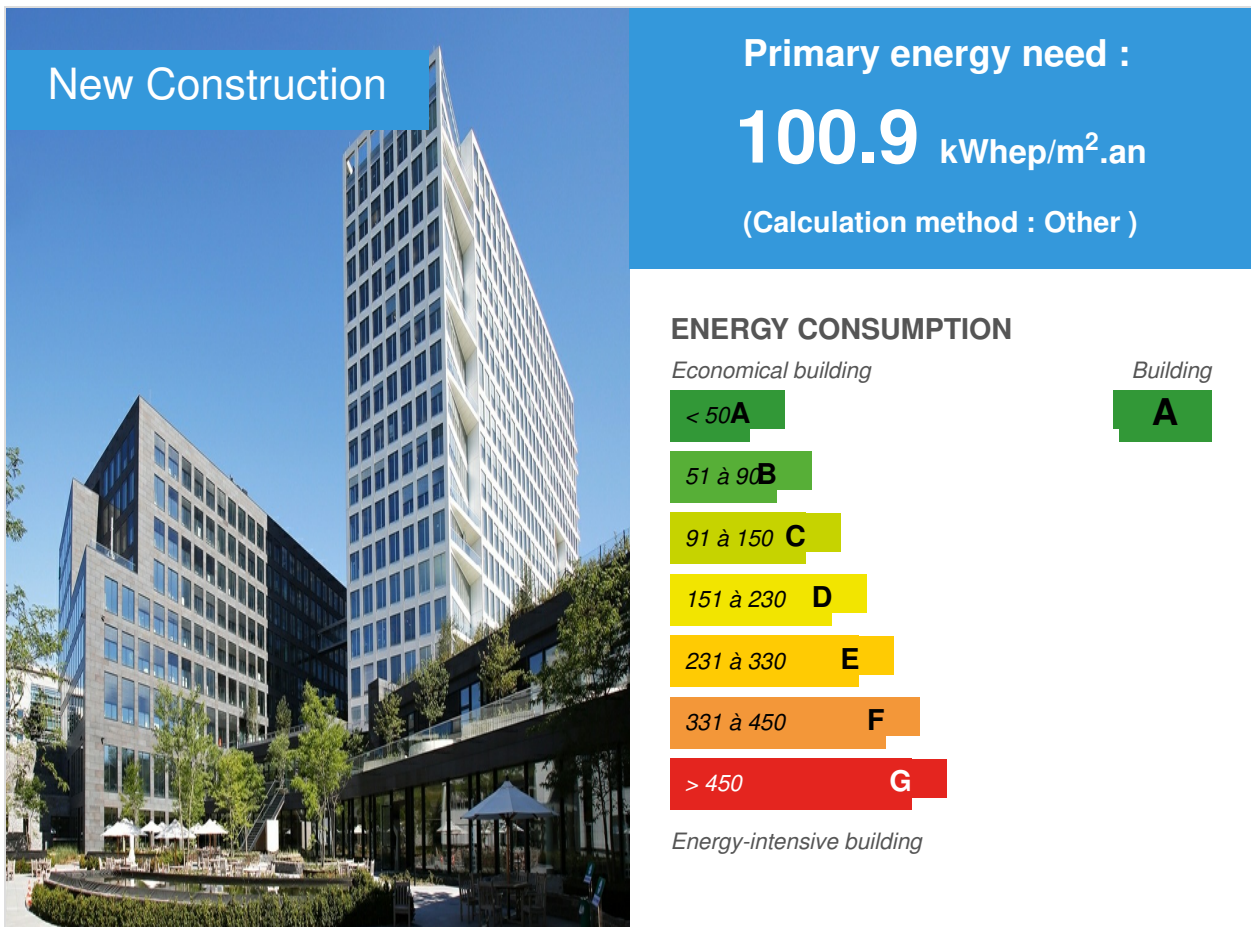


## OKsigen and eKinox 1

by Christine Donati / 2017-05-02 14:25:48 / Luxembourg / 13716 / FR



**Building Type** : Office building < 28m

**Construction Year** : 2015

**Delivery year** : 2016

**Address 1 - street** : L-2951 LUXEMBOURG, Luxembourg

**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 52 000 m<sup>2</sup>

**Construction/refurbishment cost** : 180 000 000 €

**Number of Work station** : 3 000 Work station

Cost/m<sup>2</sup> : 3461.54 €/m<sup>2</sup>

#### Certifications :



#### Proposed by :



## General information

BGL BNP Paribas starts in 2013 the construction of two new buildings (oKsigen and eKinnox) in Kirchberg, with the aim of bringing together most of the employees of the BNP Paribas Group in Luxembourg on one site.

This large-scale project consists of a 14-storey building and a second 6-storey building, both connected by a common basement on two levels, for a total area of 52,000 m<sup>2</sup> and a capacity of 3,000 personal work places.

As project manager, BGL BNP Paribas Facility Management

Ensured during the entire works that the buildings were delivered on time and that they met the needs of the occupants. The delivery of the building was thus possible in early 2016, and all occupants took possession of the premises in April 2016.

Concerned about its CSR policy, BGL BNP Paribas has launched the challenge of obtaining a triple environmental certification with a European dimension for this project. Exceptional HQE certification has already been obtained in the realization phase, BREEAM and DGNB are in the process of being obtained.

With its exceptional infrastructure, BGL BNP Paribas also puts the emphasis on the well-being of its occupants. There is a nursery, a fitness center, sports locker rooms, a concierge, an XXL auditorium, a fun zone (billiard table, ping pong table, piano, Wii console, arcade terminal ...) Panoramic view on the 14th floor with a breathtaking view of the city of Luxembourg, a 360 ° terrace on the 15th floor, and numerous dining areas (outside brasserie, lounge, contemporary café, cafeteria, canteen).

[See more details about this project](#)

<https://www.bgl.lu/fr/banque/pages/lp/espaces-bureaux-a-louer.htm>

[Data reliability](#)

## Stakeholders

### Stakeholders

**Function :** Contractor

BGL BNP Paribas

Romain Girst, Michel Gonçalves, André Foresti, Michel Rausch, Michel Steinbach, Hilde Monserez

<http://www.bgl.lu>

As prime contractor, BGL BNP Paribas' Facility Management department ensured that the buildings were delivered on time and that they met the needs of the occupants.

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**Function :** Contractor representative

BNP Paribas Immobilier

Jean-Marc Vincent

<https://realestate.bnpparibas.fr>

The Delegated Owner has technically accompanied the Client on the entire project.

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**Function :** Designer

M3 Architectes

Jos Dell

<http://m3architectes.lu>

The architect was selected following an architect competition in 2011

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**Function :** Assistance to the Contracting Authority

Alto Ingénierie

Elodie Dumas

<http://alto-ingenierie.fr>

Assistance to certifications DGNB, HQE, BREEAM

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**Function :** Structures calculist

Goblet Lavandier & Associés

André Lavandier

<http://golav.lu>

Technical Consulting Engineers

## Contracting method

Separate batches

## Owner approach of sustainability

In designing the project, the BNP Paribas Group in Luxembourg focused on respecting the environment. Particular attention has been given to eco-friendly technologies and minimal consumption of energy and natural resources. The Group has launched the challenge of obtaining a triple environmental certification with a European dimension for this project. Exceptional HQE certification has already been obtained in the realization phase, BREEAM and DGNB are in the process of being obtained.

## Architectural description

The BNP Paribas real estate complex in Luxembourg identifies itself as an urban object at the entrance to the Kirchberg Plateau, thus becoming the East Gate of the City of Luxembourg. The site consists of 2 new buildings, one of which is 6 storeys high, on J.-F. Kennedy Avenue, and a 14-storey building on Edward Steichen Street. The two buildings are located on a two-storey basement connecting J.-F. Kennedy Avenue and E. Steichen Street with connections to the existing 3rd Kronos Building. This connecting platform integrates the common functions: reception, visitor lounges, training center, 499-seat auditorium, fitness center, catering areas, etc. The car parks are spread over several basements under the base and are accessible from E. Steichen Street. The courtyard, joining the two buildings, is landscaped in the extension of the gardens designed by the landscape architect Jacques Wirtz for the Kronos building.

## If you had to do it again?

We would have made sure to select another substrate for our green roofs; Which would have allowed a vegetation, without giving a yellowish color to the rainwater recovered.

## Building users opinion

We note a small number of complaints from our employees at our Facility Service Desk which manages in particular requests for technical interventions related to the building, for example: problems of use of the blinds, adjustment of the temperature ...

## Energy consumption

Primary energy need : 100,90 kWh<sub>ep</sub>/m<sup>2</sup>.an

Primary energy need for standard building : 171,00 kWh<sub>ep</sub>/m<sup>2</sup>.an

Calculation method : Other

Final Energy : 53,40 kWh<sub>ef</sub>/m<sup>2</sup>.an

Breakdown for energy consumption :

- Heating: 14.5 kWh<sub>ef</sub> / m<sup>2</sup>.an - Refreshment: 1.5 kWh<sub>ef</sub> / m<sup>2</sup>.an - Ventilation: 11 kWh<sub>ef</sub> / m<sup>2</sup>.an - Auxiliary: 2.9 kWh<sub>ef</sub> / m<sup>2</sup>.an - Lighting: 15.3 kWh<sub>ef</sub> / m<sup>2</sup>.an - DHW: 8.1 kWh<sub>ef</sub> / m<sup>2</sup>.an

More information :

The building has 15,100 meters, which are managed by the APIGREEN application (APILOG), which allows precise and detailed monitoring of consumption. The first analyzes yield convergent results with theoretical estimates.

## Envelope performance

Envelope U-Value : 0,41 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

High thermal insulation (triple glazing and 20 cm insulation on the façade) The overall U-value calculated on the basis of EN ISO 6946 of all opaque elements is transparent, belonging to the thermal envelope of the building, amounts to 0.407 W / (M<sup>2</sup> · K) without taking into account thermal bridges and FX temperature correction coefficients. (Source CPE 27.06.2012)

Building Compactness Coefficient : 0,30

Indicator : EN 13829 - q50 » (en m<sup>3</sup>/h.m<sup>3</sup>)

Air Tightness Value : 2,19

Users' control system opinion : Access to the GTB system is limited to the technical service of Facility Management. Since the employees do not have direct access to it, we are not in a position to provide an opinion.

## Real final energy consumption

Real final energy consumption/m<sup>2</sup> : 186,00 kWh<sub>ef</sub>/m<sup>2</sup>.an

Year of the real energy consumption : 2 016

# Systems

## Heating system :

- Urban network

## Hot water system :

- Urban network

## Cooling system :

- Water chiller
- Others
- VAV Syst. (Variable Air Volume system)
- Radiant ceiling

## Ventilation system :

- Free-cooling
- Double flow heat exchanger

## Renewable systems :

- Solar photovoltaic
- Solar Thermal

Renewable energy production : 1,00 %

## Other information on HVAC :

The air handling units are HOWATHERM brand; These offer high energy yields: frequency variation on the drive and the recovery; Heat recovery via recovery batteries; High-performance air humidification (adiabatic system - osmosed water on plate with silver salt)

A feasibility study on the use of renewable energies was conducted. Concerning the supply of heat: -The obligatory connection to the district heating network of the city of Luxembourg represents an economically and ecologically recommendable system. - Thermal solar collectors for the production of domestic hot water lead to a reduction of CO2 emissions of about 5,000 kg / a for an energy price increase of only 0.3 Cent / kWh.

## Solutions enhancing nature free gains :

Recovery of energy in the waste air and humidification solution without the need for steam production.

# Smart Building

## BMS :

The GTB controls the opening or closing of the blinds according to the sunshine of the facades which makes it possible to facilitate the solar thermal input in winter and to limit this same contribution during the summer period.

[Users' opinion on the Smart Building functions](#) : Due to our recent entry into the buildings, we have not yet surveyed the occupants for their opinions.

## Environment

### GHG emissions

[GHG in use](#) : 16,46 KgCO<sub>2</sub>/m<sup>2</sup>/an

[Methodology used](#) :

Calculation carried out as part of the DGNB certification. Use of the ESUCO database, associated with this repository.

[Building lifetime](#) : 50,00 an(s)

[GHG Cradle to Grave](#) : 13,16 KgCO<sub>2</sub> /m<sup>2</sup>

Calculation performed as part of a DGNB certification. Use of the ESUCO database, associated with this repository.

### Life Cycle Analysis

Response Framework: DGNB. Database: ESUCO. Scope: Construction products, technical equipment and energy consumption on regulatory stations only. It gives the results of the LCA.

[Material impact on GHG emissions](#) :

13.16

[Material impact on energy consumption](#) : 39,80 kWhEP

[Eco-design material](#) : The local volcanic substrate (150km) to realize the green roof of the 2 buildings.

### Water management

[Consumption from water network](#) : 26 621,00 m<sup>3</sup>

[Consumption of grey water](#) : 10 083,00 m<sup>3</sup>

[Consumption of harvested rainwater](#) : 9 500,00 m<sup>3</sup>

[Water Self Sufficiency Index](#) : 0.42

[Water Consumption/m<sup>2</sup>](#) : 0.51

[Water Consumption/Work station](#) : 8.87

2 rainwater tanks with a total capacity of 500 m<sup>3</sup>

## Indoor Air quality

Concentration of CO<sub>2</sub>: - CO<sub>2</sub> sensors in HVAC systems Example of concentration of total VOCs: 91.59 µg / m<sup>3</sup> in the training base 362.77 µg / m<sup>3</sup> in the Oksigen plateau South Example of formaldehyde concentration: 2.8 Mg / m<sup>3</sup> in the Oksigen private office. 7.5 µg / m<sup>3</sup> in the Ekinox meeting room. A + sanitary labeling of indoor airborne coatings. The soft floors have labels: GUT, CRI (Green Label Plus), Angel Blue, Nature Plus.

## Comfort

**Health & comfort :** The luminaires (100% LED) which constitute the main source of artificial light adapt automatically according to the external light supply. The occupants themselves regulate their luminous needs. WALDMANN / LAVIGO luminaires. The whole glazed area of the buildings is composed of triple glazing and double-skin allowing a thermal and acoustic comfort of very high quality.

**Calculated indoor CO<sub>2</sub> concentration :**

597 PPM

**Measured indoor CO<sub>2</sub> concentration :**

La concentration est mesurée en permanence et renvoyée sur la GTC

**Calculated thermal comfort :** Hiver : Catégorie I - température opérative  $\geq 21^{\circ}\text{C}$  - atteinte pendant 95% de l'occupation. Catégorie II - température opérative  $\geq 20^{\circ}\text{C}$  - atteinte pendant 100% du temps Eté : Catégorie III - température opérative  $\leq 27^{\circ}\text{C}$  - atteinte pendant 100% de l'occupation. Catégorie II - température opérative  $\leq 26^{\circ}\text{C}$  – atteinte pendant 81% du temps. Catégories définies dans la norme 15251.

**Measured thermal comfort :** Entre 21 et 23°. Les utilisateurs peuvent ajuster la température par zone. Très peu de plaintes par rapport à d'autres bâtiments pour des populations similaires.

**Acoustic comfort :** Acoustic comfort is powerful thanks to a complete strategy, involving various parameters: - Acoustic insulation between rooms (impact noises and air noises) - Levels of noise from local sensitive equipment - Impact noise from corridors and cages d Staircase - Isolation against external noises - Acoustic isolation between premises - Impact noise insulation - Levels of noise generated by equipment - Levels of vibration caused by equipment - Reverberation times - Absorption Equivalents (AAE) - Behavioral Adaptation (New Way Of Working) More concretely and as an example, a floor was chosen in the restaurant, because less sound than tile.

Products

Product



## Use of water

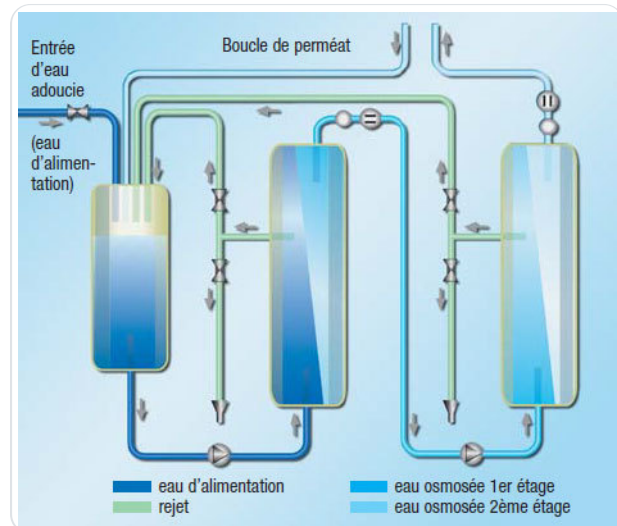
A.M. KAC

A+P Kieffer Omnitec

<https://apko.lu/>

Product category : Table

```
'c21_italy.innov_category' doesn't exist
SELECT one.innov_category AS
current,two.innov_category AS
parentFROM innov_category AS
oneINNER JOIN innov_category AS two
ON one.parent_id = two.idWHERE
one.state=1AND one.id = '29'
```



Water being a valuable resource, its rational use was one of the major environmental themes in the design of the building. This concept has been developed along three main lines: 1. Minimize city water consumption 2. Maximize harvesting and use of rainwater 3. Reduce wastewater discharges as much as possible and To contain the flows discharged to the river in case of floods The reduction of consumption in town water (potable) has resulted in the installation of taps for the washbasins with pushbutton or photoelectric detector and flow rate limited to 6 liters / minute. Each sanitary warehouse is equipped with solenoid valves on the separate circuits of drinking water and gray water, which supply respectively the faucets of the washbasins and the flushes of water (cisterns and urinals) which automatically break as soon as the detection of Presence detects that the room is empty, which automatically limits the overconsumption linked to leaks and taps that could dysfunction. The rainwater of the 2 roofs of the building is recovered and stored in two tanks with a unit capacity of 250 m<sup>3</sup>; This rainwater is used in spring and summer for irrigation and feeding of ornamental water basins and is used, if available, as a sewer for the production of gray water (see below). The production of osmosed water has been favored to the detriment of traditional salt water treatment. This osmosed water is used for the adiabatic humidification of air-handling plants, instead of production by steam boilers (centralized or decentralized) which are highly energy-consuming and not very rational in terms of water consumption. This osmosed water is also used for the production of natural ice water to obtain an adiabatic effect in hybrid cooling towers, which reduces the consumption of electrical energy. This osmosis water is also used in the kitchen for dishwashers. If the water was softened by saline (or chemical), there would have been regular releases of water concentrated in salt (and other chemical stabilizers) into the sewers. In addition, the retentates (the highly mineralized fraction separated from the osmosed water during the production of the latter) are recovered in their entirety in order to serve as gray water for flushing toilets (bowl and urinals). Depending on the availability of rainwater, gray water may consist of a mixture of retentate water and rainwater. The rainwater that is not recovered (the one harvested in the forecourt) is first directed in a gravity manner to catchment basins calibrated opening in order to limit the flow of water discharged to the network of rainwater Which is directed towards the river and therefore to limit its participation in the risks of flooding.

To complete the overall consumption and production of water are supervised and counted

through the tool GTB (Technical Management of the Building). The numerous counters make it possible to analyze well the consumption which is used for good behavior and, if necessary, the implementation of corrective actions.

## Costs

### Construction and exploitation costs

Global cost : 320 000 000,00 €

Global cost/Work station : 106666.67

Cost of studies : 31 746 000 €

Total cost of the building : 200 000 000 €

### Energy bill

Forecasted energy bill/year : 777 193,00 €

Real energy cost/m<sup>2</sup> : 14.95

Real energy cost/Work station : 259.06

## Urban environment

The BNP Paribas Banking Center in Luxembourg is strategically located at the entrance to the Luxembourg City business district, symbolizing the city's main entrance. It is surrounded by, among other things, the city's convention center, a hospital, a multiplex cinema, and a shopping center, providing numerous facilities for employees of the CBK site. The many restaurants and bars nearby will also satisfy the greatest number. Mobility being at the heart of the concerns of the Kirchberg Urbanization Fund (FUAK), the district is already well served by city buses, and also has several self-service "Vel'oh" stations . The arrival of the Tram before the end of the year will however make it possible to reach the city center in less than 10 minutes, and the future Railway Station of the Pfaffenthal will be 5 minutes away. Equipped with a number of parks, the area also offers a lot of space for green spaces, enabling employees to indulge in all types of outdoor sports. The Sports Center "D'Coque" is also equipped with an Olympic swimming pool and also hosts festive events such as concerts (Night of the Proms), varied sporting events or solidarity (Relay for Life). From a cultural point of view, art enthusiasts will be able to visit the MUDAM (Museum of Modern Art of the City) for permanent or temporary exhibitions, or at the Philharmonie to attend various more classical concerts. In short, the district of Kirchberg is definitely a changing district where it is good to

work.

## Land plot area

Land plot area : 15 070,00 m<sup>2</sup>

## Built-up area

Built-up area : 100,00 %

## Green space

Green space : 14 453,00

## Parking spaces

650 free-flow parking spaces, including 60 parking spaces available for visitors and 70 places available for electric vehicles - 76 shared places for motorcycles +/- 100 shared places for bicycles

## Building Environmental Quality

### Building Environmental Quality

- indoor air quality and health
- biodiversity
- works (including waste management)
- consultation - cooperation
- acoustics
- comfort (visual, olfactive, thermal)
- waste management (related to activity)
- water management
- energy efficiency
- renewable energies
- maintenance
- building end of life management
- integration in the land

## Contest

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