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"LIFE+ Zero Hytechpark: toward a sustainable building with thermal, photovoltaic and hydrogen technology"

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Abstract. The use of renewable energy to produce hydrogen as an energy vector can contribute to increase energy efficiency and buildings sustainability. Besides, it may contribute to develop new mobility models which are more respectful to the environment. Therefore, this is the main objective of the LIFE+ Zero-HyTechPark in order to get more sustainable Technology Parks.

On FHa building a real isolated hybrid (photovoltaic/micro-wind / hydrogen tech) renewable plant has been installed and also simulated with a specific own software developed. The hydrogen is used for two purposes, as long time energy electrical storage, and for mobile application, such as bike fleet. Also it has been installed a thermal solar panel roof plant to cover a percentage of thermal energy consumptions of the building.

This project has the capacity to behave as a referent in sustainable architecture for research centres and as the first step in real sustainable urban projects. In small-scope, the experience will be extrapolated to other Technology Parks and industrial areas effectively reducing local emissions in short and medium term.

The prototypes developed in this project present sustainable alternatives for common applications that are using fossil fuel. The use of hydrogen will reduce the CO_2 for the future.

Key words

Simulation model, photovoltaic, solar thermal energy, wind energy, sustainable building.

1. Introduction

The main objective of the LIFE + Zero – HyTechPark project, coordinated by the Foundation for the Development of New Hydrogen Technologies in Aragon (FHa) and with the participation of Huesca, Andalusia and Vizcaya Technology Parks, is to implement the capacity of full-sustainability in Technology Parks with an optimal management of energy by means of a green-hydrogen system.

The main actions that are going to be carried out during this four years' duration project consist of designing, simulating and implementing energy solutions based on hydrogen technologies and renewable energies in the building of the FHa located at Walqa Technology Park (Huesca) and extrapolating these results to other buildings of this one or other Technology Parks. The expected results of this project are based on having a building with practically zero CO_2 emissions, promoting sustainable mobility through the development, starting up and monitoring of a hydrogen vehicle fleet and disseminating the developed technologies through people in general and through interested technological sectors in particular.

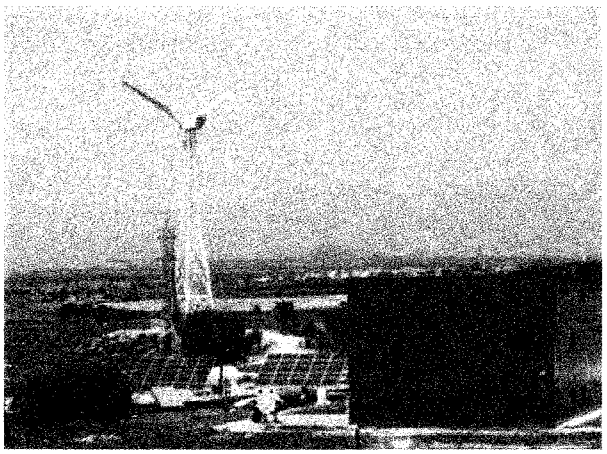

Fig. 1 FHa building

2. Isolated photovoltaic system

One of the main parts of the project is to develop an isolated system in order to cover the electrical consumptions of the FHA office.