ENERGY PERFORMANCE CONTRACT: AMBLARD HIGH-SCHOOL IN VALENCE (26)

As part of its heritage management efforts, the Auvergne-Rhône-Alpes Region has undertaken an energy savings programme by launching major renovation projects in its secondary schools.

In 2014, the Region hired the SPL (publicly-owned local corporation) OSER (regional energy services operator) to carry out a comprehensive energy retrofit of Amblard high-school in Valence. The expected reductions in consumption are guaranteed by an Energy Performance Contract (EPC).

LOCATION

Valence, the Prefecture of the Drôme department, is a city of 64,000 inhabitants (180,000 in the conurbation) located along the River Rhône.

It is part of the Valence Romans Agglo conurbation community. The city has 7 public secondary schools, including the Amblard vocational school. As for all establishments of this kind, the Region is responsible for maintenance and is the contracting authority for the work undertaken.

RENOVATION OF SECONDARY SCHOOLS, A REGIONAL COMPETENCE

The Auvergne-Rhône-Alpes Region is pursuing its regional sustainable development efforts through the Territorial Climate Air and Energy Plan (SEAP).

As part of its remit and energy transition policy, the Region is renovating secondary schools it is responsible for. The Energy Performance Contract (EPC), which guarantees energy savings and reductions in CO₂ emissions following a renovation, is an invaluable tool for the success of these projects. The secondary schools being renovated are chosen based on the potential energy savings and the need for renovation of their building envelopes and technical facilities.

This school’s renovation contributes to the targets of Valence Romans Agglo, which obtained the “Positive Energy Territory for Green Growth” (TEPCV) label and is a candidate for the Cit’ergie label in addition to its Territorial Climate Air and Energy Plan. This territory is particularly interested in increasing the use of photovoltaic energy.

CONTEXT

Objective
Primary energy consumption: -57%
Greenhouse gas emissions: -50%

Duration
10 years

Investment
€2 M Ex. VAT

Type of EPC
Works and services

Contracting authority
SPL OSER

Consortium representative
Energy service company Spie Batignolles sud-est (consortium representative)

Types of buildings:
1 school built in 1933 and workshops (jewellery shop, woodworking) dating from 1961, for a total of 9,235 m²
Objective

Technical audits of Lycée Amblard in Valence were completed at the end of 2014, following the signature a 10-year design, construction, operation, and maintenance (CREM) EPC between the SPL and the Region. It calls for a 57% decrease in energy consumption and a 50% reduction in CO\textsubscript{2} emissions, with 45% of energy needs coming from renewable energy.

The EPC includes actions to ensure significant energy savings through changes to heating equipment (the central gas heating system is recent) and significant work on the building.

The replacement of joineries, and the insulation of walls, floors, attic spaces, and flat roofs should improve thermal comfort in winter, particularly in classes and hallways. Renewable energy is used thanks to the installation of photovoltaic panels.

Implementation

The project was able to monetise Energy Savings Certificates (ESC), estimated at 18,200 MWh cumac, or around €67 k Inc. VAT. The Region signed a 20-year emphyteutic lease with the SPL. The cost of the works is covered by SPL. The Region is reimbursing this amount in the form of annual rent that includes the cost of the work, the fees, and maintenance.

60% of the services in the contract are being carried out by small and medium-sized companies from the region. The consortium representative, SPIE Batignolles sud-est, is working with the architecture firm Aries, the design office Girus, the company Busseuil (HVAC), and Alteci Énergie (maintenance). Between July 2015 and the end of June 2016, 442 hours of work were carried out by participants in occupational integration programmes (painting work and renovation of the heating system).

The following energy retrofit work was carried out:

- **Thermal insulation work from the outside or inside** of the walls (depending on the architectural constraints)
- **Thermal insulation** of the attic space (older buildings) and low floors, re-waterproofing of the flat roofs
- **Replacement of joineries** not yet replaced by efficient joinery (made of PVC, double glazing)
- **Renovation of the heating system** (replacement of the regulation, balancing)
- **Installation of single-flow ventilation** in the classrooms
- **Installation of a 680 m\textsuperscript{2} photovoltaic station** integrated into the building to produce 135 kWp. Thanks to this station, the project won a public tender from the Energy Regulation Commission.

The site’s image must also be completely transformed by restoring the central building’s façade (restoration and cleaning of the mosaics), whose character has been preserved by the insulation work, and renovating the courtyard’s awning.

The goal was for the renovations to offer cost savings of €40.3 k ex. VAT/year\textsuperscript{1} starting in 2017. This covers the energy retrofit work through cost savings of 31% in 2017, and 56% in 2036.\textsuperscript{2} The estimated primary energy consumption is 554 MWhLHV/year or 60 kWhPE/m\textsuperscript{2}/year (€33 k Inc. VAT of energy costs\textsuperscript{4}), the annual CO\textsubscript{2} emissions are estimated at 9 kg CO\textsubscript{2}e / m\textsuperscript{2}.

\textsuperscript{1} Price of energy in 2013 taking into account extra maintenance costs.
\textsuperscript{2} Inflation of energy costs by 3% per year and maintenance by 1% per year.
\textsuperscript{3} 1,276 MWhLHV / year and 138 kWhPE / m\textsuperscript{2}/year before the work.
\textsuperscript{4} €74 k Inc. VAT before the work.
\textsuperscript{5} 19 kg CO\textsubscript{2}e /m\textsuperscript{2} before the work.
Energy consumption is strongly influenced by the behaviours of a building’s occupants, regardless of the structure and type of building. To achieve energy savings in public buildings, it is critical to make users aware of their energy consumption and even help them reduce it.

The work carried out also includes the restoration of the administrative building, the covering of the awning in the courtyard, and the removal of asbestos from the joineries.

A bonus of around 5% of the cost of the work will be paid once the targets are met for a full year. Otherwise, the service provider is subject to penalties that increase each year as long as the targets set by the EPC are not met. The verifications are done according to the IPMVP protocol. The adjustment formula is based on degree days. Conditions under which the baseline situation may be revised have been established in the event of a change in use.

1 They correspond to the amount of excess consumption the first year of operation, double this amount the second year, and five times the amount in the following years if the building is unable to reach the targets set.
2 International Performance Measurement and Verification Protocol: a method to measure energy savings in the building sector
3 Degree day: difference between the outside temperature and a base temperature. It is used to estimate the thermal energy consumption required for user comfort according to the weather conditions.

An interim report in mid-2018

> Results
The first year of operation, called the probationary year (September 2016 to August 2017), had positive results: **-62.7% in primary energy** consumption, which exceeded the target set.

Avenues for improvement have been identified regarding distribution of heat and regulation in the workshops.

Work to improve these aspects was conducted in 2018. A report on the energy savings since the end of the probationary period is currently being drawn up.

> Outlook
An ongoing experiment...
The projects carried out by the SPL OSER include a guarantee of energy efficiency. Dedicated monitoring tools have been developed internally.

Stakeholders involved
- Auvergne-Rhône-Alpes Region
- Contracting authority: SPL OSER
- EPC Representative: SPIE Batignolles sud-est
- Architectural firm: Aries
- Design office: Girus
- Architect: Bertrand Feinte
- HVAC: Busseuil
- Maintenance: Alteci Énergie

Information and contacts
http://cpeauvergnerhonealpes.org
SPL - OSER (Publicly-owned local energy service company)
Laurent Bogiraud - Head of energy retrofitting projects
laurent.bogiraud@spl-oser.fr
Tel: +33 (0)4 80 61 00 27