


Eco-building

by [Xavier Bustamante](#) / 2012-02-29 10:39:51 / España / 6825 / ES



New Construction

Primary energy need :

204 kWhpe/m².year

(Calculation method : RD: 47/2007)

ENERGY CONSUMPTION

Economical building *Building*

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

Building Type : Office building < 28m
Construction Year : 2005
Delivery year : 2005
Address 1 - street : Av. de Roma, 254 8056 MANLLEU , España
Climate zone : [BSh] Subtropical Dry Semiarid (Steppe)

Net Floor Area : 1 504 m²
Construction/refurbishment cost : 1 042 187 €
Cost/m2 : 692.94 €/m²

Certifications :



General information

The Eco-building is representative of our values at lavola, a company providing services for sustainability which since 1981 has been offering personalised services for all environmental needs.

A point of encounter for the lavola personnel and their place of cohabitation, it started life with the wish to ensure better working conditions and comfort for its users, who also played a part in its conception and design. Built according to criteria of sustainability – ie economically viable, socially integrating and environmentally correct – it has become a centre open to visitors and therefore one with an educational and communicational function.

This building demonstrates the company's technical knowledge base. The company produced the engineering project and contributed its knowledge in sustainable building from the start of the construction design and in every phase of construction and use.

Office building. Three storeys above ground level and one basement storey. Green roof on the third floor + solar panels. Approximate occupation: 50 people.

Open 225 days a year. Operating regime 2,475 hours/year.

See more details about this project

<http://www.usgbc.org/LEED/Project/CertifiedProjectList.aspx>

Data reliability

3rd part certified

Stakeholders

Stakeholders

Function : Developer

Pere Pous

Av. de Roma, 254, 08056 Manlleu

<http://www.ecoedifici.com/es/>

Function : Designer

Arquitecto. Miquel Sitjà

Ptge. Àngela Roca , 1 Baixos 08560 – Manlleu

<http://ecosit.net/es>

Function : Construction Manager

Ignasi Santiagosa . Joig Constructors

c. Vilaregut, 10, 08560 Manlleu

Owner approach of sustainability

Lavola, sustainability services company. The Eco-building was built according to criteria of sustainability – ie economically viable, socially integrating and environmentally correct –, representing the values of the company and with the aim of ensuring the best possible conditions of work and comfort for the people working there. The building is open to visitors and therefore has an educational and communicational function. At the same time, it serves to demonstrate the viability and the economic and technical utility of applying criteria in building construction. The goal of the operation was to build lavola's new headquarters applying criteria of sustainability. Through the development of a method of our own, an integral and innovative process was carried out to intervene from the conception of the building until the end of its life cycle. The main goals were to achieve efficient use of resources, in particular energy and also water and materials, as well as integration in the surroundings and adaptation to the local climate, and a flexible conception of space which would allow easy communication between work areas and adaptation to changes in organisation. One of the values of the Eco-building is that it incorporates many eco-solutions which, when added together, have made it possible to achieve these goals. During the design phase, technical, economic and environmental viability studies were undertaken before deciding on certain installations or eco-solutions, such as, for example, the type of climate control or the harvesting of rainwater. Thanks to these studies, it was possible to foresee savings in energy and water consumption, with regard to a conventional building, which have largely been fulfilled and in some cases even exceeded.

Architectural description

The eco-building project was conceived from the viewpoint of passive bio-climatic design, in such a way that heat gains could also be reused by the active climate systems. To this end, the building included a greenhouse on the southern façade which provides hot air for the automatic air circulation system. The skin of the building, built from a multi-layer light system, has a ventilated façade on the outside with coloured concrete panels. The openings have fixed and movable sunshade systems. One part of the roof collects rainwater, which is used in the building for the toilets, while the other part is a green roof connecting with the meeting rooms on the third floor.

If you had to do it again?

If we were ever to find ourselves in the same situation again, we would once more opt for the construction of a sustainable building and even implement more sustainable solutions in view of the favourable results obtained so far.

For example, we would probably choose to build a larger rainwater tank to increase savings in water. At the same time, it has been noted that the automated blinds involve high maintenance costs, so that consideration would be given to the use of an alternative system.

Building users opinion

By means of anonymous surveys among the building's users, who are the company's own employees, it has been possible to ascertain that there is a high level of satisfaction in aspects such as natural lighting and ventilation, thermal comfort, hygiene and accessibility, among others. The survey was answered by 49% of users and 97% declared they were satisfied with the building.

Some people gave a moderate score to the lack of humidity in the air. This fact, along with the records of the ventilation systems, led the management to take two measures to improve the internal environment: installing a vertical garden in an interior courtyard and a mechanical system to increase the humidity of the air (humidifier).

Energy

Energy consumption

Primary energy need : 204,00 kWhpe/m².year

Primary energy need for standard building : 159,00 kWhpe/m².year

Calculation method : RD: 47/2007

Final Energy : 122,00 kWhfe/m².year

Breakdown for energy consumption :

64.75 kWh electric/m²/year + 57.53 kWh gas/m²/year

97,391 kWh electric + 86,532.32 kWh gas

(Lower Calorific Value (LCV) for a usable surface area of 1,504 m²).

The electricity consumption indicated is actual consumption (metered), without subtracting the electricity produced by the PV panels.

More information :

The figures in indicators 39 and 42 are for actual consumption (metered).

Envelope performance

Envelope U-Value : 0,54 W.m⁻².K⁻¹

More information :

The southern façade has a sound-reducing greenhouse with a glassed-in volume of 76 m³ which in winter pre-heats hygienic incoming air before passing it to the acclimatiser, thereby saving energy in heating the offices. What's more, the glassed-in structure reduces and muffles the noise caused by the proximity to one of Manlleu's busiest streets. The western, main façade has windows with balconies facing south and exterior sliding shutters that let in the maximum of sunlight and reduce the need for artificial cooling and lighting. The exterior walls are made with 15-cm rock wool, treated wood and plasterboard panels. The natural insulation and ventilated façade achieve a very low heat transfer coefficient with the exterior, reducing energy losses through the building's skin by 74% with respect to a conventional building. The transfer coefficients for the various walls (in W/m²K) are: west façade (ventilated façade) and north façade: 0.19; south façade (greenhouse-solid part): 0.6; south façade (greenhouse-window):1.2; roof: 1.37; green roof: 0.24; property wall: 0.37; floor between storeys and site floor: 0.44; interior floor (between basement and ground floor): 0.65; internal divisions: 0.63; windows: 2.25. The building's global heat transfer coefficient, calculated according to the Norma Básica de la Edificación (Basic Building Regulation) NBE-CT-79 'thermal conditions in buildings', is of 0.589.

Building Compactness Coefficient : 0,37

Indicator : HE1 BD

Renewables & systems

Systems

Heating system :

- Condensing gas boiler
- Low temperature floor heating

Hot water system :

- Gas boiler

Cooling system :

- Others
- Radiant ceiling

Ventilation system :

- Natural ventilation

Renewable systems :

- Solar photovoltaic
- Solar Thermal

Renewable energy production : 3,50 %

Smart Building

BMS :

The measuring equipment, controls and building sensors are managed and run by DESIGO software, thanks to which we can: manage the building's different systems, monitor and control the building, view the state of the systems and their operation, view the t

Environment

GHG emissions

GHG in use : 29,00 KgCO₂/m²/year

Methodology used :

For the electricity, we have used data from the National Energy Commission (Comisión Nacional de la Energía), <http://gdo.cne.es/CNE/resumenGdo.do?anio=2010> (ENDESA SAU company). For the natural gas, we have used the natural gas conversion factor provided

Building lifetime : 100,00 year(s)

Life Cycle Analysis

Eco-design material : Minimal need for paint or varnish and prioritisation of the use of water-based ecological painting. Using prefabricated structures on the ceiling and coating them with sound-reducing materials has made the use of paint almost unnecessary. Water-based paints and varnishes have been chosen for walls and finishes and, whenever the regulations have permitted, preference has been given to paints without additives or synthetic resins. This avoids evaporation and the emission of hydrocarbons and the use of heavy metals. The paint used in the building carries the European eco-label. Reticulated polyethylene tubes as an alternative to PVC for the water installation. To avoid the use of glues, we have applied the technique of joining the tubes by heating them. The interior woodwork is in Flemish pine and has the FSC stamp. Since 1993 the Forest Stewardship Council has guaranteed and made sure that wood comes from sustainable forests. Interior walls with high-density rock wool that avoids the loss of insulation over the years and the emission of gases that are harmful to the ozone layer (CFC or HCFC). The toilets, taps and showers carry the Generalitat de Catalunya's Environmental Quality Guarantee Label granted to elements of water consumption fitted with water-saving features.

Water management

Consumption from water network : 157,66 m³

Consumption of harvested rainwater : 58,20 m³

Indoor Air quality

The building has CO₂ detectors to regulate the air renewal according to the concentration of CO₂, guaranteeing the quality of the air inside as well as saving energy. In addition, the choice of materials and paint also ensures high quality of the air inside, replacing PVC tubes with reticulated polyethylene, avoiding the use of glue and using water-based paint to avoid evaporation and emission of hydrocarbons and the use of heavy metals.

Products

Product

BIOMASSA

FUEGO DE AGUA - RADIADORES - ECO

marisol@romansbanyoles.com

http://www.edilkamin.com/es/focolari_chiusi.aspx

Product category :

ROMANS BANYOLES - AVDA DE LA FARGA 95 DE BANYOLES. 972 573012 636492298 Whapp ROMANS RIPOLL - CARRER PROGRES N1 DE RIPOLL. 972 701732 636492298 Whapp. www.joanromans.com info@romansbanyoles.com Dpto.Comercial. Marisol@romansbanyoles.com

HOGARES CERRADOS DE LEÑA EDILKAMIN: LA ATMÓSFERA DE LA CHIMENEA CON UNA NUEVA IMAGEN Y TECNOLÓGICAMENTE DE VANGUARDIA. Los hogares cerrados de leña son aparatos compactos y prácticos que, por la combustión de la leña, producen aire caliente para calentar la estancia donde se encuentran instalados y/o ambientes contiguos (con las correspondientes canalizaciones). Los modelos de hogares cerrados de leña ofrecidos por Edilkamin son diferentes en cuanto a potencia, tamaño y tipología: desde el amplio y panorámico hogar hasta el vertical y esbelto, desde el de ángulo hasta el de doble cara, con cristal plano, curvo o prismático y con interior de fundición, Ecokeram® o refractario. Los hogares cerrados de leña se personalizan con revestimientos Edilkamin, disponibles en varios estilos y materiales. Gracias al uso de la leña, permiten ahorrar en los costes de la calefacción respetando el medio ambiente. De hecho, la leña, además de ser el combustible más económico, también puede encontrarse fácilmente en la región.

Focs per calefacció i aigua calenta. L'estalvi està garantit.

ESTUFES CALDERES LLARS DE FOC
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BANYOLES (Central) - Av. de la Farga, 95 - Tel. 972 57 30 12 - info@romansbanyoles.com
RIPOLL - C. Progrés, 1 - Tel. 972 70 17 32 - romansripoll@gmail.com - www.romansbanyoles.com

Costs

Construction and exploitation costs

Global cost : 1 287 000,00 €

Renewable energy systems cost : 28 320,00 €

Energy bill

Forecasted energy bill/year : 15 865,70 €

Urban environment

The building is totally integrated in the urban surroundings. During the construction of the building it was ensured that local residents were inconvenienced as little as possible. The provisional pavement was made accessible for people with reduced mobility and the risk to pedestrians was kept to a minimum. This was an important aspect of the work, in view of the proximity of a secondary school whose students passed the site every day. The workers on the building site and especially the site supervisor were informed of the need to keep the site clean and tidy. Material exemplifying good environmental practices in building work was published and one of the measures taken was to set aside an area for cleaning concrete mixers away from work or transit areas.

Land plot area

Land plot area : 319,00 m²

Built-up area

Built-up area : 94,00 %

Parking spaces

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