Low carbon procurement in practice:

Driving Energy Performance Contracting (EPC) via procurement schemes in Catalunya

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Energy efficiency and savings Plan for public buildings of the Government of Catalonia

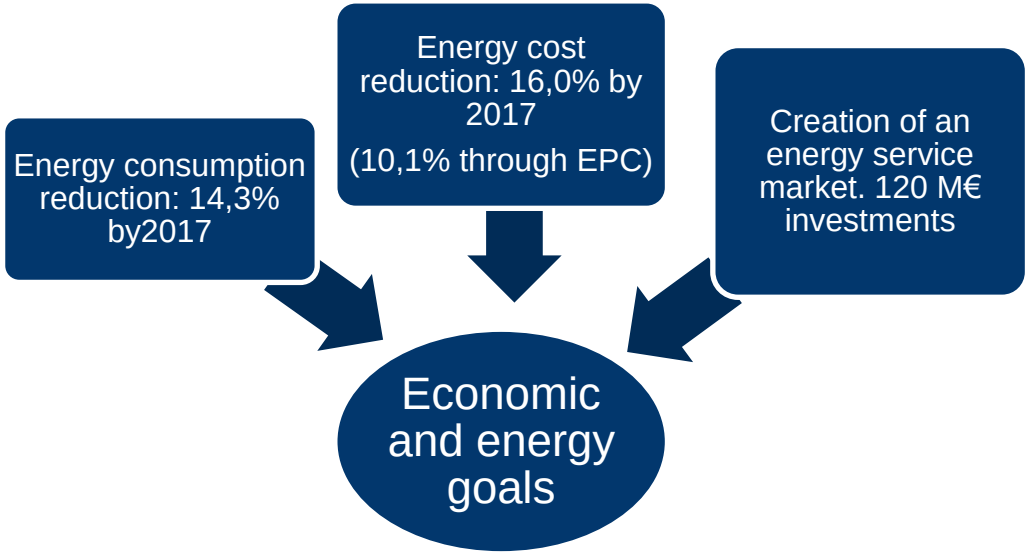
GENESIS of the project

- **European Directives** goals: “nearly-zero energy buildings” and annual renovation of the 3% of the total floor area of existing public buildings.
- Public Buildings of the Catalan Government needed **renovation.**
- Difficult to have money available (**crisis scenario**).
- Knowledge of the **EPC model**: guaranteed outcomes and payment based on savings.
- Energy efficiency and Savings **Plan for Public Buildings** of Catalan Government: goals for energy consumption and energy cost reduction.

ENERGY Plans

On August 30th of 2011 the Government of Catalonia ('Generalitat') approved the first **Energy Efficiency and Savings Plan for Public Buildings** of Generalitat (2011-2014).

Targets of this Plan have recently been updated (2015-2017).



ENERGY 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 prize with Utility companies (electricity and natural gas).

Phase 2 (Efficiency).

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

ENERGY Plan

Since 2011 **ICAEN** has been designed as **energy services promoter** for the whole Catalan public building pool in order to pull the market by creating the knowledge, procedures and convincing public and private entities of this energy transition suitability.

ICAEN has developed an **integrated tendering model** based on guaranteed energy savings (EPC):

- The model has **been approved by stakeholders** of the ESCO sector, as ESCo companies, building owners, building managers and end users. This broad consensus has generated confidence among stakeholders and so in this market
- The model has been developed **under a legal framework** that ensures an off-balance for the required investments.
- The main target and the quality are assured because this model incorporates **Measure and Verification proceedings**.

What EPC is

A model for implementing energy efficiency measures with guaranteed results.

EPC models

EPC investment projects

"Light" EPC: energy management

EPC models

EPC investment projects

- Estimated energy saving: 28%.
- Contract length: 7 to 10 years.
- Contract typology adapted: a service contract under special administrative nature:
  - service contract: it does not count as a debt.
  - allows to reach periods up to 10 years or more (instead of the 4+2 years of a service contract).
- Guaranteed energy savings.
- No energy supply.
- Tendering together energy efficiency and maintenance services.
- Energy audit establishes no binding measures.
- The ESCO proposes the measures in its offer.
- The measures are proposed, executed and financed by the ESCO.

EPC models

“Light” EPC: energy management

- Estimated energy saving: 15%.
- Contract length: 4 years.
- Shared energy savings (between 10% and 40%).
- Measures: monitoring, control and management of energy use.
- Contract typology: service.
- Separate or together with maintenance.
- Simplified preliminary diagnosis.

2 Standard EPC: investment model

Terms of CONTRACT: administrative and technical sheets

The winning ESCO will perform the following services:

A. Energy Efficiency Service:

- Actions in energy conservation Service:

The awarded ESCO has to implement and/or update the tendered facilities with the improvement and renovation of systems and equipment with the proposed measures: the called Energy Conservation Measures (ECM), once the contract is signed.

- Technical management and Measurement and Verification Service:

The awarded ESCO will conduct the technical and energy management and all actions in order to measure the performance of facility, in compliance with the technical clauses of the signed contract.

B. Maintenance Service:

Awarded ESCO will conduct preventive, standard and whole facility maintenance in order to achieve the best performance of facilities under the contract and of all of their components, as agreed and signed in the EPC contract.

Terms of CONTRACT: administrative and technical sheets

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

- **Efficiency Fee**

Pays to the ESCO for the amortization of the investment, the technical management and the measure and verification of the energy savings, and all expenditures for the right fulfillment of the signed performances.

- **Maintenance Fee**

Depends on each facility and requirements of technical specifications which should be defined in tender documentation.

Pays for maintenance of facilities.

Graphic presentation of PROVISIONS

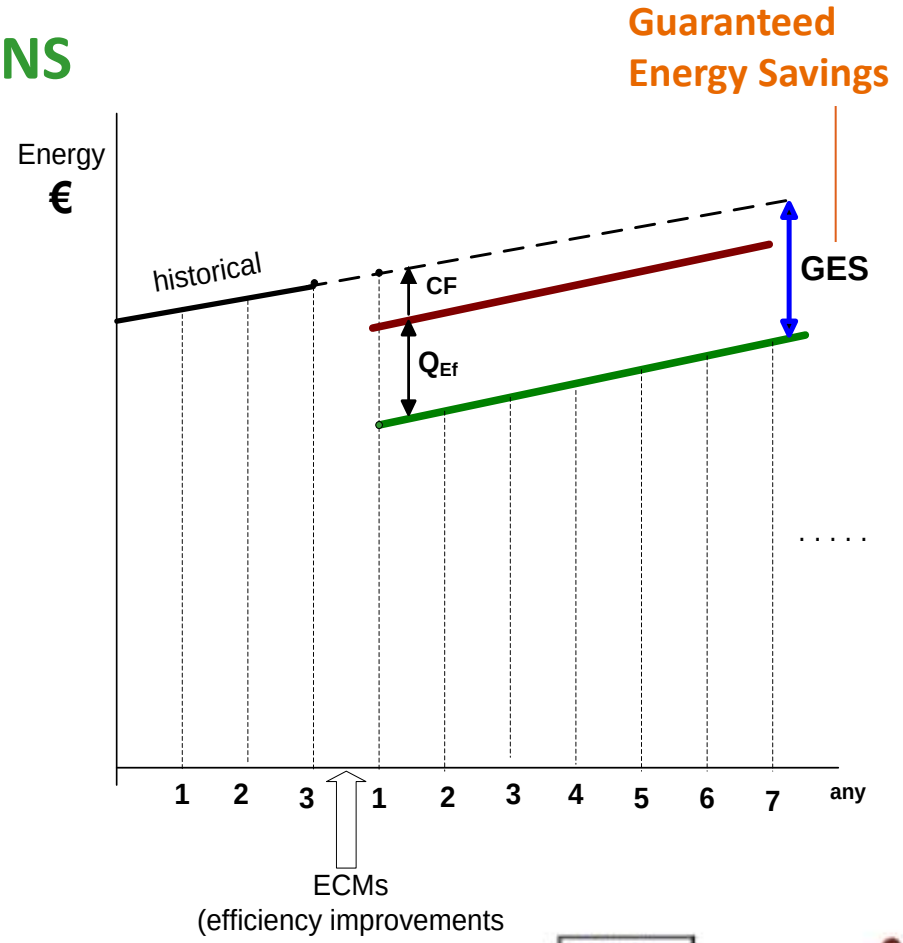
Efficiency Fee:

$$Q_{Ef} = Q_{AM} + Q_{GT} + Q_{MiV}$$

- Q_{AM}: Amortization of Improvements
- Q_{GT}: Technical Management
- Q_{MiV}: Mesure & Verification

Total Fee:

$$Q_T = Q_{Ef} + Q_M$$



DURATION of contract. INITIAL START of provisions

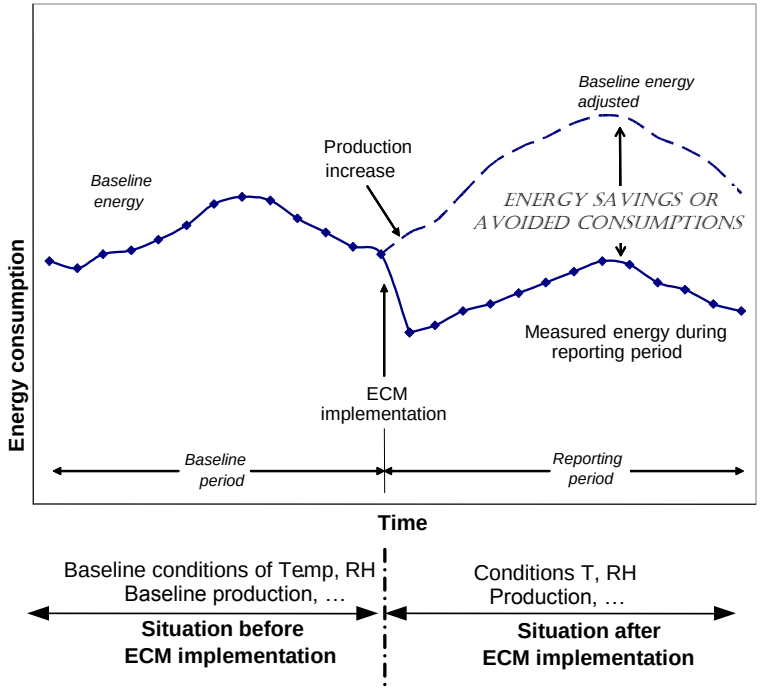
- The **contract duration** is normally between 7 and 10 years.
- Initial date for the **requirement of compliance**:
  - The energy efficiency Service will be required from the date the awarded company has **implemented all energy conservation** measures (ECMs).
  - The maximum time span to **implement all ECMs** will be between **6 to 8 months**, starting in contract signature date. If this time span is exceeded penalty will be applied according to Public Law for Service Contracts.
  - The maintenance Service will be required from the date of the **signature of the contract**.

Savings FOLLOW UP and PENALTIES

1. According to the Measurement and Verification Plan, savings will be **verified each year** at the end of each annual period.

2. If verified cumulative savings are under guaranteed savings, **penalty** will be applied:
   - If **savings are between 75% and 99%** of guaranteed value, penalty is: not saved kWh x current price €/kWh
   - If **savings are under 75%**, penalty will be as the former, but multiplied by a factor of 1,5.

3. This value will be subtracted each month to the efficiency Fee in the following year (distributed in the next 12 months: penalty/12).



TENDERING: an OPEN procedure

Assessment criteria (1/2)

0. Preliminary assessment (envelop A)

- Capacity and solvency of each bidder company.
- 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 (envelop B)

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

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TENDERING: an OPEN procedure

Assessment criteria (2/2)

2. Quantitative criteria (envelop C)

- Updated Net Cash Flow in the whole contract period

- Total guaranteed savings in energy and water

REFERENCE (Baseline) period Consumption : 201x				
Concept	unit	Expected energy use	price / unit	economic cost
Maintenance	hours/year			
Electricity	kWh/year			
Natural Gas	$kWh_{n.g}$/year			
Water	m^3/year			
TOTAL value				

REPORTING period Expected Consumption				
Concept	unit	Expected energy use	price / unit	**New economic cost**
Maintenance	hours/year			
Electricity	kWh/year			
Natural Gas	$kWh_{n.g}$/year			
Water	m^3/year			
EFFICIENCY FEE	**€**			
TOTAL value				

SAVINGS (first year)	

Boxes to be filled by the bidder :

ENERGY EFFICIENCY AND MAINTENANCE SERVICE at Catalan Institute of Oncology

ENERGY EFFICIENCY AND MAINTENANCE SERVICE at Catalan Institute of Oncology

Catalan Institute of Oncology (ICO). Ministry of Health of the Government of Catalonia:

- Built in 1987
- Surface: 57.304 m^2
- With 126 beds and 38 doctor's offices, the hospital is specialized in cancer treatments.
- Energy **consumption** (base-line):
  - Electricity: 13.566.592 kWh/year, with a cost of 1.569.248 €/year.
  - Gas: 6.243.763 kWh/year, with a cost of 277.723 €/year.
  - Water: 63.482m^3/year, with a cost of 155.918 €/year.

In 2013, ICO, with ICAEN's assessment, **tendered the energy efficiency and maintenance service:**

- The tender is under the **Energy Performance Contract** (EPC) model, with guaranteed energy savings. Mandatory minimum of 16% in energy cost reduction and 10% in water cost reduction has been included.
- The **contract length** is 4 years, with an optional 2 years extension.

ENERGY EFFICIENCY AND MAINTENANCE SERVICE at Catalan Institute of Oncology

Award criteria (1/2):

Award criteria **automatically measurable** (65 points):

- **Economical** criteria (55 points):
  - Valuation of the **maintenance service cost** (25 points).
  - Valuation of the **energy efficiency service**, using net cash flow (total guaranteed economic saving for the Catalan Institute of Oncology) (25 points).
  - Valuation of the **maintenance materials** included in the **maintenance service** (material franchise) (5 points).
- **Technical** criteria for the energy efficiency service evaluation (10 points):
  - Valuation of the **energy savings** higher than the minimum established objectives (8 points).
  - Valuation of the **water savings** higher than the minimum established objectives (2 points).

ENERGY EFFICIENCY AND MAINTENANCE SERVICE at Catalan Institute of Oncology

Award criteria (2/2):

Award criteria evaluable through a **qualitative assessment** (35 points):

- Criteria for the **maintenance service** (20 points):
  - Maintenance project (13 points).
  - Quality control procedures (2 points).
  - Maintenance team (4 points).
  - Transition service plan (1 point).
- Criteria on the **proposed Energy Conservation Measures** (ECM's) (15 points):
  - Coherent, technical and economical feasibility of the proposed ECM's (4 points).
  - ECM's implementation timetable (2 points).
  - Adaptation of the ECM's to the real needs and characteristics (4 points).
  - Level of detail, justification and coherence of the technical proposed solution (5 points).

ENERGY EFFICIENCY AND MAINTENANCE SERVICE at Catalan Institute of Oncology

Results

	CO_2 emissions (t CO_2/year)	Energy consumption (toe/year)
With energy efficiency service	3,482	1,280
Without energy efficiency service	4,620	1,703
Savings	1,138	423

3 EPC“light” model: energy management

ENERGY MANAGEMENT

1. **Adapt the energy consumptions to the needs.**
2. **Optimize equipments operation**.

Implementation of energy management:

a) Internal
b) In collaboration with external consultancy
c) "Light" EPC – energy management service through ESCO

The technical and management complexities require **expert and specialized knowledge.**

ADVANTAGES of the EPC "light" model

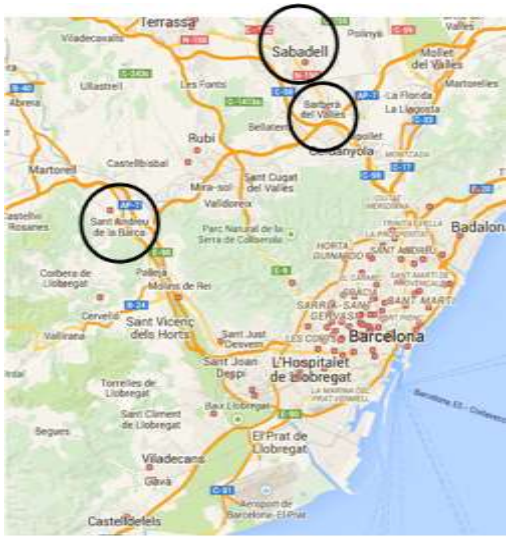
- Externalization of energy management and **savings risk**.
- **Avoids previous diagnosis** and its cost which is a barrier for ESCOs willing to invest.
- High investments **not required**.
- Applicable to **small buildings**.
- Give us knowledge and information for a **later investment project** (standard EPC model).

CHALLENGES for the EPC "light" model

- Simplified and objective protocol to **verify savings**.
- Energy saving commitment **without having a detailed diagnosis** of the building.
- To be integrated within **maintenance** specifications.
- **Multi-disciplinary capacity** of the ESCO: technical, organization and communication.
- **Train professionals** to implement this model.

EPC “light” in a pool of 12 HIGH SCHOOLS. Ministry of Education. Government of Catalonia

High School	Town
IES Rafael Casanova	Sant Boi Ll.
IES Mariano	Sant Boi Ll.
IES Bernat de Ferrer	Molins de Rei
IES el Palau	S. Andreu Barca
IES Severo Ochoa	Esplugues Ll.
IES La Mallola	Esplugues Ll.
IES Miquel Martí Pol	Cornellà de Ll.
IES Mediterrània	Castelldefels
IES La Romànica	Barberà del V.
IES Torre Roja	Viladecans
IES F. Ferrer in Guàrdia	Sant Joan Despí
IES Sabadell	Sabadell



EPC "light" in a pool of 12 HIGH SCHOOLS

Tender

- 4 years contract duration
- Energy cost of the 12 schools centers: 310.000 €/year
- Preliminary audit not required
- ESCO remuneration
  - Shared savings: between 70% and 90%
  - Maximum: 40.000 €/year (13%)

Benefits for Government of Catalonia (client)

- One part of savings: 10% to 30%
- Improvement of control facilities
- Have a protocol / manual for efficient operation and performance
- Control supervision for 4 years period
- Identify improvements for future investment

High interest for this contracting model: 15 offers

EPC "light" in a pool of 12 HIGH SCHOOLS

Tender - Energy management service

- Diagnosis and recommendations to **establish parameters** for best (optimal) **operation conditions** in all facilities, adjusting energy consumptions at its real values for each facility.
    1. Detection and proposal to **reduce unnecessary consumptions**.
    2. Set an **optimal equipment configuration** for its best efficient operation and functioning.
    3. **Adjusting** set points and daily and weekly hourly schedules including national/ official holidays.
    4. **Organizational** measures to reduce consumptions.

- Diagnosis and recommendations to **optimize contracts of energy supply**, although generally they are already included within aggregate purchase of Government of Catalonia.

EPC “light” in a pool of 12 HIGH SCHOOLS

Tender - Energy management service

- **Energy monitoring** at least for electricity, natural gas and water main supplies and internal and external temperatures.
- **Training and awareness** of users and buildings energy managers (minimum 16 hours/school).
- Implementation, supervision and follow up of **measures** (ECMs) during contract duration by the awarded company:
    1. Installation of control and management equipment.
    2. Change to other more efficient equipment if considered feasible.
    3. Optimized management and efficient operation of facility and equipment.
- **Measure and verification** of achieved savings with the implemented measures.

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