


**Case 1: Pamplona Navarra, Spain:
Sarriguren eco-city**

To deal with population growth in Pamplona, the Valle de Egüés, and the government of Navarra partnered to build Sarriguren, a new eco-city, in the outskirts of Pamplona to house 13,000 people in over 5,500 residences. Instead of a suburban neighborhood this would be a small city, serving middle to low-income populations with subsidized housing with 98% of the residences being classified as social housing and supplemented with a new industrial area that sought to attract the biggest companies of renewable energies in Spain.ⁱ

Background. Sarriguren is Spain’s first eco-city, planned as an expansion of the city of Pamplona, located at 3 km from the city. The eco-city of Sarriguren was promoted by the Navarre Government Department of the Environment, Spatial Planning and Housing, and was designed by Fundación Metropoli. It follows ten principles devised in terms of performance specifications, with specific emphasis on the protection of natural areas, energy saving, integration of renewable energies and healthy construction. In 2014, Sarriguren had some 13,000 inhabitants.

	Secondary Tools
	✓ Protection of natural areas
	✓ Energy saving, integration of renewable energies
	✓ Healthy construction, bioclimatic architectural design
	✓ Priority of public transport, cycling and walking

Award. In 2008 it won the 7th European Urban Regional planning Award of the European Council of Spatial Planners. These eco-urbanism criteria are: Nature as integral part of urban design, conservation of rural settlement structure, priority of public transport, cycling and walking, diversity of housing, integration between housing and workplaces, high quality and diversity of public realm, bioclimatic architectural design, commitment to innovation, and high-quality natural environment, with a well-confined physical framework for the eco-city.



Birds view of Sarrigurenⁱⁱ



Sarriguren Ecocityⁱⁱⁱ layout



Master Plan. The master plan for Sarriguren eco-city identified strategies for the reduction of green house gas emissions, and proposed innovative eco-measures. The eco-city plan devised eco-design criteria which guided the practical design. Sarriguren became an extension of the existing innovation corridors where high-tech firms are located. Eco-boulevards with sustainable public transport connect the eco-city with the existing urban fabric of Pamplona. The transports system provides for cycle lanes and footpaths to the surrounding nature.



Buildings. Sarriguren is to occupy a total surface area of 1,501,906 m² and some 5,207 homes have been built, 56.81% subsidized housing and 40.81% with controlled housing prices. This social housing has been built by the local housing corporation. It includes a wide range of types and tenure modalities to promote social inclusiveness. Specifications were elaborated in a Municipal Impact Sector Plan (PSIS) related to urban infrastructure. The PSIS adopts a firm commitment to the achievement of energy savings and to maximum energy utilization at two levels: spatial planning and construction: (i) the building orientation must make it possible to capture direct sunlight in cold periods and to prevent shadow casting from adjacent buildings. For this reason, the height of the buildings gradually decreases towards the south and towards the eastern and western boundaries of the residential development; (ii) with regard to construction, the bioclimatic regulations make it mandatory to ensure the dual orientation of all the homes to be developed, whilst also demanding a 25% improvement in the building thermal transmission coefficient in relation to the maximum value indicated by the maximum Spanish standard in force at the plan drafting time. Thus, the buildings were developed using passive and active energy efficiency solutions, renewable energy supply, complete water cycle and innovative smart communication technologies. These technologies were submitted to a certification process to prove their low energy consumption, and low carbon emission characteristics. The building program included refurbishment of the historic village, eco-city gates, viewing towers in the park, blocks of flats, single family houses, and live in work premises.

Green areas. The eco-city has allocated a surface area of 159,734 m² to green areas, a highlight of which is the creation of an 86,000 m² central park and an artificial lake to permit the responsible management of the water resources and which is used for irrigation purposes, rainwater collection and the regulation of the environmental humidity.

Work opportunities. Similarly, a range of job opportunities and places for learning were planned so that need for commuting would be reduced. Land reserves and infrastructure

connections enable the future growth of the eco-city.^{vi} 90% of all housing is earmarked as social (which means: low-income) housing which might assure ample supply of cheap labour for the industries but carries a risk of a future ghetto.^{vii}

Sustainability. The following aspects can be pointed out concerning sustainability of Sarriguren eco-city: (i) financial sustainability – since the project has largely been funded by the private sector, and since it is directed at different population groups, it is foreseen that public funds will flow back, and the remaining aspects will be financed by private initiatives; (ii) social and economic sustainability – expected possible since the eco-city contemplates employment and work opportunities for its target population; (iii) cultural sustainability – seems likely since the old core of the Sarriguren village has been preserved and given added value through the investments in the eco-city; and (iv) environmental sustainability – this shall be achieved through impacts of the bio-climatic architecture, the application of renewable energy projects, the ecological corridors which connect the eco-city with the city and the hinterland.^{viii}

Key figures:^{ix}

5,577 housing units
10,000 residents
33 units/ha
150 hectares

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July 2018

Sources and Further Reading:

ⁱ Schroepfer, T., Christian Werthmann, Limin Hee with Quilian Riano and Andrew tenBrink. *Transurban: Charting Experiments for Cities of the Future – Case Study 4: Sarriguren*. Cambridge: Harvard University Graduate School of Design, Design and Technology Report Series, November 2010. <http://dsgnagnc.com/transurban-0304-a-critical-view-of-two-spanish-eco-cities/>

ⁱⁱ Source : https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRE3kKLDDcjPns56iJPSDi_MZbJ-tlHjQwrdUgkcMAqjX0KyUcd

ⁱⁱⁱ Source: <http://www.fmetropoli.org/en/wp-content/uploads/Sarriguren6.jpg>

^{iv} Source: <http://www.itursa.com/en/proyectos/urbanizacion-de-sarriguren>

^v Source: http://www.apezteguia.com/sites/default/files/styles/imagen-proyecto/public/images/proyectos/web_2491.jpg?itok=Pz7_A1wO

^{vi} Ryser, J. Ecocities in Action: Sustainable Development in Europe –Lessons for and from China? in: European Union, Konrad Adenauer Stiftung, et al. 2014. *Eco-Cities - Sharing European and Asian Best Practices and Experiences*. EU-Asia Dialogue. Singapore. pp. 107-123 <http://www.eu-asia.eu/publications/eco-cities/>

^{vii} Schröpfer, Thomas: Ecological Urban Architecture: Qualitative Approaches to Sustainability. https://books.google.de/books?id=rT_iHupCe0cC&pg=PA33&lpg=PA33&dq=sarriguren+eco+city+pamplona+criticism&source=bl&ots=6H7zDrW93M&sig=o0aBLf13mgz-uUa2Uw30J8SHrnQ&hl=en&sa=X&ved=2ahUKewi9oYf-vNbcAhVLsaQKHSoqDj0Q6AEwBXoECAUQAQ#v=onepage&q&f=false

^{viii} <http://habitat.aq.upm.es/dubai/00/bp349.html>

^{ix} A good collection of quantitative information on Sarriguren can be found under https://www.arenedf.org/sites/default/files/arene_44p_english_bat_bas_def1.pdf (page 22)