



AVENUE MARLY [065]:

REDUCTION OF 793 TONNES OF CO₂ PER YEAR

OFFICES – NEW BUILDS

Avenue du Marly, 1120 Neder-Over-Heembeek

Client: FBZ-FSE

Architect: A2M

Engineers: Cenergie

11

kWh/m² year

Brussels average 106

Wood structure filled with cellulose

η 85%
n50 = 0.6/h

PV (318 m²)

Earth Heat exchanger
Sunshades,
Night cooling

Bicycle stands, showers,
public transport nearby



Extensive green roof
(37 m²)

Rainwater tank
(30 m³)

Celit, eco-paint, FSC
wood, marmoleum



False acoustic
ceilings



The Passive+ building project houses the FBZ, Vormelec and Technolec organizations. The interior area consists in a simple structure in order to create adjustable areas/rooms as required. The building corresponds to the criteria of the Passive standards, and achieves a high energetic performance thanks to the building's envelope. A good cellulose insulation level in a wooden structure is used to achieve this level of insulation. Large facade openings bring in natural lighting, while exterior shades minimize summer heat.

The airtightness and the controlled ventilation limits internal loss. In order to avoid overheating during summer, passive cooling devices are used, such as night cooling and a earth heat exchanger; this reduces energy requirements. Part of the electricity will be renewable: 318 m² of photovoltaic panels will be installed on the roof.

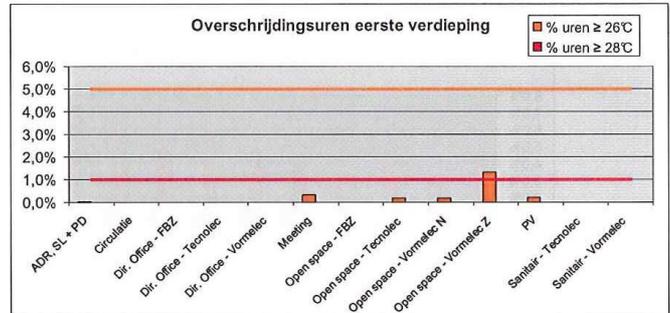
IN FIGURES

Gross area	2203 m ²
Handover	Dec. 2010
Construction costs VAT/ grants excl.	1366 €/m ²
Exemplary building grant	91 €/m ²



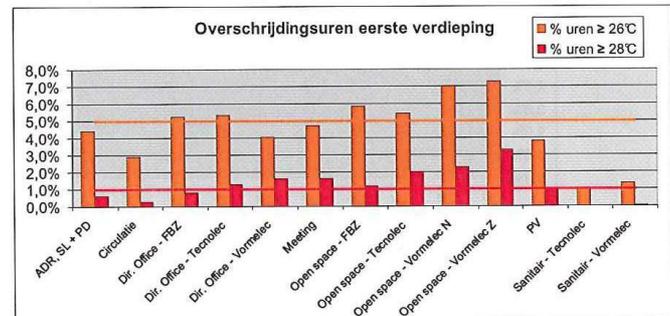
EARTH HEAT EXCHANGER: AN ANCESTRAL TECHNIQUE

Since office units do not serve the same purpose, and are not used in the same way, as residential units, the challenges to be met are different. Specifically, a passive residential unit has a heating requirement of 15 kWh/sq.m per annum. This value is relatively easy for offices to attain if the building envelope is well insulated and if the building is sufficiently compact. A further constraint in the case of offices is that the annual cooling requirement must be less than 15 kWh/sq.m. Due to internal heating sources (computers, occupants, lighting, etc.), the real challenge for an office space is actually to remain cold. This led to the team installing a Canadian well; as can be seen on the chart, doing so significantly reduces building overheating.



VISUALIZATION AND ADJUSTMENT VIA CENTRALIZED TECHNICAL MANAGEMENT

By means of this system, the status of all BUS HVAC elements, and some other technical elements, can be seen on a computer interface; in fact, not only are most elements viewable; they are also adjustable. Some of the advantages of a centralized technical management system include:



- A complete view of the installation thanks to colour images based on hydraulic and aeraulic systems, with clear identification of element statuses (operational, sales, outside system).
- Information about the temperature of the various areas and rooms, and capacity to modify preset temperatures for each room (comfort temperatures as well as compulsion temperatures).
- Alarm messages for all air-treatment elements can be given.
- Alarm messages for all the other techniques can be given.
- Position of the oscillating window displayed, and oscillating window positions can be changed.
- Position of the sun shades displayed (height and angle of rotation of blades).
- Lighting status (on/off) and hours of use.
- Weather report (outdoor temperature, rain sensor, wind sensor, wind direction, sunlight, etc.).
- Quantity of hot water generated by the boiler, depending on the outdoor temperature.
- Plan per floor level, with indication regarding the position of all VAV units, including night time display and CO₂ levels.
- Night cooling: operation of ventilators with the rates and frequencies (modifiable) + visual information of the number of windows open per floor level.
- All data is saved for at least 21 days.

This system can be used to visualize energy consumption according to a number of parameters. By analysing the data, settings can be optimised to minimize consumption.

ADDED EXTRA

A primary energy consumption level of a Passive building must be less than 120 kWh/sq.m per annum. Using 318 m² of photovoltaic panels means that the energy generated by these panels can be subtracted from the primary energy consumption levels.

