

Operation Magnolias

by Jean-Louis Dubourdieu / 2018-06-12 16:37:23 / France / 8344 / FR



New Construction

Primary energy need :

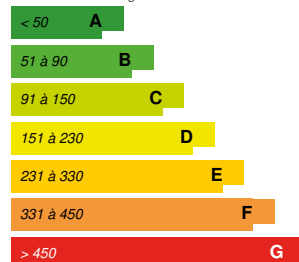
38.3 kWhep/m².an

(Calculation method : RT 2012)

ENERGY CONSUMPTION

Economical building

Building



A

Energy-intensive building

Building Type : Collective housing < 50m

Construction Year : 2015

Delivery year : 2016

Address 1 - street : 31400 TOULOUSE, France

Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 3 681 m² SHON

Construction/refurbishment cost : 1 886 450 €

Cost/m2 : 512.48 €/m²

Certifications :



effinergie⁺



General informations

The operation aims to densify a residence of 30 social rental housing, located near public transport (metro, bus).

The design in 2 buildings was chosen to minimize the solar masks and preserve the views of the existing apartments, in a very constrained site.

The chosen technique, wood-concrete, made it possible to use the prefabrication of structural and envelope elements, thus reducing the nuisance of the occupant's work and the needs for site installation.

This technique also made it possible to design "heavy concrete cores, made up of floors and partitions, and a light, only insulating shell, made of wood framing. This provision provides a thermal mass "protected" external stresses. The Toulouse climate has, in half-season of strong differences in day / night temperatures, whose inertia of the building decreases the amplitude.

Several sunscreens are used: projection wood blinds, solar shading, immediate use, ventilated roofs, double orientation apartments ...

Domestic hot water is preheated by solar panels with collective storage. The expected low consumptions allowed the adoption of intelligent electric convector

heating for small dwellings (T1, T2) and individual gas heating for higher typologies.

The installation of probes and counting allows, through a dedicated site, tracking consumption by tenants on PC or smartphone.

The operation is the winner of the call for projects "economical buildings" of the ADEME and the Midi-Pyrénées region and is the subject of an experimental follow-up over 4 years. Biosourced Level 3, it is part of the Toulouse Métropole Climate Plan.

Sustainable development approach of the project owner

CDC HABITAT (formerly SNI) has initiated the 23 collective housing project in TOULOUSE (31200) in a Habitat & Environment Profile A certification process, the BIOSOURCE BUILDING and E2 C1 labels issued by the CERQUAL certification body.

As such, CDC HABITAT is included in the policy by the Sustainable Development Group. This policy aims to reduce environmental impacts by setting up an organizational, technical and information management system.

The environmental profile targeted for this operation is also multiple:

- Environmental Management of the Operation, applied from the programming phase until the building operation.
- Clean site, with the consideration of local residents since the project came to complete a 1st tranche. The construction took place on a busy site.
- Energy - Reduction of the greenhouse effect: the energy commitment is strong on this project, with the achievement of the labels Effinergie + and E + C- (Level E2, Level C1).
- Constructive sector - Choice of materials: the operation was labeled Biosourced Building Level 3
- Water
- Comfort and health: Shared gardens were made available to residents on the operation, at the foot of buildings.
- Green gestures: a booklet has been distributed to all inhabitants to make them aware of the good things they have to do to live better and consume less.
- With the will to carry out an exemplary operation, the operation engaged in the CALL TO PROJECT - SESSION 2013 ECONOMIC BUILDINGS OF ENVIRONMENTAL QUALITY IN MIDI-PYRENEES and was winner. Highlights were: Habitat & Environment certification Profile A, biobased label level 3 and Effinergie +. With the particularity to follow for the lessor and the tenants their consumptions in their lodging.

This recognition gave an impetus to CDC HABITAT, which subsequently initiated the E + C- label project.

Architectural description

Densifying in urban areas a piece of land that is little used by the existing building, and close to public transport, brings a clear benefit: the reduction of the financial and ecological cost of travel. But it also brings many and varied constraints to which the project must adapt:

- the existing building, its influence, its jigs, its orientations, its views.
- the terrain and its geometric and regulatory constraints (PLU)
- the presence of residents on site and the management of nuisances.
- the organization of a construction site in constrained spaces.

The program led us to design volumes playing with these constraints, the views, the sun.

The buildings, labeled Biosourcé, had to assert this characteristic, by cladding wooden clapboard. It is therefore two buildings, clad in wood, which line up along the way. The forms, simple, contrast with the existing building.

A central plot articulates the accesses to the three buildings, located on different levels.

See more details about this project

https://conseils.xpair.com/actualite_experts/residence-les-magnolias-1ere-labellisation-batiment-biosource-occitanie.htm

<http://nlm.cdc-habitat.com/actualites-presse/actualites/inauguration-des-magnolias-1ere-residence-labellisee-biosourcee-en-occitanie.html>

<https://www.batiactu.com/edito/magnolias-premiere-residence-biosourcee-occitanie-52258.php>

<http://www.mpbois.net/le-premier-batiment-de-logements-collectifs-labellise-biosource-actualite.a829.html>

<https://www.qwant.com/?q=MAGNOLIAS+SNI&t=all&r=videos&o=0:a20139ba2c3ffdbd4e2646e9f6382a7c>

Stakeholders

Contractor

Name : NOUVEAU LOGIS MERIDIONAL GROUPE CDC HABITAT (ex SNI)

Contact : Monsieur Gilles Labarthe - gilles.labarthe@cdc-habitat.fr

<http://nlm.cdc-habitat.com>

Construction Manager

Name : SARL D'ARCHITECTURE LIEUX COMMUNS

Contact : Monsieur Jean-Louis Dubourdiou (B. Debeaurain, chef de projet) - dubourdiou@lieux-communs.fr

Stakeholders

Function : Other consultancy agency

TPFi

Monsieur Jérôme Malbert

BET TCE

Function : Construction Manager

ATP PAYSAGE

Jerome Classe - j.classe@atelier-atp.com

LANDSCAPE

Function : Assistance to the Contracting Authority

NOVACERT

Monsieur Cedric Juvenelle - cedric.juvenelle-taza@novacert.fr

<https://www.novacert.fr/>

ENVIRONMENTAL AMO

Function : Company

MET ENERGIES

LAURENT GARABUAU - laurent.garabuu@metenergie.fr , 05 65 77 27 04, 06 80 92 58 89

<http://www.metenergie.fr/>

developer of the energy coaching tool and @magnolias services.

Type of market

Global performance contract

Energy

Energy consumption

Primary energy need : 38,30 kWh/m².an

Primary energy need for standard building : 51,90 kWh/m².an

Calculation method : RT 2012

Breakdown for energy consumption : Gas: 16.35 Electricity: 8.54

Real final energy consumption

Final Energy : 24,89 kWh/m².an

Envelope performance

Envelope U-Value : 0,44 W.m⁻².K⁻¹

More information :

To bring inertia as well as the acoustic characteristics and regulatory firewalls, it has been favored interior floors and concrete roofs. For the rest, it has been used wood (pine and Douglas fir) from sustainably managed French forests: framing, facades, wood and hemp insulation for interior attics, tilt-and-turn windows to allow night ventilation, wooden shutters lacquered foldable projection to ensure summer sun protection.

In addition, in response to the problem of airtightness, the project management team recommended adding a mineral wool thermal lining to the interior of the peripheral walls, in an insulated wood frame. counter-partition half-stil. This allows to separate the vapor barrier membrane - guarantor of the airtightness - of the lining.

As for the roofs, which are also ventilated, two solutions have been implemented: concrete for the technical roofs housing the solar panels and the VMC double flux; wood for intermediate roofs without equipment. They are also insulated differently: two layers of wood wool and hemp (bio-based material) unrolled ventilated attic for building A; two layers of expanded polystyrene for B.

Building Compactness Coefficient : 0,55

Indicator : I4

Air Tightness Value : 0,24

More information

Energy monitoring with report to ADEME will be carried out during the year 2018 setting up of meters and probes on: ▲Heating hot water: calorimetric meter (5 units) ▲ Cold water for the individual production of domestic hot water: Volumetric meter (10 units) ▲Solar primary hot water: Calorimetric meter (10 units) ▲Electrical lighting consumption: Electric meter (10 units) ▲Electrical power consumption of specialized sockets: Meter (10 units) ▲Electric power consumption of normal outlets: Meter (10 units) ▲Electron Solar Ball Electrical Consumption: Electric Meter (5 units) ▲Electric heating electrical consumption: Electric meter (5 units) ▲ Room ambient temperature: Probe (10 units) ▲Outdoor temperature: Probe (1 unit) Measures and data recovery: - Counters - Invoices of consumption (water, gas, electricity) - Real conditions of use (Number of people, ...) - Maintenance monitoring Analyzes : - Compare real consumption with theoretical consumptions - Identify differences in consumption and their causes Remedy : - Housing utilization booklet - By analyzing the impact of the user Principle of success - Annex to the lease - Involvement and awareness of the tenant - CNIL declaration of all housing Providing each tenant with an electronic energy coaching tool called e-Magnolias on SMARTPHONE and Personal Computer. this tool is developed by MET ENERGIE

Renewables & systems

Systems

Heating system :

- Individual gas boiler
- Electric radiator

Hot water system :

- Individual electric boiler
- Individual gas boiler
- Solar Thermal

Cooling system :

- No cooling system

Ventilation system :

- Humidity sensitive Air Handling Unit (Hygro B)

Renewable systems :

- Solar Thermal

Renewable energy production : 9,30 %

Two heating modes:

Electric for small dwellings (10 dwellings)

Gas for others (13 dwellings)

Hot water :

DHW production for each building by solar panels

No collective DHW, solar primary energy distribution (no maintenance, no legionella, no counting)

Smart Building

BMS :

Energy monitoring over 4 years with reports to ADEME:

Heating part, DHW, Temperature.

- Storage on a local hard disk at a rate of 1 file per hour of all data
- Data retrieved manually via remote access via the internet.

Electricity part.

- Storage on each housing counter of:
 - 1 file / counter for a value per hour over a period of 48 hours (FIFO)
 - 1 file / counter for a value per day over a period of 2 years (FIFO)
- Data sent automatically to a mailbox or smartphone application

To enable operation it is imperative that a telephone line with internet box.

Environment

Urban environment

Land plot area : 4 246,00 m²

Built-up area : 1 141,00 %

Green space : 1 458,00

Located in Ranguel University District, between Faculty of Pharmacy, Science and Social Housing, the operation is located along a major axis of traffic, the urban fabric unstructured. The densification of this plot where is already located a residence 30 rental social housing was considered, in a very constrained area:

- by creating a frontality and an alignment on the path of the Maraîchers
- organizing the various buildings to minimize solar masks and preserve the views of existing apartments
- by organizing car parks while preserving collective green spaces
- by creating gardens shared by all the tenants of the residence
- while adapting the altimetry of the different buildings and tracks

Products

Product

E.BUILDING

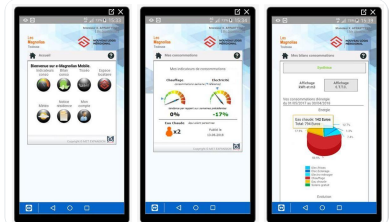
MET ENERGIE

Monsieur Laiurent Garabuau - laurent.garabuau@metenergie.fr

<http://www.metenergie.fr/>

Product category :

System for collecting individual consumption data with centralization on a server and display on a PC, tablet or smartphone. The system allows each tenant to check their consumption (water, gas, electricity, heating, DHW) in real time and to influence their way of life. The display can be done in euros.



Tenants regularly consult the site. A follow-up over 4 years will make it possible to evaluate the possible modifications of consumption.

Costs

Construction and exploitation costs

Renewable energy systems cost : 27 600,00 €

Cost of studies : 246 838 €

Total cost of the building : 2 405 550 €

Subsidies : 480 546 €

Health and comfort

Water management

Consumption from water network : 1 626,00 m³

Water Consumption/m² : 0,44

Water Consumption/Dwelling : 70.7

Comfort

Calculated indoor CO₂ concentration :

6kgCO₂/m³SHAB.an

Calculated thermal comfort : Projet : 27.3 °C / Référence : 32.1 °C

Acoustic comfort :

Complies with CERQUAL requirements for solid noise (-3 dB above regulatory thresholds), air and equipment

Carbon

GHG emissions

GHG in use : 196,00 KgCO₂/m²/an

Methodology used :

Carbon Assessment Methodology - ADEME - CSTB

GHG before use : 15,90 KgCO₂ /m²

Building lifetime : 50,00 année(s)

, ie xx in use years : 0.08

GHG Cradle to Grave : 1 110,00 KgCO₂ /m²

Using the Elodie software for calculating the LCA of the building

<https://www.construction21.org/france/data/sources/users/9213/reponse-cerqual.xls>

Life Cycle Analysis

Material impact on GHG emissions :

803

Material impact on energy consumption : 376,00 kWhEP

Eco-design material :

Synthesis of calculation of biosourced material:

- structure (wood frame): 33,975.16 kg
- insulation: 4,194.85 kg
- wall and floor coverings: 104.55 kg
- facades: 21,707.55 kg
- joinery: 10,806.36 kg
- outdoor facilities (wood terraces): 2,632 kg
- miscellaneous (package enclosures, wooden cupboards ...): 1 561 kg

Contest

Reasons for participating in the competition(s)

- DENSIFICATION
- BIOSOURCE BUILDINGS LEVEL 3
- PREFABRICATION
- THERMAL PERFORMANCE
- COMFORT OF ETE- MONITORING CONSUMPTION

Building candidate in the category



Energie & Climats Tempérés



Coup de Cœur des Internautes





Prix des Etudiants



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