


Learnlife Eco Hub: pop-up learning space

by Oliver Style / 2022-10-18 00:00:00 / España / 739 / ES

New Construction



Primary energy need :

85 kWhpe/m².year

(Calculation method : Other)

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 : School, college, university
Construction Year :
Delivery year : 2022
Address 1 - street : Passeig Marítim nº 139-141 08860 CASTELLDEFELS, España
Climate zone : [Csb] Coastal Mediterranean - Mild with cool, dry summer.

Net Floor Area : 99 m²
Construction/refurbishment cost : 120 000 €
Cost/m2 : 1212.12 €/m²

Certifications :



Proposed by :



General information

Designed by Solange Espoille, Learnlife Eco Hub is a center for sustainability and innovation located in Castelldefels (Barcelona). It is a flexible Near Zero Energy Building (NZEB) with a non-permanent structure. A building with a very high energy performance, in which the small amount of energy required is largely generated from renewable sources on site.

The building has achieved Passivhaus Classic certification, which offers energy savings of up to 90% compared to conventional buildings, and digitization processes that simplify the entire construction process. To achieve an optimal indoor environment with high energy efficiency, the [Zehnder ComfoAir XL 1500](#) and [Zehnder ComfoAir Q600](#) ventilation systems were used. The Eco Hub consists of two industrialized modules with a wooden structure, built by Tall Fusta with healthy materials with low environmental impact. The windows are from Elke Wood Windows, with meranti wood carpentry, with double low-emissive glass with argon gas. Praxis has carried out the energy simulation in PHPP, the design of the thermal envelope and hermetic layer, advice on low-impact and healthy materials, and optimization and calculation of thermal bridges and construction details.

The purpose is to contribute to improving the environment, creating not only an innovative learning space close to nature, but also a sustainable construction that reduces CO2 emissions on our planet.

See more details about this project

- <https://praxis-rb.com/pop-up-learning-space/>
- https://passivehouse-database.org/index.php?lang=en#d_6937
- <https://www.plataforma-pep.org/ejemplos-ph/learnlife-castelldefels/>

Data reliability

3rd part certified

- <https://www.learnlife.com/barcelona-eco-hub>

Photo credit

Jordi Vila and Marta/Argot Photo

Stakeholders

Contractor

- Name : Learnlife
- Contact : Sol Espoille
- <https://www.learnlife.com/>

Construction Manager

- Name : Praxis Resilient Buildings
- Contact : Oliver Style y Bega Clavero, Calle Ramon Turro 100, 5-7 08005 Barcelona
- <https://praxis-rb.com/>

Stakeholders

Function : Developer

Learnlife

Sol Espoille

- <http://www.learnlife.com/>
- District Attorney

Function : Certification company

Zephir

Dr. Francesco Nesi

- <https://passivhausitalia.com/>
- Passive House Certification

Contracting method

Lump-sum turnkey

Owner approach of sustainability

The premise was to create a sustainable construction with materials of natural origin, whose production process generates less waste, requires low energy consumption and respects nature.

The building has been designed with the idea that it could be a reference model for learning about efficiency and sustainability, allowing its users to participate in the building's energy cycles and processes.

A basic rainwater harvesting system collects rainwater from rooftops and channels it into a large reservoir for storage. This system provides water to gardens as it contains no chemicals and does not harm the plant microbiome.

"Collecting our own rainwater is a great way to conserve this precious resource"

Energy consumption

Primary energy need : 85,00 kWhpe/m².year

Primary energy need for standard building : 250,00 kWhpe/m².year

Calculation method : Other

CEEB : 0.0014

Final Energy : 42,00 kWhfe/m².year

Breakdown for energy consumption :

Heating demand: 12.6 kWh/m²

Heating load: 20 W/m²

Cooling demand: 16.2 kWh/m²a

Cooling load: 11 W/m²

Envelope performance

Envelope U-Value : 0,27 W.m⁻².K⁻¹

More information :

Fermacell gypsum fiber board. 13mm

-OSB 3 wood board [airtight layer & vapor barrier]. 18mm

-Wood fiber thermal insulation between wooden structure. 145mm

-OSB wood board. 15mm

-Waterproof & breathable sheet.

-Chamber ventilated. 60mm

-Thermo-treated wood. 15mm

Building Compactness Coefficient : 0,39

Indicator : n50

Air Tightness Value : 0,40

Renewables & systems

Systems

Heating system :

- Heat pump
- Tape

Hot water system :

- Individual electric boiler

Cooling system :

- Reversible heat pump
- Tape

Ventilation system :

- Double flow
- Double flow heat exchanger

<https://productos.zehnder.es/es/producto/zehnder-comfoair-xl-1500?stay=true&cHash=b86ab9e6c0c69b4428a272d8e5c69b91>

Renewable systems :

- Solar photovoltaic

Renewable energy production : 89,00 %

Other information on HVAC :

Two BAXI NANUK RZGK35 cooling and heating systems with direct expansion cassettes as terminal system.

The use of clean and self-produced solar energy from photovoltaic systems is maximized, reducing electricity costs and contributing to the protection of the environment.

Solutions enhancing nature free gains :

42% of the windows in this project face south, improving solar gain in winter. A sunshade was also incorporated to create shades on the windows during the summer.

Smart Building

BMS :

Electronic control systems have been incorporated to measure and monitor the interior environment, allowing optimal conditions to be maintained to improve results and performance. The monitor records data and reports on the dashboard allowing users to get an instant reading, as well as monitor trends and compare spaces with different environmental factors.

Environment

GHG emissions

GHG in use : 136,60 KgCO₂/m²/year

Methodology used :

PHPP

Water management

A basic rainwater harvesting system collects rainwater from rooftops and channels it into a large reservoir for storage. This system provides water to gardens as it contains no chemicals and does not harm the plant microbiome.

“Collecting our own rainwater is a great way to conserve this precious resource”

Indoor Air quality

To achieve an optimal indoor environment, materials with low emissions of Volatile Organic Compounds (VOCs) have been used, together with a ventilation system with Passivhaus [Zehnder ComfoAir XL 1500](#) component certification, which constantly renews the indoor air, with high energy efficiency. .

Comfort

Measured indoor CO₂ concentration :

01/07/2022 - 31/07/2022: Máximos de 494 PPM de CO₂

Products

Product

ComfoAir XL 1500

Zehnder Group Nederland B.V.

+31 38 429 6911

<https://www.zehnder.nl/>

Product category :

PassivHaus certified ventilation system with sensible heat recovery.

NANUK RZGK35

BAXI

900 80 20 68

<https://www.baxi.es/>

Product category :

Heating and cooling system with cassettes as an expansion system.

MTIO SLVP 6.5

Cointra

+34 916 707 459

<https://www.cointra.es/>

Product category :

Electric water heater.

iV68

Elke Wood Windows

+34 931 358 610

<https://www.elke.cat/>

Product category :

Carpintería de madera con una transmissividad de calor baja. (1.6 W/(m²K))

Domotics

Buo Home

info@buohome.com

<https://www.buohome.com/>

Product category :

Monitoring system manufactured by Buo Home

Helical Piles

Techno PIEUX

info.espana@technopieux.es

<https://www.technopieux.com/es-ES/>

Product category :

The ability to install the steel piles and build on top of them in the same day greatly increases production. Add in the fact that I save huge amounts of money and labor by not having to do earthworks, haul concrete and clean up the mess.

Costs

Construction and exploitation costs

Total cost of the building : 120 000 €

Building Environmental Quality

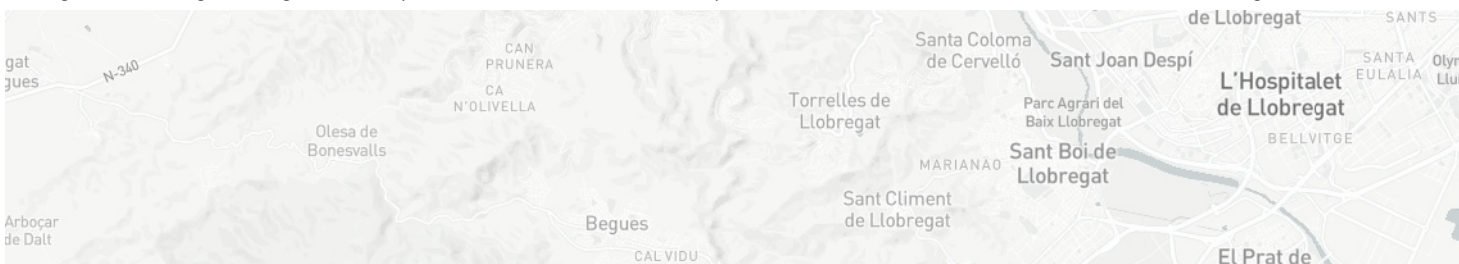
Building Environmental Quality

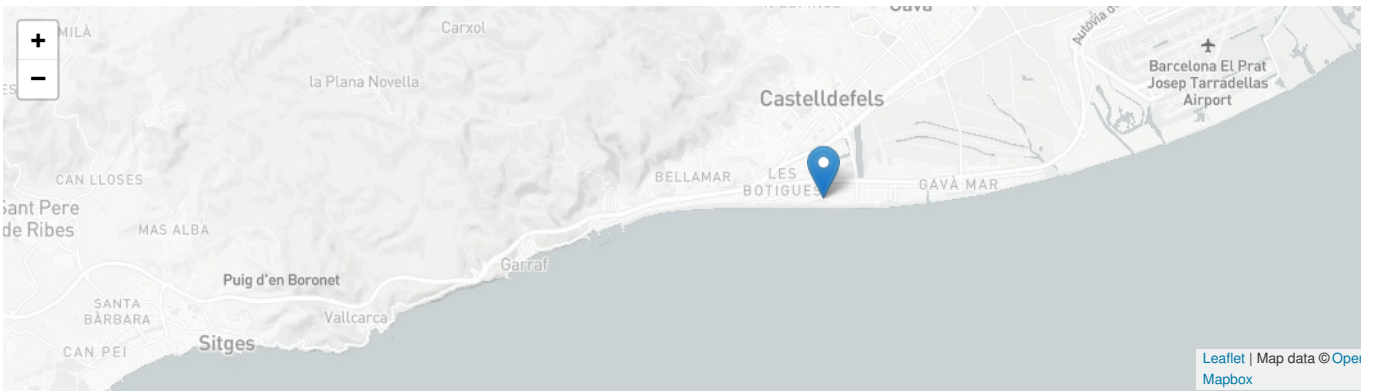
- indoor air quality and health
- consultation - cooperation
- acoustics
- comfort (visual, olfactive, thermal)
- energy efficiency
- renewable energies
- products and materials

Contest

Reasons for participating in the competition(s)

Proyectado por Solange Espoille, Learnlife Eco Hub es un centro de sostenibilidad e innovación situado en Castelldefels (Barcelona). Se trata de un edificio de energía casi nula (NZEB), flexible, con una estructura no permanente. Un edificio con un rendimiento energético muy alto, en el que la pequeña cantidad de energía necesaria se genera en gran medida a partir de fuentes renovables in situ. La premisa era crear una construcción sostenible con materiales de origen





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