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Bordeaux Saint Jean Belcier project, toward a desirable sustainability

The public institute development Bordeaux Euratlantique (EPA) has been created in mars 2012 as the urban developer of the National Interest Operation which bears the same name (OIN). The OIN aims to reshape a strategic territory in Bordeaux metropolis given the arrival of several high-speed railways connecting Bordeaux to Paris, Toulouse and Spain.

The project is spread on a perimeter of 748 hectares with the ambition to realize 1.055.000m² of housing and 790.000m² of business blocks and equipments. The urban development plan is engage in 4 urban areas. The first developed area was **'Bordeaux Saint-Jean-Belcier' around the train station.**

Both precursor and demonstrator, this project lead by the urban planner 'Reichen & Robert and associates' with his construction manager team, lay the foundations for a 'sustainable land renewal' as it was wanted by the urban developer.

This project is in keeping with the orientations of the 'sustainable territory renewal charter' as they were shared with Franck Boutté Consultants Agency over it sustainable urban development assistance and the public institution of whom the main stake was to 'create a low-carbon territory with high added value'.

The EPA settled an ambition to not exceed energy regulatory performance, currently only design for buildings, but to extend this performance over a territory level. This bigger scale decreases more effectively the carbon footprint of all users and inhabitants within sectors in process. Alternatives mobilities, shared supply or buildings and public spaces Life Cycle Assessment are necessary levers to an actual low carbon project.

Carbon sobriety of the territory is specifically aimed. Even though this sobriety is a large part of the project, it has to go with other fundamental stakes such as: the quality of the living framework with a strong expectation on high housing/offices quality, the reduction of the environmental impacts through a risks and negative effects management plan, a solidarity with existing building lots.. But this stake is not achievable if it prejudices attractiveness territory. It must compromises with the territory potentialities and constraints to actually creates a sustainable city. The project is indeed over a **complex territory** with specific features (the Garonne river, the future train station, land holdings in progress close to the city center) and marked by urban and social diversified contexts (Soil and noise pollution, water flooding..). **Every ambitions and actions have to adapt to each and every new urban or property project.**

bordeaux euratlantique

This project takes place on 144 hectares around the 'Bordeaux Saint-Jean' train station. It is therefore representative of the urban renewal that will show how to limit urban sprawl tomorrow. It opens possibilities to create a city over the city already on site that benefits from virtuous transport connections while also having environmental annoyances known as : soil and noise pollution or water flooding alike most cities nearby rivers.

Create a city over the city with such program as 740 000 m² of housing, offices, equipments, hotels within this specific area, represents a real challenge in term of urban development as far as it has, despite its constraints, to create a competitive real estate project over the local market.

The sustainability comes from the project ability to adapt to these specific situations and to define itself according to strong environmental constraints, environmental and energies ambitions not see as brakes or additional cost but as an attractive value.

This very pragmatism defines the ambition of the project. The EPA has aims a 'low carbon territory' from his site constraints and advantages in order to improve the entire area attractiveness. The 'Saint-Jean Belcier' project, by its urban, landscape and architectural aspects, offers a unique living environment because the low carbon challenge achievement means a desirable living framework.

VIP (Vélocipede Inter-modality Pedestrian)

In spite of the population doubling due to the project development, the urban public developer wants to increase alternative mobility versus individual car use.

Supported by a tramway and a public transportation network, the project develops an urban shape toward a "city of short distances" where density distribution and public spaces development turn pedestrian or cyclist journey very pleasant. This unique mobility approach has been named VIP (Vélo Intermodalité Piétons / Velocipede Intermodality Pedestrian).

The VIP is indeed a structural itinerary for pedestrians, cyclists and buses that serves the entire project area and offers different panoramic views over the river.

The connection between the VIP and inhabited areas (called 'domaines') goes through an itinerary that looks for offering a pleasant journey thanks to unique landscape and various atmospheres transforming the 'no car transport' enjoyable.

A shared network of ground floor or silo parking lots participates in using personal car more reasonably. This choice of 'aboveground' parking lots also helps to avoid underground spaces in a polluted soil.

Positive densities

To create the city over the city, the project has to be relatively dense. Around the Bordeaux train station, this density has to include four key measures :

- Reusing building materials from their own area that will permit to distinguish densities.
- The establishment of a landscape pattern from the planted urban square to the vegetated park opened over the river, surrounded by the VIP and offering a natural urban cooling.
- The optimization of vertical densities protecting the 'right to the sky' for everyone, already well recognized in Bordeaux through a principle of stratification which limits building emergences and shadows by placing them in the strategic spots.
- High quality housing offer (Large apartments, Generous outsides, flexibility, ..)

An energy strategy, ambitious by its realism

This fair density, tends to limit the urban sprawl and participates in reducing the cost of public equipment within a network. As for the public transportation, the energy network becomes possible. This is how the project will generate an urban heating network (heating and domestic hot water) which permits reusing heat from the incinerator in Bègles lost over the past. This heating network participates in supplying a very large part of the urban project. (75 % of the project - excepted Amédée-Saint-Germain's domain, which is too far away from the network and only provided by bridges that appeared after a real estate transaction - the RCU covers 95 % of needs of the operational areas center). It creations can also provide every districts in Bègles Garonne, the sector in process, as well as existing city parts that could be connected.

On a building scale, the project aims to master energy consumption. In France, it has been proved that a majority of building with energy efficiency pushed beyond regulatory showed gaps between studies goals and real consumption.

For this reason, the EPA directed the researches toward actual efficiency for its urban recommendations: it is about making sure that what is decided, according to preliminary studies, is the closest from field consumption in order to master energy bills.

In that purpose, each stakeholder should get together and:

- Insure a design monitoring assessment and include behavioral drift in an early stage.
- Train companies for the construction site and particularly small companies in the field of energy efficiency control such as air-tightness.
- Enable users to get informed about the various consumption categories and through a pedagogic program to assess and correct building consumption two years after the project handover.

Experiments and 'high added value' studies

The actions previously mentioned are completed by experimentations and investigations in progress to compete the low carbon program:

- Experimentation of a 'Smart Grid' on the building lot named « Amédé-Saint-Germain » including mix programs. The stake of this experimentation, already on an advanced stage, is to reach an energy and electric needs disappearance within acceptable conditions for the market. The project offers several additional actions to achieve this goal:
 - o A local production – storage - consumption strategy that decreases electric power needs and promotes low carbon solution
 - o Develop energy sobriety leading architecture adjustment and building guideline according to climate conditions
 - o Create favorable conditions for the emergence of an 'energy manager' service allowing a strategic scheme toward live energy planning via digital solutions
 - o Give a live consumption monitoring to users

- Another experiment, which participates in the low carbon stake, is also in current progress. It concerns wooden construction with the local sector (Pin des Landes) which today is not really structured for the building market. It is a major territory challenge in order to develop a new market. The EPA, through a exemplary operation with a local real estate owner, tries to show it is possible.

- Other studies are in progress to implement an alternative strategy for:
 - o Develop shared logistic solutions for construction sites supplies including sea and river transportation modes.
 - o The use of low carbon building materials provided by local stakeholders.
 - o Enhance shared technical system (water, trash, parking) or shared services and facilities. (Platform to manage trashes or soil pollutions.)

Concerted governance

Carrying ambitions as strong as those we just exposed requires the implementation of a monitoring plan which will allow to set up and realize these ambitions both with rigor and flexibility helping adjustments throughout its various phases.

The governance and assessment plan are based on :

- A steering committee to approve the great orientations and asserts a political support of the low carbon territory.
- A committee to insure a monitoring according to a methodology setting global stakes and the responsibilities of the different stakeholders - from an early stage until the building life time.
- A real dialogue about the project which associates the citizens to the various achievements
- Finally, and over a wider scale, the monitoring of the project through a 'sustainable city observatory' allowing both evaluation and corrective measures.