



Environmental Education Center of Torres Vedras

Territory

Torres Vedras has 400 km², and 79 503 inhabitants, and is located 46 km away from Lisbon, in the west region of Portugal.

Sustainability Highlights

The City has 20.000 inhabitants.

The mobility solutions implemented in the city are a Public bike sharing system with conventional bikes and e bikes, and an Electric Mobility System with a car charging network.



The region has 20 km of coastal area, more than 20 beaches and it is a Quality Coast destination.

The Wave potential is evaluated in 20 MW per each km of coast. This means that the 20 km available could in theory, supply about 50 % of the total needs of the region.



There are 9 large wind parks for Wind Energy production adding up to 112 MW installed and responsible for the production of 332 GWh, representing 100,5% of the total of electricity consumption in the region.



Due to Photovoltaic Energy Production Torres Vedras has an average of 2479 hours/year of clear sky and 145 kcal/cm².year of solar radiation. The PV plants count with a number of 328 installations adding up to 1.1 MW, responsible for an estimated production of 1760 MWh, which represent 0.11% of the total energy consumption.

New Environmental Education Center Building

Context

This project is the result of Torres Vedras participation in the Greenmed Project, on green public procurement, funded by the LIFE program.

And from other cooperation activities, as an example with NASA/C3P, by the time of a Nasa committee visit, with Olga Dominguez and David Amidei to several projects in 2011. This visit it was an opportunity to benchmark and cooperate on these themes.



The ancient environmental education center of Torres Vedras was founded in 2005 and its purpose was to provide environmental education activities and a project on education for citizenship and the environment. However, the existing building where the ancient center is based has become too small for all activities that are taking place there. Thus, the construction of a new sustainable pilot building suits and matches the Environmental Education Center's goals.

The new environmental education center (EEC) was inaugurated in September 2013. The building has an enclosed area of 661 m², and an open area of 432 m².

The new location selected is the Varzea Green Park, which as being a sort of green lung of the city.

With this project the new center building intends to establish connections with the natural environment surroundings through diverse paths and routes, connecting the city and the sights of the park.

In this sense, the new building must meet the dual objective of educating and raising public awareness of the benefits of sustainable and environmentally effective construction, the use of renewable energy sources and the consequent savings inherent in this new way to building design, construction and occupation.

The EEC is a sustainable pilot building which aims to integrate a large number of sustainable energy and bioclimatic systems.

The total Investment Cost was € 1.349.909 with a QREN (Innovation incentives system) contribution of € 944.936.

Construction

Building construction was guided by bioclimatic and sustainable principles in order to save energy. Walls, windows and ceilings have been designed in order to make the best use of the building's location, orientation and design with respect to solar radiation, ventilation and natural lighting. Solar and photovoltaic panels will be installed, as well as solar thermal panels and micro wind turbine, energy-saving water system and lighting resources. Some inner walls are to be constructed using recycled materials.

The building is an example in sustainable construction and a “near zero energy building”.



The Building

The “camouflage” of the building in the Park resulted in two options: One floor that occupies a significant area of the longitudinal portion of the available land and transforming the roof of the building in an extension of the park (offering the possibility of an alternative route which returns up in covering the soil plant occupied by the building).



Water

The building has a system recovery and reuse of gray water and rainwater.

The routing of rainwater is made for two 10000L deposits, buried outside the building, ensuring that rainwater is protected from light and without great temperature variations, factors relevant to prevent the formation of algae and developing certain microorganisms.

The water is treated by a filtering process control and / injection chlorine, from which is then pressurized for the feeding of alternative network cisterns.

Buried drop by drop System installed is an alternative method, to the traditional spraying, that achieves water saving of around 25%, since the evaporation is much smaller, almost summarized perspiration, and nullifies the effect of the wind, particularly in coverage area, greatly reduces the efficiency of the sprinklers.

The gardens watering correspond to an area of 1,653 m² and include green roofs and courtyards of the building.



Sun

The Solar Thermal System and Photovoltaic System installed have 11 modules that have an estimated production of 4010 kWh/year.

The building also has natural lighting and shading.



Wind

The Wind Turbine System produces up to 3.2 kW peak, and the nominal speed of 12 (twelve) m/s has a power of 2.5 kW.



Land

Geothermal System function is cooling in summer and heating in winter. The great advantage of using a geothermal system due to the fact, that the soil maintains a small depth from a constant temperature of approximately 17 ° C. Were used in the exploration to a depth 500 meters 4 holes of 125 m.

Buried Construction option ensures that the soil temperature remains relatively constant throughout the year. From this viewpoint, the ground is colder in the summer than the outside ambient temperature, a greater contact with the ground building entails a temperature decrease. In winter the opposite happens.

Certifications

The building has Class A+ environmentally sustainable building Certification, which is a certification of energy performance and indoor air quality.

And also has a Sustainable Construction Project (LiderA) Certification in National Certification System, Voluntary Assessment System for Sustainable Construction developed by the Instituto Superior Técnico, Lisbon University.



Environmental Education

The building possess areas for interactive games with environmental themes, a laboratory, a restaurant articulated with environmental education activities, and a permanent exhibition on the different topics related to environmental sustainability.



Activities

In the first year the center, held 437 (four hundred thirty-seven) environmental education activities for 17.010 (seventeen thousand and ten) participants.

A broad range of activities are developed in the Centre, including: Raising Awareness Sessions, Thematic Daily Sessions, Laboratory Sessions, Study Visits, Commemorative Dates, Afternoons in the Center, Workshops, Contests, Blue Flag, Activities , Holiday Workshops and Cleanup Beach Actions.

The main topics covered in the activities are: Water, Waste, Composting and Recycling, Biodiversity, Sustainable consumption, Mobility, Energy, Climate change, Noise, Coastal Areas, Oceans, Tree and Forests, Environment and Nature Conservation.



Awards

The Municipality has received a Sustainable Procurement Award sponsored by LNEG (National Laboratory of Energy and Geology), due to public procurement process with environmental criteria in the Environmental Education Center Building.



Reproducibility and transferability

The ideas that were developed to create this sustainable building can be reproduced in other projects. The know-how and all the homework done until this stage in order to achieve the A+ Class environmental sustainable building can be re-used for other projects. The knowledge acquired with this project can and should be transfer to everyone who desires to build a sustainable building.

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