic materials producing better performance to the tune of some 5%, thanks to more advanced technology, and this despite losses of around 1% occurring during production when the pipe-work is well insulated.

SOLAR PANELS FOR THE PRODUCTION OF HOT WATER FOR SANITARY PURPOSES

The production of hot water for sanitary purposes is made using a centralised heating unit located in the basement; it is of semi-instantaneous type and includes a panel exchanger feeding an accumulation tank also located in the centralised unit.
A second accumulation tank is planned. The water from this tank is heated by solar panels in the roofing. The surface area of the roof-mounted panels is optimised so that it covers some 35% of annual needs in hot water for sanitary purposes, the rest being produced by the boilers.
It should be noted that this optimisation is achievable thanks to the use of centralised hot water production.

DUAL FLOW VENTILATION

Ventilation is essential to bring in hygienic air required by the occupants and to evacuate interior pollution (humidity, dust, odours, C02…).
Ventilation output levels conform to the NBN D 50.001 norm.

The planned system is of Type D according to the norm and requires two distinct air pulsion networks:
An extraction network in the areas known as ‘damp’ (bathrooms, shower rooms, kitchens, laundries, WC…).
A pulsion network in the living areas (lounges, bedrooms, offices…).

This type of ventilation provides not only for the comfort of the occupants thanks to controlled ventilation (filtered air at medium temperature instead of cold exterior air coming in through grills located in windows and varying according to wind speed), but also for energy to be used in a rational manner by recovering heat from extracted air. There is a dual advantage in this recovery: energy savings and reduction in CO2 emissions.

Energy savings are achieved thanks to the use of a cross-flux exchanger in which the two flows (input and output) exchange their heat and enable up to 90% of heat in extracted air to be used to heat the hygienic air.
The reduction of CO2 emissions involved in heating the hygienic air is of the same order.

RECOVERY OF RAIN WATER

Rain water is recovered for watering the gardens and plants and for supplying the dual service taps used in the maintenance of the common areas of the building.