

**GPP**  
**2020**

procurement  
for a low-carbon  
economy



## Energy Service Contracts models for Public Buildings

### The Energy Efficiency and Savings Plan for Public Buildings of Generalitat de Catalunya

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## Genesis of first EPC project in Catalonia

### Energy efficiency & savings Plan for Public Buildings of the Government of Catalonia

Approved by government agreement back on August 30<sup>th</sup> 2011.

#### ■ Generalitat' Main Targets

1. Emphasize the **role of Catalan Government** in pioneering this new savings strategy (model).
2. Initiate new actions in order to achieve the objectives of the **EPBD** (Energy Performance of Buildings Directive) which focuses on buildings of nearly zero energy consumption by 2020 (2018 in case of public buildings).
3. **Reduce** the Energy consumption (**kWh**) and the Energy bill (**€**) in all public buildings which belongs to the Catalan Government.



## Genesis of first EPC project in Catalonia

### Objectives: in energy and money

- Reduce consumption of Energy (kWh) in the overall set of public buildings of Catalan government by **12%** by **2014**
- Reduce the energy Bill (€) of Catalan Government:
  - ✓ in 3,2% by 2013
  - ✓ in 4,4% by 2014
  - ✓ in 15,2% by 2020
- Carry out **Investments** which will produce energy efficiency and savings. Maximum potential: 296M€. A first phase of around 140M€ of investment in Generalitat buildings is foreseen to be achieved in the next four years. Deployed by private companies.
- Create an energy service market: for public & private sectors.



## Genesis of first EPC project in Catalonia

### Scope

- The whole public buildings of the Catalan Administration ('Generalitat') and those entities whose budgets are part of the Catalan government (buildings for which the Catalan Government pays the Energy bill)
- Exceptions:
  - ✓ Buildings with a rental period of 4 years or less
  - ✓ Specific Institutional Buildings not compatible with this action Plan



## Action Plan

**Action Plan contents: two phases developed at same time:**

Phase 1 (Energy Supply Review).

- Optimize conditions of **Energy supply** for all Public Buildings, in order to reduce power and obtain best price with Utility companies (electricity and natural gas).
- Electricity represents 90% of total energy consumption for Catalan public buildings of Generalitat (about 100 M€/any).
- Estimated savings: **3-4%** of current bill, which is approximately equivalent to **3-4 M€**.

Phase 2 (Efficiency).

- Develop a program of **Good Practices** and an **Investment** program.



## Action Plan. Phase 2 (Efficiency)

### 2.1. Good Practices Program

- Carry out campaigns through local actions to make aware public employees for an efficient use of facilities of Catalan public buildings.
- Training of all Energy managers of Catalan public buildings.
- Introduce criteria to obtain better efficiency and savings for aggregate purchases.

### 2.2. Investment Plan

Considered 3 different typologies of buildings:

- Type 1 (High energy use).

**Investment projects** economically feasible under modality of guaranteed savings (EPC).

- Type 2 (Medium level of energy use; lower potential savings; significant investments wouldn't be recovered by those savings)

EPC only applicable for **monitoring and managing energy** (monitoring and verification of savings).

- Type 3 (Very short potentiality of savings)

EPC not applicable. Investments no recovered by savings.



## Energy services typical models

### Equipment Installation

**Delivery &  
installation of  
equipment/parts  
of equipment**

**Invoicing of  
installation**

### Energy Supply Contracting

- **Planning,  
financing,  
implementation**
- **Operation**

**Invoicing of energy  
delivered**

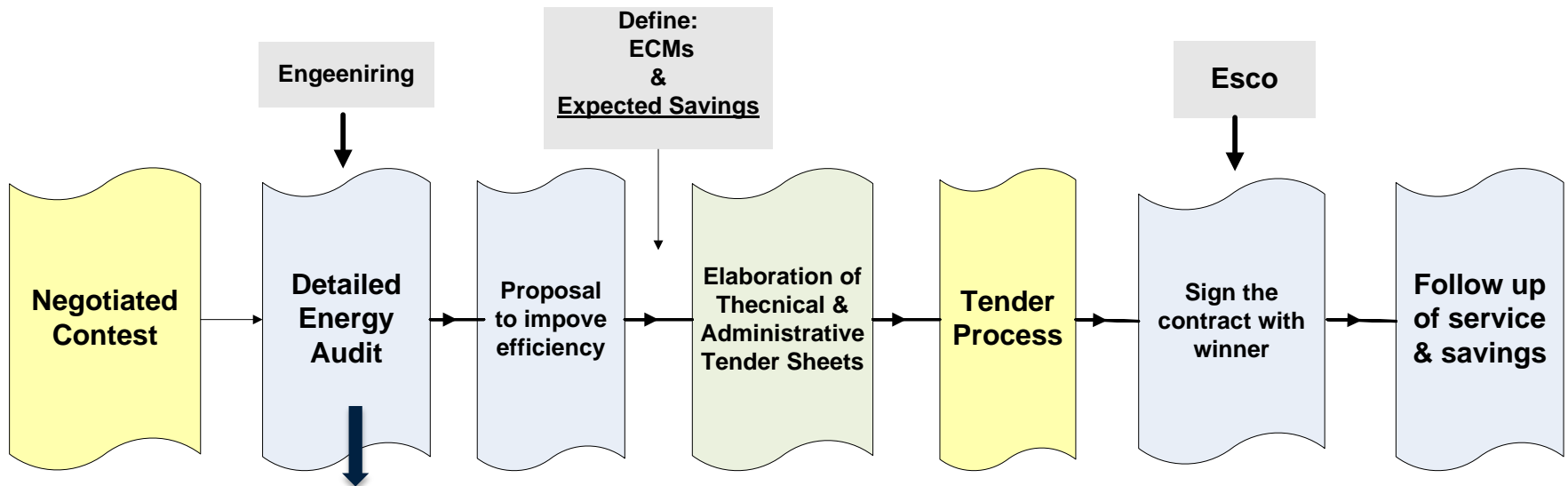
## Energy Performance Contracting

- **System analysis,  
planning,  
financing,  
implementation &  
operation**
- **System  
responsibility for  
equipment &  
users' behaviour**

**Invoicing of reduced  
energy consumption**



## EPC approach. Process used by ICAEN:



- **Outcomes from detailed energy audit:**

- Energy Use Baseline.
- Proposal of a set of ECMs (Energy Conservation Measures).
- Energy savings (kWh, €, Tons of CO<sub>2</sub>), achievable with proposed ECMs.
- M&V plan for the proposed ECMs.
- Behavior (modeling) of Equipment & systems (facility).





## Terms of Contract: Administrative & Technical Sheets

### Deliveries

The winning ESCO will perform the following services:

- **A. Energy Efficiency Service:**
  - Improvement of facilities, implementing all ECMs proposed in the winning offer.
  - Management (control) of facility and M&V. Contractor will measure performance of equipment & systems.
  
- **B. Maintenance Service:**
  - Contractor will perform preventive maintenance to assure the best efficiency and performance of the Building/s.



## Terms of Contract: Administrative & Technical Sheets

### Economic data. Maximum budget

The maximum price of the contract is the sum of the efficiency and maintenance fees.

- ✓ **Efficiency Fee**. Pays amortization of Investment, technical management of facility and M&V.
- ✓ **Maintenance Fee**. Preventive maintenance of all facilities under this contract.



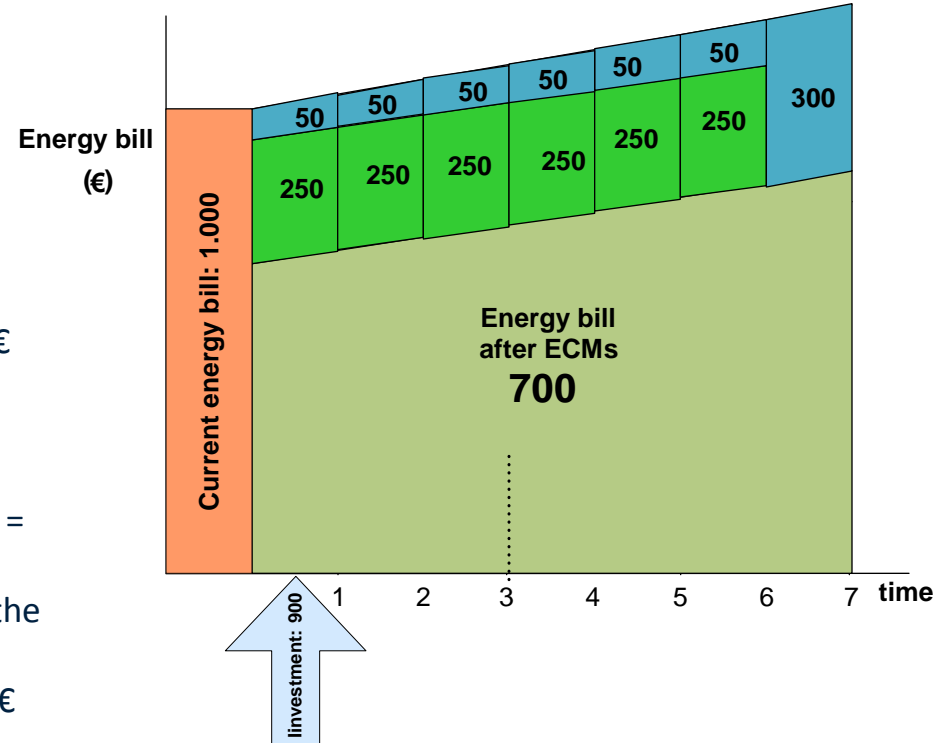
# Energy Performance Contract (EPC). Example

Simplified example:

- Building annual energy bill = 1.000€
- Maintenance = 100€
- Total annual payment = 1.100€ (1.000€ energy + 100€ maintenance)
- *Needed investments for ECM = 900€*
- *Annual guaranteed savings = 300€ (30%)*
- Part of the savings for the property: 50€
- Part of the savings for the investment amortization: 250€
- Project simple payback: 6 years

Actions and results:

- Building annual energy bill after implementation of ECM = 700€ (=1000 – 300)
- ESCO designs and implements the ECM and guarantees the savings
- Annual payment would be (during 6 years) = 1050€ (700€ energy + 250 [amortization + technical management + M&V] + 100€ maintenance)
- Net annual saving for the property (first 6 years) = 50€
- Net annual saving for the property (after 6 years) = 300€.



# Terms of Contract: Administrative & Technical Sheets

## Evaluation criteria

### 0. Preliminary evaluation

- If tenderer company has nobody as CMVP (Certified Measurement & Verification Professional), is automatically discarded.
- Each tenderer has to present an M&V plan as specified in technical sheets. If the plan is not complete or not adherent to the IPMVP (International Performance Measurement and Verification Protocol), company is excluded.

### 1. Subjective criteria

- Maintenance service (15 points)  
Maintenance Plan, Improvements in periodicity & new actions, team and transition plan.
- Proposed ECMs. (30 points)  
Covering all lines, New ECMs, proven technologies, detailed level.



# Terms of Contract: Administrative & Technical Sheets

## Evaluation criteria

### 2. Quantitative criteria

- Updated Net Cash Flow in the whole period of 10 years (25 points)
- Total guaranteed savings in energy (16 points) & water (4 points)
- Savings by type of ECMs:
  - RED (**Reduction of Energy demand**) (5 points) ECMs that reduce the energy demand of building services.
  - IEC (**Improvement in Energy Conversion**) (3 points) ECMs rising energy efficiency of the current equipment. Don't reduce the energy demand of the building, but reduce energy consumption.
  - **Fuel Switching Strategy** or EG (**On site Energy Generation**) (2 points) Improvements producing thermal or electric energy generation from fossil fuels or renewable fuels (natural gas CHP or biomass boilers).



## Annex I to Technical prescriptions Sheet

### Guaranteed savings

Each tenderer has to fulfill guaranteed savings in the following table:

**Table 1. Total Guaranteed Savings**

| Year | Energy / Utility Savings (€) | Water Savings (€) | Total Savings (€) | Accumulated Savings (€) |
|------|------------------------------|-------------------|-------------------|-------------------------|
| 1    |                              |                   |                   |                         |
| 2    |                              |                   |                   |                         |
| 3    |                              |                   |                   |                         |
| 4    |                              |                   |                   |                         |
| 5    |                              |                   |                   |                         |
| 6    |                              |                   |                   |                         |
| 7    |                              |                   |                   |                         |
| 8    |                              |                   |                   |                         |
| 9    |                              |                   |                   |                         |
| 10   |                              |                   |                   |                         |

According to the M&V plan, savings will be verified each year.



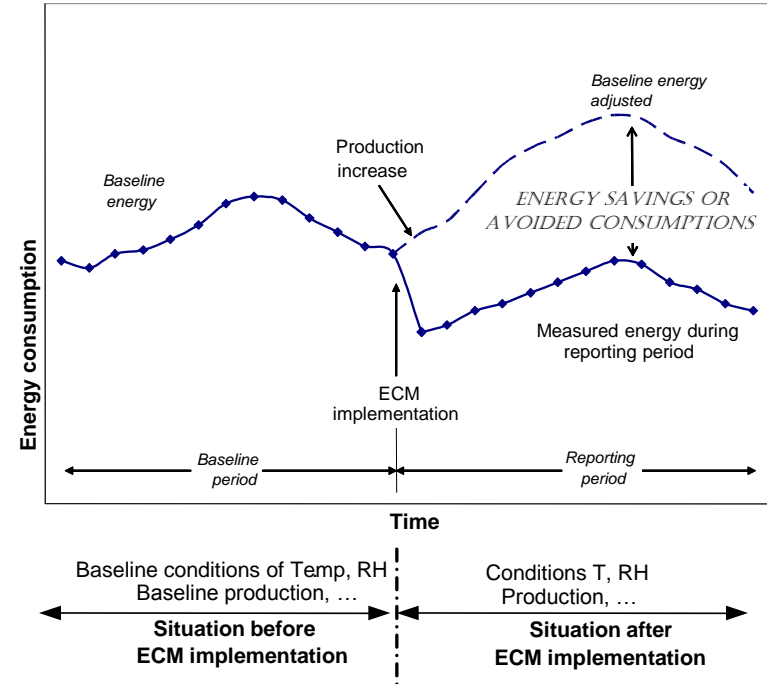
## Annex I (Energy Performance guarantee)

### Guaranteed savings

Methodology to evaluate savings (from annex II: M&V Plan)

- Energy savings will be computed monthly as:  
Units of saved energy (kWh, m<sup>3</sup>,...) x  
cost of energy (€/kWh, €/m<sup>3</sup>,...)

Units of saved energy = Adjusted Baseline Energy –  
Energy consumption measured at reporting period.



- Routine & non-Routine adjustments will be done according to Annex II (M&V Plan)

- If :

Cumulative Savings  $\geq$  guaranteed savings  $\rightarrow$  No penalty

Cumulative Savings  $<$  guaranteed savings  $\rightarrow$  Penalty



## Annex I (Energy Performance guarantee)

### Guaranteed savings

Savings reconciliation:

- Will be done each year at the end of each annual period
- Annual verified savings will be added to verified cumulative savings in each annual reconciliation (surplus or deficit of savings)
- Saving deficit will be reduced from the Efficiency Fee (distributed in the next 12 months year)





## Annex I (Energy Performance guarantee)

### M&V of ECMs

- All bidders will present in their offer a preliminary proposal of a Plan of Measure & Verification of energy performance according to the established IPMVP EVO 10000-1:2009(CAT) protocol
- Contractor will prepare within a maximum lead time of one month a definitive M&V Plan. After revision by Icaen Contract (EPC) will be signed.



## Example: CAR

- **Building:** CAR (public-owned sports facility)
- **Baseline:** 700.979 €/year
- **Guaranteed savings:** 39 % = 280.000 €/year
- **Invest:** 1,2 M€
- **CO<sub>2</sub> reduction :** 1,085 t/year
- **Duration of contract:** 10 years (start in 2014)
- **Measures:** Boilers retrofit and fuel change, lighting, distribution systems (cold and hot water and air) swimming pools: heat distribution and filters, ventilation, control and management systems, user trainings
- **Special feature:** Switch from fuel to natural gas.



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