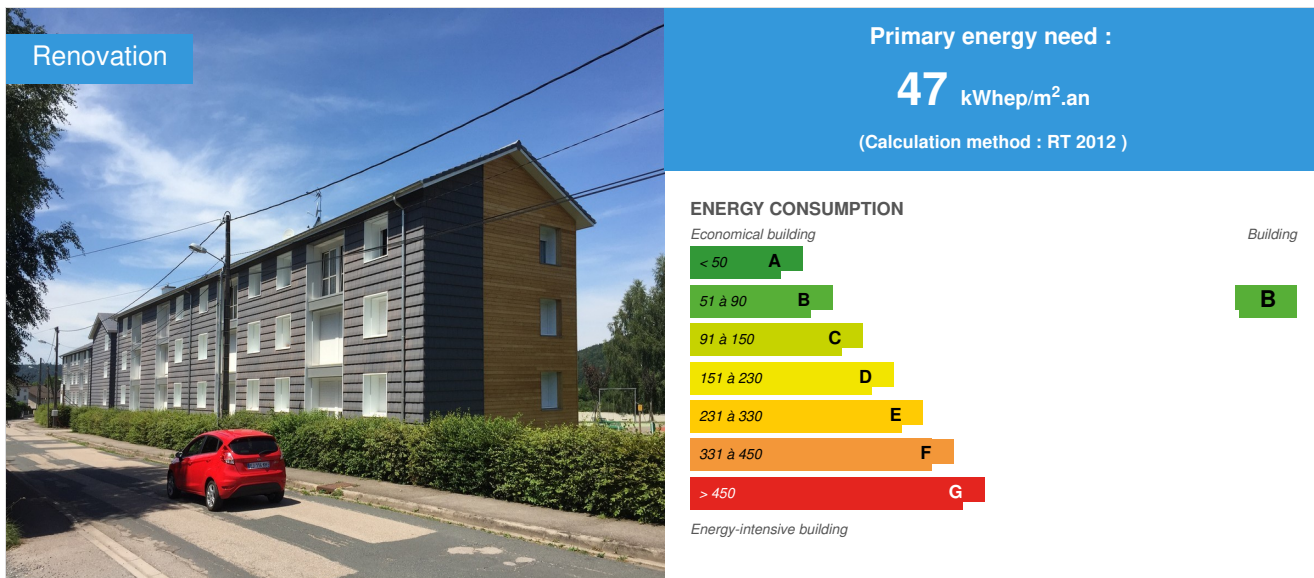


## Biobased renovation of 24 social housing units

by Vincent CHEVALLIER / 2021-03-26 18:39:51 / France / 8742 / FR



**Building Type** : Collective housing < 50m  
**Construction Year** : 1975  
**Delivery year** : 2017  
**Address 1 - street** : 1 route de chavré 88110 RAON L'ETAPE, France  
**Climate zone** : [Dwb] Humid Continental Mild Summer, Dry Winter

**Net Floor Area** : 1 860 m<sup>2</sup> SHON  
**Construction/refurbishment cost** : 1 177 000 €  
**Cost/m2** : 632.8 €/m<sup>2</sup>

### General information

This building was awarded the Energy & Temperate Climates Prize of the Green Solutions Awards 2020-21 at the national level; and received a mention for the same category at the international level.

The project made it possible to consolidate the energy renovation strategy of the entire Toit Vosgien rental stock.

This also made it possible to experiment with the use of prefabrication in the workshop (wood frame) and the use of more durable facade materials (terracotta and wood cladding in protected facades)

The bias has remained unchanged:

- economically reduce tenants' energy costs by 10
- use local and bio-sourced materials (wood structure and wood insulation)
- use renewable and local energy (wood plate) for heating and DHW

The process designed to be carried out on an occupied site (the tenants remained in their respective homes during all of the work, there were no modifications to the apartments) has become more efficient and rapid (prefabrication in the workshop and using facade materials that are not very sensitive to site weathering).

The attached wooden structure has been adapted (reservations) to the methodology consisting in carrying out continuous insulation of buildings 30 cm thick and taking the opportunity to integrate the octopus distribution between facade and insulation of a high performance double flow CMV collective per building.

The latter is located in the vast basements of the buildings.

The perforation of the facades from the outside in each room allows the air to be extracted or blown through the vents placed in the apartments (only 10 min intervention inside).

A collective wood boiler located in one of the buildings ensures the production of energy for the entire site.

## Sustainable development approach of the project owner

Le Toit Vosgien has been involved for 20 years in wood and passive construction. This approach makes it possible to use local resources because forests cover 50% of the surface of the Vosges department. The performances achieved allow, in a territory with harsh winters, to generate significant savings in heating and therefore charges for tenants.

This logic of **wood construction + passive performance** is now available in a massive program of energy renovation of heritage dating from the 60s and 70s.

## Architectural description

The 3 buildings to be renovated had been designed with a simple architecture. These simpler shapes allow efficient thermal renovation to be offered.

The facade receives insulation from the outside made of wood wool insulation and wooden cladding or terracotta tiles depending on the exposure. The roof is replaced. The entrance halls are preceded by awnings to shelter tenants and visitors from bad weather.

The insulation is completed by cellulose wadding in the attic and the soffits of the low slag flocking floors.

The exterior joinery, which had been recently renewed, has been preserved.

With regard to energy systems, the high thickness of the facade insulation allows the ventilation ducts of the double flow to pass through them. The fuel oil boiler has been replaced by a wood pellet boiler 5 times less powerful.

## Building users opinion

The proposed architecture changes the perception of this building by outsiders. This is rewarding for the inhabitants of these buildings.

## If you had to do it again?

The concept is available in other operations on other buildings in the Toit Vosgien heritage. The insulation is carried out identically. Energy systems are being upgraded according to more efficient innovations designed by manufacturers.

## See more details about this project

### Photo credit

ASP architecture and Frédéric Mercenier



## Stakeholders

### Contractor

**Name :** LE TOIT VOSGIEN

**Contact :** Vincent Chevallier

### Construction Manager

**Name :** ASP architecture

**Contact :** Antoine Pagnoux

### Stakeholders

**Function :** Thermal consultancy agency

TERRANERGIE

Vincent Pierré

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**Function :** Company

BIELHMANN

large work lot

---

**Function :** Company

SERTELET

lot facade covering

---

Function : Company

ISOLECO

interior insulation package

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Function : Company

MCV

carpentry lot

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Function : Company

WATT AUTOMATION

electricity lot

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Function : Company

EURY

heating ventilation batch

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Function : Company

PPE

plasterwork lot

---

Function : Company

LAUGEL ET RENOUARD

Locksmith metalwork lot

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Function : Company

LENOIR

paint lot

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Function : Company

CAPTESPACE

TV access control package

## Type of market

Global performance contract

## Energy

### Energy consumption

Primary energy need : 47,00 kWhep/m<sup>2</sup>.an

Primary energy need for standard building : 100,00 kWhep/m<sup>2</sup>.an

Calculation method : RT 2012

Initial consumption : 400,00 kWhep/m<sup>2</sup>.an

### Envelope performance

Indicator : n50

Air Tightness Value : 1,20

## Renewables & systems

## Systems

### Heating system :

- Water radiator
- Wood boiler

### Hot water system :

- Wood boiler

### Cooling system :

- No cooling system

### Ventilation system :

- Double flow heat exchanger

### Renewable systems :

- Wood boiler

Renewable energy production : 100,00 %

[☞ chaudière aux granulés des bois](#)

Other information on HVAC :

Collective double flow ventilation. The ducts serve the rooms to be ventilated from the facade without having to create ducts inside the housing.

## Environment

### Urban environment

Land plot area : 4 600,00 m<sup>2</sup>

The building is located at the foot of a small town in a mainly residential environment.

The town center with all services and shops is 200 m away.

## Products

### Product

ISOLATION REPORT AND FACADE

ENTREPRISE SERTELET

Product category : Gros œuvre / Structure, maçonnerie, façade

The facade insulation was prefabricated in the workshop. Timber frame walls were prefabricated and fitted with the planned insulation. Handled with a mobile crane by sliding them between the original walls and the scaffolding, these timber frame walls were fixed by brackets. This organization has helped to reduce the duration of work on this station.



## Costs

### Construction and exploitation costs

Cost of studies : 87 000 €

Total cost of the building : 1 177 000 €

Subsidies : 316 000 €

## Health and comfort

### Indoor Air quality

Before the renovation, the dwellings were ventilated by means of static ventilation. The air renewal was therefore random depending on the weather conditions.

After renovation, double-flow ventilation ensures permanent air renewal in all the rooms.

## Comfort

### Acoustic comfort :

Building insulation improves sound insulation from the outside

## Carbon

## GHG emissions

GHG in use : 1,00 KgCO<sub>2</sub>/m<sup>2</sup>/an

Building lifetime : 50,00 année(s)

## Contest

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

- Renovation on an occupied site and with prefabrication of the elements (10 minutes of intervention per dwelling)
- Tenants' energy costs reduced by 10
- Widely replicable project
- Reflection on the production of heat from local energy: wood chips
- Biobased use: wood and wood wool, cellulose wadding, etc.

### Building candidate in the category



Energie & Climats Tempérés



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