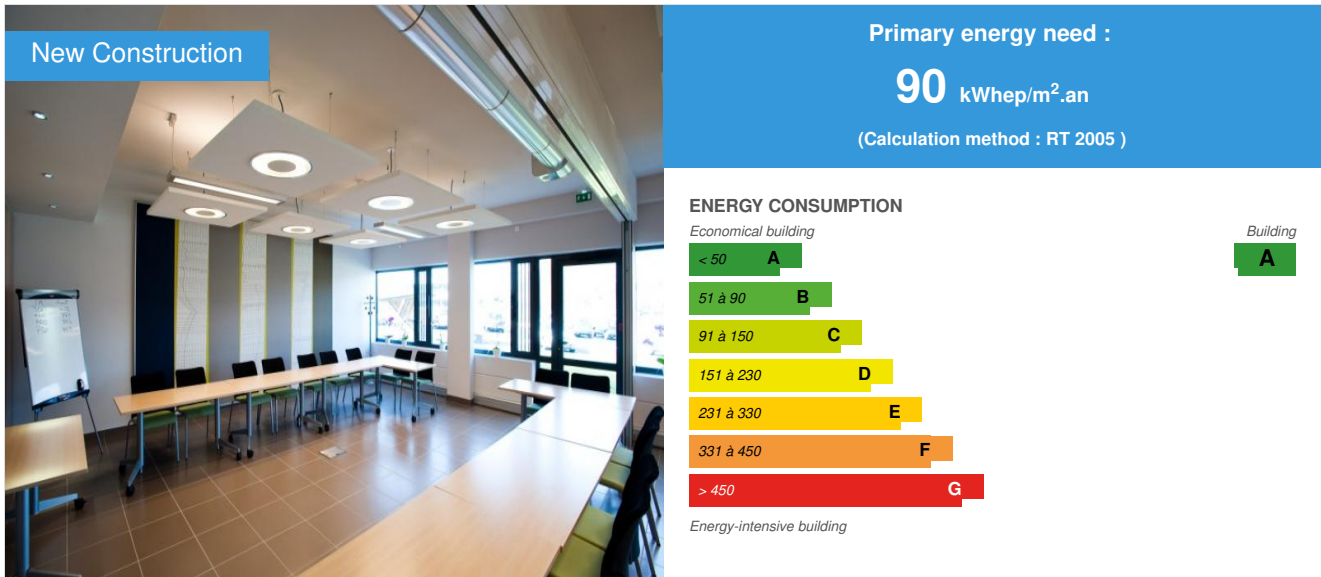


## 6ENERGY+ : the BEPOS - ACC that keeps its promises

by René GAMBÀ / © 2014-02-15 16:42:03 / France / © 14968 / FR



**Building Type** : Office building < 28m  
**Construction Year** : 2009  
**Delivery year** : 2009  
**Address 1 - street** : 163 rue du Colombier 31670 LABEGE, France  
**Climate zone** : [Csa] Interior Mediterranean - Mild with dry, hot summer.

**Net Floor Area** : 950 m<sup>2</sup> SHON  
**Construction/refurbishment cost** : 1 350 000 €  
**Cost/m<sup>2</sup>** : 1421.05 €/m<sup>2</sup>

Proposed by :



### General information

The 6ENERGY+ building houses the Gamba Group headquarters, and its meeting rooms open for event and training planners.

Bio-climatic design, geothermal heat pump, dual flow ventilation, very high thermal inertia, and solar PV sensors can produce 63.500 kWh versus 36,000 kWh consumed, on conventional usages, INCLUDING ACTIVITIES AND COMFORT! This last point is important because what good would it be to create buildings without any comfort? Energy efficiency shouldn't come at the expense of the user's well-being, his health and comfort.

### Sustainable development approach of the project owner

In 2007, the Gamba group programmed the building. The objective was to create a building producing more energy than it consumes, including activity and comfort. The feasibility study was made in 2008, associating the users to the design stage. Construction stage took 11 months during the year 2009. The will to build a healthy, comfortable building housing a friendly environment has resulted in the implementation of a HQE (High Environmental Quality) approach without the certification. The approach was led by the project owner, with high efficiency targets:

1. Harmonious relationships

- 2. Integrated choice
- 4. Energy
- 8. Hygrothermal
- 9. Acoustic
- 10. Visual
- 11. Olfactory
- 12. Health
- 13. Air quality

After four years of occupation and usage, we produced 1.7 times more energy than we have consumed, including activity and comfort, and we noticed a greater stability of production and consumption from year to year.

## Architectural description

Bio-climatic design, with North / South orientation, solar protection of the southern façade, external thermal insulation, high inertia, shed and large windows, ventilation Dual stream flow of the regulatory requirement, Geothermal heat pump for floor heating / refreshing, PV sensors. Acoustic treatment specific to each type of space, very appreciated by the users and well perceived by visitors.

## Building users opinion

"It's great", "why everyone isn't doing the same", "we are happy to work here", "The good part is the energy savings are not made at the expense of the users: here it is heated to over 21°C in winter and during the summer the feeling of freshness is real and persistent "...

## If you had to do it again?

We'd do it all the same, except:

- 1) The same person kept track of the construction as the project owner and as the contractor's acoustician... Being the project owner is more cumbersome than the acoustics ... If it were to be done again, two different people would be in charge of these two roles.
- 2) We would order for a mission of commissioning ...

## See more details about this project

<http://www.acoustique-gamba.fr/actualites/6energy.htm>

## Stakeholders

### Stakeholders

Function : Contractor

6ENERGY+

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Function : Designer

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Function : Thermal consultancy agency

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Function : Structures calculist

GAMBA ACOUSTIQUE

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<http://www.acoustique-gamba.fr>

Function : Structures calculist

Terrell Maurette

Guillaume Niel

## Type of market

Global performance contract

## Energy

### Energy consumption

CEEB : 0.0001

Primary energy need : 90,00 kWh/m<sup>2</sup>.an

Primary energy need for standard building : 234,00 kWh/m<sup>2</sup>.an

Calculation method : RT 2005

Breakdown for energy consumption : Meter reading over one year:

- Thermal (heating, DHW) = final 10.7 kWh / m<sup>2</sup> / year
- Ventilation & Pumps = 8.7 kWh / m<sup>2</sup> / year
- Lighting = 5.1 final kWh / m<sup>2</sup> / year
- Office and Home Appliances = 13.2 kWh / m<sup>2</sup> / year

### Real final energy consumption

Final Energy : 24,50 kWh/m<sup>2</sup>.an

### Envelope performance

Indicator : EN 13829 - n50 » (en 1/h-1)

### More information

The consumptions are lower than predicted by the calculations:

Underestimated free inputs (especially due to the winning couple dual flow ventilation strong flow + high thermal inertia), underestimated lighting yields, underestimated performance of the heat pump.

## Renewables & systems

### Systems

Heating system :

- Geothermal heat pump
- Low temperature floor heating

Hot water system :

- Heat pump

Cooling system :

- Floor cooling
- No cooling system

Ventilation system :

- Nocturnal ventilation
- Free-cooling
- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic
- Heat Pump on geothermal probes

Renewable energy production : 191,00 %

## Environment

### Urban environment

Land plot area : 2 700,00 m<sup>2</sup>

Built-up area : 20,00 %

Green space : 1 400,00

The site lies in an area of services activity, served by public transport, with many shops and services (restaurants, etc.) nearby.

## Products

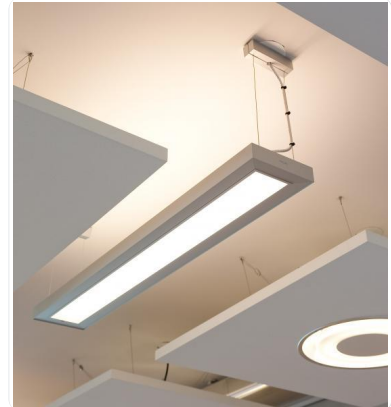
### Product

MASTER SOLO with integrated lights and two double flow ventilation flow

#### Product category :

Mobilizing the thermal inertia implies not to cover the entire underside of the slab with a continuous ceiling. Ensuring acoustic comfort implies to implement the maximal surface of absorbent materials, and incidentally the room must be enlightened, comfortable. Finally, the design dimension needs to be treated. The compromise has been found with three manufacturers ECOPHON, ALDES and PHILIPS and the project owner. It consisted in optimizing used surfaces, by taking into account air flows from the dual flow ventilation, which high flow allows the increased recovery of free inputs and their distribution throughout the building. This was made possible thanks to a laboratory study of acoustic and thermal performance of MASTER SOLO. The integration of the lights in the panels was an asset to the layout plan of the different elements.

The originality of "The" solution lies equally in the performance reached on all energy and comfort criterias than in the elaboration process of the solution, after a "win-win" partnership between the project owner, the contractor and the three manufacturers. Therefore "The" solution born from this compromise was well received by the project owner who contributed, and well perceived by the users who appreciate the design, the visual, hygro-thermal and acoustic comforts . The system exceeded performance expectations especially on energy due to an underestimation of the free inputs. Those were actually recovered through the winning couple "Dual-flow ventilation flow" and very high thermal inertia. This experimental work has led to positive evolutions for the manufacturers' product range of products, which are now standardized, including integrated lighting in suspended panels.



</data/sources/users/328/docs/solution-technique-6nergie-plusgamba-acoustique-labege.pdf>

## Carbon

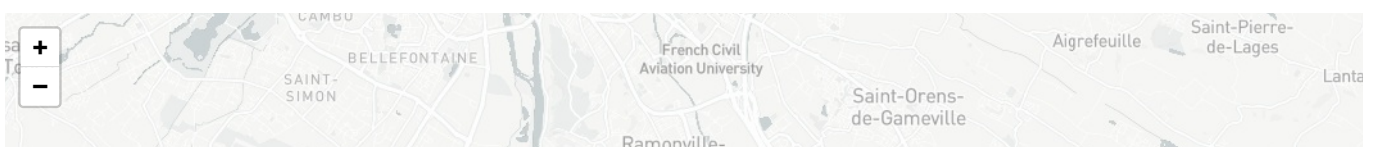
### GHG emissions

GHG in use : -2,00 KgCO<sub>2</sub>/m<sup>2</sup>/an

#### Methodology used :

Method perimeter ADEME: Operating activities included the building, excluding displacements

## Contest





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