Category : Eco refurbishment of a monastery into housing
Case study : Vaugneray

Project cofinanced by
European Regional Development Fund

Lead Partner
Provincia di savona

Sustainable Construction in Rural and Fragile Areas for Energy efficiency

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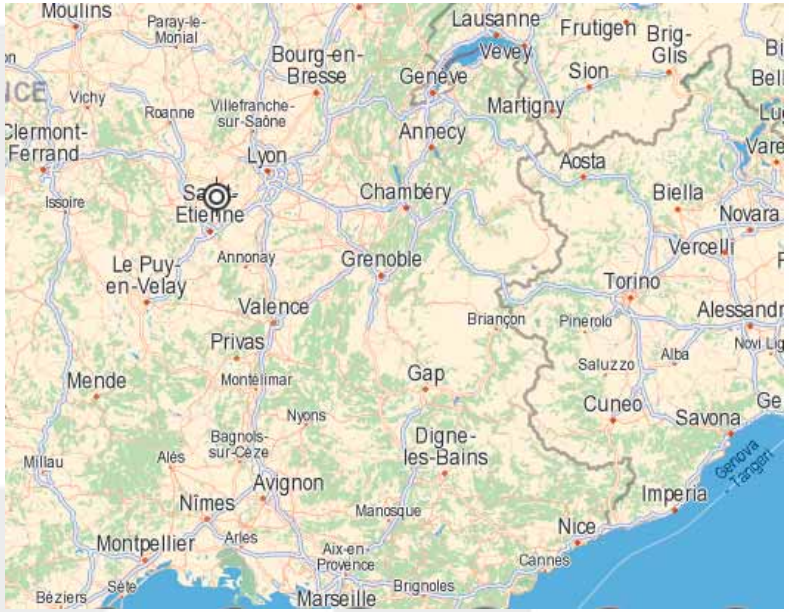
Project location



The Project is located in the west of Lyon, in the East quater of France, at about 20 km from city center. Vaugneray is 4 000 inhabitants small town spreading over 22.38 km². Project is located at 1 km in the North of the village.

The climate is continental with below zero temperatures in winter and high temperatures in the summer months (≈25 ° C).
The average rainfall precipitation ranges around 825mm/yr with peaks in May and during the fall months.
The major winds have North and South orientations (cold and dry from the North, hot and humid from the South.
The climate is inclined to a wide range of natural events, ranging from frost to snow to thunderstorms to fog and haze.

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Project goals

In 2005 the association « Domus Pacis » decided to sold the « visitation » monastery, built in the end of the sixties. In order to patrimony's conservation of this « Le Corbusier » style construction and to full fil the need of housing, the town of Vaugneray bought this building to create 28 flats.

To encourage mixity, the town wished to realise socials housing but also for people who are looking for homeownership. As a matter of fact, the town stay the owner, to manage the operational budget.

Environemental goals

First, the scop of the town was to refurbish the monastery, but no environemental approach has been thought. Major scale (enjeu) was the concrete frame which needex to be totaly rethought.

When they were loking for a design team, the town received a lot of ernetic improvement propositions.
But without experience in it, the town ask the help of a local association : « HESPUL », spécialist in renewable énergy, energy efficiency ans sustainable buildings.
Hespul helped the town to fill a regional invitation on energy efficiency. Once laureat, town folowed in this direction of energy savings.

In addition of the buildings team the town choose:
- Eco services to realyse a feasability studies about the use of renweable energy. (The conclusion leed to a wood furnace for heating and solar panels for hot water ;
-Enertech to validate the design team calculation, about all the eating and hot water production.

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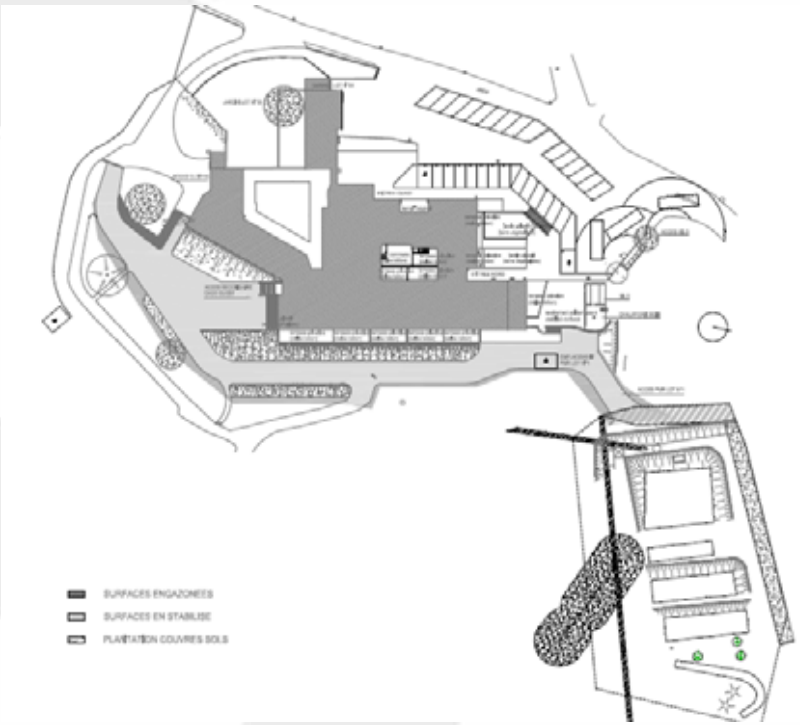
Project Détails



Project provide 28 apartment in 2 staiwells : (2 T1, 8 T2, 16 T3, 2 T4), on 2 980 m² or 1 744 m² (usefull).

Project is labeled Low Cunsumption Building (LCB) and has received the « Patrimoine Habitat et Environnement » certification which main caracteristics are :
- Exterior insulation,
- Wood furnace for heating,
- Solar panel for hot water,
- Local Grey water treatment and on-site infiltration of all rain water,
- Wood for solar protection in front of windows,
- Building envelope performance: U-value = 0,684 W/m².K, an increase of 4 of the existing building,
-Conventional cunsumptions : 77 kWh_{pe}/m^2_{shon}.an, an increase of 78% from existing building,
(kWh of primary energy and m² of net gross floor area)

- Air infiltration n_{50} (h^{-1}) between 1.93 and 4.51.
 - CO2 emisions : 7 kg_{eqCO^2}/m^2_{shon}.an

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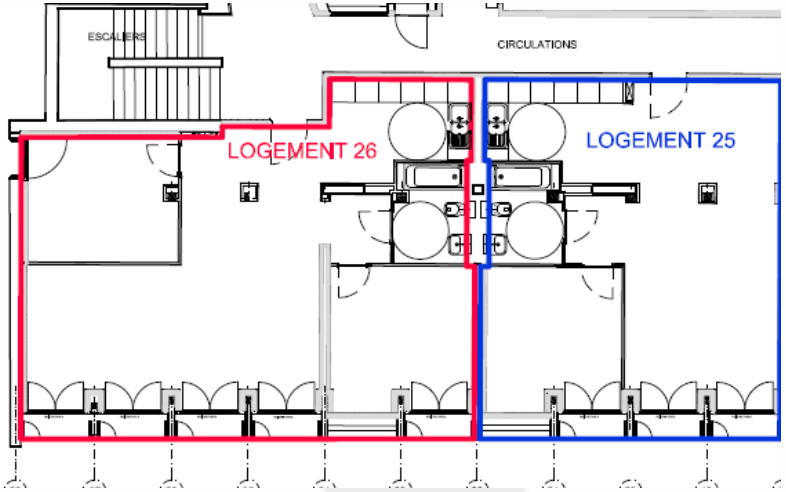
Détails du projet



Structure
Monastry was build in renforced concrete, partitioned in individual room.

Numbers of wall have needed to be cut and replaced by concrete post and beams.
Design team had to invent functional flat around these structural post.

Insulation
External insulation was recommended in order to stop « thermical bridges » and improved inertie of the building for summer confort.
Nevertheless west front was in stone cladding which have to be preserved.
That is why an internal and external insulation have been chosen.

Asbestos waste have also needed a specific treatment for elimination.

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Détails du projet

Insulation

External wall / West : 12 cm internal of glass wool;
External walls (E, S et N) : 15 cm external of glass wool;
Roof : 15 cm polyuréthane ;
Floor : 12 cm of expended polystyrene foam ;
Windows, double glazing : Uw = 1.6 W/m².K.

Heating

Wood furnace of 80 kW to cover 80% of heating needs, with the help of gaz boiler of 120 kW in case of low zero temperature.

A silo of 35 m3 has been implemented to store the wood chips.

Inside heating is provided by steel low temperature radiators in each apartment.

A heat meter is now in service shaft per unit.

Détails du projet

Hot Water
28 m² of solar panels branded Pellesol provides solar pre-heating.
A 60 kW gas boiler ensures the extra 2 balls in 1000 L.

A heat meter is present on the hot water inlet of each housing.

A counter is also provided on the cold water inlet of each housing.

Ventilation
Ventilation is single stream humidity controlled to limit the ventilation rates to damp rooms.

Lighting
Natural light in the corridors and artificial lighting with occupancy sensor and timer.

Exterior lighting is also connected to presence detectors and sensor twilight.

Détails du projet

Exploitation

Town will stay the owner of 13 homes, but will be part of the condominium and will have access to tracking actual consumption.

The various meters installed to track accurately the consumption of the units.

Raising awareness amongst users, tenants and owners

In the same way the town, part of the condominium, will inform and educate the people in the gestures eco citizens.
It is intended to provide a welcome booklet for each inhabitant.

The project was delivered in late July 2011.

Sustainable Construction in Rural and Fragile Areas for Energy efficiency

Project Financing

The budget for this operation will be removed from the budget of the municipality, with the aim to balance the budget.
The town has benefited from two types of support for this operation.
Aid for the realization of social housing from the state, region and community of municipalities: € 280 992;
Aid related to environmental performance from ADEME (state), the region, the department: € 107 336.

The Town, through its internal services sought, regional invitation to tender, to improve the project without jeopardizing the financial stability of the project. It was able to receive aid:
Low Consumption Building: Region and ADEME,
Wood boiler: association of department, Region and ADEME,
Solar thermal: Region and ADEME,
Feasibility study: ADEME.

Project transferability

This project was made possible by the openness and the willingness of municipal facilities. Team that has surrounded itself with various advisors and specialized consulting firms.

The impact of subsidies even if real, remains to be qualified, because it is less than 4% of the cost of the construction cost. The additional cost of energy efficiency and renewable energy is estimated at € 300 000, 11% of the construction cost. Return on investment shows an economy from the eighth year of operation on the assumption of higher energy prices by 5% per year.

If such a project had to be done today, no doubt the time and performance would be improved. Indeed, the project owner has integrated the environmental requirements during the design, it had to find new skills and methods of financing.
However, we must put the project in the context in 2005 - 2006, when issues of environmental performance were still restricted to circles of professionals and experts.

The town is rightly proud to offer high quality housing environment, low energy consumption and does not produce any waste water, all for a sale price below market.

The town hopes in this way, enable families to become homeowners and thereby affect the third lever of sustainable development through its social aspect.

Project cofinanced by

European Regional Development Fund

Lead Partner

- Province of Savona (ITALY)

Project Partner

- Region of South Aegean (GREECE)
- Read S.A. (GREECE)
- Local Energy Agency Pomurje (SLOVENIE)
- Agência Regional de Energia do Centro e Baixo - Alentejo (PORTUGAL)
- Official Chamber of Commerce, Industry and Shipping of Seville (SPAIN)
- Rhône Chamber of Crafts (FRANCE)
- Development Company of Kefalonia & Ithaki S.A. - Kefalonia (GREECE)
- Chamber of Commerce and Industry Drôme (FRANCE)
- Cyprus Chamber Of Commerce and Industry (CYPRUS)
- Chamber of Commerce & Industry Marseille Provence (FRANCE)

SCORE

Sustainable Construction in Rural and Fragile Areas for Energy efficiency