

## The thermal rehabilitation of a high school through a public-private partnership

Bulgaria has a continental climate, characterized by a very hot summer and a very cold winter. Under these conditions, public buildings not covered by adapted thermal characteristics (insulation - heating) do not provide living conditions that are acceptable to users. The thermal rehabilitation construction becomes indispensable to secure the use of these buildings throughout the year. But the high cost of this work and the limited loans availability to a municipality can quickly make them inconceivable. Placed in this situation, the township of Belene has nevertheless found a solution through the establishment of a public-private partnership.

The thermal renovation of Belene's high school was indispensable in regard to guaranteeing a level of comfort acceptable to its users. At the same time, the township has shown interest in decreasing its energy costs and the building's energy efficiency.

### The context

In recent years, Belene's high school was confronted with problems of thermal comfort. In winter, students and teachers frequently complained to the director of the school. Several renovation projects had been considered but none reached the stage of implementation.



*The renovated high school*

### Triggering factor? The students themselves

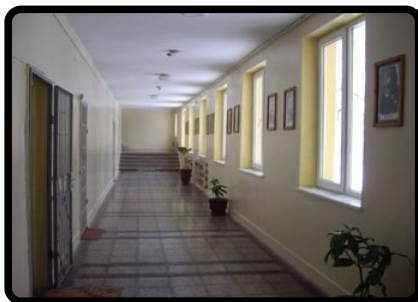
One day in winter 2005, the students went to classes thermometers in hand. The 13 or 14°C (55-57°F), which was the standard in the classrooms had convinced them that it was: "too cold to study." They decided unilaterally to leave school and head to cafés in the city.

In the days that followed, the city engages in the process of renovating the building. It launches a public market. The project chosen is the one of the Bulgarian firm ENEMONA, an ESCO (Energy Service Company). The firm offers an ambitious renovation without initial investment from the municipality, through the establishment of a **public-private partnership**. The contract signed guarantees results in terms of energy efficiency for the city. **The contract period is six years and energy savings are expected to reach 60%**, representing a consumption of 82 kWh/m/year, which is minimal, especially for an old building.

### The construction completed in the school

As a first step, the company began construction permitted them to **improve the thermal insulation of the building envelope** (change of windows, insulation in walls and roof), to replace the old boiler and to install an automated system to monitor temperatures in the classrooms and boilers (information then transmitted by satellite to the provider).

The amount of this investment was 300 000 €. The city alone would not have been capable of making such investments, which represent **20% of the annual municipal budget**.



*A hall of new windows in the high school*

### Results beyond expectations

One year after the work, the establishment has become a comfortable workplace, even during the month of January 2008 which was particularly harsh. In addition, with **energy savings in excess of 60%**, the results are slightly higher than those initially expected. As stipulated in the contract in such circumstances, additional profits made are returned to the company.

Moreover, this experience has led to the creation of **weekly classes on energy conservation and resources** for high school students.

### A Brief Overview

#### The township of Belene

Population :  
10 000

Number of public buildings : 150 of which  
49 are schools  
Number of renovated buildings : 4 schools

#### The school's renovation

Number of students at this school : 700  
Work completed :  
**improvements to the thermal insulation of the envelope**  
Goal in energy consumption :  
82 kWh/m<sup>2</sup>/year (savings of 60%)  
Duration of the public-private partnership's contract :  
6 years  
Savings achieved :  
superior to 60 %

#### Financially Speaking

Amount of investment :  
300 000 € (20% of the annual municipal budget)  
Financing : contract public-private partnership

#### Dates

2006 : work is carried out

#### Project manager

Municipality of Belene in partnership with the firm ESCO ENEMONA



## The contract for a public-private partnership

### A multi-faceted contract

Establishing the terms of the contract is the result of a complex equation using energy audit and integrating the various constraints of each party in addition to the constraints of the basic contract, namely that **the amount of annual repayment is of the order of estimated energy savings**. In other words, the sum of the new bill (lean) and the repayment of the investment is roughly equal to the building's old energy bill (on average over the year). Here, the company is refunded after 6 years of monthly payments paid by the city, which corresponds to the **length of the contract** negotiated by the two entities. In the case of the high school in Belene, the signatories of the contract choose the combination of renovation work that best meets their criteria:

#### *For school and the municipality*

- Significant improvement in the comfort of children and staff,
- Reducing the energy bill,
- A return on investment as soon as possible (without setting any limit).

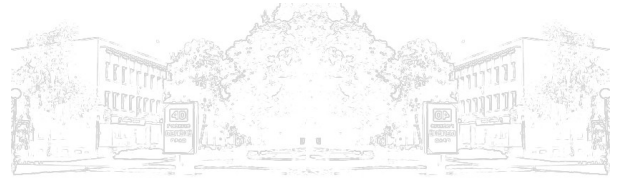
#### *For the company:*

- Carrying out renovation work of significant magnitude,
- A rapid return on investment (5 years),
- An entry into the economic environment of the city in order to win future bids for other project.

### A guaranteed result

An important concept here is the notion of **guaranteed income for the city**. This means that both parties have agreed to start negotiations on a rate of minimum energy savings to be achieved from this work. For example, in the case the Belene high school, the firm had guaranteed 60% energy savings. The school was thus ensured to not pay more than 40% (in energy terms) of its former bill. If that were the case, the firm would have had to pay the difference. The objective of 60% having been met and exceeded, the city has paid the financial surplus to the firm. **These payment transfers are decided during meetings of the commission, set up according to contract and composed of members of both parties.**

To adjust the magnitude of work to be done, try to maximize its benefits and in order to enable the commission to take its decisions, the contracting firm should monitor, during the contract period, the actual consumption of the building with the help of municipal experts.



### The limitations of the contract

The estimated **savings of energy (and money)** is a crucial issue of the contract. This is calculated after an **energy audit** conducted by the contracting firm (in this case, ENEMONA). But as the magnitude of its profits depends on this estimate, it should not be alone in carrying out the audit. Thus, in general, experts from the city follow it closely to ensure its impartiality; this was indeed the case in Belene.

>The contract also has **limits in terms of energy efficiency**. It does not guarantee an ideal effectiveness depending on the situation, rather one that is achievable depending on the duration of the contract. The analysis of this duration is essential in achieving the desired objectives. Some contracts provide for only 20% in energy savings.

>Another considerable limitation is that there is **no existing legislation** (at least in Bulgaria), which oversees this type of contract sealing a public-private partnership, despite the fact that legislative framework has recently been drawn up on the European level. Furthermore, cities are often insufficiently equipped for these negotiations. Experts on partnerships of this kind, working in private practice, are still uncommon in this country and the costs are very high. Negotiation is sometimes intense and time-consuming; there is a great deal of patience required.



*The old and new boilers*

### Useful advice

The establishment of a contract with an ESCO type firm is very delicate. The impartiality of the preliminary audit is paramount and it is necessary that a representative of the city makes sure that it is properly conducted.

To negotiate such contracts, it is also important to be well-informed about its terms and, if necessary, seek feedback or even advice from experts. A success on this sort of contract also requires a consensus among different political parties of the city because its duration is often superior to that of a mandate.

### For more information...

Site of the municipality of Belene :

<http://obshtina.belene.net/> (bulgarian only)

Articles about Belene on the ChallenGES Tour blog :

<http://challengestour.blogspot.com/>

An Energie-Cités document to assist the creation of an energy performance contract : <http://www.energie-cites.eu/>

### Who to contact in Belene ?

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