

- **Category : Sustainable renovation of public building**
- **Case study : Montaulieu district – redevelopment of the meeting room**



Project cofinanced by



Lead Partner



- Category : Sustainable renovation of public building
- Case study : Montaulieu : redevelopment of the meeting room

●●● Project situation

The geographical and human situation

The village of Montaulieu is located in Drôme Provençale, near to Nyons, and therefore on the northernmost edge of the Mediterranean region. Montaulieu is a typical hilltop village that forms part of the rural heritage of the Hautes Baronnies.



Montaulieu is located in an area where agriculture is declining leaving behind it plenty of space for the natural scenery to develop. The village is essentially built in stone and the renovation work done over the past decades has respected the local character. The rural architecture of Montaulieu has been preserved thanks to the efforts of elected representatives over a number of years. Stone has been used in restoration work which has been undertaken with discretion and sensitivity. Consequently, the village now benefits from an architectural unity that adds to the beauty of the site.

- Category : Sustainable renovation of public building
- Case study : Montaulieu : redevelopment of the meeting room



● ● ● Project situation

Its inhabitants are enterprising and several innovative activities have emerged there over several decades: the first organic baker in the region (Pain d'Epi), stand-alone solar panel and wind farm installations, the first research office in the Drôme in eco-friendly phyto-purification solutions (Aquatiris, M. Deconinck)...

The council elected to office in the 2007 elections bears witness to these initiatives and this commitment.

The objectives set for this project by the elected representatives.

The village council decided to redevelop a meeting room located above the town hall premises.

The elected representatives aim to make this a **project that leads the way in terms of environmental considerations**, while preserving the character of this rural building.

The renovation will employ eco-materials; renewable energies will provide all of the building's energy requirements: automated wood-fuel heating, solar-powered electricity supply. Educational aspects will be emphasised.

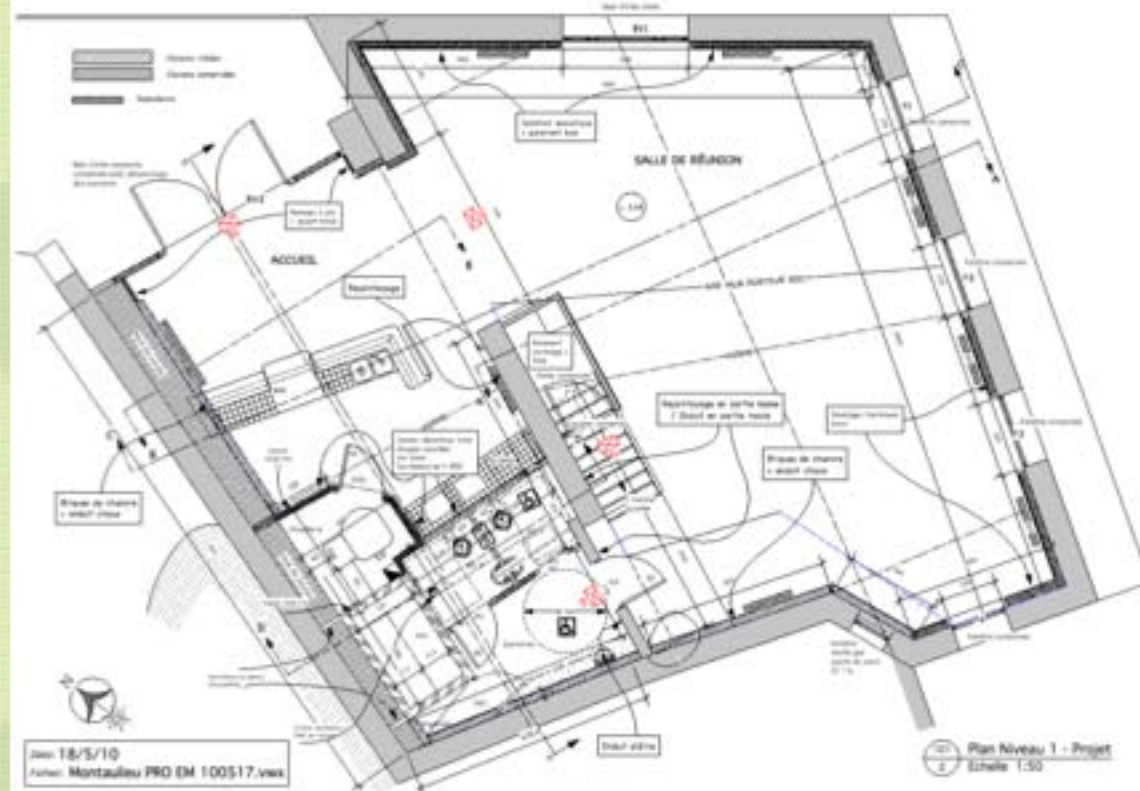
The climatic situation

Montaulieu is located at an altitude of 500 m, at latitude 44.21 N, in an H2 climatic zone

The climatic conditions are relatively harsh. Temperatures drop to -8°C in winter (basic outdoor temperature) [-21°C (minimum daytime temperature)], and climb up to 38°C in the summer.

The day/night temperature difference is significant, thereby allowing buildings to be cooled simply by ventilating the rooms at night.

- Category : Sustainable renovation of public building
- Case study : Montaulieu : redevelopment of the meeting room



● ● ● Project situation

The project: architectural and environmental objectives, the plans

This space designed for meetings and cultural events includes a large room, a foyer-bar, toilets and a boiler room. It is accessible directly from the outside and linked to the town hall by an internal staircase.

The size of the room will remain the same. The adjoining building houses the entrance-foyer-bar area as well as a boiler room and its silo (automatic wood-pellets).

The exterior access ramp has been updated: Wide steps with an accompanying ramp for pushchair and wheelchair access and deliveries to the bar.

Adopting a sustainable development approach, this project implements the following elements:

Respect for the historical and architectural context and the urban environment

Energy efficiency: significant improvement of the insulation, lighting

renewable energies for the production of heat (wood-energy) and electricity (solar panels)

materials that have a positive impact on the environment (insulating materials that come from agriculture...)

reduced sanitary impact (VOC-free paint...)

water savings (economical taps + upstream water pressure reducer)

improvement in noise absorption with a floor treatment and the installation of absorbent walls and ceilings

- Category : Sustainable renovation of public building
- Case study : Montaulieu : redevelopment of the meeting room



● ● ● Detailed description

The initial state of the building; diagnostic assessment

The building was a barn. In 1993, initial works were carried out and the town hall was established on the location.

The layout of the meeting room on the first floor was prepared for future development. During this initial phase of works, they were only able to create the openings and fit the double glazing.

The building is made of stone, in a rustic style that is secure. Set on a rock base, there are no cracks; it is well-preserved. The bedrock protrudes into the room itself: these protrusions are features that are enhanced in the project. The interior stone wall will be repointed with lime mortar; the concrete parts are rendered with the same mortar.

The existing floor must be reinforced to bear the load when it is used by the public: the metal beams rest on the central load-bearing wall (on the ground floor) and the outer walls support joists and a floor of wooden boards: the lighter solution.

The existing wood joinery is preserved. A glass bay-window has been added to the North-East facade.

The roof is retiled with interlocking aged mission tiles.

A central solar panel has been installed: the panels are fitted on the roof and in the form of a peak on the south-east facade that shelters the windows of the room from summer heatwaves. The panels of the peak are semi-transparent: from below, one can spot the characteristic shape of the solar panels. This enhances the educational impact of the project and simplifies its appearance.

- Category : Sustainable renovation of public building
- Case study : Montaulieu : redevelopment of the meeting room



●●● Detailed description

The project's guidelines

Energy efficiency

The insulation is treated on the different walls using organically sourced materials.

For the floors, the noise and thermal insulation are enhanced by pouring bulk boon (hemp bark shavings) in between the joists. The roofing is insulated with 240mm of hemp wool protected on the underside by a 40mm insulating and absorbent acoustic panel made of non-flammable rockwool.

The walls are treated in different ways:

Most of them are lined with 120mm of hemp wool and a 13mm plaster panel protecting the insulation from fire.

Some of them get an interior covering made of openwork larch slats, that absorb noise: behind this covering is a 60mm layer of non-flammable rockwool that will protect the plant-based insulating material from fire.

Lastly, some walls are very pronounced batter (they are leaning): they will be lined with hemp and lime-based insulating bricks, coated with a traditional lime and sand-based render: this material follows the contours of the wall while preserving the authenticity of this old building.

The lighting is provided by fittings that use fluocompact bulbs with the exception of several points that have low-voltage halogen lamps (bar).

All the spaces except for the toilets (located in part of the adjoining building) are bathed in natural light.

- Category : Sustainable renovation of public building
- Case study : Montaulieu : redevelopment of the meeting room



● ● ● Detailed description

The quality of the air and the sanitary impact

Given that the materials used come from agricultural sources that only receive minor transformations, their production uses little grey energy. They are totally renewable and recyclable after use.

They regulate the temperature as well as the humidity: the walls breathe and the air retains a level of moisture that is pleasant throughout the year.

The type of treatment applied to the walls results in flexible and agreeable acoustics: an essential quality of a space intended for human relations.

The paintwork has a very low VOC rate (1g/l for the paint, 5 g/l for wood treatment products).

The floor is made up of tiling in the entrance-foyer and the toilets and lino in the meeting room. The adhesive used does not compromise the quality of the air inside.

The bar furniture switches between tiled masonry work benches and solid wood fixtures (oak). It includes sanitary facilities and lighting.

These materials are noticeably robust and hygienic.

- Category : Sustainable renovation of public building
- Case study : Montaulieu : redevelopment of the meeting room



●●● Detailed description

respect for natural resources

The overarching idea of the project owner as well as the architect regarding the management of natural resources makes no exception regarding the respect for the water supply, of course. All the plumbing fixtures have an automatic flow restrictor or timed control.

Renewable energies

The central heating system installed will also be used by the town hall, on the ground floor, which has had its insulation improved with the lining added to the outer walls as well as the first floor. It is provided by a boiler that uses wood pellets, stored on site in a 3-cubic-metre silo.

The solar water heating system was not installed: the quantity of hot water needed is relatively low given that the bar is only used occasionally. An instant 15 l electric heater is enough to produce the small quantity of hot water required all year round. With this type of use, a solar-powered tank must be maintained at the right temperature all the time and the electricity used to complement the solar power would exceed that used by the instant electric heater.

The village council decided to take the extra step of compensating for its electricity requirements by producing solar power. As a result, a diagnostic assessment was carried out to work out the building's potential.

Given the orientation and the barriers to light caused by neighbouring constructions, an area in which to install the station was defined: 3 mini-stations will have to be created, with a total power of 6 kw for 47m² of solar panels.

The south-west-facing sections of the 2 roofs that cover the building will be equipped with solar panels as well as a peak that will extend beyond the roof, to emphasise the building's educational aims: this element will be clearly visible.

- Category : Sustainable renovation of public building
- Case study : Montaulieu : redevelopment of the meeting room



● ● ● Detailed description

The financial result

This operation was budgeted according to very stringent guidelines.

The General Council of the Drôme financed 80% of the project within its strategy for preserving community life and activities in rural environments. The village council put forward its own funds of about €50,000. The production of solar power will form part of the village resources.

The budget for the operation had been estimated at €195,000 ex. VAT during the pre-planning phase, excluding unforeseeable costs (€226,000 ex. VAT, project management included: architect and research centre costs, technical checks and H&S coordination).

The tender for businesses resulted in a market price for the works of €192,813 ex. VAT; Unforeseeable works that were added during construction work led to an overall budget of €208,551 ex. VAT (€1,390 ex. VAT/m² net surface area including the insulation of the outer walls on the ground floor and the central heating of both levels and the solar power station). The overall budget for the operation amounts to €240,527 ex. VAT, €31,976 ex. VAT of which is for the management of the project (architect + engineering calculations + health and safety + building control).

Works lasted for 8 months.

- Category : Sustainable renovation of public building
- Case study : Montaulieu : redevelopment of the meeting room



● ● ● **Project assessment and potential transferability**

Successfully running such a project requires a special effort from those involved. Fortunately the project owners can count on some experienced project managers, architects and research offices.

The training and motivation of businesses to work in the area of environmental quality is growing year on year. Construction materials that were only available in exceptional cases a dozen years ago are now supplied by most building material merchants, and specialised wholesalers are emerging that provide both materials and information.

Consequently, it is now possible to run construction sites with high-quality environmental standards from the design, supply and financial points of view.

It must however be kept in mind that these are recent developments in expertise (even if some skills such as the lime-based renders have a long history). Project owners and managers must pay close attention throughout the process to avoid returning to old ways whenever a problem is encountered: use of "conventional" adhesives for example, treated wood instead of naturally durable essences, paints... This means that the project manager must know how to anticipate and sometimes demand that businesses stick to specification documents.

Suppliers and businesses have developed skills, but are still unused to employing more natural and less harmful products on a systematic basis: the will to move forward and, above all, due care and attention are still required to catch up.

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 (SLOVENE)
- Agnôcia 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 & Itaki S.A. - Kefalonia (GREECE)
- Chamber of Commerce and Industry Dordne (FRANCE)
- Cyprus Chamber Of Commerce and Industry (CYPRUS)
- Chamber of Commerce & Industry Marseille Provence (FRANCE)

