

DE BONNE DISTRICT – GRENOBLE

1. GRENOBLE BASIS : TOWARDS A SUSTAINABLE CITY

Make advantages from constraints

Grenoble, a compact city without available spaces

Main metropolis of the French Alps, located at the foot of the Vercors, Chartreuse and Belledonne Mountains, Grenoble is a compact city in a dense populated area, surrounded by nature. The urban challenges are promoting a less space consuming town planning, while harmonizing new urban design with older forms, irrigating the heart of the city with soft and clean transports, developing a clever architecture that is able to reduce energy consumption.

In the early 19th century, Grenoble was little more than an ill-assorted military stronghold bursting at its seams. The first Roman ramparts, then the wall built by Lesdiguières in the early 1600s, and finally the fortifications erected in the 19th Century all gradually disappeared, swallowed up by the town and digested by the city's exponential growth. It took till the middle of the 20th century for the population to reach 100.000 inhabitants. In the next three decades, the number rose by a further 60.000 inhab. The result is clearly apparent : urban development completely fills the valley bottom. The sense of limitation now concerns the whole conurbation and its 450.000 inhabitants.

The necessary regeneration of the town on its own roots

Regeneration of the town on its roots, tackling the environmental issues are the challenge the city has to face from decades. The aim is to grasp what makes Grenoble a genuinely contemporary town, in step with the 21st century. Grenoble is taking part in the never ending process by which a city regenerates itself on its own roots, with the willingness to realize a sustainable city, a place which fulfills our needs and desires without jeopardizing the environment.

Whether the purpose is to build new homes, fight social exclusion, retrofit housing, create jobs, open a garden or enhance our heritage,... it is up to architects and planners to turn these projects into real achievements, harmonizing new urban designs with older forms, rooted in place and history.

Urban regeneration is always torn between preserving the past or satisfying present needs. Urban planning in Grenoble try to make a balance between clear and rebuild, reconnect and refurbish, reveal and notice.

Some former military or industrial urban wasteland represented an opportunity to adjust the overall balance of the town. The aim was not just to produce floor space but to foster new links between neighbourhoods, open new parks, mix various communities... and finally create places where people can live and work.

Among these projects, de Bonne former barracks refurbishment is a good example of the process. The City of Grenoble has experimented on de Bonne in terms of functional and social mixity, what will be, tomorrow, its future built-up urban area.

2. DE BONNE DISTRICT : 1st FRENCH ECOQUARTIER

Old barracks transformation into an eco-district

De Bonne scheme prime objective was to enlarge the town centre by rebuilding a whole district of the city (8,5 hectares of military wild land available after the army left in 1994) with its own shops, restaurants, offices, public spaces, infrastructure and amenities, with an exemplary architectural and environmental high quality approach. Of the old barracks, the project has kept the elegant main courtyard and the three buildings overlooking it. These have been converted into flats and shops, but all around them a new landscape is taking shape, surprising for the diversity of its materials and colors, the co-existence of contrasting forms, the design of certain facades... and the arrays of roof-mounted solar panels. There is a sense of restraint, a determination not to overdo things, and to generate a nice diversity in the different architectural style.

De Bonne project's ambition was to create a self-sufficient energy district with renewable energy production, (from sun, ground, water..) and energy efficiency of the buildings.

The project (which was part of the Concerto European Initiative launched under FP 6 frame) targeted in 2004 an energy consumption level of maximum 75 kWh/m²/yr, far better than national Thermal Regulation. Some buildings are complying with the new Thermal regulation RT 2012 (60 kWh/m²/yr for Grenoble).

The project rely on a new mobility concept, turned toward public transport (3rd tramway line) and bicycles lines and pedestrian comfort.

The district is also characterized by the richness of social and activities diversity : 850 family housing units, (40 % for social housing), a school built in wood, a home for the elderly people, two student residences, a hotel residence and 15 000 m² of shopping malls and offices, an experimental art film theatre and 5 hectares of urban parks and gardens in the heart of the district.

De Bonne area is now a entire neighbourhood, well connected to town historic centre. De Bonne became a national showcase since the refurbishment of De bonne area receive several Prizes (a lot of visitors from France and abroad are visiting the area).

Key figures :

- 900 family dwellings, of which 40% social housing
- 5 hectares of public parks and courtyard gardens
- a shopping mall with 53 retail outlets (La Caserne de Bonne)
- 5,000 sq m office space, including a positive-energy building with 1,600 sq m floor space (Bonne Énergie)
- a bioclimatic school with 16 classes (Lucie-Aubrac)
- a home for 80 dependent senior citizens, with adjoining residential accommodation (Maison du Bois d'Artas)
- 2 student residences (CROUS and Lamy)
- a home comprising 24 flats for disabled young people and adults (Les Loges)
- an art house cinema (Le Méliès, three screens)
- a hotel-residence (Résidhome Apparthôtel)
- a four-star hotel
- a gourmet restaurant

Dissemination of the lessons learned

The ten years of de Bonne project was a great jump forward for city planning in Grenoble. A lot of lessons learned during this process have been shared with all stakeholders (from decision makers, planners to construction firms and end users) and spread to other projects.

Evaluation studies, monitoring of the building's energy consumption, relation with inhabitants performed after the commissioning of de Bonne buildings are really instructive for the stakeholders involved in the process and also for national stakeholders of the construction sector.

Since De Bonne, all urban projects in Grenoble are taking into account social and functional diversity, environmental issues (not only energy matters), but also the importance of the management process, without forgetting the aim to provide inhabitants a better town to live in.

3. DE BONNE DISTRICT – ENERGY ELEMENTS

" Le quartier de Bonne, à Grenoble, a réalisé une première sans doute mondiale sur un plan fondamental : le suivi très serré de ses performances énergétiques. De ce point de vue, il rend un immense service à la communauté des acteurs de la ville qui, loin de se contenter d'un simple affichage, visent l'excellence en matière d'économies d'énergie dans les bâtiments et les infrastructures." La Revue Durable n°45 – Avril/Mai/Juin 2012.

Presentation : Towards a selfsufficient energy district

Final energy consumption :

- heating : 50kWh/m²/yr
- hot water : 20 kWh/m²/yr (without solar system)
- outhouses electricity : 10 kWh/m²/yr

The technical spécifications requested (1st part) :

- Exterior insulating system
- Energy-efficient glazing
- Absence of thermal bridges
- dual-flow ventilation system
- 9 small cogeneration modules developed for the production of electricity and heat from natural gas (GEG production)
- 1.2 m² of thermal solar sensors per flat unit to cover 50% of hot water needs

The energy wipe

In 2003 the ENERGY wipe has been added to the Zac de Bonne project. At that time nobody in France was taking into account energy efficiency in building construction. In order to get expected results, a technical team was gathered. It has supported, guided and helped the designers. Targeted goals in 2003 were half of the assigned requirements for new building construction at this time ! De Bonne is a laboratory in which the whole Zac de Bonne buildings are prototypes. A monitoring was done to learn widest possible lessons with all due humility. Accepting unsuccessful operations as teaching may help everybody move forward.

Lessons

1. One of the most important lessons we should keep in mind is that anticipating consumption is seducing but remains an illusion and is not realistic. For example, the calculation of heating final consumption depends on parameters that designers would never control : the meteorological data, heating temperature chosen by occupants, real ventilation rate, wind scheme and consecutively air leakages, household electric consumption.
2. One of the most important point we should keep in mind is that final performance will rely on a large number of parameters going from designers and equipment maintenance to users' behavior and construction quality.
3. Finally the last batch of lessons concerns the actors of the building sector :
 - it is necessary that designers substantially change habits, accept to ongoing education about energy performances, and play a more active role on building site
 - the quality of work of construction companies must matches the intended goals (regarding energy performance) : for examples a high quality must be in the laying of outdoor insulation or in the installation of dual flow ventilation system.

4. DE BONNE DISTRICT – PROJECT'S PLAYERS

PILOTS

- GRENOBLE CITY

The City of Grenoble is committed to reducing energy consumption, encouraging the use of renewable energies, promoting social solidarity, setting up alternative forms of transport that reduce car-dependency and developing High Environmental, Architectural and Urban Quality (HQEAU). As a major player in the Local Climate Plan, the city is striving to reduce greenhouse gas emissions locally. To reach its objectives, Grenoble is implementing a range of actions: a local urban development plan that focuses on maintaining a compact city, drafting a HQEAU guide, drawing up specifications within the framework of public development operations, the creation of a biennial sustainable habitat event, etc.

- SEM SAGES

The SEM SAGES is a semi-public company specialising in urban development within the City of Grenoble and acts as an operational partner to the City for all town-planning matters. Since 2001, it has been committed to implementing high-quality environment, architecture and urban development objectives. Public and private promoters must work to specifications drawn up by the SEM. This makes it possible to monitor issues relating to environmental quality, the integration of projects into the environment, the running of clean worksites and the management of high-quality public areas and parks. Today, all SEM SAGES constructions are equipped with outside insulation and use renewable energies, especially solar power.

DESIGNERS

- PROJETS URBAINS DEVILLERS ASSOCIES

The agency was create in 1990. She is divided in two areas : town planning and architecture. She is engaged for a long time in virtuous practices for sustainable development, in town planning and architecture areas. Her knowledge increase continually in several projects scales, from town scale to building. This agency is achieving in this time two Ecocités and nine Ecoquartiers, which deal with various strategic subjects about sustainable development : ecomobility, shared parking, alternative energy production and control, smartgrids, alternative drainage, water cycle, ecobuilding, carbon balance, inhabitants participation, social mix, new centrality...

- AKTIS ARCHITECTURE URBANISME

The agency was also create in 1990. AKTIS's way to work integrates environmental challenge. For example, AKTIS considers that the link with environnement is essential to avoid urban sprawl, which generates disparities and costs. The agency deal with the challenge of energy savings. She considers that her job has human, social and cultural responsibility.

ENERGY PLAYERS

- LOCAL ENERGY AGENCY

The Grenoble conurbation local energy agency (ALE) is involved in a range of actions geared towards sustainable development: lending its support to districts, social housing lessors and other Local Climate Plan partners (help with the drafting and assessment of their action plans), conducting awareness and information campaigns about the challenges and solutions relating to energy control and the environmental quality of buildings and, finally, informing the general public.

- GAZ ELECTRICITE DE GRENOBLE

For several years now, Gaz Electricité de Grenoble has been setting up actions to promote energy savings, focusing in particular on decentralised electricity production and renewable energies (8 small hydro power plants built), the development and operation of cogenerators and the production of photovoltaic electricity. Its involvement in sustainable development is reflected in its green electricity offer, the benefits of which are appreciated by the Bastille cable-car company among other customers. Gaz Electricité de Grenoble is also paving the way for the future by taking part in the MINALOGIC and ENERRDIS competitiveness centres.

- COMPAGNIE DE CHAUFFAGE

The Compagnie de Chauffage has joined the Local Climate Plan approach and is carrying out targeted actions on its production resources in order to limit CO2 emissions: increase in the wood combustion capacity of the Villeneuve boiler plant and capacity for household waste recycling in its incineration plant, leading to optimised combustion of household waste. Furthermore, the Compagnie de Chauffage has also committed to taking part in diagnoses aiming to rationalise its customers' use of energy.