

## **HOUPLA – Holistic Urban Planning in the Bizkaia Technology Park**

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### **1 ABSTRACT**

The Bizkaia Tecnology Park (PTB) is an industrial ecopark with 200 companies & 7000 researchers & technicians gathering 40% of the innovation from Bizkaia. HOUPLA proposes an infill mixed-use plan for an autonomous ecoquarter with 100 dwellings & areas for creative industries. It provides the PTB with specific dwelling for temporary researchers who have no proper offer in the metropolitan Bilbao. It answers to the diversity of workers at the PTB & surrounding municipalities. Companies, PTB managers, municipalities & candidates inside HOUPLA are involved in a joint participatory process to choose technologies, investment, property modes & design facilitated by a multidisciplinary team of planners, architects, engineers, sociologists, biologists & economists. It includes greenhouse, cob, wood & straw buildings, vegetable roofs, locally managed vegetable gardens, passive solar design, natural grey water treatment & more ecotechnological features.

### **2 ENVIRONMENTAL URBAN PLANING AND MANAGEMENT**

#### **2.1 Previous experience**

The Urban and Industrial Environment Unit at Labein Tecnalia employs 40 biologists, chemists, engineers, planners, architects, environmental psicologists, geographers and physicists to research on issues concerning regional planning under changing climate conditions, urban environmental management and ecoindustrial strategies. It provides municipalities and regional governments with policies and management tools to control water, athmospheric and soil parameters in order to provide the society with sustainable environmental conditions. It consults logistic centers and high-impact industries with closed-loop strategies, by-product synergies, environmental technologies and applications and specific innovation. Feeds the society in general with new knowledge in cooperation with international universities researching on cutting-edge issues like sustainable water management and nanotechnologies, noise reduction at the public realm, participatory processes facilitation and biodiversity restoration at urban and reginal scale.

#### **2.2 Environmental planning at the Bizkaia Technology Park (PTB)**

Based in Zamudio, the Technology Park was set up in 1985 by Basque Country public institutions designed to promote diversification in industry and the transfer and diffusion of technology and innovation. It comprises 250 hectares of privileged natural environment where advanced technology companies are based, together with excellent communications infrastructures.



Fig. 1: Aerial view of the PTB

### 2.2.1 Mission and Vision

The Bizkaia Technology Park's mission is to decisively contribute to technological development and innovation in Bizkaia, in a sustainable way, encouraging the exchange of knowledge and transfer of technology between businesses, technology agents and universities, promoting the creation and growth of innovating businesses and offering top quality installations and added value services. The Bizkaia Technology Park's vision is defined in its consolidation as a benchmark in business innovation and technological development in Euskadi and as an international model.

Thus, the Park should act in the vanguard of innovation, belonging to networks, and promoting technology and knowledge transfer, to continue to be a benchmark in the introduction and development of technologically advanced businesses. In this way, it can continue to be a benchmark in the future, contributing to increasing the competitive edge of the businesses and providing society with added value.

### 2.2.2 Technology and innovation in the park

The Bizkaia Technology Park is a benchmark in Basque Country Research, Development and Innovation, with a big concentration of innovating businesses that devote more than 10% of their investments to R&D&i. It also has a considerable scientific-technological community made up of more than 2,000 researchers in the Technology Centres, University Departments, R&D Business Units and R&D&i coordination Agents.

Innobasque, the Basque Innovation Agency-Berrikuntzaren Euskal Agentzia, created to coordinate and promote innovation in Euskadi in all its fields is located in the Park, is at the head of the second transformation, to become a European benchmark. Innobasque is made up of the Basque Science, Technology and Innovation Network agents, private businesses, Basque public institutions, institutional entrepreneur representatives and all types of Basque workers and organisations related to innovation, many of them located in the Technology Park itself.

### 2.2.3 Location values

The Bizkaia Technology Park now has 202 companies, technology centres, research centres, etc. that employ more than 6,750 workers, more than 45% of which are devoted to research and development. The Technology Park has a privileged location in the municipalities of Derio and Zamudio, in addition to being connected to the European motorway network:

- 2 km from the airport
- 10 km from Bilbao
- 6 km from the University



Fig. 2: Location of companies at the PTB

#### 2.2.4 Environment and facilities

Situated in an exceptionally beautiful environment, the Technology Park is built on the municipal territories of Zamudio and Derio, two small towns near Bilbao. The coexistence in the same area of modern companies and the latest telecommunication infrastructures and traditional Basque farmhouses and almost 100 species of trees, offers one of the most attractive contrasts to be found in this Technology Park. The companies integrated in this technology complex have an unbeatable provision of constantly evolving and up-dated services: from all types of support services, such as security, maintenance, hotel and catering and leisure, to the most advanced professional services for businesses in telecommunications, support and promotion of research, development and innovation, cooperation, specialised training and incubation of new technology based companies.

### 3 THE HOUPLA PROPOSAL

#### 3.1 Goal

The goal of this “Holistic Urban Planing” project is the conception; social, energetic and ecosistemic simulation and 1:1 prototipe building of an ecoquarter at an infill location inside the Bizkaia Technology Park. The 10 year long monitorization of real living conditions of about 120 dwelling units, services, utilities and nested innovative sustainable companies should give account of the interactions between the ecosistemic, the socioeconomic and the innovation realms. It aims at identifying and recreating appropriate urban conditions for a healthy environment, society and economical activity. It uses participatory tools along the whole process to develop a sustainable behaviour and community. It implements flat governance models and the highest standards on mobility, building, land, water and landscape management.

#### 3.2 Main features

- High liveability
- Negative net resources consume
- Net production of land, energy and biodiversity
- Bioconstruction standards with low-impact local materials
- Microuurban planning from an ecological perspective
- Synergic location with socioeconomic territorial aspects
- Specific attraction and services for the creative class
- Participatory management through accessible ICT



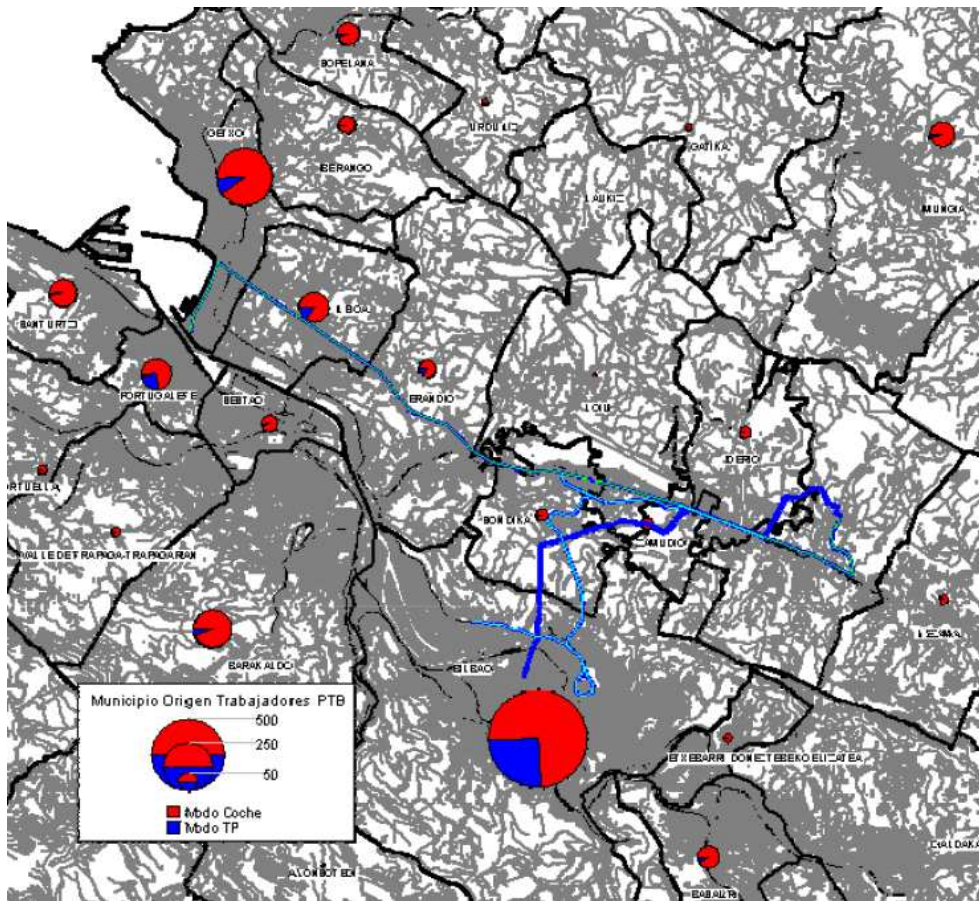


Fig. 3: Car/public transport rate mobility to PTB

### 3.3 Quantitative indicators

- 100 % of environmental services and functions to be offered within
- 90 % of its energetic demand to be produced on site
- 80 % of cultural, leisure, creative and innovative proposals to be created within 10 kms
- 70 % of the technological needs to be answered within 20 kms
- 60 % of its social realm to be found within 30 km
- 50 % of its material components to be produced within 40 kms



Fig. 4: Distances from the PTB (10 km and 20 km radius)

### 3.4 Sociocultural benefits

It offers a prototype for regional planning to become integrative and innovative while at the same time immersed into the current political and socioeconomical paradigm. The very same social profile of this ecoquarter is a space of dialogue between actors of the regional strategy. The experience means to be monitorized in order to transfer learned lessons to the international community. ICT parallel to direct contact communication and dissemination of the experience at local and global level aims at retrofitting the society with holistic alternatives to urban activities. The very integration of persons with different origins –both the foreign engineer researching on roofgardens and the local gardener, for instance- shall be an example of sociocultural innovation and a benefit to the region itself.

### 3.5 Industrial benefits

It makes visible at urban scale all technologies of energetic efficiency, LCA, logistics, urban metabolism, urban greening, innovative vernacular architecture, bioclimatic urban planning, ecosystemic services balance, productivity and R&D networking, electric transportation systems, creative class attraction, etc. It is a mash-up of applied technology and science. Industries supporting the material and infrastructural processes are invited to collaborate with the development of innovative products. A much sought synergy between university, technological centers and SME is made possible along the making process.

### 3.6 Environmental benefits

With its green roofs, facades and courtyards, greenhouses, depuration and symbiotic pools, water collection tanks, composting facilities, flexible land use plan and agricultural areas, HOUPLA makes possible the reintroduction of natural corridors across urban areas. It contributes to the biodiversity balance, to energetic and material savings with its associated emissions, to local food production and to appropriate watershed



management. The gap between urban and natural systems is broken, nature can arrive to productive areas. The urban border is carefully completed in order to allow a soft transition to the rural.

### 3.7 Socioeconomic benefits

It answers to the regional call for sustainable living areas, specifically providing the existing creative class with appropriate dwellings and community areas. It reduces the mobility pressure on the area, introducing not yet existing transport modes –bicycle, walking and electric cars-. It enables the area to be used at non working times, and providing the community with leisure and cultural services. Different alternatives of property are offered to adapt to the personal circumstances of the people who choose to live there. It proposes an innovative review of the traditional local cooperatives into up to date condominiums. It develops new land management principles coupled with updated financial strategies. The participation of future users, involved companies and regional managers in the design and planning process allows their needs to be answered.

### 3.8 Research benefits

- climate change urban adaptation measures are implemented
- urban heat island effect monitorization and mitigation measures are given
- bioconstruction methods are extended from the family home to the neighbourhood domain
- a full participatory process is developed with involvement from society, institutions and companies
- data for microclimatic models is provided
- social engineering is applied in a context with chances for success

## 4 METHODOLOGY

### 4.1 Design team

The Urban and Industrial Environment Unit at Labein Tecnalia leads a team of 5 persons from other units of Tecnalia, namely, the Construction Unit and The Regional Development Unit as well as external consultants and the main stakeholder, the PTB. The multidisciplinary of the team becomes even wider, incorporating a sociologist, an economist, a consultant and a real state manager. Each one brings together a bigger team behind, with specific knowledge and skills per area.

The team is in charge of designing financial, urban, architectural, landscape, social and industrial processes in a joint iterative cycle. External aid is found at further development stages. Partnership with planners, financial companies, local institutions and private companies is looked for in order to cristalize a joint venture that makes the project possible.

Different activities to mature the idea and approach have taken place in Labein and outside. The two most relevant ones are:

- the Ideas Market, where it was presented to the whole company (350 people) and patronate, and
- the Stereonoise “ready2go” event, where it was tested and hibridized together with another 7 ideas.

Synergy with other research areas and activities has helped with the early phases of design, among others:

- Intelligent territories and spatial planning for the creative industries,
- Cultural heritage masterplanning and integrative neighbourhood regeneration,
- Urban metabolic flow analysis and brownfield recovery strategies, and
- Watershed management under climate change scenarios.



01. Nombre de la empresa.  
Tecnalia
02. Página web.  
www.tecnalia.es
03. Sector.  
I+D+i
04. Clientes potenciales (no es necesario indicar nombres, tipo de cliente)  
Constructoras, Eléctricas, Administraciones...
05. Posicionamiento de la empresa en España frente a competidores  
Mayor centro de investigación privado
06. Tamaño de la empresa (nº trabajadores, sucursales, etc.)  
1300 investigadores, 7 centros
07. Descripción de producto(s) /servicio(s) de la empresa  
Soluciones tecnológicas, planificación estratégica, consultoría avanzada, certificación...
08. Nombre, cargo y departamento de los participantes  
Borja Izaola. Jefe de proyecto Unidad de Medio Ambiente  
Igone Revilla. Jefe de proyecto Unidad de Construcción  
Alberto Calderero. Jefe de proyecto Unidad de Desarrollo regional  
Andy Backer. Consultor de sostenibilidad  
Álvaro Auesta. Gestora inmobiliaria del Parque Tecnológico de Bizkaia
09. Problemática resumida en 4 líneas.  
Diseño, planificación e implantación de un infill que aporte las carencias de sostenibilidad del Parque Tecnológico de Bizkaia, integrando movilidad compartida, generación energética, disponibilidad de espacio público, actividad cultural y residencia de perfil específico.

Fig. 5: Briefing at the Stereonoise event

## 4.2 Experts panel

Inspired by previous experiences and contacts, a group of 22 European research institutes, planners, regional analysts and green technologists was consulted in a series of emails. A collaboration proposal is being formulated as the design process advances. The idea of developing an infill with the characteristics of HOUPLA in other European regions is growing and a research consortium is building up.



Fig. 6: European experts' network

### 4.3 Open forum

Contact with the experts' network as well as with local stakeholders is mainly carried out via internet. At the site, best practices, discussions, technologies and collaborative planning is centralized and left open for dissemination. After two months of intense use it is currently waiting for a major dissemination act among the 7000 workers at the PTB. It is three-lingual and keeps a low-profile language in order to make it accessible to the public, who is enabled to start discussion topics of their own interest.

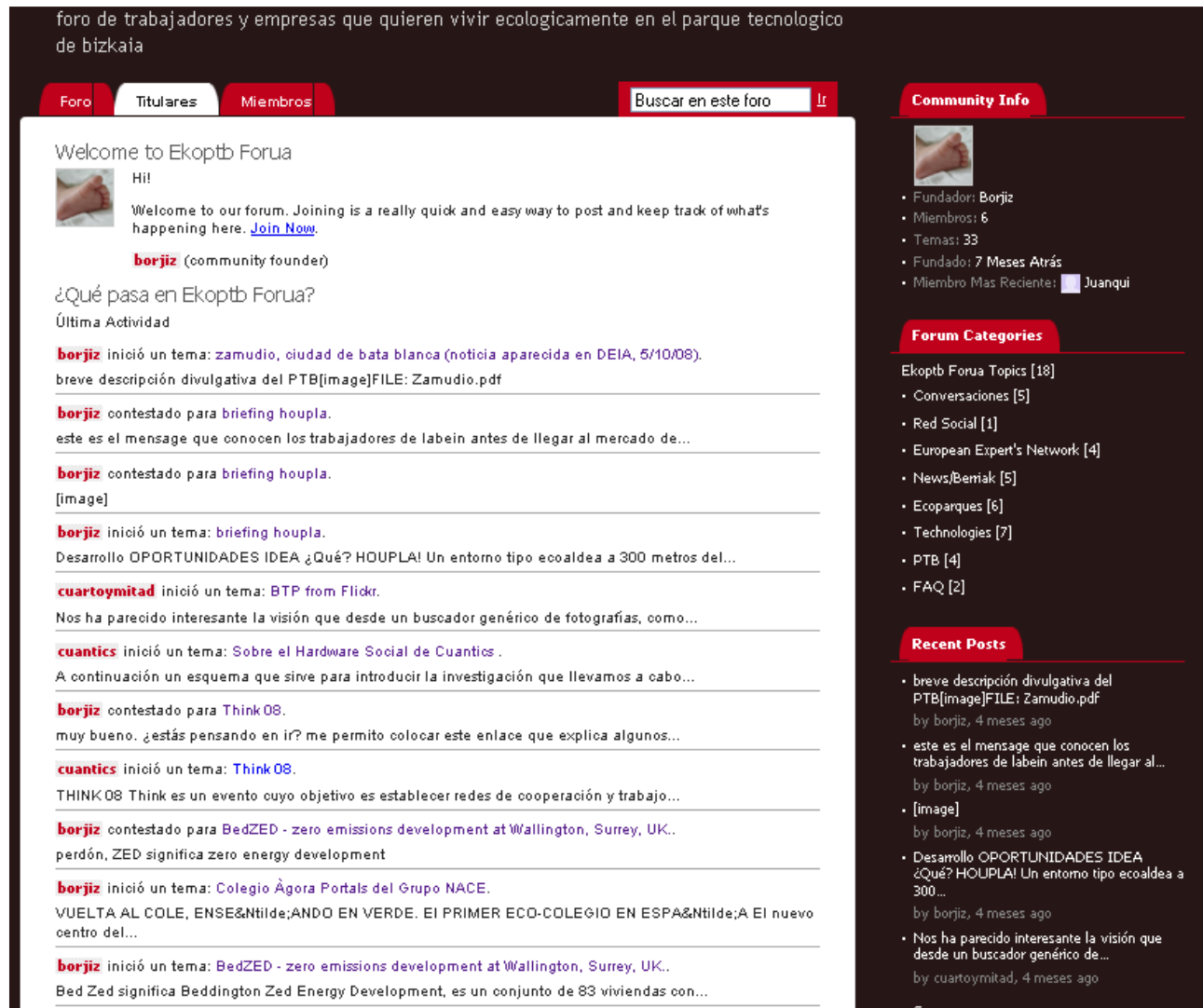


Fig. 7: Internet forum EKOPTB

### 4.4 Negotiation with stakeholders

#### 4.4.1 PTB managers

Several meetings with the innovation, sustainability and real state managers of the Bizkaia Technology Park have been held to check the running process. Other interested companies within the PTB are yet to be reached. While the PTB is included in a network of ecoparks and is itself providing guidelines for the nested companies to impulse industrial symbiotic processes, economic circumstances create their own frame to accelerate or retain the decisions to implement HOUPLA.

#### 4.4.2 Regional policies

Regional planners as well as public and private institutions involved in the area and creating development strategies at medium and long term are informed and interested. Prototyping in this business is unusual and



financial securities are still being found to make the project viable. Participatory constraints do bring sometimes political response in difficult situations and political benefits of the project are being formulated.

## 5 CURRENT SITUATION

- While unanimously acclaimed, HOUPLA shows management limitations due to its very ambitious scope.
- Credibility of extensive participatory processes from planning to budgeting to land use is under scrutiny and private companies claim bigger benefits and control.
- A 1% (70) of the workers at the PTB has been identified with high predisposition to invest, live and cooperate; technical aid and cooperation from their companies has not matured yet.
- The european experts' network is looking for a european research project to finance a R&D consortium via FP7 or similar.

## 6 REFERENCES

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