

Urban Studies have traditionally paid little attention to urban projects implemented in small cities. The debate is usually based on what happens in large cities. However, now we claim to the small, we take medium-sized cities into consideration because this is the city of the countryside, where more than 60% of urban population of the world live (UNESCO Chairs Programme, CIMES). The urban project we submit to the 10th European Urban and Regional Planning Awards 2013-2014 is the Gardeny Hill Special Planning Area (PCITAL, for its acronyms in Catalan): the Lleida Agri-food Science and Technology Park Development Plan, Lleida (Spain).

The city of Lleida has a population of 140.000 people and the metropolitan about 250.000. It is one of the medium-sized cities that make up the urban network that sustains the rural territory in the hinterland. The city is located along the same route Barcelona and Madrid are to be found, in the Ebro river corridor. It is the central place of the largest agricultural area of Catalonia. Despite it is not one of the largest metropolitan areas in Spain, it is the reference and passage point from the coast inland. Lleida's economy is based primarily on agriculture, which had a boom in the early twentieth century due to the construction of an irrigation system that turned the traditional dry land into an irrigated land.

In 1996, the closing of the barracks located in a plateau, the Gardeny hill, enabled an urban project to promote the economy of the area by upgrading a science park based on agricultural and food economy of the region. The topography and landscape of the hill gave this project an exceptional urban significance. The city of Lleida is located in a vast plain by the Segre River, at the foot of two plateaus. The Seu Vella hill, around which the city was built up, and the Gardeny hill, which during the second half of the twentieth century hosted the barracks. The outline of the city is dominated by these two platforms. The longitudinal section of the city becomes its spectral signature. In the largest plateau, with the bell tower and cloister still standing, we can read the passage of time, as well as the hopes of the future.

The Park planning and construction has been an ongoing process: in 1999, with the back-up plan (the Specific Plan), and in 2013, with the Gardeny Hill Special Planning Area and the definition of the final urban planning strategy. The project was based on two strategies, which set the pace of the whole process:

- The purchase of the Park and its public management
- The will of the project is to be energetic and environmental sustainable.

The City Council purchased the Park in order to avoid urban speculation and involve private investments in innovation and construction activities of the Park. The development of the Park according to sustainable environmental and energetic criteria meant to be an exemplary approach to an agricultural type of economy that respects nature. This is why they decided to:

- Protect and reuse cultural and military heritage, both the archaeological remains from the seventeenth and eighteenth centuries and modern facilities,
- Renovate buildings according to sustainable principles, using passive methods and renewable energies.

The first action was the renovation of a set of buildings in the shape of H (PCITAL) according to bioclimatic principles. To accomplish this objective, the open patios transformed into greenhouses in order to create an inner microclimate; the buildings were wrapped with a system of adjustable slats to regulate sunlight and ventilation of the façades; thermal inertia increased by insulating the outer walls and improving thermal exchange between the building and the patios; the roof was turned into a water tank to provide the ceiling with thermal inertia and insulation; cross ventilation was upgraded to have a better ventilation in the buildings; high-quality hermetic seals were installed to avoid thermal leaks; were used and rain water and water from condensation were collected in buried tanks to water plants and humidify the air in the Summer.

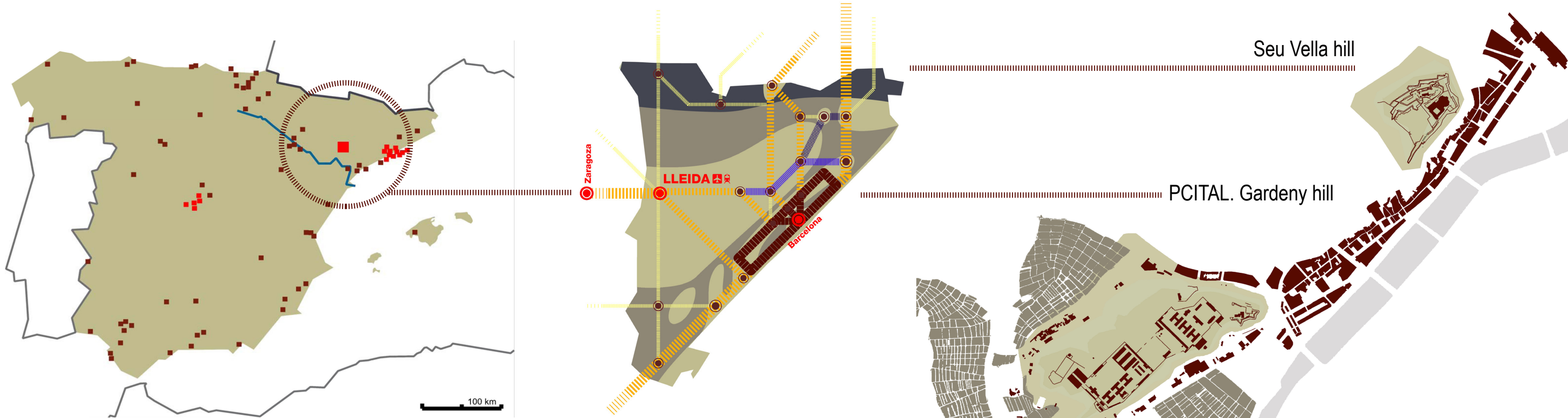
After ten years working on the Park without a definitive urban planning project, the Administration commissioned us to design the Gardeny Hill Special Planning Area to provide the project with a final perspective.

- To begin with, three questions should be resolved:
- How a Science Park should be from an urban point of view
  - How the environmental sustainability and the energetic efficiency criteria must be implemented.
  - How the hill should be designed from a landscape perspective.

In the last years, eighty Science Parks have been promoted in Spain, with diverse goals, solutions and results. However, there has not been any study on these experiences. Thus, the first task was to analyse those parks and draw conclusions that could be useful for the Gardeny Hill. The extensive-growth pattern Science parks used to follow has been left behind. Today, a more compact design prevails, similar to the one implemented in the technological districts developed in obsolete industrial areas.

The Science parks size is decreasing in order to adapt the facilities to the capacities of each area. The occupation is no longer measured by the potential development, but the positions and the relation floor space/worker (nowadays, the average is 28,83 m2). Specialization is still essential, but it is necessary to be receptive to other scientific fields and activities to enlarge opportunities and enrich the whole park. In short, nowadays parks tend to be more compact and more complex. Nevertheless, most forward-thinking parks appreciate more other immaterial aspects, such as the name, urban planning and the value of the site.

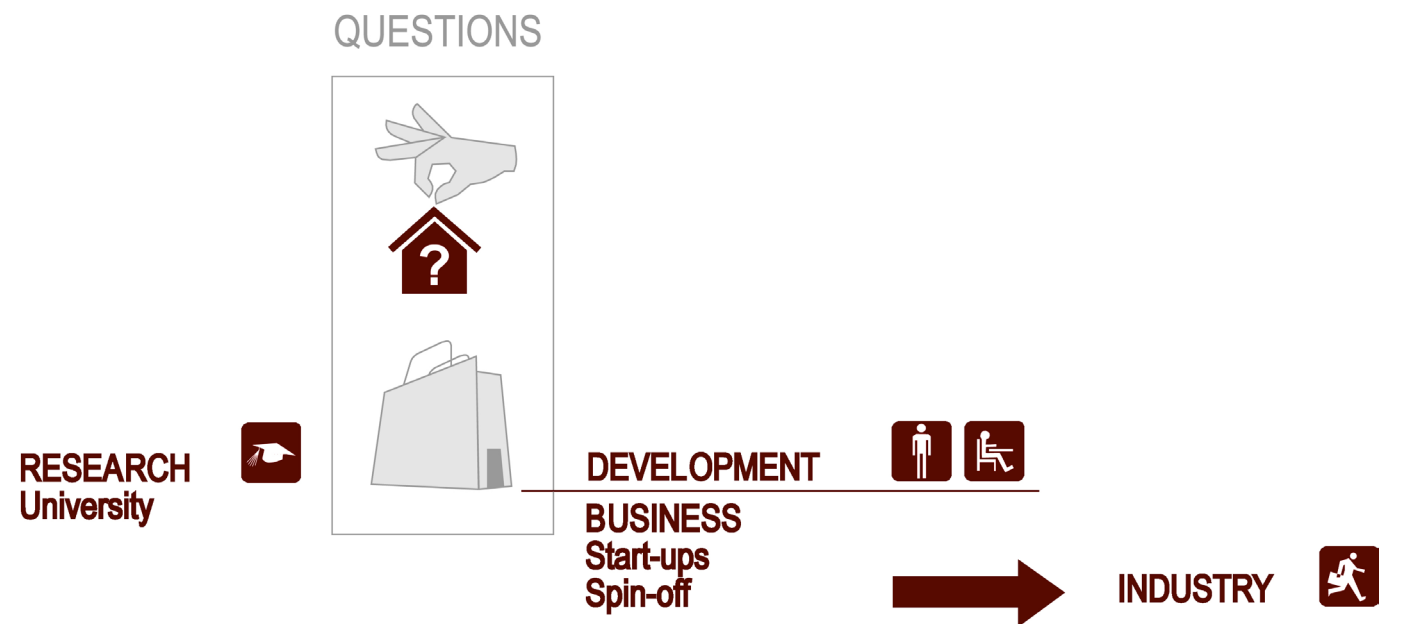
From the beginning, the environmental and energetic concern has been there, due to the scientific nature of the park and the exemplary purpose of the project. The final draft of the Plan takes a step forward on the Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.



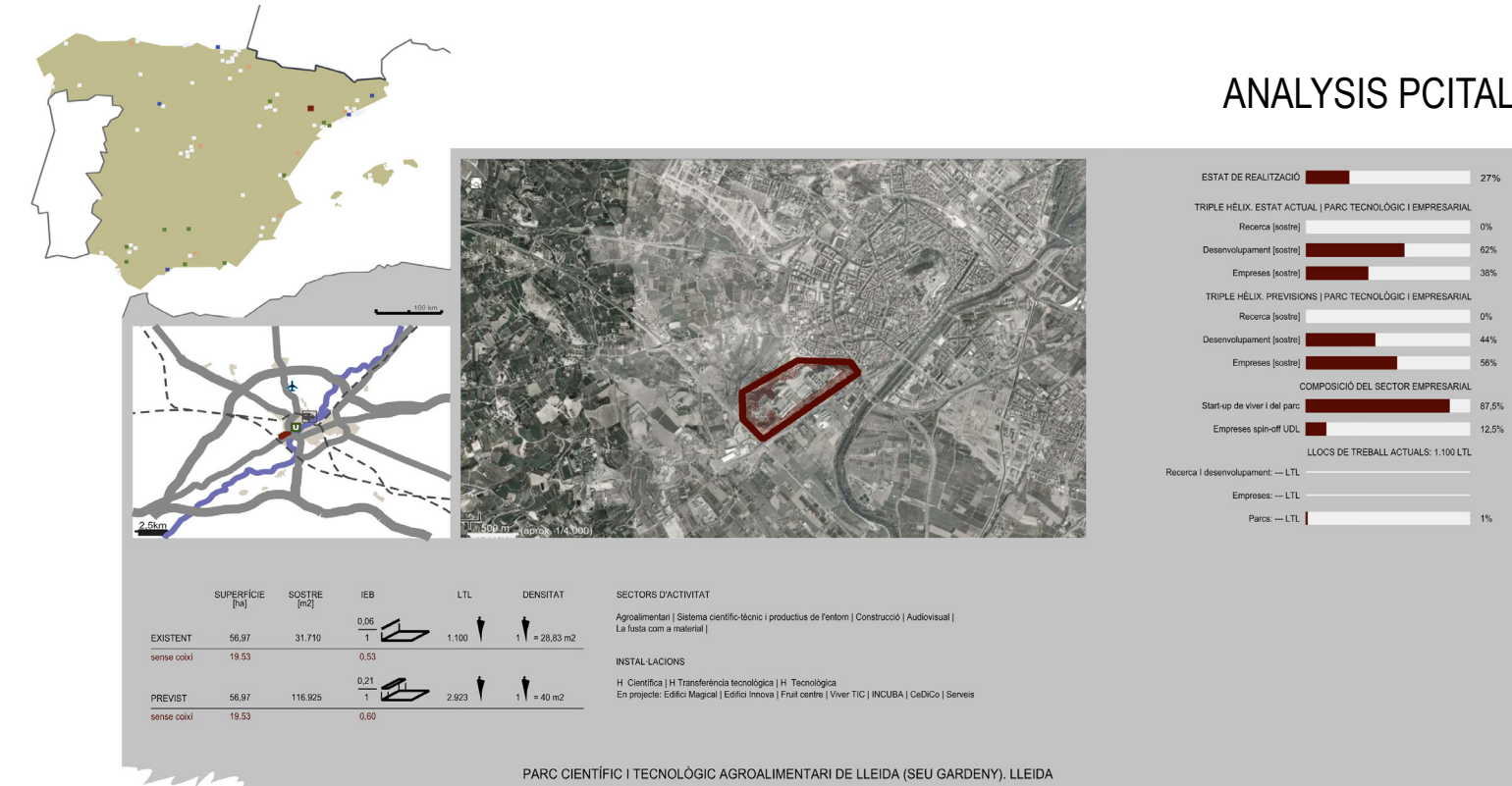
Garden Hill Special Planning Area (PE)  
The Lleida Agri-food Science and Technology Park Development Plan, Lleida (Spain)  
Lleida's economy is based primarily on agriculture, which had a boom in the early twentieth century due to the construction of an irrigation system that turned the traditional dry land into an irrigated land.



The project was based on two main strategies: the purchase of the barracks, and the creation of a Science Park run by the Public Administration, following energetic and environmental sustainability criteria.

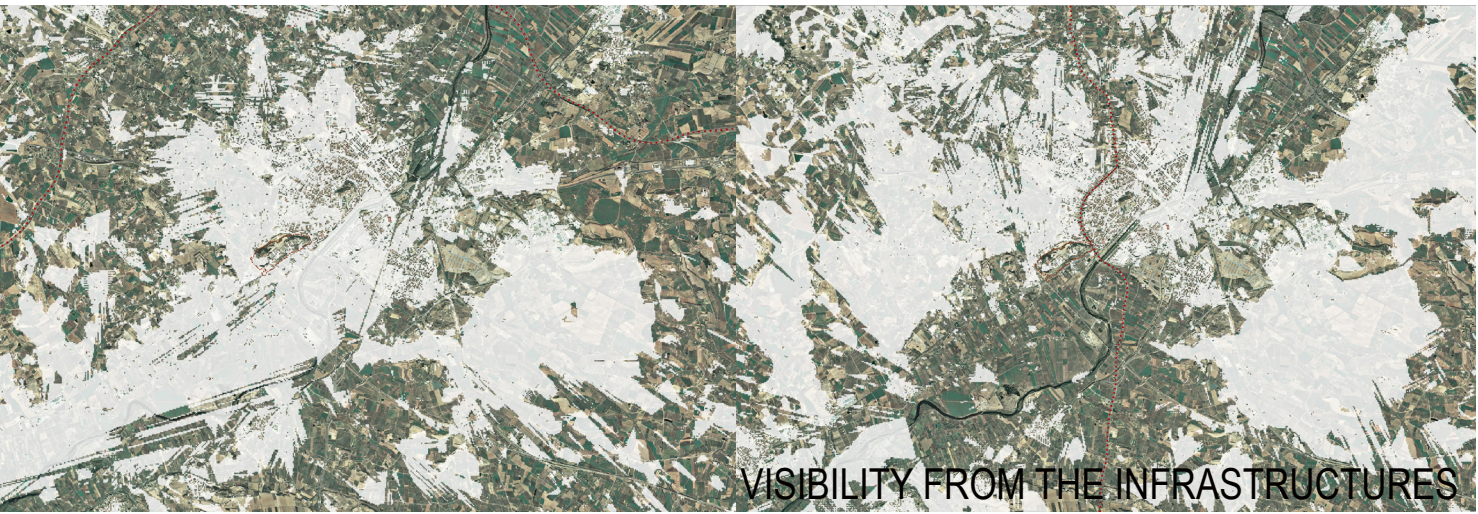
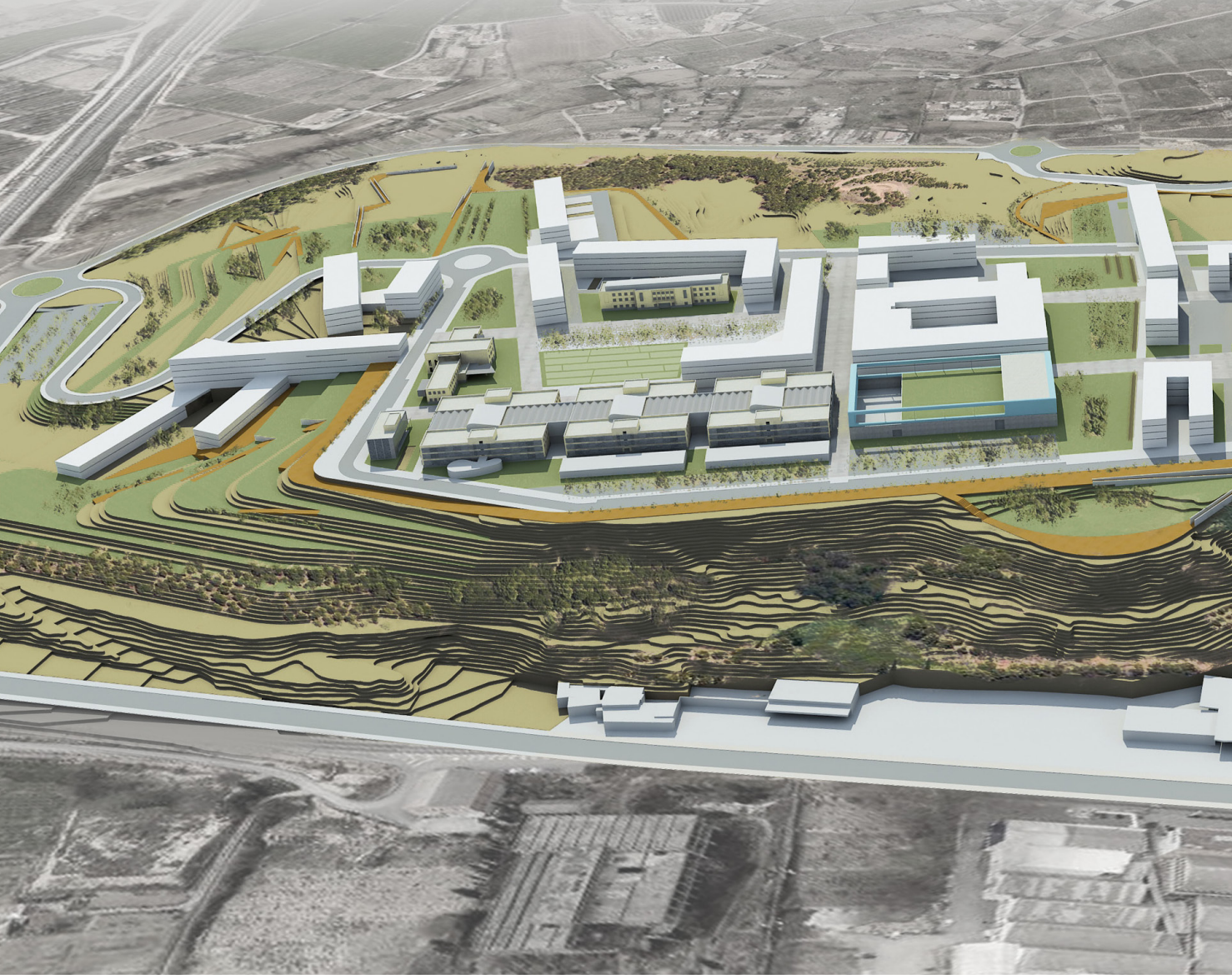
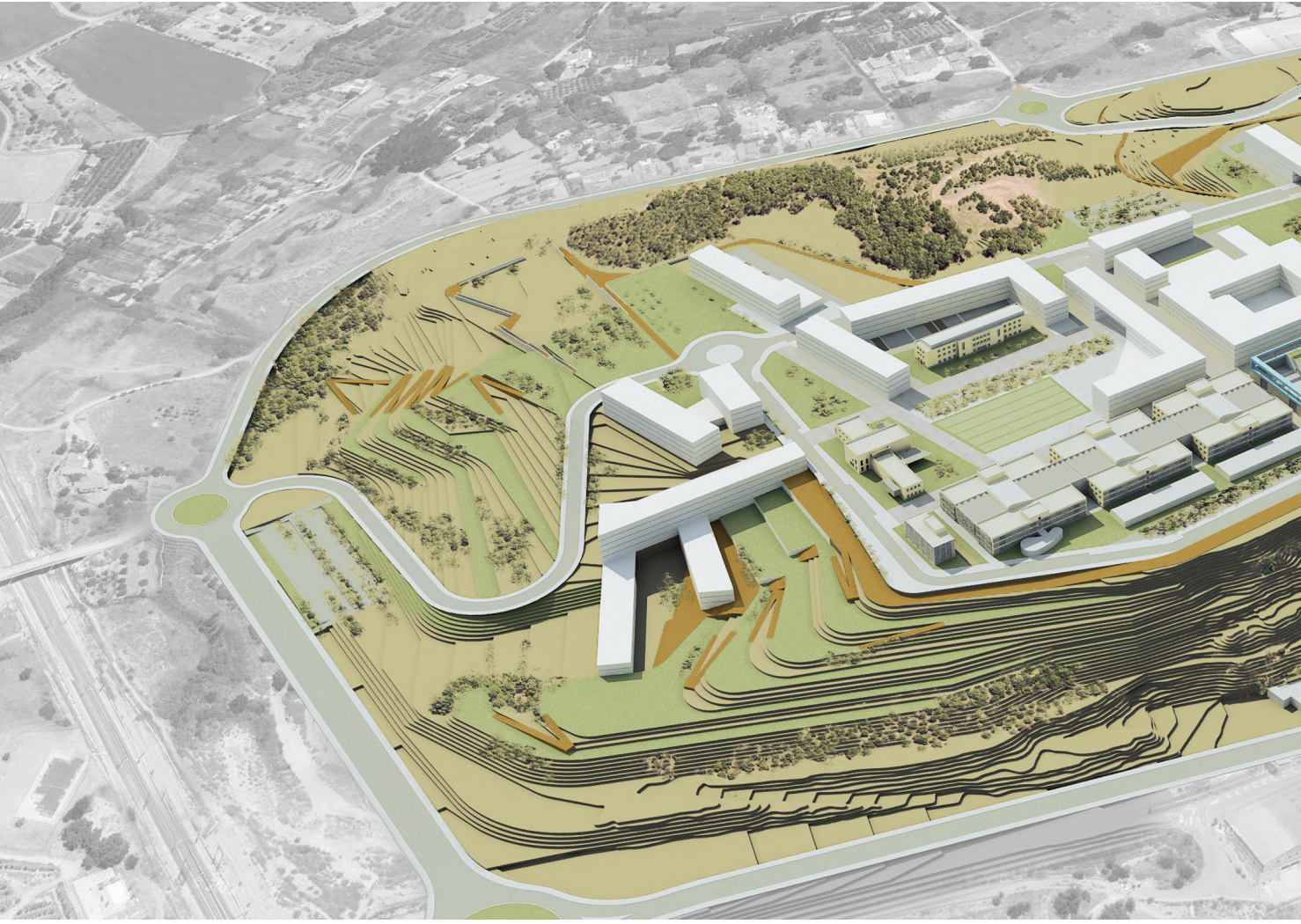
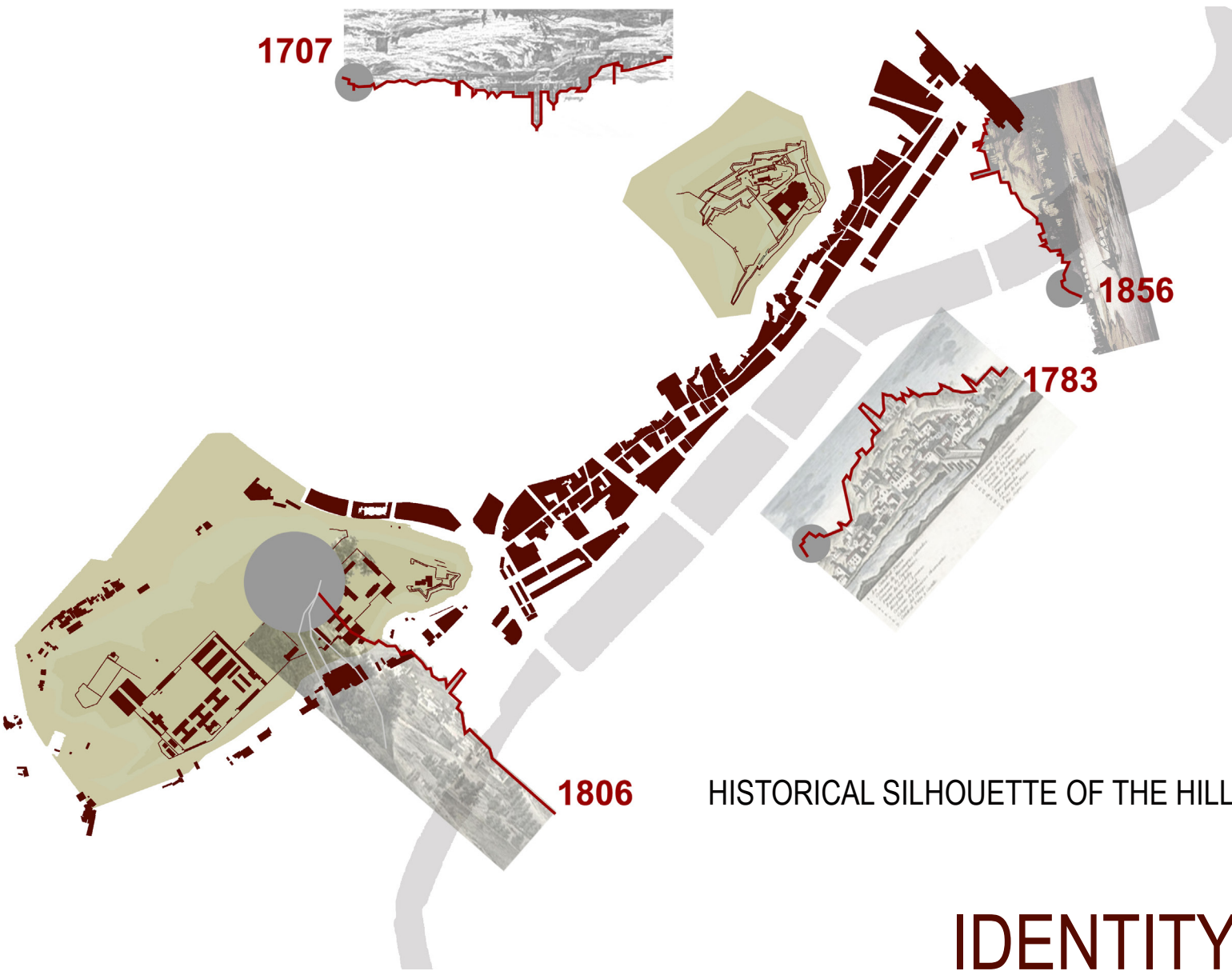


To begin with, three questions should be resolved: how a Science Park should be from an urban point of view, how the environmental sustainability and the energetic efficiency criteria must be implemented and how the hill should be designed from a landscape perspective.



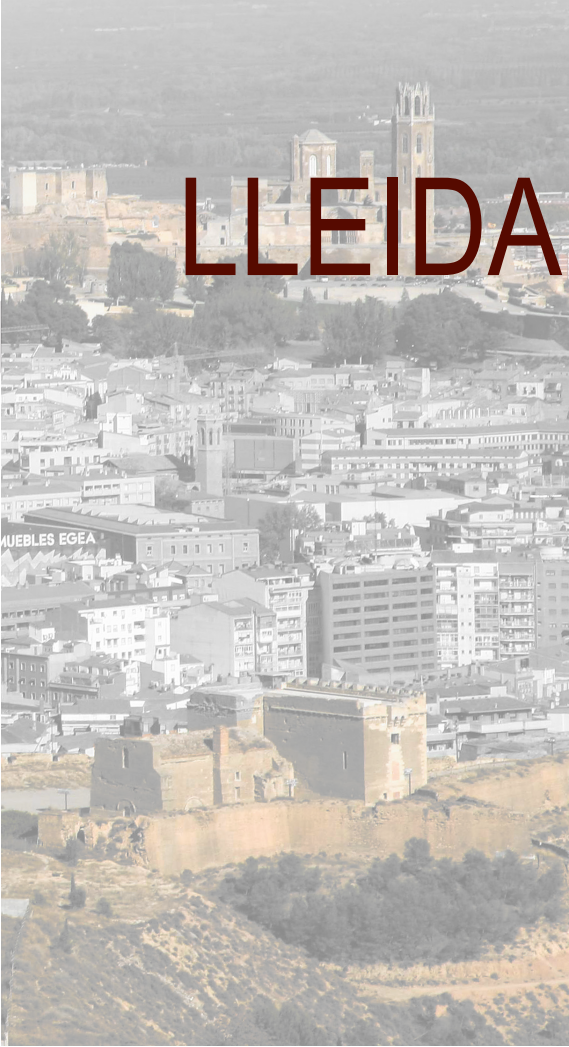
Area= 60ha.  
Roof= 31709.5 m2st.  
Buildability= 0.06 m2st/m2s.  
Employees= 1.300  
Density= 28.83 m2st/worker tending to 40 stm2/worker  
State of realization= 16% (2009) and 27% (2011)

## QUANTITY AND COMPLEXITY



## IDENTITY





# LLEIDA AGRI-FOOD SCIENCE AND TECHNOLOGY PARK (PCITAL)

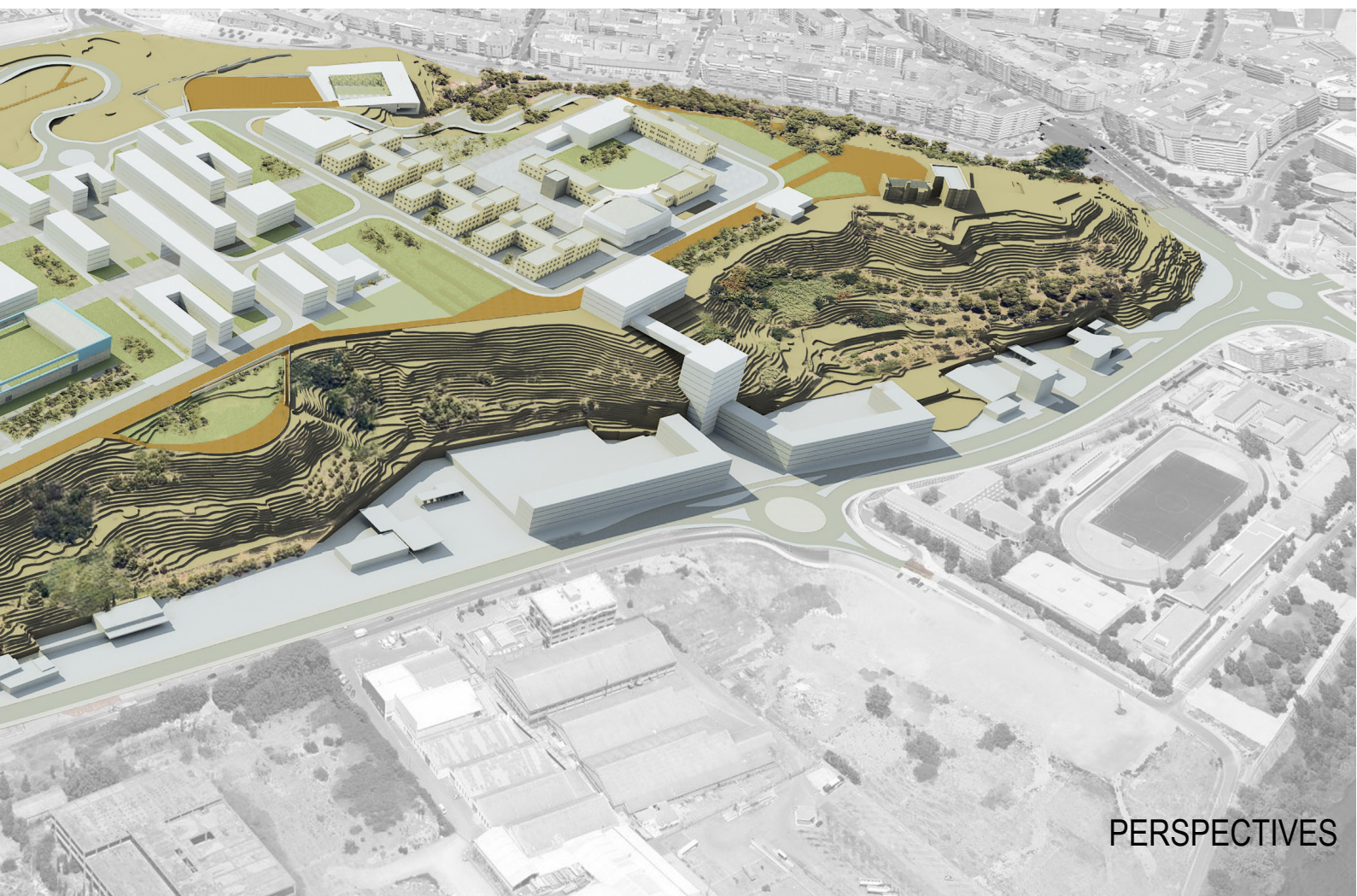


## URBAN SUSTAINABILITY

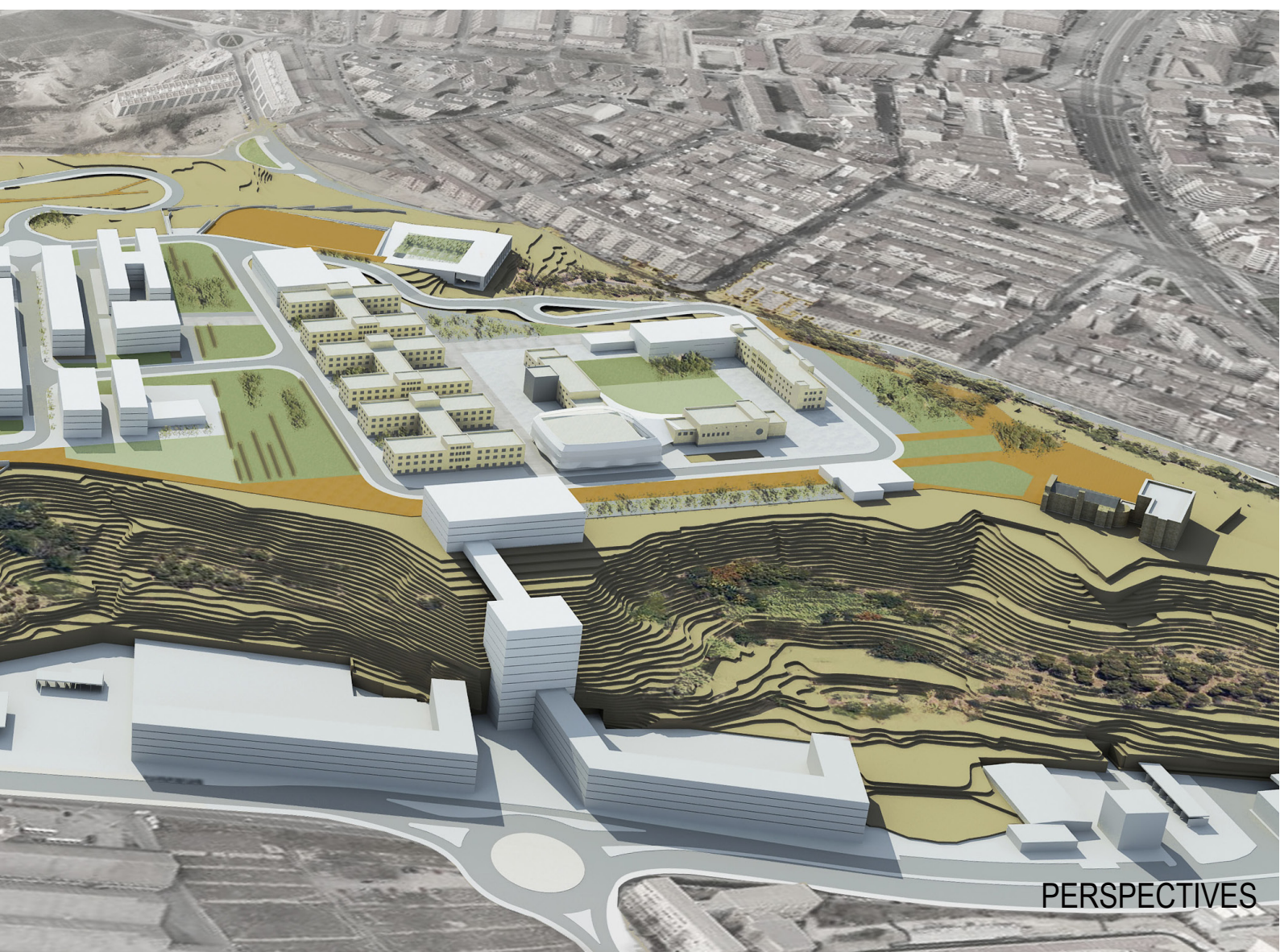
VIEW OF THE TWO HILLS



TRANSVERSAL ELEVATION



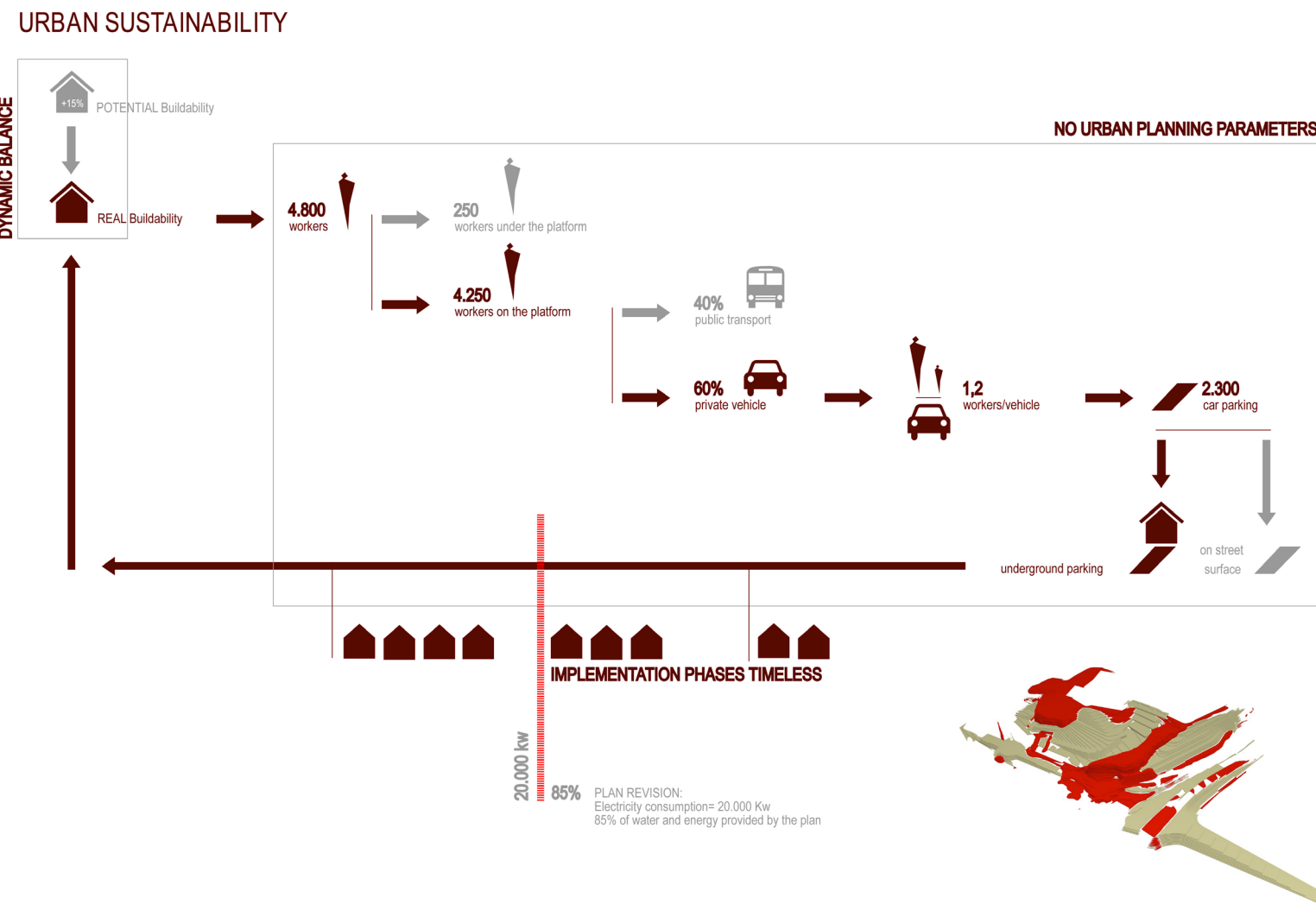
PERSPECTIVES



PERSPECTIVES



PERSPECTIVES



## LANDSCAPE



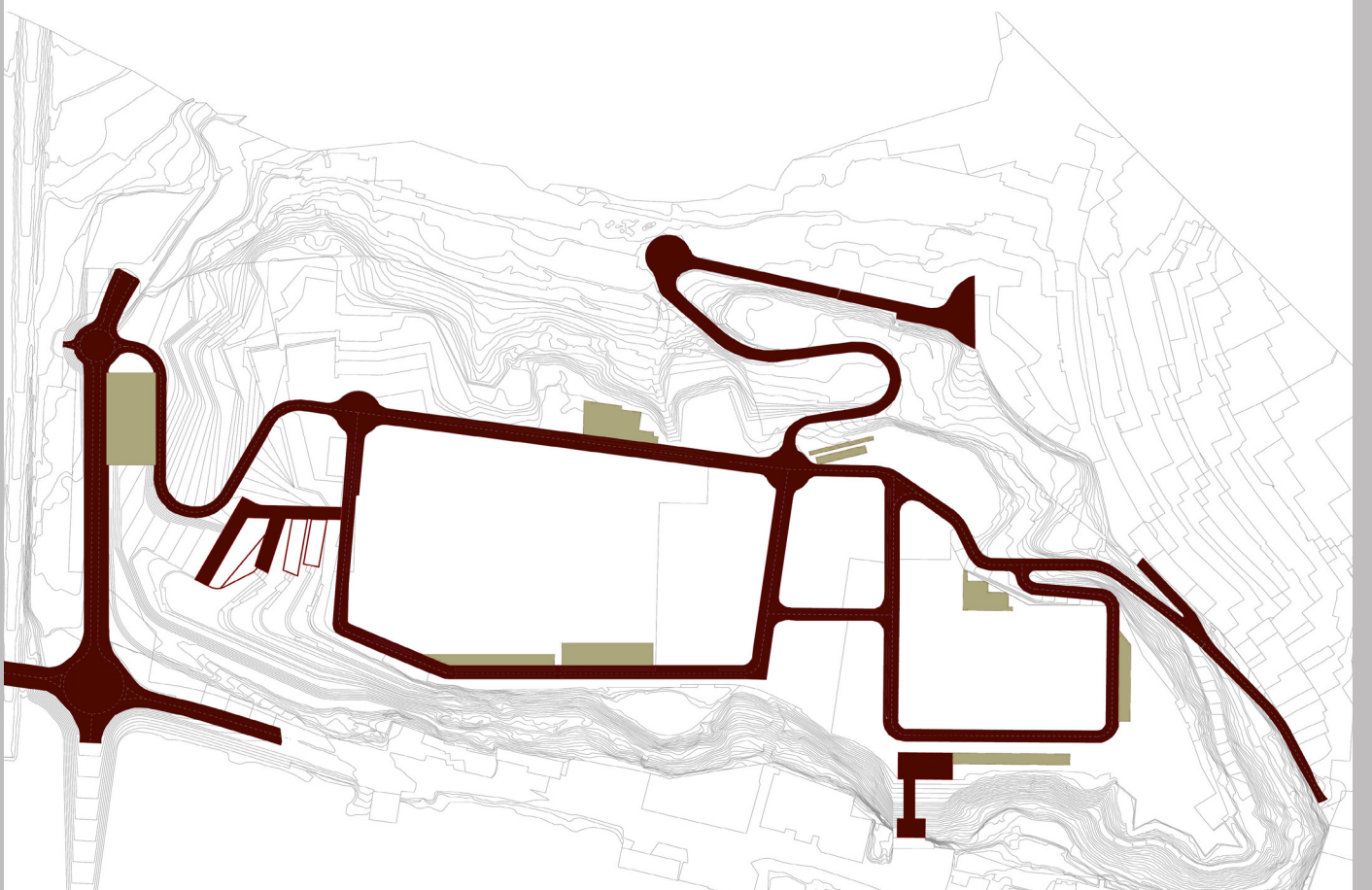
## LANDSCAPE

The landscape deployment of the Plan should be achieved by regarding its silhouette at general scale and by stabilizing the hill sides



## STRUCTURE

The open spaces system, together with the green belt around the Hill, is made of three bands which overtake the PCITAL and continue beyond



## ACCESSIBILITY

Two alternative solutions are presented: on the one hand, the use of public transport, and on the other hand, a new road network to get a smart traffic management

The environmental criteria aim at taking advantage of passive instruments: the control of sunlight and shade, ventilation and thermal insulation, the increase of the thermal inertia and the use of recycled materials. If this is good to constructions, these recommendations focus on executing solutions to decrease heat absorption, the excessive waterproofing of soils by using vegetation to improve the comfort conditions of the open areas. From an energetic point of view, it is essential not to increase the electric power installed, although this would not be enough if we follow usual parameters, because we want to reduce energetic consumptions and ask new facilities to produce energy.

Finally, concerning landscape we must pay special attention to the formal values of the plateaus. Both hills play a key role in the spatial mark of the city landscape. The PCITAL forms a counterpoint with the Seu Vella Hill and the background plain where the motorway leads to the city. Thus, the landscape project must be more than a decorative action. It must reinforce its identity to become a key role together with the Seu Vella Hill. This means it must be displayed as a key element of the skyline of the city and a foundational member of the general structure that is composed of the river and the two plateaus. The PCITAL must be important not only because of the innovative activities, but also because of its privileged location and landscape.

The proposals of the Plan can be explained from four points of view:

- Landscape personality
- Urban structure
- Urban planning
- Accessibility

The landscape deployment of the Plan should be achieved by regarding its silhouette at general scale and town planning according to the natural features of the site. The Hill is an elevated platform, rectangular, with very different sides. The North side is a slope, the South and East ones are vertical and empty, and the West side is an abandoned quarry. The Hill is composed of a superposition of rock layers with diverse hardness.

Due to the erosion there are landslides and rock fall. In the Seu Vella Hill works have historically been carried out to minimize the erosion. In the Gardeny Hill, concerning the most unprotected sides, a vertical garden is designed in order to stabilize the ground. In the West side, the creation of a new road justifies the movement of the most instable parts and the building of a new topography. The different functions of the PCITAL have been designed according to the landscape and topographic characteristics: the top platform hosts the installations and research buildings, while the hillsides host the accesses and the green area. The North one, a green park next to the main entrance. The South and West host some lifts and a vertical garden made up of balconies and viewpoints. The West one has a new topography that permits the creation of a new road and a large parking area.

The urban structure of the PCITAL is based on a double entrance scheme, one that comes from the barracks and a new one proposed within the open spaces system, on a local scale. The starting grid is made up with the military buildings to which has been overlapped a second one based on the historic city, a bit lopsided, next to the river. The open spaces system, together with the green belt around the Hill, is made of three bands which overtake the PCITAL and continue beyond: to the South until the river, and to the North, to the future developments on that area.

The Plan conserves preserved buildings, paying special attention to the defensive tower from the twelfth century. It also coordinates new installations according to the patterns of the urban structure of the whole. The new Science Museum, next to the traditional path that heads to the hill, new hotels to be built near the PCITAL and the rest of them, following the road network spread along the top platform. Construction is not only regulated according to environmental and energy saving criteria, but also adaptability.

The structure gauges allow a superior capacity than what can be built in each plot. Research centres have different spatial needs than speculative housing. Regulations should not be an obstacle: double rooms, open patios, double skin façades, natural light, sound barriers, insulation or the need to build up singular constructions. The parameters are adaptable in order to offer innovative architectural and environmental solutions.

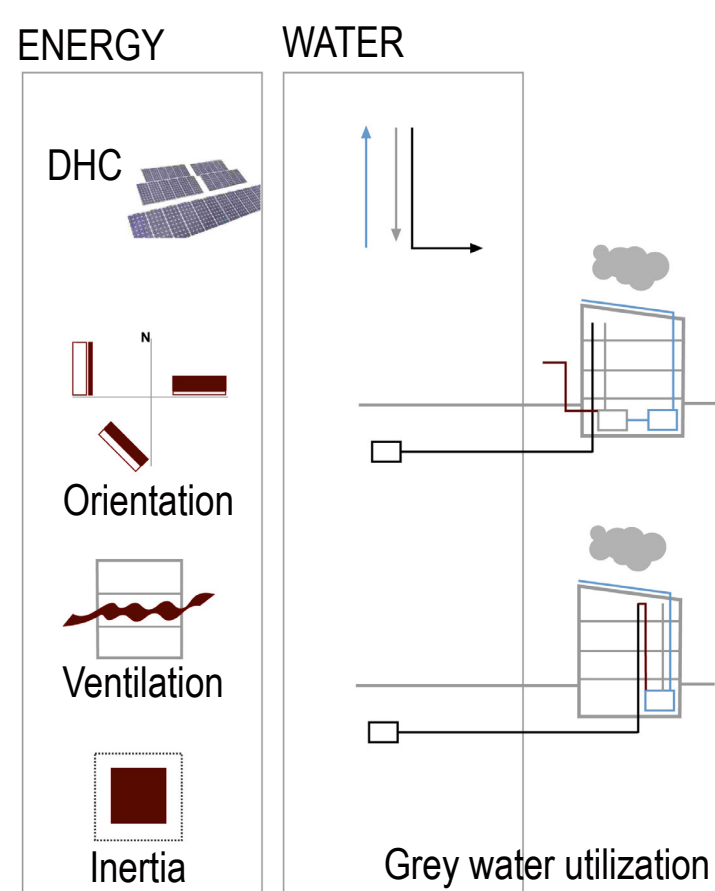
The solution to the problems of accessibility to the PCITAL is a key urban issue. The topographic conditions of the hill and the massive use of private car could hold up the Park. Thus, two alternative solutions are presented: which turn out to be better than a maximized road network to be operative during the rush hours. On the one hand, public transport: a shuttle bus service direct to the top platform, and lifts through a services and offices building located on the South side, at the foot of the Hill, or large park-and-ride facilities and escalators on the West façade. On the other hand, a new road network to get a smart traffic management, by choosing one direction over another, or by giving priority to public transport or high-occupancy vehicles.

The PCITAL Special Planning Area is aimed at a sustainable urban growth, so this is ecological and energetic sustainability criteria are present in its design. It also avoids consequences of the recent economic crisis: empty buildings and residential areas. The sustainability of the project depends on the self-sufficiency of the stages to be implemented. The City Council management makes this easier. Thus, a flexible implementation agenda has been considered, according to activities carried out and the public or private investment at every moment. The urban project wants to avoid speculation, which would not be good for the project. The PCITAL wants to be an instrument to create knowledge and activity.

The Lleida City Council understood that the closing of the barracks was an opportunity to promote an exemplary urban project in terms of environmental and energetic sustainability and promote the economy of the city and its region.

## ENERGY EFFICIENCY IN THE URBANIZATION AND CONSTRUCTION

LONGITUDINAL ELEVATION



## ECONOMIC EFFICIENCY & SOCIAL EFFICIENCY WITH ATEMPORAL PHASES

