ICF housing Sablière - ZAC Clichy Batignolles

by Simon Barret / 2015-07-08 10:27:04 / France / 19934 / FR

*

Primary energy need :

15 kWhep/m².an

(Calculation method :)

ENERGY CONSUMPTION

Economical building — *Building*

< 50	A	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 : Collective housing < 50m
Construction Year : 2015
Delivery year : 2015
Address 1 - street : rue René Blum 75017 PARIS, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 3 310 m²
Construction/refurbishment cost : 7 200 000 €
Number of Dwelling : 50 Dwelling
Cost/m2 : 2175.23 €/m²

Certifications :

HABITAT & ENVIRONNEMENT — NF HQE HABITAT — effinergie

Proposed by :

Rabot Dutilleul

General information

The project is a new construction, composed of two separate buildings of 27 and 23 rooms with a total living area of 3310 m². It is located in Paris, in ZAC Clichy Batignolles, in the newly created rue René Blum (17th arrondissement). It occupies a land that was not built until then.
The owner of the operation is the social landlord ICF Sablière.

The construction site took place between August 2012 and January 2015.

The operation targeted (and achieved) a triple performance objective:

- Low energy consumption building (Effinergie BBC) via an Habitat and Environment Performance certification by Cerqual

- Respect of City Climate Plan of Paris (50kWh / m².year without geographical modulation)

- Workbook Compliance with Environmental Regulations and Sustainable Development (CPEDD) ZAC Clichy Batignolles

Sustainable development approach of the project owner

The construction site took place between August 2012 and January 2015.
The operation targeted (and achieved) a triple performance objective:
- Low energy consumption building certification (Effinergie BBC) via an Habitat and Environment Performance certification by Cerqual
- Compliance of City Climate Plan of Paris (50kWh / m².year without geographical modulation)
- Compliance of Environmental Regulations and Sustainable Development local workbook (CPEDD) ZAC Clichy Batignolles.

Architectural description

The general concept is the following:
- reduced need for insulation and advanced air tightness (level of requirement passive)
- limitation of thermal bridging
- bioclimatic treatment for summer comfort
- high-performance but financially justified systems
- clearing consumption by renewable energy (photovoltaic here)
- extensive debate on environmental quality throughout the building: water conservation, waste management, health air quality and materials, revegetation of areas, ...

See more details about this project

http://www.lemoniteur.fr/portfolio/projet-architectural-de-50-logements-sociaux-a-paris-17e-par-antoninidarmon-pour-icf-la-sabliere-4562526

Stakeholders

Stakeholders

Function : Contractor

ICF Sablière

24 rue de Paradis 75010 Paris

http://www.icfhabitat.fr/sabliere

Function : Designer

Antonini Darmon

36 Rue de Lancry, 75010 Paris

http://www.antonini-darmon.fr/

Function : Thermal consultancy agency

Tribu Energie

60 rue du Faubourg Poissonnière 75010 Paris

http://www.tribu-energie.fr

Contracting method

General Contractor

Type of market

Table 'c21_maroc.rex_market_type' doesn't exist

Energy

Energy consumption

Primary energy need : 15,00 kWhep/m^2.an

Primary energy need for standard building : 93,00 kWhep/m^2.an

Calculation method :

Breakdown for energy consumption : Final consumption of building regulations No. 1 kWhep / m², year kWhep 5.40 Heating / m².year kWhep 17.39 ECS / m².year Fans kWhep 9.58 / 6.78 m².an Lighting kWhep / m².year Auxiliary kWhep 0.70 / m².year Photovoltaic kWhep 22.82 / 17.03 Total m².an kWhep / m².year finals of building regulations consumption No. 2 in kWhep / m², year kWhep 5.36 Heating / m².year ECS kWhep 15.73 / 10.23 m².an Fans kWhep / m².year Lighting kWhep 6.76 / 0.76 Auxiliary m².an kWhep / m².year Photovoltaic kWhep 26.18 / 12.65 Total m².an kWhep /m².an

Real final energy consumption

Final Energy : 14,90 kWhef/m^2.an

Envelope performance

Envelope U-Value : 0,47 $W.m^{-2}.K^{-1}$

More information :

The Buildings description is:
Envelope - Construction system: poured concrete - Walls: double insulation within 120 mm / 140 mm outside for Up <0.120 W / m² K - Roofing insulated by 200mm insulation terrace (and vegetated part): Up <0.120 W / m² K - Low Floor Parking Lot: Insulation on the underside (150 mm including beams returns) and sub-screed (60 mm) <0.155 W / m².K - Double glazing clear 4 / 16/4, with Ug <1.1 W / m².K - mixed joinery wood / aluminum Uw <1.4 W / m² K - Balconies: floor working (thus lighter), fixing hooks point to limit the structural thermal bridges - Air tightness: n50 <1 vol / h, a Q4 ≈ 0.35 m3 / hm under 4 Pa

Building Compactness Coefficient : 0,43

Indicator :

Air Tightness Value : 1,00

More information

The buildings being occupied since early 2015, the feedback is not sufficient to make an assessment on actual consumption

Renewables & systems

Systems

Heating system :

- Urban network

Hot water system :

- Urban network
- Heat pump

Cooling system :

- No cooling system

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic

Renewable energy production : 30,00 %

Other information on HVAC :

1. Heating Connection to district heating system of Paris Offering by radiators fitted with thermostatic valves hyper reactive (temporal variation = 0.40 K) Minimizing the cold wall effect avoids traditional investments (under the window) and placing the radiators at best to minimize distribution losses - gain of 2 kWhep / m².year compared to traditional insulation ECS. In a high-performance building, the ECS is the largest consumer of electricity (before heating). An innovative system: ERS - heat recovery from waste water by a heat pump - was set up for this consumption.Advantages: - Recovery of energy previously lost - High energy performance : COP up to 4.20. This choice has an impact on the design: - Provide a local to R-1 plumb wastewater networks - Collect the waste water and EV and EP also. Significant work has been done to optimize the loop circuit: in fact, the line losses are too often underestimated and catastrophic for an ambitious building. For example, they would have shown in this project, especially without treatment, about 35% of total consumption ECS !! This involved working on several points: - Limiting the number of risers: approximation of puisages points in compliance with the Legionella regulations. The principle of risers by technical sheath serving housing 2 has been established so as to optimize the network. The sheath distribution landing (that is to say, on the floor landing) is not satisfactory for several reasons: long hydraulic networks and expensive (it generally takes more than 2.7m to reach a point of use, while the addition of a technical sheath increases only the necessary length 2.7m), significant waiting times for hot water, uninsulated recessed known circuits participating in discomfort summer - Surisolation the circuit loopback: a class 5 was retained, allowing loss less than 8 W / ml, while in many cases the losses on a traditional insulation are 20 or 25 W / ml. Such losses are unacceptable because in the case of a closure ECS they take place 24/24 and 365 days per year The above measures allow a gain of around 10 kWhep / m².year compared to a traditional solution (loop landing sheath, insulation class 2) 3. Breakdown dual flow ventilation system Collective - air heat recovery extracts > 80% - Group Housing arranged roof terrace - low energy consumption fans - exchanger by-passable for the comfort in summer and mid-season - Respect fire standards with extractor C4 by-passable - Network ventilation Sealing class C (leak test carried out by the company). ENR Objective of production of 40 MWh of electricity, 29 kWhep / m².year - photovoltaic Surtoiture 158 m² for each building - Orientation South privileged, offset with respect to the orientation of the building - Polycrystalline panels

Solutions enhancing nature free gains :

Une innovation de ce projet consiste en la mise en place d'une récupération de chaleur thermodynamique sur les eaux usées: Récupération de chaleur sur eaux usées Le système est principalement composé d'une cuve d'échange thermique et d'une pompe à chaleur

Environment

Urban environment

Land plot area : 1 543,00 m^2

Built-up area : 40,00 %

Green space : 870,00

The project is located in Paris, in ZAC Clichy Batignolles, in the newly created rue René Blum (17th arrondissement).

Products

Product

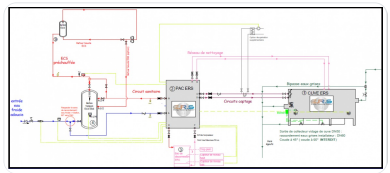
ERS Biofluid

Biofluides

300 avenue de l'Europe 77310 SAINT-FARGEAU-PONTHIERRY

http://www.biofluides.com

Product category : Génie climatique, électricité / Chauffage, eau chaude



The system is mainly composed of a heat exchange tank and a heat pump water / water. Gray wastewater is collected at an average temperature of 29 ° C, and pass through a tank in which are immersed heat exchangers. It is these exchangers, in which a coolant circulates, which will supply calories to the heat pump system which produces a hot water at 45 ° C. The treated gray wastewater is then discharged at an average temperature of 9 ° C in the sewer system. This technology is particularly interesting for several reasons: - coincidence of the DHW with consumption (unlike solar for example) - Performance (COP) of very high and constant year-round production (in contrast to a PAC air / water) - Valuation of energy that would be lost

This solution had been followed up on another previous installation, conducted by both the book Masters (ICF Sablière) and thermal BE (Tribu Energie). The measured COP were very satisfactory, with results above expectations. Based on this successful experience, the building owner and tribe Energy therefore decided to re-implement this solution on this project.

Costs

Construction and exploitation costs

Renewable energy systems cost : 161 000,00 €

Total cost of the building : 7 190 000 €

Health and comfort

Water management

Consumption from water network : 4 500,00 m^3

Water Consumption/m2 : 1.36

Water Consumption/Dwelling : 90

Indoor Air quality

Glues and primary: EC1 Paintings: A + NF environment or soil Coating: Class A +

Comfort

Health & comfort : The issue of health quality (and thus the health of occupants) was treated on this construction by different solutions:
- choice of materials with the best results in terms of VOC emissions (paints, glues, primary and flooring)

- double collective flow ventilation, for filtering the supply air, thus improving theoutdoor air quality. This solution also improves acoustic comfort with the outside, due to the lack of vents on the windows. This is an important element in an urban environment (the project is located in Paris)

Calculated thermal comfort : Le confort d'été a été particulièrement travaillé pour atteindre les résultats suivants: moins de 26 heures au-dessus de 28°C à l'intérieur. Cela est notamment obtenu car les logements sont traversants, permettant de générer un fort débit d'air.

Acoustic comfort : The acoustic treatment is particularly studied in this operation: - 33 dB isolates facades - standardized NTPPA sound pressure levels <30 dB (A) in rooms and stays - Acoustic Performance Delta Lw = 18 dB soil coverings, ways to deal and impact noise transmission between dwellings

Carbon

GHG emissions

GHG in use : 3,00 $KgCO_2/m^2/an$

Methodology used :

The scope covered for regulatory purposes (heating / DHW / fans / lighting), net of CO2 emissions avoided through the PV

Contest

Reasons for participating in the competition(s)

The project's philosophy is to offer simple, effective and proven solutions to meet very high performance-oriented goals.
A crosscutting approach was needed in project design to achieve not only a high energy performance objective, but also taking into account related environmental issues: Water cycle, outdoor Planning (stormwater retention , biodiversity, thermal regulation limiting the phenomenon of urban heat island) , choice of materials (embodied energy , ...) , clean building site , "soft" transport, automated vacuum collection , etc ...

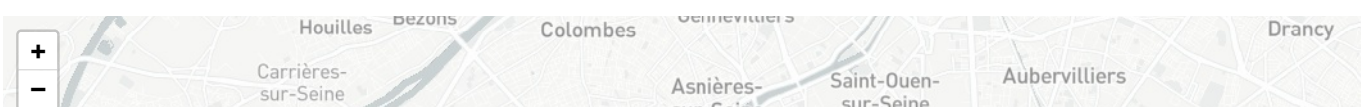
Building candidate in the category

Green Building Solutions Awards 2015
powered by Construction21

Energies renouvelables

Bâtiment zéro énergie

Santé et confort



Date Export : 20230630024743