



# Best Result

Building and Energy Systems and Technologies in  
Renewable Energy Sources Update and Linked Training

***BEST RESULT Project:  
Building and Energy Systems and Technologies in  
Renewable Energy Sources Update and Linked Training***

***Project no. EIE/05/201/SI2.420210***



**UNIVERSIDAD DE VALLADOLID (Uva) Partner 09  
Responsible: Dra. Julia Bilbao**

**D26: Local Exhibitions of RES Installations  
WP4, Task 4.4.**

**Supported by**

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**Partner: UVa (numer 09)**

**DELIVERABLE: D26 – Taks 4.4 Local exhibition of RES Installations**

**TITLE: Solar Facilities in the C.I.B.A. (Low Atmosphere Research Centre)**

**DATE AND LOCATION:** Low Atmosphere Research Centre (C.I.B.A.) Laboratory. Valladolid University.. Located: Villalba de los Alcores , Valladolid, (Spain)). (March 2<sup>nd</sup> 2007).

**ORGANISING INSTITUTION:** UVa Partner number 09

**ACTIVITY:** Exhibition of RES Instalations.

**NUMBER OF REGISTRATION:** 5 people

**ANNOUNCEMENT:** The visit was advertising at the different sections on the University people.

**SHORT DESCRIPTION OF THE EVENT:**

A group of people visited the Research Solar Laboratory that the Group of Energy and Atmosphere manages at the C.I.B.A. (Low Atmosphere Research Centre).

The CIBA Center is located 35 km from Valladolid, 42°49'N, 4° 56'WW and 840 m above sea level. The Laboratory activities in relation to RES are: measurement of solar and wind resources, Photovoltaic installation and passive and bioclimatic installations.

Solar and meteorological variables are recording in the Laboratory. The experimental material is a measurement station where different pyranometers and meteorological sensors are established and data of global horizontal and tilted solar radiation; air temperature, relative humidity, wind speed and direction and also ultraviolet (UV-B and total), infrared, illumination and photosyntecally active radiation (PAR, 400 to 700 nm) are measured and modelled. The data recording and storing system is composed by two Campbell Scientific data-logger CR-23 X model. Global and diffuse solar radiation is measured continously and data are evaluated in order to know the performance of solar radiation in the region. The objectives of the research is to provide industries, and different renewable energies sectors with suitable and accurate information on solar and wind resources as this information would reduce the cost of planning, improve the system efficiency and increase the values of energy produce by solar systems.

The Laboratory building is a passive solar house was also visited. It is a building with a 300m<sup>2</sup> surface that was designed taking into account bioclimatic principles and the needs of the laboratory. It is arranged along the east-west axis and insulated with five bases of pebble bed, each of them fed by a Trombe wall and two windows. The building has a system of air redistribution, natural light windows at ceiling.

The solar house has 4 Trombe walls on the South orientation. The wall is make of reinforced concrete or bricks. It has a width of 20 cm, and the thermal wave takes 7 hours in crossing the wall and as consequence the temperature takes this time in meeting the interior face of the wall and to contributing to night heating.

The South wall of the Trombe device is painting in “Black chrome”, that it is a selective material that permit crossing the short waves and stopped the long waves. The Trombe has night blinders to night protection and in these conditions the profit is on the 30%. The glass surface is double, with  $1 \times 0,6 \text{ m}^2$  . The air is moving between the Trombe wall due to the pressure difference that is established which is a function of the air temperature. The Trombe wall would be installed with a shadow system in order to avoid the sun rays in summer. The evaluation of this system has been made for August days.

Professor A. de Miguel shows the different details to students and it can be seen below some figures with information about solar building, sensor station and inverters for PV installation that provide DC/AC power conversion. Data acquisition systems on PC were also shown.



Solar measurement station at CIBA site



PV control and monitoring system



PV inverter system



Solar house and Trombe wall at CIBA site