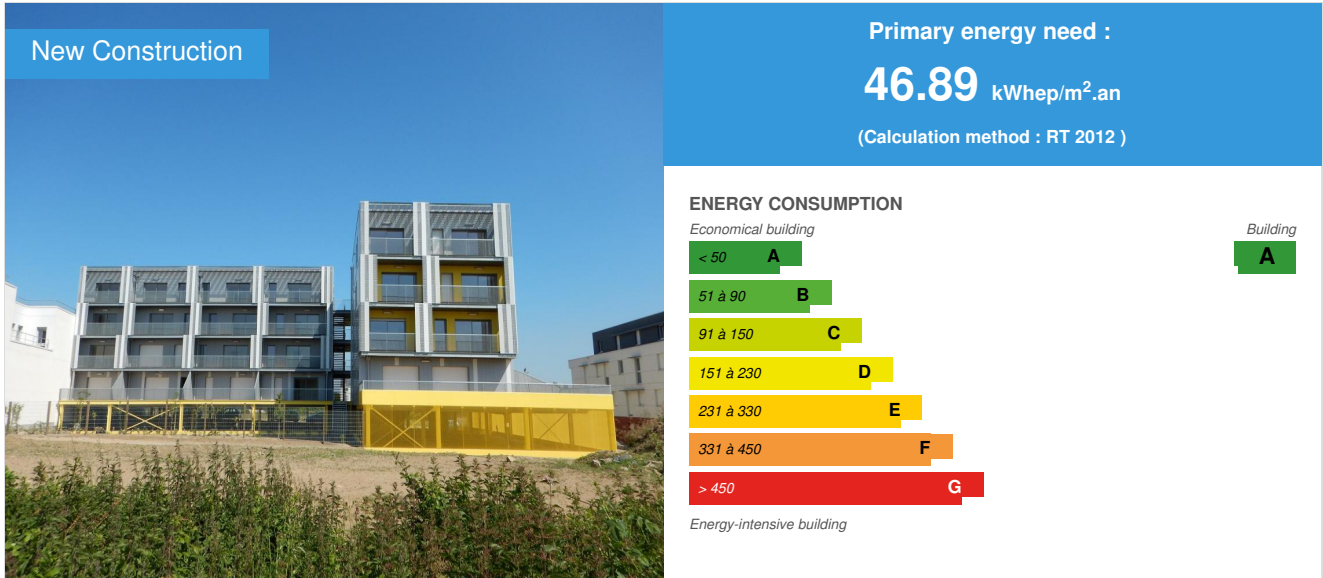


## Be Positive

by Florian GIRAUD / © 2015-06-22 15:18:09 / France / © 14192 / FR



**Building Type** : Collective housing < 50m  
**Construction Year** : 2014  
**Delivery year** : 2015  
**Address 1 - street** : rue Marion Cahour 44400 REZÉ, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 2 554 m<sup>2</sup>  
**Construction/refurbishment cost** : 3 262 060 €  
**Cost/m2** : 1277.24 €/m<sup>2</sup>

**Certifications :**



### General information

- Positive Energy Building label, Effinergie 2013 (certified)
- Social housings
- Near the Radiant City (by Le Corbusier)

First design and construction operation launched by Atlantic Homes, social landlord in Nantes, in the region of Rezé in France. This two Positive Energy Building certified social community buildings, echo the avant-garde style of the Radiant City, which it faces, by the originality of its metal frame.

This program of 32 certified Positive Energy Building certified housings, the first of its kind in France, was wanted by IDEFIA and Atlantique Habitations to demonstrate the possibility to combine innovation and energy sobriety while maintaining low construction and operation costs. The project has many advantages:

- metal structure ensuring stability of the building (earthquake calculations)
- timber frame walls (high insulation) to "dress" the framework
- dissociation of the secondary structures
- Elevator autonomously operating at 80% thanks to solar panels

- Individual thermodynamic cylinders on extracted air
- individual electric heating

## Sustainable development approach of the project owner

This social collective buildings project was launched by Atlantique Habitations (design & construction) and won by the group Idefia-Urbanmakers-Tual. The contractor and the construction manager wanted to save energy, while controlling investments which allowed to implement simple and inexpensive solutions:

- Installation of individual calories recovery on wastewater (Zypho)
- Installation of radiant electric heaters
- Installation of individual thermodynamic cylinders on extracted air (Aldes TFlow Hygro Plus)
- Installation of energy managers like CALYBOX 1020WT from Delta Dore, allowing to monitor the consumptions by regulatory usages daily, weekly or monthly
- Efficient elevator, running on solar panels, supplied with 220 V with an autonomy of 100% from March to October and 80% outside this period.

The building continues the commitment to innovation initiated at the time by the Radiant City of Le Corbusier in Rezé, beneath which it is built. This is why the contractor wanted to go beyond the goals set by the regulations, which meant for our building system and according to our technical choices, to add photovoltaic solar panels to meet the Positive Energy Building (Effinergie) label (certification in progress).

## Architectural description

A "couture" architecture.

Located in the heart of urban development operation of Bourderies, in a sequence of large linear buildings, between intermediate housings and vast landscape, our project proposes a "couture" architecture: we wanted it clear, sober and light. With a contemporary personality, the new group of buildings adopted a strategy for a good relationship with the surrounding buildings: its proportions, transparencies of its base, the clarity of its facades and the management of privacy are the assets for its good integration in the neighborhood.

Each building faces acquires outdoor spaces in the thickness of a double skin. Sometimes solid or perforated, facades are read as inhabited and useful areas. Their thicknesses filter views, hide, put a distance.

Facades are made of a white shades, sometimes composed of silvery (brushed aluminum) and sometimes white (lacquered) vertical shards degraded to the sky. They turn white when the light is low-angled, glare and capture the changing hues of the sky.

## See more details about this project

<http://www.idefia.fr/projets-en-cours.html>

[http://www.otis.com/\\_layouts/ProjectNewsPopup.aspx?ID=51&siteURL=http://www.otis.com/site/fr/pages/default.aspx](http://www.otis.com/_layouts/ProjectNewsPopup.aspx?ID=51&siteURL=http://www.otis.com/site/fr/pages/default.aspx)

<http://www.lemoniteur.fr/article/des-logements-bepos-effinergie-tout-electrique-vont-voisiner-avec-la-cite-radieuse-26279935>

<http://www.idefia.fr/Images/idefia/pdf/bourderies.pdf>

[http://www.idefia.fr/Images/idefia/pdf/IDEFIA\\_revue\\_presse\\_oct14.pdf](http://www.idefia.fr/Images/idefia/pdf/IDEFIA_revue_presse_oct14.pdf)

## Stakeholders

### Stakeholders

**Function :** Contractor

Atlantique Habitations

M SCIALOM Stéphane

<http://www.atlantique-habitations.fr/6-rue-marion-cahour/op%C3%A9ration-be-positive-%C3%A0-rez%C3%A9>

Office for Public Housing

**Function :** Designer

URBANMAKERS

M. MOTTE Antoine

<http://urbanmakers-archi.eu/projets/les-bourderies-ilot-g-reze/>

**Function :** Construction company

IDEFIA

M. GIRAUD Florian

<http://www.idefia.fr/projets-en-cours.html>

**Function :** Thermal consultancy agency

BET TUAL

M. TUAL Patrick

Function :

EXCADIA

M. OLIVIER Maxime

<http://www.excadia.fr/neuf.html>

Function : Manufacturer

Otis, une filiale de United Technologies Corporation Buiding and industrial Systems

M PRIOU Maxime

<http://www.otis.com>

Ascensoriste

## Contracting method

Other methods

[Conception-realisation](#)

## Energy

### Energy consumption

Primary energy need : 46,89 kWhep/m<sup>2</sup>.an

Primary energy need for standard building : 57,90 kWhep/m<sup>2</sup>.an

Calculation method : RT 2012

Breakdown for energy consumption : - Heating: 21.4 kWhep / m<sup>2</sup>.year

- Hot Water: 17.19 kWhep / m<sup>2</sup>.year

- Lighting: 4.0 kWhep / m<sup>2</sup>.year

- Ventilation auxiliaries : 4.3 kWhep / m<sup>2</sup>.year

- Photovoltaic Production: - 63.5 kWhep / m<sup>2</sup>.year

### Real final energy consumption

Final Energy : 18,10 kWhep/m<sup>2</sup>.an

### Envelope performance

Envelope U-Value : 0,36 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

The building continues the commitment to innovation initiated at the time by the Radiant City of Le Corbusier in Rezé, beneath which it is built.

The building steel structure, ensuring the bearing frame, is dressed afterwards by timber frame walls (insulated with 145mm rockwool lambda 0.035 W / mK) and an inner lining (60 mm glass wool lambda 0.032 W / mK). This design eliminates all external thermal bridges in the structure such corridors and balconies, limiting losses.

The multilayer cover is composed of a false inner ceiling 2 \* 140 mm (glass wool with a lambda 0.040 W / mK) and insulation on steel tray (60 mm of rock wool with a lambda 0.040 W / mK).

Finally mixed joinery PVC / aluminum completes the envelope with performance ranging from Uf = 1.1 W / m<sup>2</sup>.K 1.2 W / m<sup>2</sup>.K.

Building Compactness Coefficient : 0,59

Indicator : I4

Air Tightness Value : 0,52

## Renewables & systems

### Systems

Heating system :

- Electric radiator

Hot water system :

- Heat pump

#### Cooling system :

- No cooling system

#### Ventilation system :

- Humidity sensitive Air Handling Unit (Hygro B)

#### Renewable systems :

- Solar photovoltaic

Renewable energy production : 136,00 %

#### Solutions enhancing nature free gains :

Un système de récupération sur les eaux grises individuelles (Zypho)

## Environment

### Urban environment

Land plot area : 1 517,00 m<sup>2</sup>

Built-up area : 68,20 %

Green space : 480,00

Implantation in heart of town, beneath the Radiant City, near the town hall, church, shops, schools and transportation systems. Very close to the Atlantique Habitations agency facilitating access and information.

## Products

### Product

Gen2 Switch, Lift powered by solar energy

OTIS

<http://www.otis.com/site/fr>

<http://www.otis.com/site/fr>

Product category : Management / Others

Connected to 4 solar panels located on the roof of the Bourderies building, the Gen2® Switch elevator will be autonomous in energy in 80% immediately after installation and up to 100% from March to October - the sunniest months.

The Gen2® Switch elevator can also be coupled to other alternative energy sources such as wind. The elevator has been designed to operate in case of power outages, thanks to a battery system. Charged by the power grid, these batteries can in turn feed the engine of the elevator. In case of power failure, the battery can ensure up to 100 trips in an nine-storey building, limiting all disadvantages related to a power failure. A regenerative drive also serves to recover energy created by the elevator and return it to the batteries. According to a recent US study from the Council for an Energy-Efficient Economy, elevators and escalators consume on average 2-5% of the energy of a building, but can sometimes reach up to 50% of energy consumption in the periods of peak usage. With its battery system, the lift Gen2® Switch consumes 0,5kW, less than a microwave and a light bulb when it is in standby. Finally, the battery was itself thought in a logic of sustainable development is composed of 97% recycled materials. More information about the Gen2® Switch on the chain YouTube Otis France:

<https://www.youtube.com/watch?v=gU2-E1p7Jsl>

As part of a "Tour de France" of construction, during which the Minister of Housing, Territories Equality and Rural Policy presents the measures implemented by the government to revive the construction sector, Sylvia Pinel on April 28 stopped in Rezé, near Nantes. On this occasion, Sylvia Pinel visited the eco-district of Jaguère including the building "The Bourderies" where Otis installed the first Gen2 elevator Solar Switch. The Tweeter account Sylvia Pinel testifies of the enthusiasm of the Minister of Housing.



Aldès

<http://www.aldes.fr/>

<http://www.aldes.fr/>

Product category : HVAC, électricité / heating, hot water

## Costs

### Construction and exploitation costs

Renewable energy systems cost : 201 761,00 €

Cost of studies : 236 618 €

Total cost of the building : 3 498 678 €

Subsidies : 458 576 €

## Carbon

### GHG emissions

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

Methodology used :

Compliant with the RT2012 thermal study

## Contest

### Reasons for participating in the competition(s)

- Label BEPOS Effinergie 2013 (certifié)
- Utilisation de la maquette numérique (BIM)

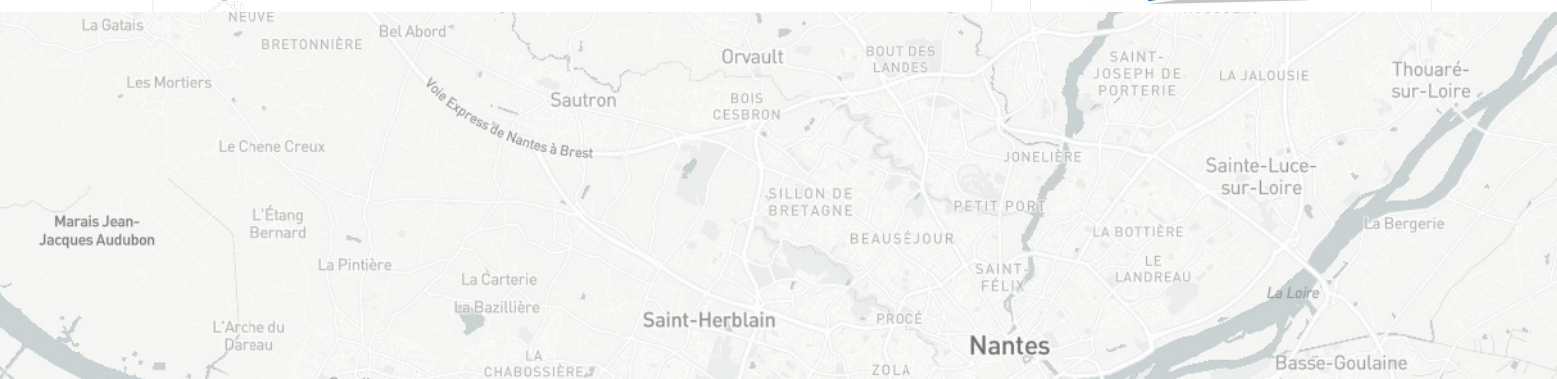
#### Maquette numérique :

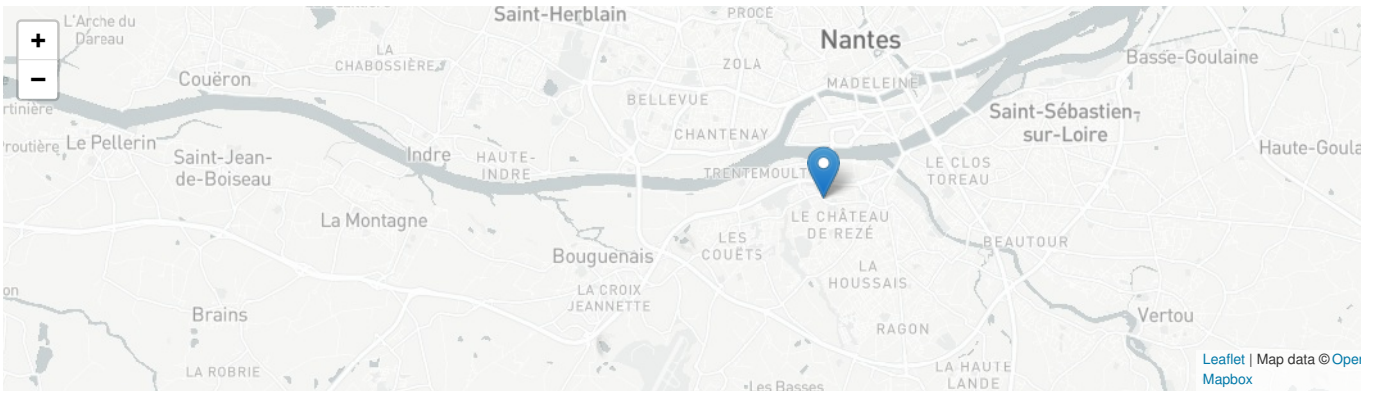
Le projet a été mené dès la phase de conception en maquette numérique, permettant une libre expression architecturale tout en respectant une faisabilité technique et économique. Le clos / couvert étant industrialisé et maîtrisé par les entreprises du groupe, chaque corps d'état de l'enveloppe a fourni une maquette BIM à partir des logiciels métiers de modélisations 3D (pilotage de machines-outils à commandes numérique). Cette particularité de fonctionnement nous permet de faire vivre le projet depuis la phase d'esquisse jusqu'à la phase d'exécution sous la forme de maquettes numériques, les maquettes initiales d'architectes étant remplacées par les maquettes d'exécution au fil de l'avancement des études.

#### BEPOS :

L'autre particularité de ce projet est l'utilisation de l'électricité comme vecteur de chauffage et de production d'ECS. Lors de la phase concours, la maîtrise d'ouvrage souhaitait se raccorder sur le réseau de chaleur de la ville de Rezé. Cependant, fort de notre retour d'expérience sur d'autres opérations, nous avons pu faire valoir notre savoir-faire auprès du maître d'ouvrage, afin de dépasser la réglementation actuelle, tout en s'affranchissant du réseau de chaleur. La maîtrise d'ouvrage a souhaité, dès lors, orienter son projet vers de l'efficacité énergétique, et atteindre le label BEPOS. Le projet, respectant les demandes de la ville au niveau de l'insertion architecturale (proximité avec la Cité Radieuse de Corbusier), devait un traitement de la cinquième façade, traitée avec des panneaux photovoltaïques. Nous avons ainsi combiné les souhaits de la maîtrise d'ouvrage ainsi que ceux de la ville afin d'insérer au mieux notre projet dans le tissu urbain existant (centre de formation et foyer d'accueil de jeunes travailleurs encadrants le bâtiment).

### Building candidate in the category





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