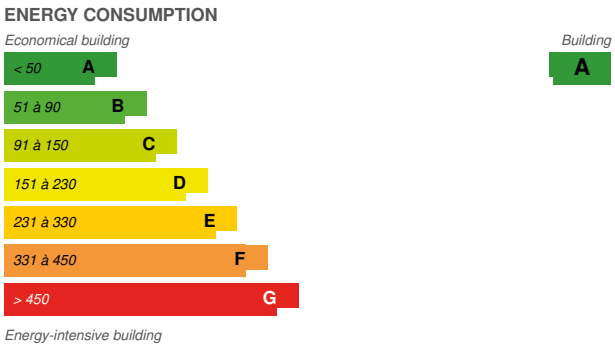
Gustave André School Extension

by Simon Barret / 2019-05-16 12:19:43 / France / 5144 / FR

Primary energy need :
kWhep/m².an
(Calculation method :)



Building Type : School, college, university
Construction Year : 2018
Delivery year : 2018
Address 1 - street : Rue des Ecoles 26120 CHABEUIL, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 802 m²
Construction/refurbishment cost : 1 800 000 €
Number of Pupil : 170 Pupil
Cost/m2 : 2244.39 €/m²

Certifications :

Bepos 2013

General information

Envelope:

- Wood frame walls
- Biosourced insulation: compressed straw 40 cm in walls and roof (R = 7 m²K / W) -Metallery in metal Uw <1.6 W / m²K-Sunscreen type Roller shutter or sunshade outside direction (according to orientation)

systems:

- Connection to existing gas boiler of the school group
- Emissions by room-driven radiators by 2-way valve - Double Flow ventilation (82% heat recovery, by-pass for summer conditions) - Photovoltaic panels: 224 m²

Sustainable development approach of the project owner

The main objective is twofold:

- aim for energy excellence, with the BEPOS Effinergie level, and make the building an exemplary case of compensation for energy consumption through local production
- incorporate a maximum of local materials and biobased, through the facade and wood frame, with insulation by straw bales (choice of companies and local suppliers)

Architectural description

This building presents a mixed structure:

- The superstructure of the building is of the post / concrete beam type, with slab and intermediate floors also provided in concrete, so as to provide the necessary thermal inertia for the building
- All facades, as well as the roof are made of wood / straw construction.

Photo credit

Simon Barret

Stakeholders

Contractor

Name : Ville de Chabeuil
Contact : Frédéric PROTHÉRY - Directeur Général des Services - DGS@MAIRIE-CHABEUIL.FR
https://www.mairie-chabeuil.com/

Construction Manager

Name : ICARE Développement
Contact : Patrick Berruet Patrick.berruet@icare-developpement.com
https://icare-developpement.com/

Stakeholders

Function : Designer

Fabre Architecture

contact@fabre-architecture.com

Function : Assistance to the Contracting Authority

Tribu Energie

simon.barret@tribu-energie.fr

http://www.tribu-energie.fr/
speaker labeling BEPOS Effinergie

Function : Certification company

Certivéa

elisabeth.porpe@certivea.fr

https://certivea.fr/#

Function : Thermal consultancy agency

Gedatel

Pascal Vermot-Gauchy

http://www.gedatel.fr

Contracting method

General Contractor

Type of market

Table 'c21_maroc.rex_market_type' doesn't exist

Energy

Energy consumption

Primary energy need for standard building : -87,00 kWhep/m^2.an

Calculation method :

Breakdown for energy consumption : 50% related to heating 5% ECS 13% lighting 1% distribution auxiliary 21% Ventilation auxiliaries 7% others (current outlet, etc ...)

Real final energy consumption

Final Energy : 33,50 kWhef/m^2.an

Year of the real energy consumption : 2 018

Envelope performance

Envelope U-Value : 0,42 $W.m^{-2}.K^{-1}$

More information :
Box wall wood / straw with straw boots 40 cm thick U = 0.177 W / m²K
Roof timber frame + straw box U = 0.186 W / m²K
Low floor on solid ground, continuous insulation U = 0.174 W / m²K
Aluminum joinery Uw = 1.6 W / m²K

Building Compactness Coefficient : 0,44

Indicator :

Air Tightness Value : 0,72

More information

The perfromances described above are derived from the calculation RT2012 and the calculation of consumption outside the scope RT (ratio) The renewable energy contribution allows to speak of positive energy building with needs of -88.5 kWhef / m2.an

Renewables & systems

Systems

Heating system :
- Low temperature gas boiler
- Water radiator

Hot water system :
- Individual electric boiler

Cooling system :
- No cooling system

Ventilation system :
- Double flow heat exchanger

Renewable systems :
- Solar photovoltaic

Renewable energy production : 317,00 %

Other information on HVAC :
The low temperature boiler used is the existing one, feeding the other part of the school

Solutions enhancing nature free gains :
Brise Soleil Orientables

Smart Building

BMS :
Simple and efficient management of HVAC systems: V2V-driven radiators and thermostats in every classroom.

Environment

Urban environment

Located near the center of Chabeuil, 5 minutes walk from the town hall, the school is bordered:

- college Marc Seignebos, in the immediate vicinity to the east of a district pavilion (single houses mainly) all around

Products

Product

Straw boot insulation

Etablissement Die

etsdie@orange.fr

http://www.die-fourrage.fr/
Product category : Second œuvre / Cloisons, isolation
Straw and fodder set in wooden box for insulation façade and roof

Easy installation

CTA double flux

Rotatech

https://www.atlantic-climatisation-ventilation.fr/ventilation/traitement-de-l-air/centrales-double-flux-hr-echangeur-rotatif/rotatech-debits-jusqu-a-4-000-m3-h
Product category : Génie climatique, électricité / Ventilation, rafraîchissement
Central double flow wheel exchanger

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Costs

Construction and exploitation costs

Renewable energy systems cost : 46 326,00 €
Cost of studies : 330 905 €
Total cost of the building : 2 737 553 €
Subsidies : 1 025 169 €
Additional information on costs :
All costs above include VAT

Health and comfort

Indoor Air quality

Double flow ventilation with filters and flow rates measured at reception to ensure good air quality

Comfort

Calculated thermal comfort : Utilisation de la STD pour vérification des températures estivales - optimisation choix et orientation des vitrage
Daylight factor : Calcul de Facteur de Lumière du Jour via le logiciel Dialux

Carbon

GHG emissions

GHG in use : 4,70 $KgCO_2/m^2/an$

Methodology used :
Based on RT2012 consumption

Life Cycle Analysis

Eco-design material :

Use of straw to insulate thermally and acoustically the walls facing the outside + wood frame

Contest

Reasons for participating in the competition(s)

The building is under construction timber frame, and the entirety of the external facades is isolated by straw boots (from the department). This choice comes from a desire to build using local and duplicable resources, low emitting greenhouse gases.

Building candidate in the category

Bas Carbone

Prix du public

Prix des Etudiants

Date Export : 20230709192801