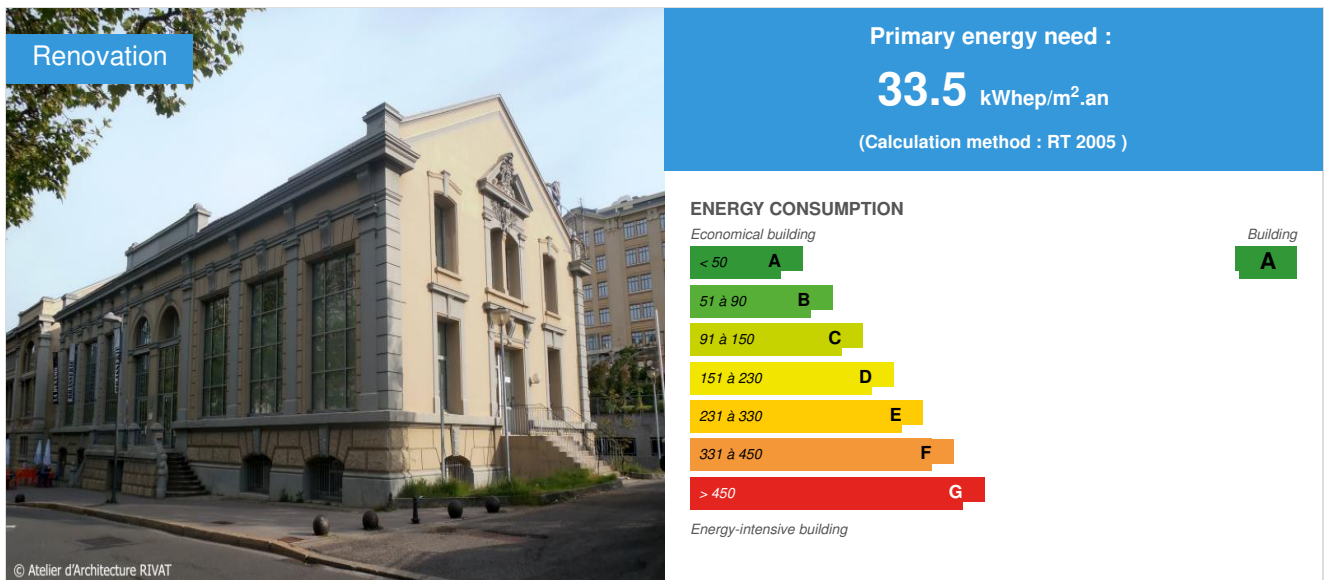


## 53 FAURIEL in Saint-Etienne

by Julien RIVAT / 2013-02-08 09:38:54 / France / 9590 / FR



**Building Type** : Office building < 28m  
**Construction Year** : 2012  
**Delivery year** : 2012  
**Address 1 - street** : 53 Cours FAURIEL 42100 SAINT-ETIENNE, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 610 m<sup>2</sup> SHON  
**Construction/refurbishment cost** : 640 000 €  
**Cost/m2** : 1049.18 €/m<sup>2</sup>

**Certifications :**



### General information

The project consists of the rehabilitation of part of a building located at 53 Cours Fauriel in Saint-Etienne, in which are located the offices of the Atelier d'Architecture RIVAT. The building is part of the former site Manufrance, it is the former local machine, built in 1902 and designed by the architect LAMAIZIERE, registered in the French "Supplementary Historic Monument List."

Our aim was to obtain the label "PassivHaus" which sets the energy needs heat at a maximum 15KWh / (m². year) . A passive building consumes 90% less heating energy than existing construction and 40% less than a BBC building. Our architectural agency has long been oriented towards constructions with low environmental impact. This project is a strong symbol, it also serves as a test project for ourselves but also for the ADEME which monitors its evolution very carefully. Indeed it is the first listed historic building rehabilitated with the label "PassivHaus".

#### SUB Award 2013 : this building contribution to the city of future

The city of the future must incorporate into its infrastructure management scheme of this type of heritage. We can not live without one's past. But we shouldn't live either in the past.

This project proposes an answer based on the conservation elements of the past, incorporating today's lifestyle with energy performance tomorrow.

## Sustainable development approach of the project owner

Our ambition has been to label the project standard "PassivHaus" which sets the energy needs heat 15KWh / (m². Year) maximum. A passive building consumes 90% less heating energy than existing construction. The choice of a standard renovation Liabilities is explained by the fact that we did not have the means to finance renovations heat 2: BBC today and liabilities in 8-10 years. The BBC finally turning an intermediate solution in the march to the factor of 4 of the Grenelle Environment. This project also raises the issue of rehabilitation of built heritage of the 20th century and its integration into the contemporary city. How to rehabilitate heritage without distorting? How to restore the use? To prepare the city for the future, it may be necessary to first identify the elements that make up the city today and ask for their futures. The city of the future must incorporate into its infrastructure management scheme of this type of heritage. We can not live without her past. But do not live in the past. This project proposes an answer based on the conservation elements of the past, incorporating today's lifestyle with energy performance tomorrow.

## Architectural description

Our architecture studio, has chosen to locate its premises and to rehabilitate harmonizing with the recent renovation of the "former electrical transformer", terraced. The offices are located in an urban context, consisting mainly of residential buildings and commercial activities. The relevant part housed the boilers. It has been a major renovation to bias questionable in the 80s, to receive Numéricable offices. To do this replace all the woodwork was indispensable. Front, only the woodwork will be taken to be in perfect harmony with the environment and in particular the adjoining building, not affected by the operation. These windows are made of aluminum. South front, on the Cours Fauriel, the lay of the woodwork is done in the same row. The pinion to the East, sees maintain its existing secondary access. The windows are modified and calepinées consistent with the other facades of the project. As in the northern façade, only the upper parts of the woodwork on the R level 1 of the project have changed. The roof tile is stored identically, sealing shingles replaced by zinc and polycarbonate canopy replaced with double glazing very high energy performance. To reach the standard label "PassivHaus," the only replacement of exterior woodwork is not enough. The implementation of a complex special insulator is required. The project takes advantage of setting up a interior insulation. The slabs being from the walls, the solution technique avoids all thermal bridges. The internal lining of the walls is composed of two layers of wood wool 100mm and 200mm. An air gap is provided between the existing wall and these elements in order to cut more efficient heat transmission inside / outside. These insulating layers are present In the underside of the roof, in the form of three layers of insulation, 80mm, 200mm and 40mm this time. Heating is provided by a geothermal heat pump in two boreholes 99 m. This system is coupled to a mechanical ventilation double flow. The project is carried out within a historical monument, it was not allowed us to implement photovoltaic panels. The project is connected to local networks EDF without producing electricity. However, recall that in Passive buildings, the need for primary energy is 120 kWh / m² a and the project it will be 100kWh / m² a.

## See more details about this project

<http://www.lemoniteur.fr/181-innovation-chantiers/article/solutions-techniques/18128894-prouesse-thermique-dans-un-batiment-historique>

### Stakeholders

#### Stakeholders

**Function :** Contractor

SCI 53 FAURIEL

53 Cours Fauriel - 42100 Saint-Etienne

**Function :** Construction Manager

Atelier d'Architecture RIVAT

53 Cours Fauriel - 42100 Saint-Etienne - Tel : 04 77 38 01 66 - [contact@rivat-architecte.fr](mailto:contact@rivat-architecte.fr)

**Function :** Thermal consultancy agency

HELIASOL

15 allée des Magnolias - 69390 VOURLES - Tel : 06 77 99 59 52

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

**Function :** Certification company

La Maison Passive France

110 Rue Reaumur - 75002 Paris - Tel : 01 45 08 13 35

<http://www.lamaisonpassive.fr>

Function : Others

ENGIBAT (BET Structure & Economie de la construction)

53 Cours Fauriel - 42100 Saint-Etienne - Tel : 04 77 38 47 83 - [contact@engibat.fr](mailto:contact@engibat.fr)

## Type of market

Global performance contract

## Energy

### Energy consumption

CEEB : 0.0001

Primary energy need : 33,50 kWh/m<sup>2</sup>.an

Primary energy need for standard building : 71,50 kWh/m<sup>2</sup>.an

Calculation method : RT 2005

Breakdown for energy consumption : Heating Ep 3.3 KWH ECS 0.0 KWH Ep Cooling Ep 0.0 KWH Auxiliary ventilation Ep 1.8 KWH Auxiliary heating Ep 0.4 KWH Ep 28 KWH Lighting

Initial consumption : 801,00 kWh/m<sup>2</sup>.an

### Real final energy consumption

Final Energy : 12,98 kWh/m<sup>2</sup>.an

### Envelope performance

Envelope U-Value : 0,39 W.m<sup>-2</sup>.K<sup>-1</sup>

Building Compactness Coefficient : 0,35

Indicator : n50

Air Tightness Value : 0,60

## Renewables & systems

### Systems

Heating system :

- Geothermal heat pump
- Low temperature floor heating

Hot water system :

- Heat pump

Cooling system :

- Geothermal heat pump
- Floor cooling

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- No renewable energy systems

## Environment

### Urban environment

Land plot area : 378,00 m<sup>2</sup>

Built-up area : 88,00 %

Green space : 45,00

The site is in the city, in a bottom, thus protected from the wind. The surrounding buildings are taller and do not create a mask important route located in the south is very broad. The soil is clay, without the presence of groundwater.

## Costs

### Energy bill

Real energy cost/m<sup>2</sup> : 1.15

Real energy cost/Work station : 35

Forecasted energy bill/year : 700,00 €

## Carbon

### GHG emissions

, ie xx in use years : 6.39

GHG in use : 18,70 KgCO<sub>2</sub>/m<sup>2</sup>/an

Methodology used :

PHPP

GHG before use : 119,50 KgCO<sub>2</sub> /m<sup>2</sup>

Building lifetime : 100,00 année(s)

GHG Cradle to Grave : 1 989,00 KgCO<sub>2</sub> /m<sup>2</sup>

The emission of GHG do not include deconstruction and initial construction of 1902 or the heating system.

## Contest



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