Renovation of Paradis School

by Fernanda Batista / 2018-03-16 00:00:00 / France / 7193 / FR

Primary energy need :

124 kWhep/m².an

(Calculation method : RT 2012)

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 : 1972
Delivery year : 2013
Address 1 - street : 20 rue du Paradis 75010 PARIS, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 2 362 m² SHON
Construction/refurbishment cost : 800 000 €
Number of Pupil : 147 Pupil
Cost/m2 : 338.7 €/m²

Proposed by :

dalkia smart building

General information

In Paris, 100 schools have been renovated in two years to improve their energy performance! This challenge, Optimal Solutions, subsidiary Dalkia (EDF Group) noted. The program is a major component of the energy and climate plan launched by the City of Paris in 2007. The aim is to reduce CO2 emissions by 30% and achieve 30% energy savings by 2020. Why schools?

Because they represent 25% of the City of Paris real estate.

An EPC - Energy Performance Contract is an innovative business model, which reduces risks for the city, and which asserts itself as the pivot of the energy transition of local communities. On the menu: the reduction of energy losses and the installation of heating systems, regulation and lighting with high energy performance. To meet this challenge of energy performance, Optimal Solutions, for its part, has combined a tailor-made approach that integrates the architectural and thermal specificities of each school.

Optimal Solutions has deployed an intelligent digital tracking system and remote control of energy performance; planning interventions outside school time to minimize discomfort; an eco-awareness program for both municipal officials and schoolchildren, in partnership with the Éveil association, during the twenty years of the contract. This case study focuses on the renovation of one of the schools representative of the program : Ecole Paradis, located in the 10th arrondissement.

Program of work: implementation of standard operations, such as thermostatic valves, pins for managing the periods of partial occupation, regulation or

improvement of class lighting. The program also includes insulation work in the basement and the replacement of joinery in the classrooms.

Interventions, managed mainly during school holidays, have avoided any inconvenience to the occupants.

Sustainable development approach of the project owner

This is the largest energy renovation program conducted in France. Goals :

- To pursue the City of Paris Climate Plan initiated in 2007: reduce energy consumption and CO2 emissions by 30%.
- To renovate and modernize 100 schools (buildings from the 17th to the 21st centuries)
- To improve occupant comfort and control consumption over time
- Global strategy for a local result A global strategy has been put in place following the personalized diagnosis and analysis of the functioning of each school:

- 3 types of schools have been identified: the Jules Ferry school (classically designed, 19th century), the post-World War II school (rebuilding 50s-70s, predominantly concrete) and functionalist schools (80s and later).- 3 thermal zones have been identified: the entrance (very low heating), corridor (moderate heating) and classroom (maximum heating to guarantee user comfort).- 3 moments were identified in the life of the school: the time of the children (during the day), the time of the study (30% of the used premises) and the time of the adults (the evening and the weekend). From the diagnosis of each school, a strategy has been put in place to achieve optimal thermal comfort for users while limiting heat loss and the cost of renovation work. The work was therefore focused on the replacement of window frames (windows) in the classrooms, and the insulation of the classroom / outdoor courtyard wall façade) and on the attic insulation.

Architectural description

Functionalist type school, light structure - 6 classes - guardian housing + executive accommodation.

Main building: reception, kitchen, refectory, housing, class, sanitary, master's room, yard, office direction, local staff

See more details about this project

http://www.edfoptimalsolutions.fr/nos-references/cpe-paris
https://www.edf.fr/collectivites/transition-energetique/references-et-realisations/ville-de-paris-30-d-economies-d-energie-pour-les-ecoles

Stakeholders

Contractor

Name : Société Nov'Ecoles Paris
Contact : For the realization of this project, a project company (NOV'ECOLES Paris) was created between Optimal Solutions, the Caisse des Dépôts et Consignations with the Exterimmo fund and Atlante Gestion with the France Infrastructures fund.

Construction Manager

Name : Coteba - Groupe Artelia
https://www.arteliagroup.com/fr/le-groupe/qui-sommes-nous/histoire/coteba

Stakeholders

Function : Developer

Optimal solutions

Président : Arnaud Westrich

http://www.edfoptimalsolutions.fr

Function : Construction Manager

Chiarodo & Maillet

office@chiarodomailletarchi.com; +33(0)1 45 89 10 60

http://chiarodomailletarchi.com/

DPLG architect, school diagnosis and help in the development of the overall renovation strategy

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Function : Environmental consultancy

Ville de Paris

Contracting authority

Function : Company

Leon Grosse

http://www.leongrosse.fr/
General Enterprise

Function : Other consultancy agency

Apave Parisienne

https://www.apave.com/apave-parisienne.html
SPS Control and Coordination Office

Function : Company

Urilec

http://www.urilec.com/
Electrical engineering

Function : Company

UTB

http://www.utb.fr/
Heating, roofing, waterproofing, plumbing

Function : Company

CRAM

http://www.cram.fr/
Energetic efficiency

Function : Environmental consultancy

Function : Environmental consultancy

Contracting method

Other methods

Energy

Energy consumption

Primary energy need : 124,00 kWhep/m^2.an
Primary energy need for standard building : 164,00 kWhep/m^2.an
Calculation method : RT 2012
CEEB : 0.0001
Initial consumption : 253,00 kWhep/m^2.an

Real final energy consumption

Real final energy consumption/m2 : 142,00 kWhef/m^2.an
Year of the real energy consumption : 2 012

More information

An EPC - Energy Performance Contract is an innovative business model (30% energy savings and reduction of CO2 emissions guaranteed over 20 years) that reduces the risks for the city, and which asserts itself as the backbone of the energy transition of local authorities. If the performance is lower than forecast, the policyholder pays the City of Paris a compensatory amount defined by contract. In case of outperformance, the gain is shared.

Renewables & systems

Systems

Heating system :
- Urban network

Hot water system :

- Heat pump

Cooling system :

- No cooling system

Ventilation system :

- Natural ventilation

Renewable systems :

- No renewable energy systems

Other information on HVAC :

Work done for domestic hot water production
- Pump replacement with variable flow pumps For heating
- Where possible, electrical pins have been inserted into the heating elements. When this is not possible, the radiators will be replaced by fan convectors equipped with a hot water coil and an auxiliary resistance for the treatment of the extracurricular period.
- Thermostatic valve installations Lighting
- Replacement in place of existing luminaires in classrooms and school activity areas (library, computer, music, visual arts)
- Replacement of manual ignition controls with detection systems automatic

--> The whole is controlled by Optimal Solutions

Smart Building

BMS :

Establishment of a centralized technical management allowing the supervision of the technical equipment of the site and the control of the performance by the various actors concerned + screenshot.

Establishment of a Computer Assisted Maintenance Management (CMMS) allowing:
- to establish a complete inventory of equipment
- to centralize requests for interventions / interventions by the occupants
- to allow consultation by the services of the City of Paris of the good progress of the interventions

Establishment of probes allowing the contradictory monitoring of the control of the installations of heating Setting up of a system of optical reading allowing the resumption of the information of the counters. This operation aims to monitor the consumption of the site and thus avoid any energy drift.

Environment

Urban environment

The school Paradis is located in the 10th arrondissement of Paris in a dense urban fabric.

Products

Product

Awareness raising and training for children, technical staff and cleaning staff

Optimal Solutions en partenariat avec l'association Eveil

Association éveil : http://www.eveil.asso.fr

http://www.edfoptimalsolutions.fr

Product category : Management / Implication des parties prenantes

Optimal Solutions has set up a training and awareness program for 3 different targets:
- Children and teachers: at a rate of 250 courses per year, for kindergarten and CM1/CM2 students. They learn the right things and why.
- The technical agents: they manage the buildings under the tutelage of Optimal Solutions which trains them every year on the piloting of the schools. They are either agents of the City of Paris trained by Optimal Solutions, or private contractors trained regularly internally.
- The cleaning staff: They are there before and after everyone. They therefore have a key role in steering the buildings. They must be made aware not to open the windows large to ventilate the rooms and encourage them to report a malfunction.

Good acceptance in general, especially among teachers who are very demanding of this type of awareness. Energy performance is at the rendezvous

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Intelligent digital system for monitoring and remote control of energy performance

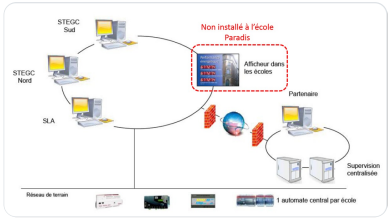
Optimal solutions

http://www.edfoptimalsolutions.fr

http://www.edfoptimalsolutions.fr

Product category : Management / Facility management

Thermal probes were installed in each school: 1 per floor and per building.
All thermal centers are managed by Optimal Solutions and up the consumption data.



Costs

Health and comfort

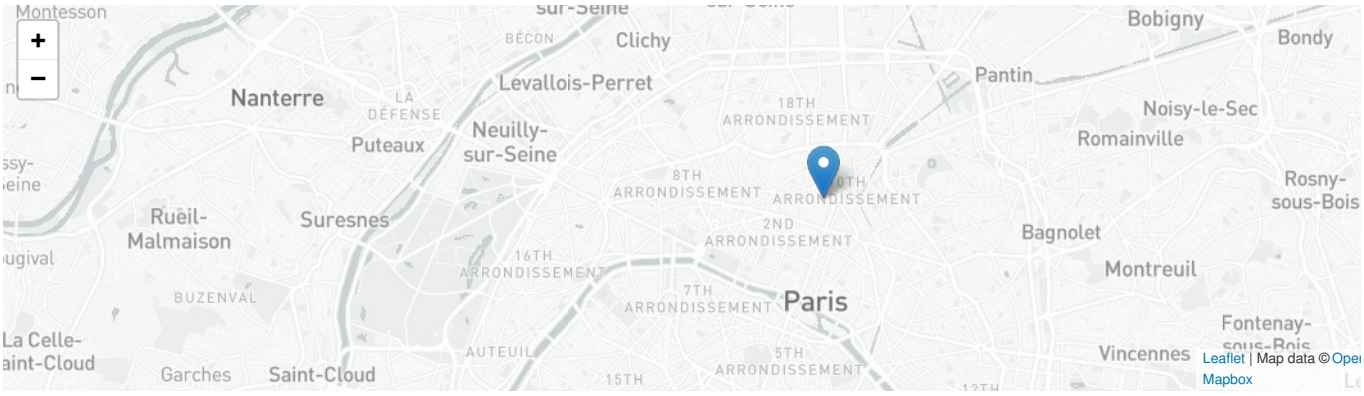
Comfort

Health & comfort :

- Energy efficient luminaires have been installed

- Thermal probes were installed on each floor- Installation of double glazed windows

Calculated thermal comfort : 19°C
Measured thermal comfort : 19°C



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