

SCHOOL GROUP « LA CASTELLE » (Lattes, FRANCE) – Renovation

Project performance - 53 kWh/m²/y PE

GENERAL INFORMATION

Primary energy: In France, the conversion of primary energy into final energy is fixed (1 kWh of electricity = 2.58 kWh of primary energy, hydrocarbon 1 kWh = 1 kWh of primary energy, wood 1 kWh = 1 kWh of primary energy (0.6 kWh of primary energy in the BBC label EFFINERGIE).

Ubat: Heat loss of a building by transmission through the walls (including thermal bridges) and windows expressed in W/m²/K. The lower Ubat is, the better the building envelope is performing.

Cep: Conventional energy consumption of a building for heating, cooling, domestic hot water, electricity for pumps and fans, and lighting facilities are expressed in kWh/m²/year in primary energy.

BBC Label EFFINERGIE

The energy target is not given in absolute value. This label requires designing buildings twice as efficient as conventional buildings.

New buildings: The target for maximum primary energy consumption is 50% of the baseline fixed by the thermal regulation. It is mandatory to design airtight buildings to minimize air infiltrations and therefore the needs for heating (Cep ref of the thermal regulation 2005).

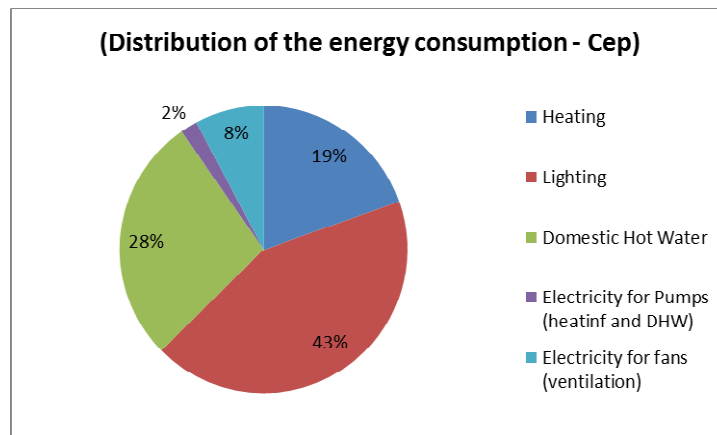
Retrofitting buildings: The target for maximum primary energy consumption is 60% of the baseline fixed (Cep ref of the thermal regulation for existing buildings).

GENERAL INFORMATION	
Name of the public building renovation	School Group La Castelle
Location	Lattes (Hérault – France)
Altitude	15 m
Area	2076 m ²
Date of construction	1976
Date of renovation	2012
Short description	<p>“La Castelle” renovation project was the winner of a call for proposals launched by ADEME and the Languedoc-Roussillon region.</p> <p>The renovation of the school group "La Castelle", built in 1976, includes the insulation of the concrete walls from the outside with 10 cm of polystyrene and of the roof with 20 cm of cellulose wadding.</p> <p>In addition, all windows (except those less than two years) have been replaced by double glazing with aluminium and PVC joinery.</p> <p>Regarding equipment, the existing boilers were replaced, single-flow ventilation was implemented in classrooms and double flow ventilation is present in the refectory.</p> <p>Finally, the building was instrumented in order to achieve an energy monitoring.</p>
Key actors	
building owner	Mairie de Lattes
Thermal studies engineers	ENR Concept



Thermal calculation results

	Performance Level	BEFORE	Regulation objective	AFTER (Project)
Building 1	Cep [kWep/m ² /year]	102.92	92.53	53.30
	Ubat [W/m ² /K]	1.715	0.957	0.748



ENERGY EFFICIENCY MEASURES			
Building envelope	Walls	Exterior block walls 20 cm, insulated from the outside with 4 cm of polystyrene and inside with 10 cm of glass wool	Up = 0.291 W/(m ² ·K)
	Low-floor insulation	Low floor open ground, consisting of a 20 cm concrete slab without insulation	Up = 0.470 W/(m ² ·K)
	Flat floor	Attic roof, consisting of a 20 cm concrete slab insulated with 28 cm of glass wool.	Up = 0.180 W/(m ² ·K)
		Flat roof, consisting of a 20 cm concrete slab insulated with 20 cm of cellulose wadding	Up = 0.191 W/(m ² ·K)
	Windows	Double glazing aluminium windows out of thermal bridges	Uw = 2.31 W/(m ² ·K)
		Double glazing PVC windows	Uw = 1.57 W/(m ² ·K)
Thermal bridges	No information		
Air tightness	1.70 m ³ / (hm ²) at 4 Pa - Value not confirmed by measuring		
Building techniques	Heating	One new Gas condensing boiler with a capacity of 115 kilowatts and one new low temperature gas boiler with a capacity of 114 kilowatts	
	DHW	Existing electrical balls (50, 150 and 200 liters)	
	Ventilation	Mechanical ventilation single flow (classrooms and health) Double ventilation with exchanger efficiency of 80% (refectory)	
	Local electricity production	None	

BUDGET and SOURCE of FINANCING	
Global budget	€ 307 500 without VAT € 148 without VAT/m ² of floor area
Source of financing	€40 without VAT/m² of floor area (max € 100 000) Region Languedoc Roussillon = € 50 000 without VAT ADEME = € 50 000 without VAT

