TOMORROW'S BUILDINGS: ADAPTABLE AND UPGRADEABLE?

As illustrated by the example of 22@Barcelona, modern business districts are following a trend towards a certain number of common values: density, diversity of activities, with the accent on services and the knowledge economy, revitalisation of public spaces and green spaces, quality and sophistication of infrastructures, mobility and social desegregation. The aim is to create a dynamic, convivial and lively environment, by facilitating interaction and co-operation between professionals, both on the site and externally, by encouraging communication with the neighbouring urban areas and between the different stakeholders, and by strengthening for the latter, a feeling of belonging and pride in being an employee, resident or user.

In brief, quality of life, good governance and participative management, openness towards others and towards the world at large, along with economic efficiency, form part of the basic recipe for success. In addition, they contribute to promoting a sustainable architecture and urbanisation movement more respectful of the physical and human environment. This is true irrespective of whether the business district is managed partially or totally by a private company, such as Morgan Stanley in Canary Wharf or Abengoa in Seville, or a by public body such as the EPAD at La Défense.

This is the context already mapped out for the building of tomorrow.

NEED FOR CHANGE

The prospect for imminent climate change forces us to plan for taking corrective measures, notably in terms of cutting greenhouse gas emissions. As it stands, the building sector is one of the planet's biggest emitters. Accordingly, in Australia, the industry accounts for 23% of the country's total emissions. To a great extent, this is largely due to amount of energy it consumes. Therefore, the highest priority has to be to act in this area where major opportunities for improvement exist.

In Australia, for example, a reduction in commercial and residential building energy consumption of 50% by 2030 (and of 70% by 2050) not only appears achievable, but also profitable. Simple improvements to buildings' energy efficiency would result in cutting the sector's energy bill by between 30% and 35% between now and 2050. That would produce a GDP increase of around 38 billion Australian dollars (~22 billion euros) a year and would result in full compliance with the target set by the Kyoto agreement for Australia, at almost zero cost.

However, to fully understand the challenge, we have to consider the question of energy from all its aspects:

- ***Production methods***

Centralised or not? If they are not, is there a body to co-ordinate or supervise the various producers?

- ***Energy sources***

Cost, efficiency, availability of the various sources, taking account of the entire life cycle for each type of energy.

- ***Distribution circuits***

Distribution wastage, network coverage and flexibility, connections with offshore production sources.

- ***Consumption levels***

Differ between sectors, types of buildings, activities and management modes (somewhat decentralised in manufacturing, often the opposite in services); data available currently imperfect, notably in terms of different users in the same building.

In respect of the measures to be taken, they can be divided into two categories: passive measures and active measures. Here are a few examples:

- ***Passive measures***

These relate to building architecture and site organisation. In Seville, for example, Abengoa has placed emphasis on compact buildings with large and similar sized platforms. This encourages air circulation and creates an environment where the ambient temperature remains stable, without as such increasing energy consumption. Moreover, the buildings are oriented and located in relation to each other to create the maximum amount of shade. For sun protection, they have double-cladding of varying formats, depending on the building façade. In fact, in office buildings, it is the cooling system rather than the heating system that consumes the most energy. Patios are planted with deciduous trees to create a refreshing microclimate and cool the atmosphere. In winter, after the leaves have fallen, the bare trees allow natural light to enter the buildings.

- ***Active measures***

These relate to energy, heating or cooling production: solar, heat pump, hydrogen cell, convection, etc., the choice of systems and appliances, along with responsible behaviour on the part of users.

OBSTACLES TO CHANGE

Even if everyone is now claiming to be prepared to combat climate change , sometimes we observe very slow progress towards actual achievements.

In fact, existing building were not designed with this issue in mind. At best, adapting them is costly and, at worst, extremely difficult. In any event it is not very profitable. This gives rise to the second issue: the return on such investments only becomes apparent in the medium term, while enterprises are generally faced with more immediate demands for profitability. Finally, there remains the issue of employee and user behaviour. They are often reluctant to any change whatsoever, out of fear of losing out in terms of comfort or seeing their daily tasks becoming more complicated.

MOTIVATIONS AND OBLIGATIONS TO CHANGE

Some enterprises, such as Szencorps in Melbourne, or business districts, such as 22@Barcelona or Seville Abengoa, are taking the initiative to build modern, adaptable and upgradeable buildings. They derive a host of benefits from such buildings: improved image with employees, users and the public, higher real estate values and rents, ease and comfort of use, lower running costs.

The role of national government, local authorities or bodies in charge of developing business remains nonetheless vital for generalising initiatives and ensuring the transfer and sharing of best practices around the world.

Accordingly, in France, following the Environment Summit (La Grenelle de l'Environment), the Existing Buildings Operational Committee made a building energy diagnosis obligatory prior to any rental contract, along with the publication of the level of greenhouse gas emissions in public buildings. In addition, energy consumption in buildings is subject to a pro-rata tax, from which owners or tenants can sometimes gain exemption if they adopt energy savings measures.

If it wants to keep ahead of the field and attract the most dynamic enterprises and the most creative employees, the building of tomorrow has to be adaptable, even modular and upgradeable, in relation to the emergence of new technologies, new uses or new needs. Moreover, it must be highly energy efficient, low polluting, comfortable and easy to use. It is at this price, and only at this price, that it will be able to survive obsolescence and guarantee its sustainability.