Energy efficiency services for school buildings
12 secondary schools in the Province of Barcelona Ministry of Education

- Energy efficiency services contract: implementation of energy management measures.
- Four years contract with a reduced annual energy consumption between 13% and 18%.

Benchmark
- There wasn’t any Energy Efficiency Service
- Energy consumption and CO2 emissions:
  - 341 toe/year
  - 913 t CO2/year

GPP 2020 tender
- Energy Efficiency Service
- Energy consumption and CO2 emissions:
  - 290 toe/year
  - 776 t CO2/year

Results
- Energy savings:
  - 51 toe/year
  - 204 toe/contract (4 years)
- CO2 savings:
  - 137 t CO2/year
  - 548 t CO2/contract

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Contract tendered


- The tender runs under an Energy Services Company (ESCO) model. Therefore, the awarded company is responsible for the energy management of the 12 schools.

- The contract is over 4 years and has a value of 160,000 € (VAT excluded), corresponding to 40,000 € per year.

- The tender is aligned to the framework of the Catalan Government buildings energy efficiency plan 2011-2014 and follows the goals of the Energy and climate change plan 2012-2020, approved by the Government of Catalonia respectively on 30 August 2011 and 9 October 2012.

Procurement approach

Procedure used

Open procedure.

Technical specifications

The execution of the contract means that the awarded company carries out the full performances of energy management service, which includes the energy savings measurement and verification plan, diagnosis and technical advice, implementation and monitoring of savings measures.

In particular, measures to reduce energy and water consumption and cost include:

- Diagnosis and recommendations for establishing the optimum operating parameters of the facilities with adjustment of consumption to their actual use:
  - Diagnosis and proposal for reducing unnecessary consumptions.
  - Determining the optimal configuration of equipment for efficient operation.
  - Determining temperatures set value and daily and weekly hourly schedules, including public holidays.
  - Organizational measures to reduce consumptions.

- Diagnosis and recommendations for optimizing the procurement of energy supplies, even though the schools are within the aggregate purchase of the Government of Catalonia.

- Energy monitoring, at least general supplies (electricity, gas and water) and inside and outside temperature.

- Training and awareness-raising for users and buildings managers (minimum of 16 hours per school).

- Implementation, supervision and monitoring by the awarded company of saving measures during the contract:
  - Installation of management and control equipment.
  - Change to more efficient equipment, if applicable.
- Optimised management and efficient driving of the facilities and equipment (programming).

- Measurement and verification of the savings achieved with the proposed measures.

Award criteria

The following award criteria were applied:

A) Award criteria automatically measurable (up to 65 points):

1. Economical criteria: valuation of reduction with respect to the maximum energy management quota (up to 20 points):
   - An offer of 40,000 € (equal to the maximum quota) will get zero points and an offer of 37,000 € will get 20 points.
   - The remaining bids will be valued proportionally.

2. Sharing savings: valuation of the percentage of the cost savings that the ESCO will transfer to the Ministry of Education (up to 35 points):
   - A percentage of 30% of the verified savings will get the maximum score corresponding to 35 points.
   - A percentage of 10% will get a score of 0 points.
   - The remaining bids will be valued proportionally.
   - Proposals that consider sharing savings of over 30% or less than 10% will be disqualified.

3. Training and awareness raising proposal for users and buildings managers (up to 10 points): will be valued the training and awareness offer that exceeds the minimum of 16 hours/school established in the technical specifications, at a rate of one point for each hour of additional training.

B) Award criteria evaluable through a value judgement (up to 35 points):

1. Technical proposal for energy management (up to 35 points):
   - Energy conservation measures proposal (up to 20 points): valuation of measures for reducing energy and water consumption and its adaptation to the needs of the school, level of detail, justification and coherence of actions.
   - Proposal for making the initial diagnosis and recommendations of optimal parameters of school operation (up to 10 points).
   - Description of preliminary measurement and verification plan that identifies the important parameters for adjusting the base line consumption (up to 5 points).
Contract clauses

Remuneration of the service

The Energy Service Company will implement the improvements in schools and its remuneration will depend on the savings achieved, so that a percentage of savings, between 10% and 30%, will be for the school and between the corresponding 90% and 70% will be for the company.

The energy management quarterly fee will be equal to the quarterly verified savings minus the amount corresponding to the percentage of savings transferred to the Ministry of Education that the awarded company had included in its offer, up to a maximum of one quarter of the annual energy management fee specified in the offer (see point A.1] of paragraph Award criteria).

Measurement and verification plan

Bidding companies must include in its offer a description of the preliminary measurement and verification plan identifying the main features.

In general, the initial approach is to measure and verify the total savings for each school and each energy and water supply (equivalent to option C of the International Performance Measurement and Verification Protocol (IPMVP) EVO 10000 – 1:2010).

Contract monitoring

For the contract monitoring it is important that the awarded company implements all the necessary equipment (sensors, meters, etc.) that allow the proper monitoring of energy consumption and supervise the comfort conditions and the implementation of saving measures.

The awarded company will submit a quarterly and an annual monitoring report that will include, among other, the following information:

- Evolution of the measures' implementation.
- Prevision and real total monthly consumption for each energy source and water.
- Prevision and real monthly savings for each energy source and water.
- Prevision and real monthly economic saving.
- Description justifying any correction made on the dataset analyzed.
- Justification of the achieved savings.
- Energy prices used for the calculation of the achieved savings.

Criteria development

The standard tender specifications for energy efficiency services of the Catalan Government buildings have been further worked on with the stakeholders of the energy services market. The aim was to obtain a successful tender specification model and give confidence to the market that is still immature in Catalonia.
## Results

<table>
<thead>
<tr>
<th></th>
<th>CO₂ emissions</th>
<th>Energy consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>With energy efficiency service</td>
<td>776 t CO₂/year</td>
<td>290 toe/year</td>
</tr>
<tr>
<td>Without energy efficiency service</td>
<td>913 t CO₂/year</td>
<td>341 toe/year</td>
</tr>
<tr>
<td>Annual savings</td>
<td>137 t CO₂/year</td>
<td>51 toe/year</td>
</tr>
<tr>
<td>Total savings (4 years contract)</td>
<td>548 t CO₂</td>
<td>204 toe</td>
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### Calculation basis

- The energy consumption in 2013 is used as baseline to calculate the energy savings per year.
- Energy consumption savings of 15% are estimated.
- The CO₂ emission reductions have been calculated using the following conversion factor (Source: The Catalan Office for Climate Change – Government of Catalonia):
  - Electricity: 0.267 kg CO₂/kWh (peninsular mix for 2014).
  - Natural gas: 0.201 kg CO₂/kWh.
  - Diesel fuel: 0.263 kg CO₂/kWh
- There have been 15 bids.
- The contractor submitted a bid with an energy management fee of 37,000 € (VAT excluded) and a proposal of sharing savings of 30%, which will mean an expected reduction in the cost of energy and water around 17%, equivalent to 53,000 € per year.

### Lessons learned

In the framework of the Catalan Government buildings energy efficiency plan 2011-2014, this is the first tender under the energy services model based on the application of energy management measures. Unlike those made so far have taken the form of investment model. This first experience will enable a first validation of the model and check its advantages:

- **Simplification of previous diagnoses**: the previous requirements for the tender have been simplified, which have become one of the initial barriers to the implementation of energy performance contracts under the investment model. The initial diagnosis is focused in these cases in gathering information on the characteristics of buildings, usage, and facilities inventory and energy consumption.
- **Contract duration lower than contracts with renewal of facilities**: the low payback periods of the energy management measures can reduce the length of contracts to four years, which allows using a standard services contract and prevents other specific formulas as mixed or special contracts.
• Facilitates subsequent contract for renewal of facilities: once implemented improvements in energy management, with the knowledge of the building energy performance and the information collected by the energy monitoring system, it is easier the identification of potential improvements with renovation facilities measures.

• Making use of technical audits: It has been validated the formula for the evaluation of proposals without having a technical audit before the tendering or forcing the bidder to make this audit. Finally only the awarded company will make the building energy audit.

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About GPP 2020

GPP 2020 aims to mainstream low-carbon procurement across Europe in support of the EU’s goals to achieve a 20% reduction in greenhouse gas emissions, a 20% increase in the share of renewable energy and a 20% increase in energy efficiency by 2020.

To this end, GPP 2020 will implement more than 100 low-carbon tenders, which will directly result in substantial CO₂ savings. Moreover, GPP 2020 is running a capacity building programme that includes trainings and exchange. – www.gpp2020.eu

About PRIMES

Across six countries in Europe: Denmark, Sweden, Latvia, Croatia, France and Italy, PRIMES project seeks to help municipalities overcome barriers in GPP processes, many of which lack capacity and knowledge.

PRIMES aims to develop basic skills and provide hands-on support for public purchasing organizations in order to overcome barriers and implement Green Public Purchasing. This will consequently result in energy savings and CO₂ reductions. – www.primes-eu.net

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