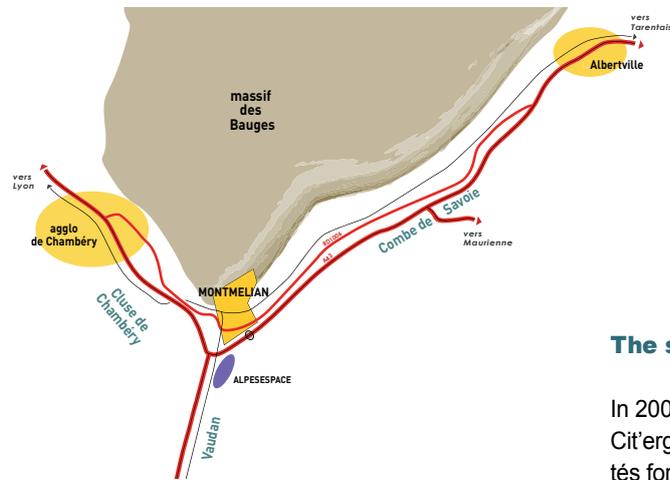




'In the sunshine of course'

Montmélian and its future Triangle Sud solar area

Montmélian is a town of 4,000 inhabitants, situated at the strategic crossroads of the Alpine furrow, at the intersection of the Combe de Savoie, the Cluse de Chambéry and the Grésivaudan valley, where roads and motorways cross, but also railway lines.



The smallest town with a Cit'ergie label

In 2007, Montmélian was awarded the European label Cit'ergie, the European energy award, by Energie-cités for the demonstrable and exemplary results of its Energy-Climate policy. Today, after the Creation of its 2007-2011 programme, the town has renewed its commitment with Cit'ergie. Montmélian is a pioneer in this field, its solar commitment was already made more than 30 years ago. The town has 1.564m² of thermal solar panels, equivalent to 390 m² per 1.000 inhabitants, which is ten times more than national average that is 32 m². Furthermore, 87 kWp of photovoltaic are installed on public or private buildings for lodgings or activity sectors. Since 1983, the town swimming pool has been heated by solar energy. In its town planning document (Land Use Plan), approved in 2012, the Planning Directives imposed for all new constructions, including town ones, a principle of energy efficiency that is 20% higher than the thermic regulations in force with 50% of its primary energy supplied by renewable energy, giving priority to solar energy.

The Town has also directly involved its inhabitants through a pedagogical approach. The objective of the municipal policy is for the town to be at the heart of a collective awareness of environmental issues. By positioning itself as an experimentation area for new solar technologies, Montmélian wishes to demonstrate that a small town can be a motive force to develop these renewable energies.

A great urban and environmental ambition: the Triangle Sud project is continuing with these innovation dynamics

For its new Land Use Plan, the town has fixed the objective of welcoming new inhabitants and answering the future need for accommodation. Along with a certain number of sites undergoing urban renewal, the Triangle Sud has confirmed itself as a future urban development area with strong environmental ambitions: to construct an area, including a network of solar heating, supplying 80% of thermal requirements.

The pre-operational urban study of the design of the whole of a new area of 800 à 1.000 lodgings was launched in 2012 on this basis.

A preferential area for urbanization

This hub position gives the town a key role that is both central and structured on a local scale. However, the town's population has remained stable since the 1980's: the town has a large amount of council housing (40% of the total accommodation) and aims, by means of new residential developments, to stimulate population growth. The SCoT of Métropole Savoie, a planning document, identifies Montmélian as a 'small town' with a railway station, facilities, services and shops, with a large employment sector nearby (the Business Park Alpespace is situated less than 2 kms away). For this reason, Montmélian has to make it a priority to accommodate additional inhabitants. This future vision has been included in town planning for several years when the Triangle Sud sector was classified as a future urban development area during the zoning ordinances of 1982. Building land is almost entirely managed there.

The study was entrusted to the LIEUX-DITS group (mandated architects-town planners), PROGRAMMES-URBAINS (urban programming and setting up operations), TECSOL (solar energy), MDP (transport engineering by cable), INDDIGO (heating network expertise), HIS&O (hydraulics), H. SAUDECERRE (landscaper).

A partnership with INES (National Institute for Solar Energy) has been set up for the SDH plus programme (Solar District Heating). It associates Solar heating network experts, and regional partners who do not have this network, with the aim of developing these solar applications.

50% of the people who worked on the study were less than 38 years old. The team's town planner coordinator was 34 years old.

'In the sunshine of course'

A site to be rebuilt: where the town extends to the plain

The project concerns the Chavort plain, forming a triangle to the south of the town's territory between the river Isère and its alluvial woodland, the road (RD 1006) with an A road status and its associated constructions, and the municipal boundary, edged by the railway embankment.



The site viewed from the fort.

This site of about 20 hectares is the main building land reserve of this town of 565 hectares with mountain areas (eastern edge of the Bauges massif) and hillsides of vineyards (appellation area for Savoy Wine). The Triangle Sud is also in a strategic position for enabling Montmélian to evolve and develop its image as a town and a strategic urban area, displaying its innovations on the edge of the RD 1006. Today this road by-passes and isolates the old medieval town, the main areas and the existing public amenities.

This opportunity for new positioning brings with it a considerable problem of liaison:

- with the current centre of gravity of the town which requires 30 m of slope to be crossed (hill corresponding to a former glacial moraine in the valley of the Isère) ;
- with the Alpespace business park (2.000 employees which is situated on the left bank of the Isère).

It is essential to link these 3 entities in order to succeed in adding this future urban area and presents a considerable challenge as far as mobility is concerned. It is a question of ensuring accessibility to the multimodal area and particularly Montmélian train station (more than 100 trains per day travelling to and from Chambéry and Grenoble).

In its current form, the site juxtaposes spaces (tenant farms, allotments), or facilities (sports field, municipal swimming pool, authorized sites for New Age Travellers etc) and various constructions.

At the same time as this eclectic angle, the very close proximity of the Isère provides it with a strong identity with a riparian forest along the embankment and remains of alluvial woodland, the carving of paths that were formerly associated with former displacements of the river bed in the incredible setting of the Combe de Savoie with views of the Belledonne mountain chain, the massifs of the Chartreuse and the Bauges, and the Mont-Blanc.

Despite the part of undeveloped land, this site is logically a place for renewal and urban rebuilding because of the considerable usage that is made of it (frequent intercommunity use of the swimming pool, the rugby pitch, and footpaths on the edge of the Isère).

Summary of the main challenges in urban design and landscaping:

- extending the town down to the river Isère including the succession of north-south transitions (land model, road crossing, link with the Isère and functional link with the business park);
- reorganizing the urban facade of the RD1006

road (entrance to the town and handling different sequences, safe mixed use of the road area by the different means);

- make the banks of the Isère a vast landscaped leisure area, including the natural dimension, and also improving the usage of the sports facilities;

- create a graded road network separating the residential buildings with progressive views along the park, with a height difference and enhanced by a South facing aspect.

An original design approach

The aim of including a network of solar heating in this future area required studying the means of doing this with the multi-profession team and working with the town, therefore, first and foremost, necessitating study on the technical dimension to really define the solar energy requirements (m² of panels), storage between seasons and the associated network in order to reach 80% of energy needs.

Whereas more generally the technical approaches, superimpose on the urban and landscaping approach, taking the edge off certain solid development principles, in the case of this project, the town planning work was integrated well in advance into the technical approaches in a well-proven way so as to strengthen and develop an overall environmental coherence. A real commitment to composition and programming has emerged from this process.



An environmental and social commitment objective 80% of solar energy

The objective is to obtain a level of solar energy (balance between solar production and needs in heating and domestic hot water) of around 80% with accommodation at an attractive price.

The technical choices involved

- the buildings will be constructed and designed to be equipped with fields of solar captors (orientation, limited shading, type of roof);
- the performance of the buildings must be increased to limit heating requirements: objective RT 2012 - 20%;
- the high rate of solar energy will require setting up storage to transfer the high level of solar energy in the summer period to winter heating requirements;
- the size of the captors + storage should enable the objectives fixed to be reached by phasing the construction;
- the setting up of a heating network by sharing the energy production equipment will enable an optimization of the installation. The network must function at a low temperature;
- the urban density must be increased to optimize the heating network;
- the phasing of the construction will require a 'decentralized' network architecture to enable each of the phases (equivalent to a building of 150 lodgings) to be autonomous.

For a cheaper stable energy bill

The Town wishes to obtain:

- an acceptable heating cost (100 € / MWh) that is to say inferior to the national average for energy consumption for lodgings;
- a cheaper and stable energy bill guaranteed over 20 years for occupying tenants and owners.

This requires an original and new operational set up in which the solar installation cost is incorporated in the development. The building land will therefore be sold 'heated' to the developers and landlords. The balance sheet for the operation has been studied and balanced with this approach in view.

To fulfill the aim of the project, it seems the most appropriate solution will be for the development operation to be directly managed by the town by means of an urban development zone.

Including solar storage in the urban landscape

The question of urban storage for the system remains a major constraint: the storage tank necessary for a building of 150 lodgings would be 6.000 m³, the equivalent of a 3 storey block. Casing solutions can be envisaged (a tank incorporated in the centre of a multi-storey car park or a climbing wall) as it is not possible to bury it because of its proximity to the water table.

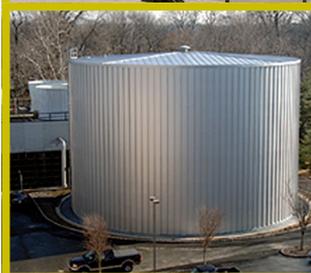
However, another possibility has been evaluated consisting of storing the energy by geothermal probes: the principle is to transfer the heat at a high temperature (95°C) underground (to a depth of between 30 and 100 m), during the period of high production (in summer) and to recuperate it in the period of low production (in winter). The heat is recuperated at a lower temperature (between 65 and 25°C). A heat pump is therefore necessary at certain periods to take advantage of the recuperated heat. This solution seems to be an economically good one for handling the energy, but its feasibility will depend on future studies and hydrogeological and thermal measurements.

Principle of the solar heating network per building

Energy production is ensured for each building by means of a field of captors. The solar energy is transmitted to the networks, so as to supply all the buildings. A central boiler room, per building, supplies the additional energy. The excess energy, that is not used by the buildings, particularly in summer, is stored.

The elements in this solution are (per building):

- a heating network supplying each lodging via a sub-station and functioning at temperatures between 45°C (return) and 70°C (outgoing);
- several solar collector fields installed on the roofs of the buildings and directly connected to the extra heating system. Estimated surface 10 m² / lodging;
- a heating solution for backup heat;
- Inter-seasonal storage of a Thermal Tank Heat Storage (TTES) type. That is to say in a exterior tank/silo: estimated surface 38 m³ / lodging;
- A sub-station per building consisting of a storage tank for domestic hot water.





'In the sunshine of course'

An urban programme taking up the challenge of increasing the attractiveness of Montmélian's peri-urban area

Through the urbanization of the Triangle Sud, the town wishes to offer an attractive and alternative urban proposal that does not overlook the requirements of households preferring detached houses, whilst at the same time measuring up to the environmental challenges: controlling land use, energy saving, reduced travelling, consideration of the overall cost of the development... from this a programme has been developed that is adapted to the particular characteristics of Montmélian within the Combe de Savoie.

A complete housing offer

The diversification of accommodation in Montmélian involves developing – in a town where 40% of its accommodation is council housing - a proposition of private and tenant home ownership. The challenge is also to propose, between classic detached houses that are too space consuming and residential buildings (already well provided for in Montmélian), new types of intermediary housing.

This diversity of housing provides a favourable context for continuing to encourage social diversity enabling everyone to find accommodation adapted to their needs and means.

These housing proposals owe their attractiveness to the services and amenities which are also provided. The project will develop:

- a central local retail area enabling future inhabitants to find their local shops nearby;
- an alternative transport offer: the project is only convincing if it is possible to walk or cycle to the central part of the town historically situated on a hill with a railway station and numerous facilities. The first phase of the project, at the foot of the slope, has a town lift. Its feasibility in terms of investment and functioning was evaluated in the study;
- an economic programme: Montmélian has for a long time been an active town that has more jobs than working population. To maintain this equilibrium the project envisages 6.000 m² of tertiary activities along the RD 1006, thereby handling noise constraints;
- additional public facilities. By the swimming pool and the sports fields, the town plans to build a new gymnasium along the RD 1006, the town's sports showcase. These facilities will be installed in the park on the edge of the river Isère with the main aim of being available to everyone. Apart from these elements connected with sport, the park also aims to provide varied facilities: playground and walking areas, community gardens etc.

Work with Montmélian's inhabitants now and tomorrow...

In line with its environmental commitment, the town is considerably implicated in its social policy where inhabitants live in harmony together.

This particularly concerns the installation of effective public amenities made available to numerous cultural associations and sports clubs that ensure that the town has a real influence on the inter-community level. This attractiveness that does not yet exist with regard to housing, is already well in place as regards its cultural and sports dimension and its citizen spirit.

During the preparation of the town planning document (2010-2012), the town actively consulted the inhabitants and the representatives of the associations.

This attentiveness to citizens views was naturally extended to the development project for this future solar area to live in. Firstly, meetings were organised with the clubs and associations who use the stadium and the football and rugby pitches. It was in fact essential to know the opinions of the main users of the existing sports facilities, as they will be altered in the plan, to enable them to be installed in the park on the edge of the river Isère, with the idea of providing easy access and quality surroundings, with shared amenities and safe traffic flow.

The municipal elections in 2014 have necessitated putting this dialogue with the inhabitants on hold. But workshops should be organised from spring onwards to gain a better understanding of the innovative nature of this future solar area. The intentions is to discuss this technical approach with the largest number of people as this will have important repercussions on everyone's ecological commitment and the long-term energy bill of households.

The town also wants the inhabitants of Montmélian today and tomorrow to be able to reflect on the finer points of the different residential buildings and the park on the edge of the river Isère and open up this dialogue with the inhabitants of the other communities in the Combe de Savoie and to voluntary self-promotion groups.

*Pour un quartier
où il fait bon vivre,
sous le soleil
évidemment.*

*'For an area
where it's
good to live in
the sunshine
of course'.*

*Béatrice Santais
Députée - Maire
de Montmélian
Mayor of Montmélian*

