



**Diputació
Barcelona**
xarxa de municipis



ACCIONS REALITZADES DELS PAES A LA PROVÍNCIA DE BARCELONA

Ramon Rabella

Carme Melcion

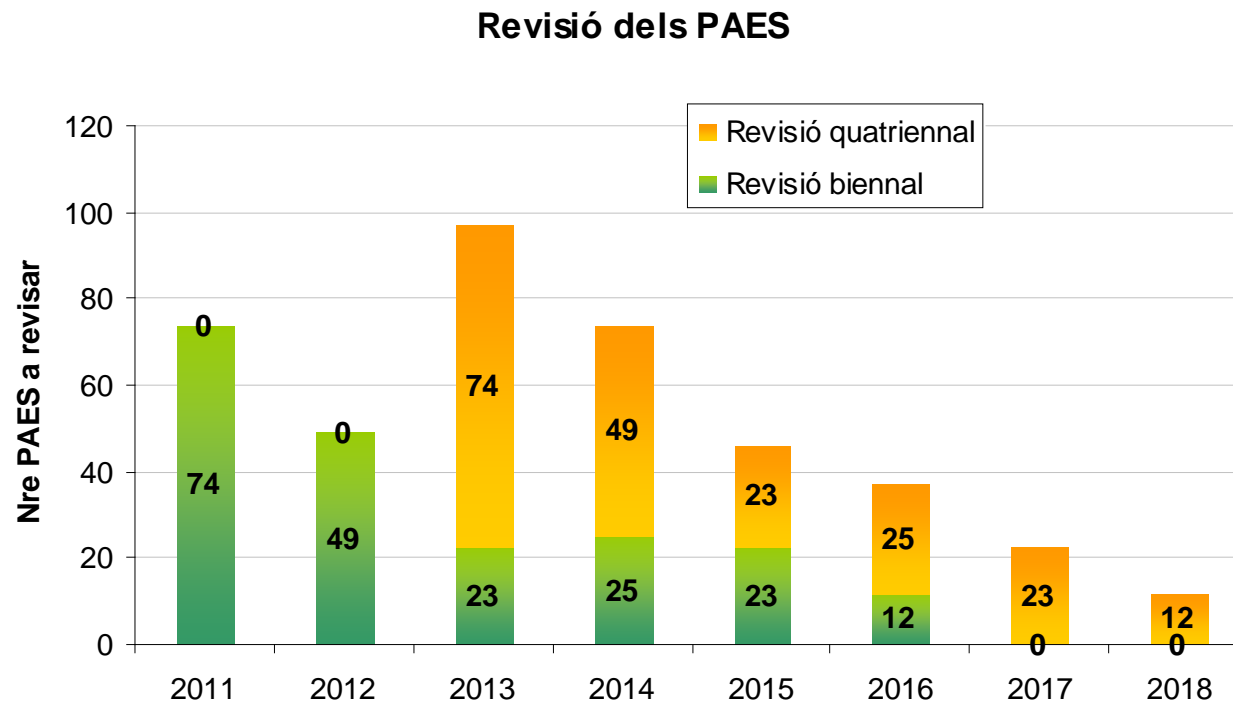
Oficina Tècnica de Canvi Climàtic I Sostenibilitat

Diputació de Barcelona

16 DE SETEMBRE DE 2013

Situació actual:

- 206 municipis adherits dels 311 de la província
- 183 PAES acabats i lliurats amb un cost de 3M€



Per al 2014 es preveu que s'hagin de fer 171 revisions !!



Accions previstes als PAES

ACCIONS	
Nombre de PAES considerats	175
Nombre d'accions	8.232
Expectativa d'estalvi energètic (MWh)	5.517.564
Expectativa de producció energètica (MWh)	564.593
Expectativa de reducció d'emissions (tCO ₂)	2.686.715
Costos estimats globals (M€)	1.172
Costos per l'Ajuntament (M€)	907
% accions en equipaments (inclou renovables) i flota municipals respecte total accions	58%
% accions de producció local d'energia respecte total accions	12%
% accions producció local energia administració pública respecte total de producció energia	79%



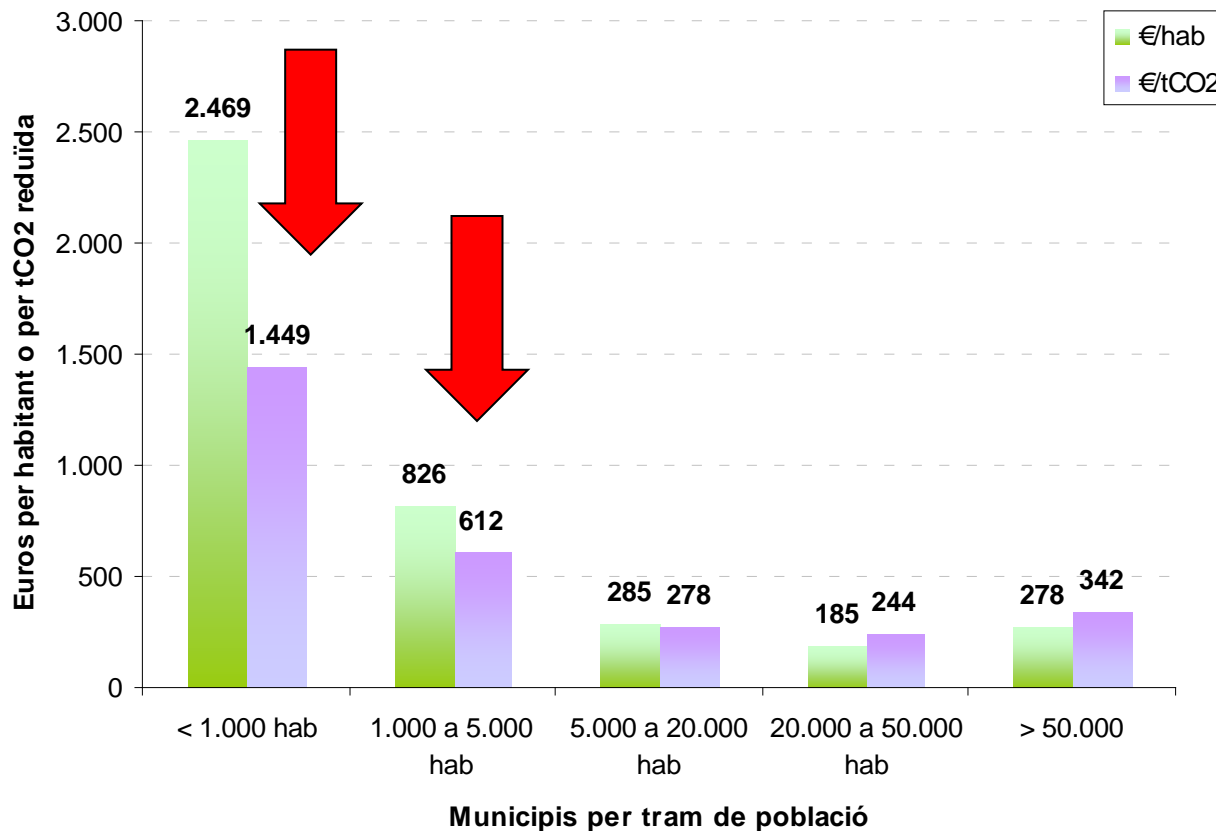
Per temàtiques:

	Cost per l'Ajuntament	tCO ₂ estalviades	Nre d'accions
Equipaments municipals i infraestructures	90.664.789	54.873	2.630
Enllumenat públic i semàfors	107.418.220	76.348	611
Flotes de vehicles municipals i transport públic	33.781.963	36.750	495
Compra verda	965.869	48.350	313
Planificació	302.743.475	694.612	600
Transport privat i comercial	18.436.936	243.591	344
Sector domèstic i serveis	10.258.871	639.262	663
Energies renovables i cogeneració	278.069.975	289.579	965
Sensibilització, formació	12.254.092	214.955	835
Aigua i residus	51.854.279	364.496	706
Altres	316.173	23.899	70
	906.764.642	2.686.715	8.232

La majoria d'accions es centren en els equipaments municipals i l'enllumenat. Moltes accions del sector domèstic i serveis es basen en la difusió i la comunicació.



Costos relatius d'executar un PAES en funció de la mida del municipi



S'HAN DE DUR A TERME LES ACCIONS

ACCIONS DE COMUNICACIÓ, SENSIBILITZACIÓ

- Publicacions específiques

Activitats durant la Setmana de l'Energia

- Cine fòrums
- Paquets de curtmetratges de medi ambient (col·laboració amb el FICMA)
- Obres de teatre per a escoles
- Conferències i tallers per a escoles i per a la població

La setmana de l'energia de 2013 s'ha dut a terme en col·laboració amb l'ICAEN, amb la finalitat d'optimitzar els recursos disponibles.



ACCIONS DE COMUNICACIÓ, SENSIBILITZACIÓ

• *Accions previstes als PAES*

- Es preveuen **581 accions** de sensibilització i comunicació en els **175 municipis**

• *Amb el suport DIBA*

- Entre 2010 i 2013 (4 anys) s'ha arribat a uns **156** municipis diferents i s'han fet **441** accions de comunicació, per tant s'ha arribat al **75%** dels adherits.
- S'ha comptat amb la col·laboració de l'ICAEN (**124 activitats**), la Xarxa de Ciutats i Pobles cap a la Sostenibilitat i l'EUSEW



ACCIONS D'ESTALVI I EFICIÈNCIA EN EQUIPAMENTS

Accions "low cost"

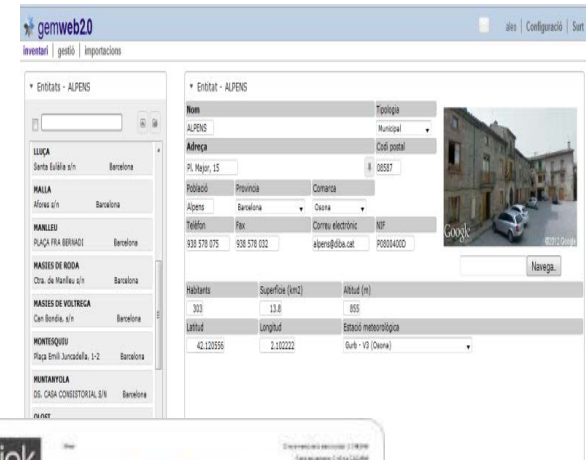
Basades en el coneixement dels usuaris i en l'adquisició de nous hàbits

- Euronet 50/50: Participació de **13 escoles de 13 municipis** diferents. Al nou Euronet 50/50max es preveu arribar a **100 escoles i instituts i 10 equipaments municipals** d'una **cinquantena** de municipis diferents.

- Suport a la gestió energètica municipal:





- comptabilitat energètica de **10** municipis

-Estudi del consum energètic d'uns **80** equipaments de **10** municipis



A LA NOSTRA ESCOLA, ESTALVIEM ENERGIA!!!



-  Aprofita la calor i la llum natural
-  Recorda apagar el llum quan no hi hagi ningú
-  Utilitza només l'aigua que necessitis
-  Posa't la roba adequada

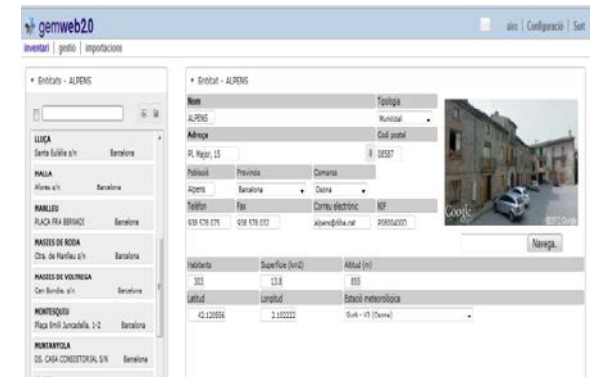
ACCIONS D'ESTALVI I EFICIÈNCIA EN EQUIPAMENTS

- Cessió de material per avaluar el funcionament energètic dels equipaments municipals: smart meters, analitzadors de xarxa, luxòmetres, càmera termogràfica:

68 municipis (>**30% adherit**) han tingut material, sobretot smart meters i analitzadors de xarxa





- Suport econòmic a través del catàleg (2011 a 2013) per implantar comptabilitat energètica i telegestió a **33** ens locals amb **95.100€** (cost final **231.425€**)

- Suport econòmic en els acords de la Xarxa de Govern Local per a la comptabilitat i gestió energètica **117.116€**



**A LA NOSTRA
ESCOLA, ESTALVIEM
ENERGIA!!!**



-  Aprofita la calor i la llum natural
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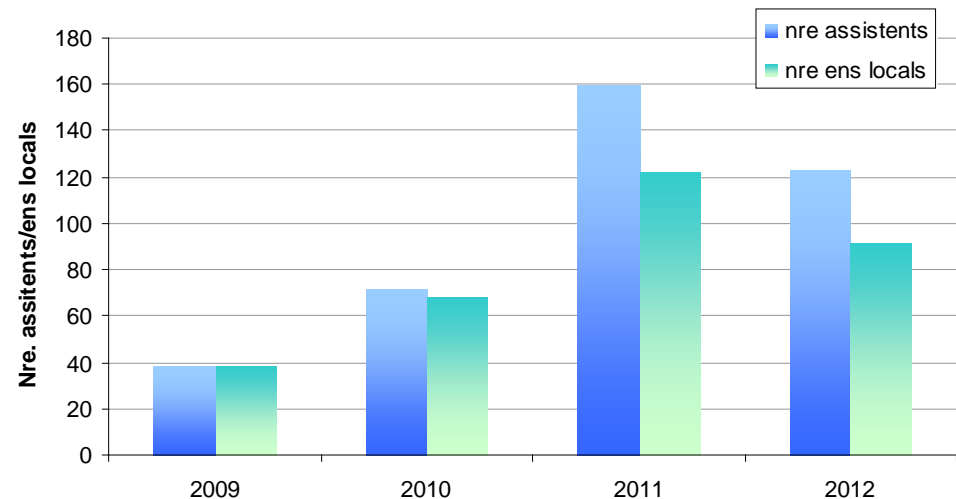
ACCIONS D'ESTALVI I EFICIÈNCIA EN EQUIPAMENTS

Accions "low cost"

- A la província ja hi ha les agències locals de l'energia que donen suport a la gestió energètica municipal dels municipis adherits. Les dues agències més consolidades a Barcelona són la d'Osona i la del Maresme (vinculades als Consells comarcals). Recentment han començat a treballar el Bages, així com l'Alt Penedès i el Vallès Oriental.

- Formació al personal municipal: cursos específics (uns 400 assistents de 321 ens locals). **Als PAES es proposen 143** accions de formació i sensibilització al personal municipal.

- Gestió energètica de l'enllumenat
- Noves tecnologies en enllumenat públic
- Instal·lacions d'energia solar tèrmica
- Instal·lació de fotovoltaica en edificis públics
- Auditories energètiques en edificis públics
- Empreses de serveis energètics i sector públic
- Gestió energètica municipal bàsica
- <https://www.diba.cat/web/mediambient/form>



A més regularment s'organitzen seminaris, tallers i jornades específiques



ACCIONS EN EQUIPAMENTS, ENLLUMENAT I RENOVABLES

Accions amb inversió

Suport donat a través del projecte REDIBA (ELENA):

- **Eficiència i estalvi en equipaments:** S'han atès **22** ens locals s'han fet 29 estudis (n'hi ha de jurídics i de caire més general) amb un cost de **315.975€** i s'ha generat 1,5M€ de volum de negoci.

- **Enllumenat públic:** S'han atès **55** ens locals, s'han fet 73 estudis (n'inclou de jurídics) amb un cost de **976.747€** i s'han generat 74,7M€ de volum de negoci

- **Energies renovables:** s'han atès **64** ens locals, s'han fet 76 estudis (inclosos jurídics) amb un cost de **623.878€** i un volum de negoci de 4,5M€

Total estudis per **1,9M€** per generar **30M€** d'inversió i 80M de volum de negoci.



ACCIONS EN EQUIPAMENTS, ENLLUMENAT I RENOVABLES

Accions amb inversió

Suport econòmic donat a través del catàleg de concertació

- **Eficiència i estalvi en equipaments:** 46 ens locals amb 143.192€ per portar a terme projectes d'estalvi i eficiència d'un valor de 723.204€ d'inversió.
- **Enllumenat públic:** 54 ens locals amb 201.800€ per dur a terme projectes d'un valor de 1,8M€.
- **Energies renovables:** 10 ens locals amb 42.450€ per a projectes de 603.812€

Total ajuts per 387.442€ per a projectes de prop de 3,1M€ d'inversió



ACCIONS EN EQUIPAMENTS, ENLLUMENAT I RENOVABLES

Accions amb inversió

Suport econòmic donat a través de la xarxa de Governes Locals de la DIBA

- **Eficiència i estalvi en equipaments:** 23 ens locals amb 5,1M€.
- **Enllumenat públic:** 7 ens locals amb 1,5M€.
- **Energies renovables:** 13 ens locals amb 1,8M€

Total ajuts per a **43** ens locals per un import de **8,4M€**

També s'ha donat suport tècnic i econòmic per a accions en mobilitat i per fer campanyes de sensibilització en el sectors domèstic i de serveis.

CONCLUSIONS

Quins problemes hi ha?





On es poden anar a cercar:

-Autofinançament..... Només uns pocs

-Ajudes: ICAEN, PUOSC, altres departaments de la Generalitat i Diputacions o UE

-UE: els projectes europeus solen ser complexos de fer i justificar, per la qual cosa és més fàcil que hi puguin accedir ens supramunicipals, o si més no en col·laboració amb aquests ens.

- Via tercers: com per exemple les empreses de serveis energètics, noves fórmules en els contractes de manteniments...



Suport financer divers:

IEE

<http://ec.europa.eu/energy/intelligent/>

Intelligent Energy Europe:
capacitació i coneixement sobretot

ELENA-BEI

<http://www.eib.org/products/elena/>

ELENA-KfW

<https://www.kfw.de/KfW-Group/About-KfW/Auftrag/Sonderaufgaben/Foerdkredite-EU/ELENA---European-Local-ENergy-Assistance/>

Assistència tècnica

ELENA-CEB

MLEI (IEE)

<http://www.coebank.org/Contenu.asp?arbo=161&theme=2&ChangeLangue=EN>

**EEEF (European
Energy Efficiency
Fund)**

<http://www.eeef.eu/home.html>

Finançament i inversions

**Smart cities and
communities
initiative (FP7)**

http://ec.europa.eu/energy/technology/initiatives/smart_cities_en.htm

JESSICA

http://ec.europa.eu/regional_policy/thefunds/instruments/jessica_fr.cfm



- **Però hi ha d'altres barreres que també cal superar:**
 - Projectes petits i difícilment interessants per a potencials inversors
 - Desconeixement de nous mecanismes de finançament i l'encaix legal a l'Administració pública per part de tècnics, serveis jurídics i secretaris
 - Descoordinació entre diferents departaments
 - Desconeixement dels consums reals dels equipaments: el PAES ajuda a posar al dia això i a fer-ho palès.
 - No hi ha diners per invertir, però i el manteniment?
 - Les bones pràctiques no són prou esteses
 - Incertesa jurídica en relació a la producció local d'energia elèctrica (fotovoltaica, cogeneracions...)



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SEAP ACTIONS CARRIED OUT IN THE PROVINCE OF BARCELONA

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Oficina Tècnica de Canvi Climàtic I Sostenibilitat

Diputació de Barcelona

NOVEMBER 2013

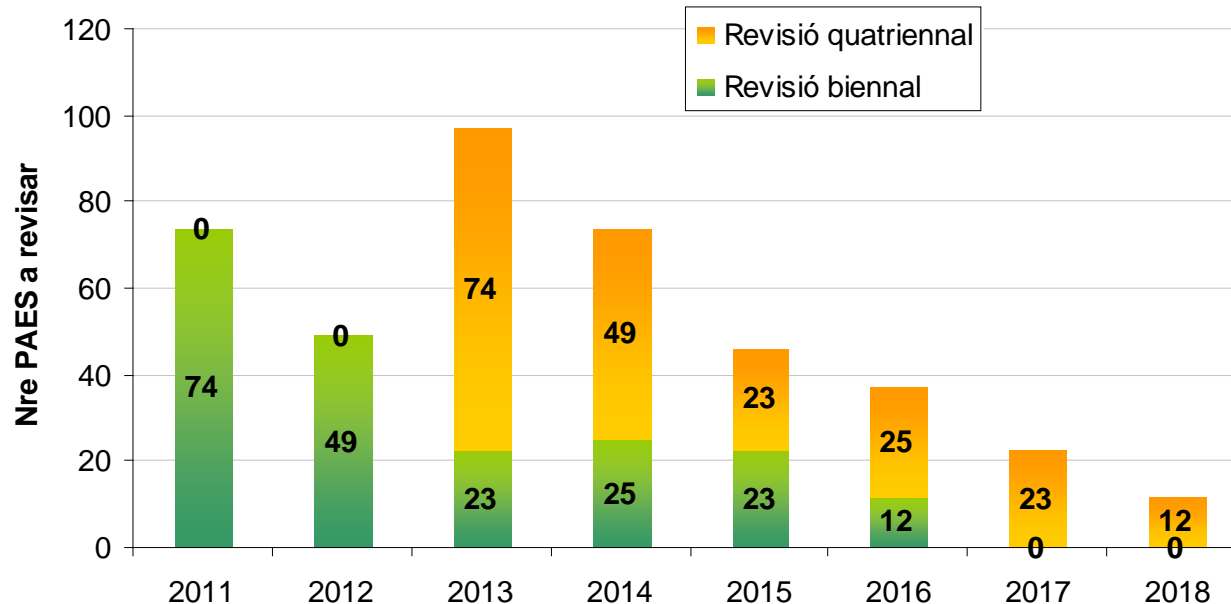


**Diputació
Barcelona**

Nowadays situation:

- 207 municipalities signed the CoM out of 311
- 183 PAES acabats i lliurats amb un cost de 3M€

Revisió dels PAES



In 2014 we foresee to monitor 171 SEAPs !!



Actions foreseen in SEAPs

ACTIONS

Number of studied SEAPs	175
Number of actions	8.232
Expected energy savings (MWh)	5.517.564
Expected energy production (MWh)	564.593
Expected emissions' reduction (tCO ₂)	2.686.715
Estimated global costs(M€)	1.172
Town Council costs (M€)	907
% actions in buildings (including RES) and municipal fleet respect total actions	58%
% Local energy production actions respect	12%
% Local energy production actios by public authorities respect total local energy production	79%

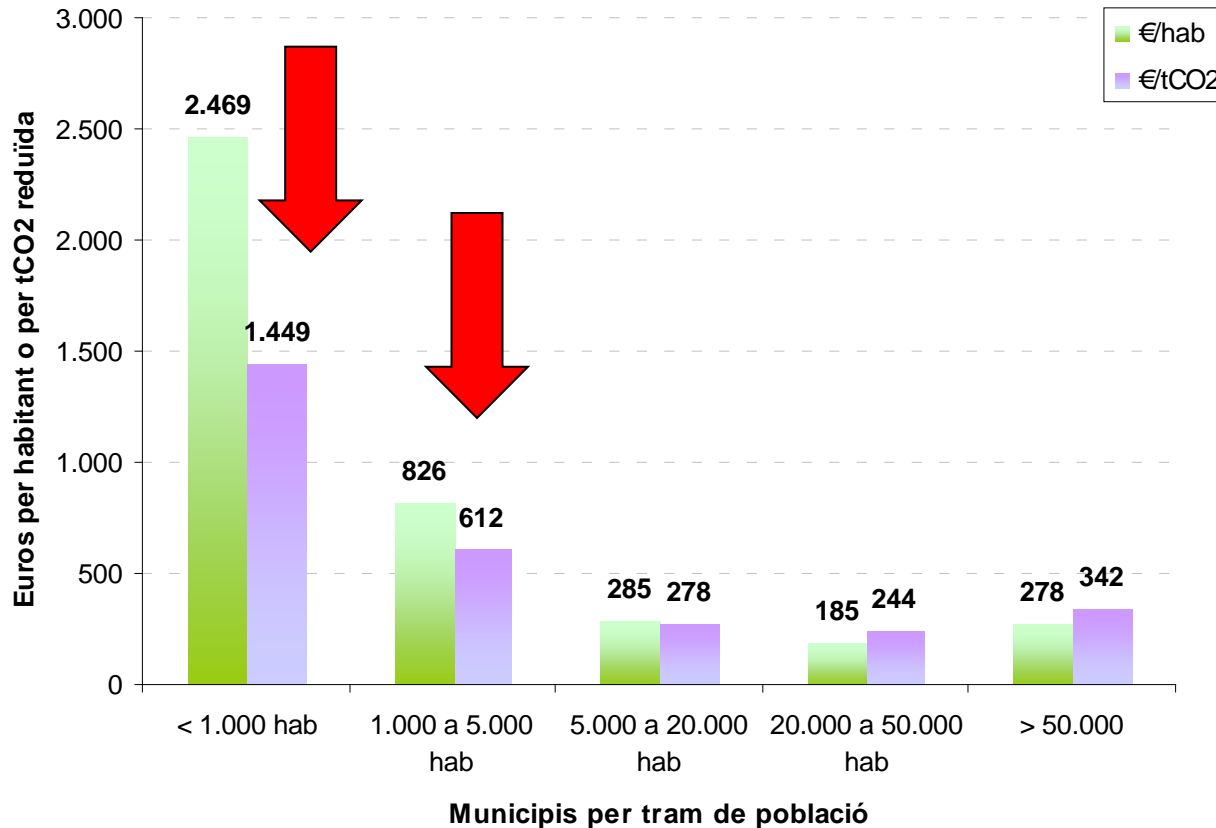


By areas:

	Cost per l'Ajuntament	tCO ₂ estalviades	Nre d'accions
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Altres	316.173	23.899	70
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Most actions focus on municipal buildings and facilities and in public lighting. Actions for residential and services sectors are mainly based on communication, and raising awareness, as well as the Town Council acting as an example.

Relative costs to implement a SEAP according to the size of the municipalities





ACTIONS MUST BE DEVELOPED

COMMUNICATION AND RAISING AWARENESS ACTIONS

- Specific pubs

Activities along the European Sustainable Energy Week

- Cine forums
- Packs of short films on environment (cooperation with FICMA_International Environment Film Festival))
- Theatre plays for schools
- Conferences and workshops for citizens

ESEW 2013 has been carried out in cooperation with ICAEN (Energy Catalan Institute), to optimize resources spent.





COMMUNICATION AND RAISING AWARENESS ACTIONS

• *Actions proposed in SEAPs*

- **581 actions** on communication and raising awareness in all studied SEAPs (**175 municipalities**)

• *With DIBA support*

- From 2010 to 2013 (4 years) we act on **156** municipalities and **441** communication actions developed, we reached **75%** of signatories.
- Cooperation with ICAEN (**124 activities**), with the Network of Towns and Villages towards Sustainability and with EUSEW





ENERGY SAVING AND EFFICIENCY IN MUNICIPAL BUILDINGS

Low cost actions

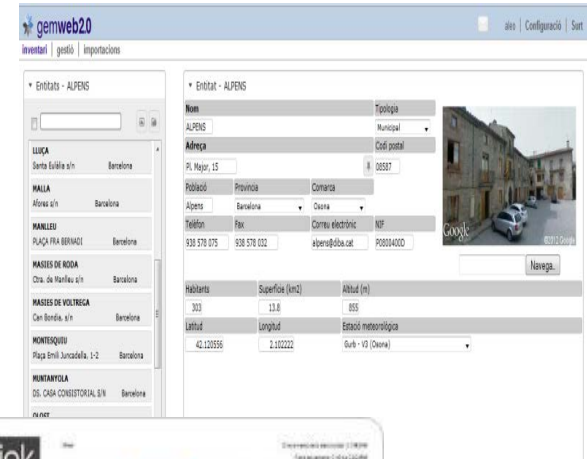
Based on the knowledge acquired by final users and in behavioural changes.

- Euronet 50/50: **13 schools from 13 municipalities**. New Euronet 50/50max **100 schools and 10 municipal facilities** from around **50 municipalities**.

- Support to municipal energy management:

- energy accountability of **10 municipalities**

-Energy consumption studies of **80 buildings** from **10 municipalities**



A LA NOSTRA ESCOLA, ESTALVIEM ENERGIA!!!



- ★ Aprofita la calor i la llum natural
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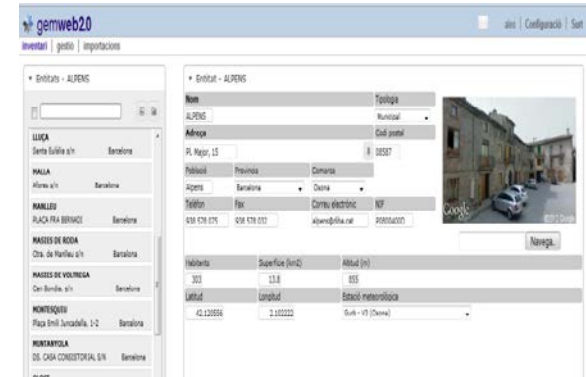
ENERGY SAVING AND EFFICIENCY IN MUNICIPAL BUILDINGS

- Lending tools and devices to measure instant energy consumptions: smart meters, grid analyzers, luxòmeters, thermographic camera:

68 municipalities (>30% signatories) have had some devices, mainly smartmeters and grid analyzers

-Financial support to implement energy accountability systems and remote management, through the yearly aids that DIBA gives to Local Authorities. From 2011 to 2013 **33** Local Authorities; total aids: **95.100€** (final cost of the actions: **231.425€**)

- Financial support for energy accountability and management through the aids given every 4 years by DIBA : **117.116€**



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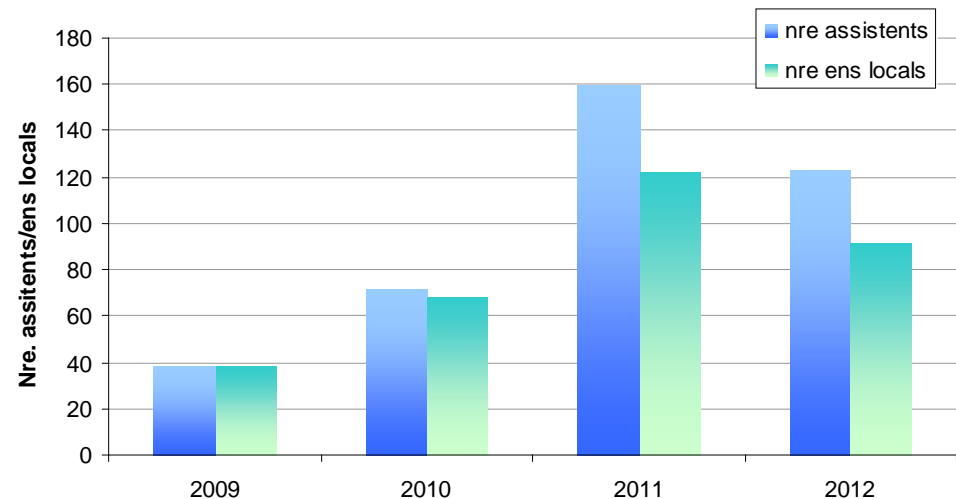
ENERGY SAVING AND EFFICIENCY IN MUNICIPAL BUILDINGS

Low cost actions

- There are some Local Energy Agencies in the province which give support to municipalities in energy accountability and management.

- Training to municipal staff: specific courses (400 attendants).

- Public lighting energy management
- New technologies in public lighting
- Solar thermal installations
- Photovoltaic installations in public buildings
- Energy audits in public buildings
- ESCo and public sector
- Basic energy management
- <https://www.diba.cat/web/mediambient/form>





ACTIONS IN BUILDINGS, PUBLIC LIGHTING AND RES

Actions that require investments

REDIBA (ELENA) project support:

- **Energy savings and efficiency in buildings:** 22 Local Authorities demands; 29 studies (including transverse studies on legal issues) with a total cost of 315.975€ which have generated a turnover of 1,5M€
- **Public lighting:** 55 Local Authorities attended, 73 studies with a total cost of 976.747€ which have generated a turnover of 74,7M€
- **Renewable energy sources:** 64 Local Authorities attended, 76 studies with a total cost of 623.878€ which have generated a turnover of 4,5M€

Total costs of the studies 1,9M€ which have generated investments in sustainable energy of 30M€ and with a total turnover of 80M.



ACTIONS IN BUILDINGS, PUBLIC LIGHTING AND RES

Actions that require investments

Financial support through the aids given by DIBA every year

- **Energy savings and efficiency in buildings:** 46 Local Authorities; support of 143.192€ to carry out projects with a total investment cost of 723.204€
- **Public lighting:** 54 Local Authorities; 201.800€ to carry out projects with a total investment cost of 1,8M€
- **RES:** 10 Local Authorities; 42.450€ to carry out projects with a total investment cost of 603.812€

Total aids: 387.442€ to carry out projects with a total investment cost of
3,1M€





ACTIONS IN BUILDINGS, PUBLIC LIGHTING AND RES

Actions that require investments

Financial support through the every 4 years agreement plan:

- **Energy savings and efficiency in buildings:**

Local Authorities **23**;

Total support: **5,1M€**

- **Public lighting:**

Local Authorities **7**;

Total support: **1,5M€**

- **Energies renovables:**

Local Authorities **13**;

Total support: **1,8M€**

In total **43** Local Authorities and financial support up to **8,4M€**

There has been technical and financial support too from mobility actions and communication and raising awareness actions.





CONCLUSIONS

What are the main barriers?





Where can we look for €€€€:

-Self financing: just a few

-Aids: to all existing supramunicipal authorities

-UE: European projects are usually complex, and their procedures might be difficult enough for a medium or small municipality. It might be easier taht those projects be coordinated bu supramunicipal authorities..

- Third parties: like ESCo; funds; new contract models and formulas





- **But there are other barriers that have to be overpassed:**

- Small projects usually are not very interesting for potential investors.
- Lack of knowledge of new financial schemes and how they can match with Public Administration procedures and legal issues.
- Lack of coordination among different departments of the same Local Authority
- Lack of knowledge of energy consumption of buildings and facilities: SEAPs help municipalities in that..
- Good practices are not widespread enough
- In Spain: legal uncertainty towards renewable energy production.



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Mobilizing sustainable energy investments in municipalities

Diputació de Barcelona
NOVEMBER 2013



Diputació
Barcelona



Investments on energy efficiency and savings for Local Authorities

1. Where are we?
2. Some ideas for how to proceed
3. What are we doing in the province of Barcelona?
4. What have we learnt? Some conclusions





1. Where are we?

- Obligation to provide basic services and assistance to citizens.
- Municipalities have seen their income reduced drastically.
- Little or no capacity to make investments.
- Limited borrowing capacity.



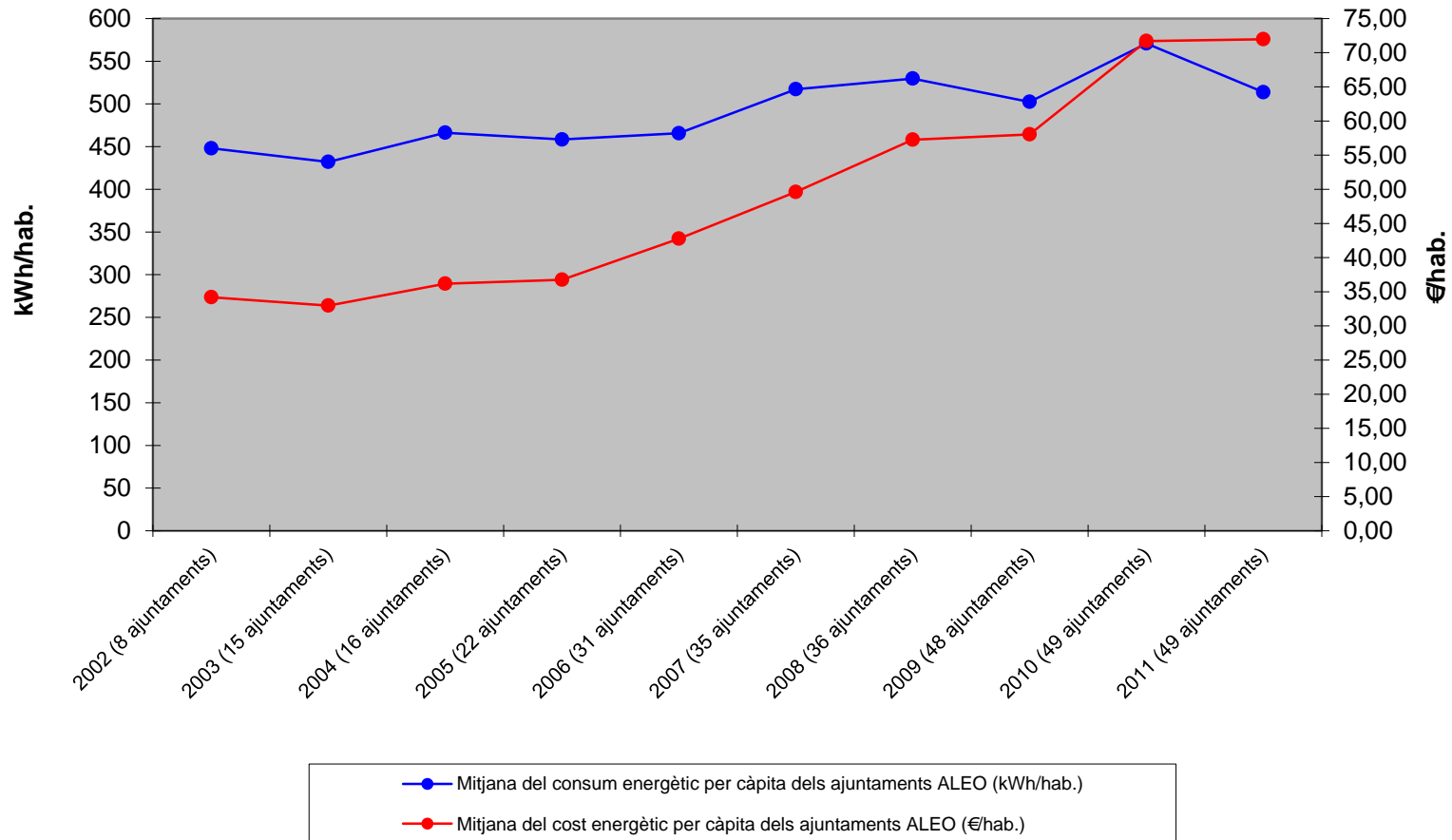
Energy prices continue to rise.





Evolution of the municipal energy consumption and cost per capita .

Consum i cost energètic per càpita dels ajuntaments ALEO





105% diesel cost from 2002 to 2011.



78% piped gas cost from 2002 to 2011



65,3% electricity cost in **municipal buildings** from 2005 to 2012.



76,87 % electricity cost of **public lighting** since 2002.





2. Some ideas for how to proceed.



Self-financing

Aids/Grants

Management and
behavioural practices
(high personnel
efforts, but very low
or no-cost)

Promote public -
private partnership
(an ESCO contract) or
renting / leasing



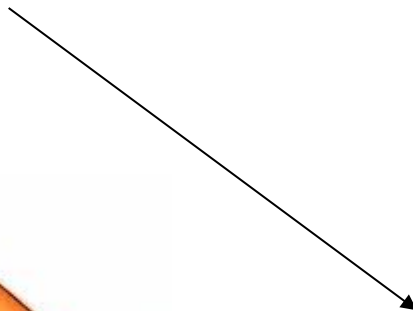


Self-financing

Aids/Grants



- PUOSC (Works and Services Plan of Catalonia)
- Other funding lines of the Catalan government.
- European Union programs



Diputació de Barcelona (Barcelona Provincial Council)

- Support to some measures. (*low cost*)
- Agreement plan (every 4 years).





2. Some ideas for how to proceed.



Self-financing

Aids/Grants

Management and
behavioural practices
(high personnel
efforts, but very low
or no-cost)

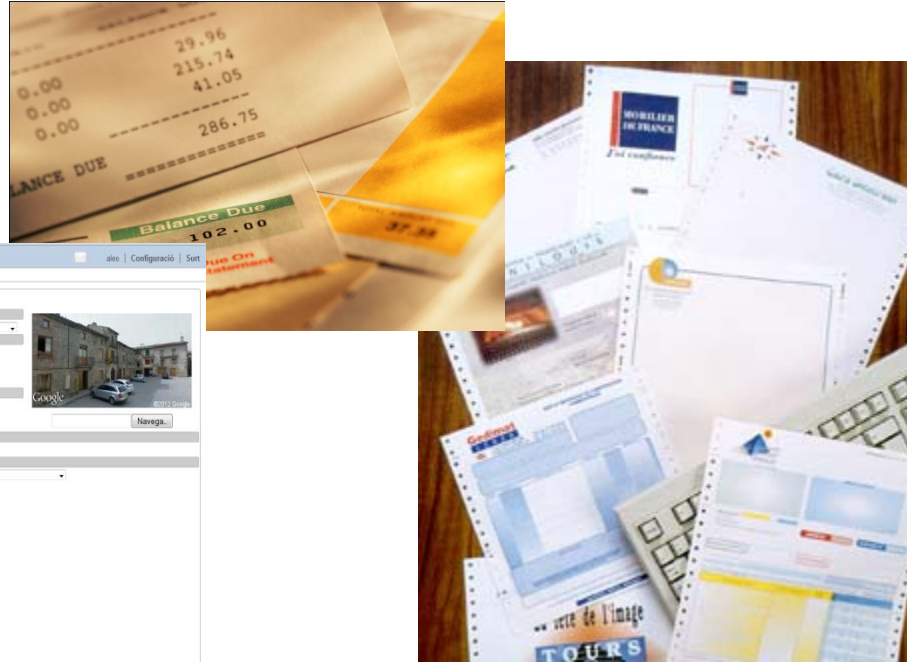
Promote public -
private partnership
(an ESCO contract) or
renting / leasing





1

Knowing how much energy we do consume



gemweb20

inventari | gestió | importacions

Entitat - ALPENS

Entitat	Tipologia
ALPENS	Municipal

Adreça

PL Major, 15 Codi postal: 08587

Població: Província: Comarca:

Alpens Barcelona Osona

Telèfon: Fax: Correu electrònic: NIF:

938 578 075 938 578 032 alpens@diba.cat P0800400D

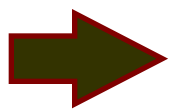
Habitants: Superfície (m2): Altitud (m):

303 13,0 855

Latitud: Longitud: Estació meteorològica:

42,120556 2,110222 Barc - V3 (Osona)

Mapa



Monitoring and cost control of municipal energy consumption





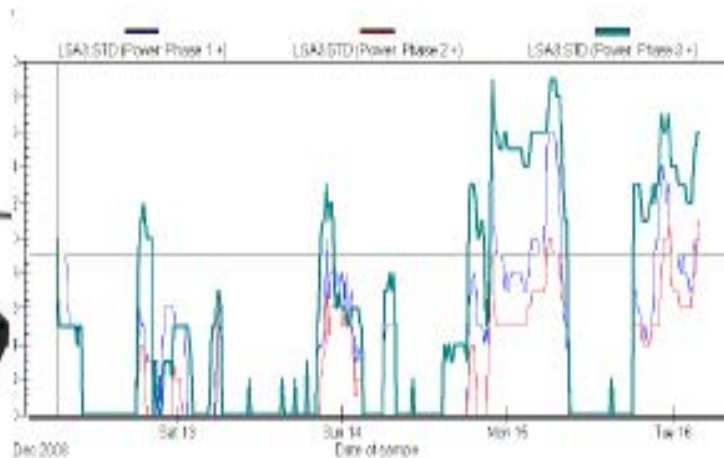
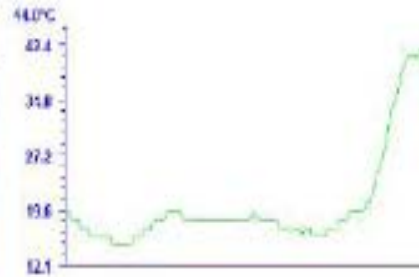
Knowing how and where we do consume energy





Other tools ...

- Thermal Camera - Thermal analysis of facilities
- Lightmeter – level of light
- Network analyzer (DMM) - Monitoring (about 1 week).
- Smoke analyzer - levels of boiler combustion



```

-----
                teste 339
V1.10                #12678437E
-----
Carpeta
Situation
02.01.1998                02:22:45
Combustible: GasNatural
O2ref.: 3.92
CO2max: 11.9%
-----
122.3    °C Temp. Gas. con
17.7     °C TA
0.74     % O2
0         ppm CO
6.95     % CO2
1.45     Lambda
99.3     % SEN
6.7      % qR
-----

```



3

Involving people



A LA NOSTRA ESCOLA, ESTALVIEM ENERGIA!!!



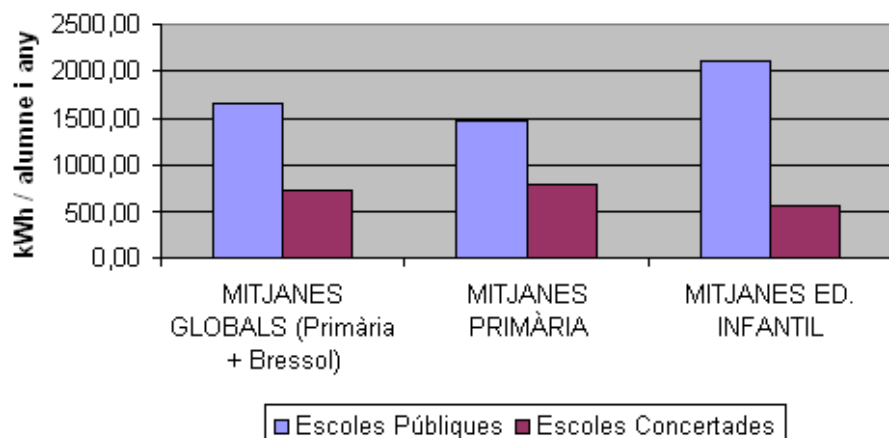
- * Aprofita la calor i la llum natural
- ⌚ Recorda apagar el llum quan no hi hagi ningú
- 🚿 Utilitza només l'aigua que necessitis
- 👕 Poca't la roba adequada

QUAN SURTIS APAGA EL LLUM !!

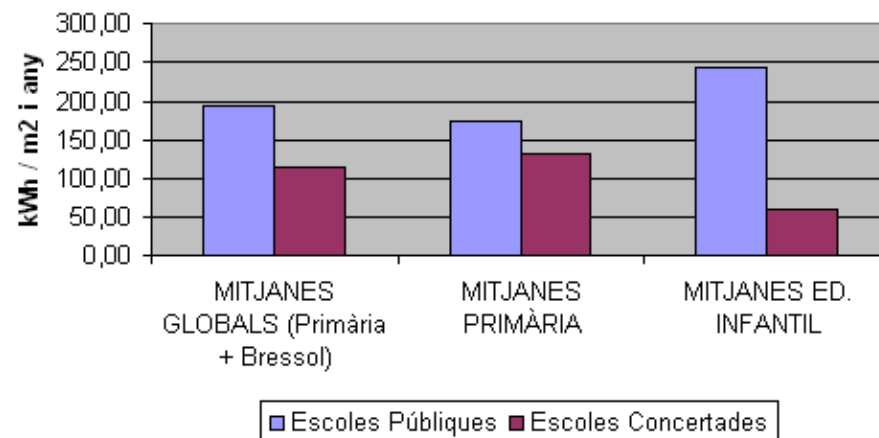




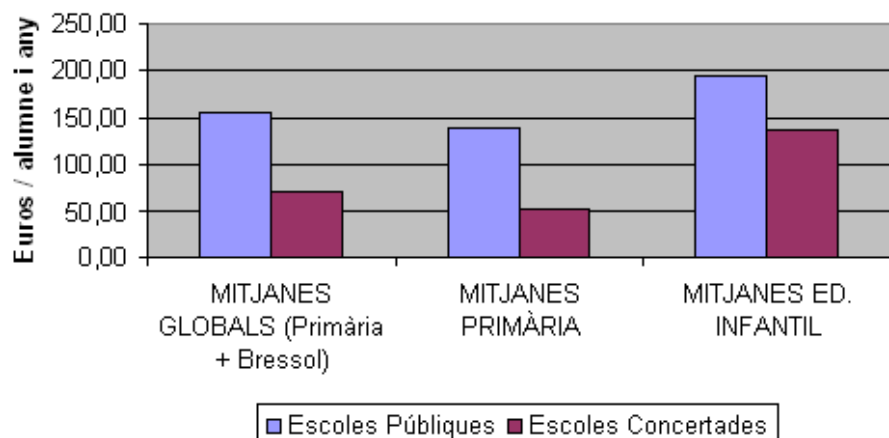
Consum energètic / Alumne i any



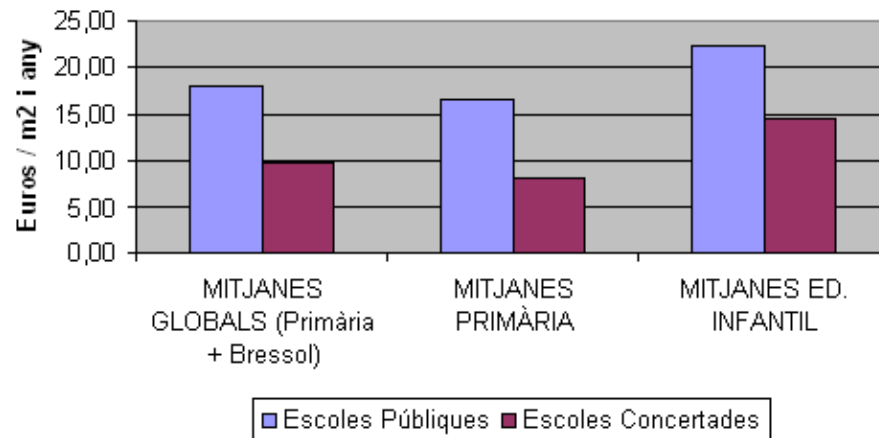
Consum energètic / Superfície i any



Cost energètic / Alumne i any



Cost energètic / Superfície i any





EURONET 50/50

<http://www.euronet50-50.eu/>



- 6900 students and 43 municipalities work together against climate change. Now is finished but there is an new one: Euronet 50/50 max.
- 40 (70%) schools have saved energy.
- 339 t of GHG avoided !!!
- More than 1.100 MWh saved !!
- 2.100 €/school saved !!!



Energy accountability

10 %

**Management,
control/monitoring and
evaluation**

10 %

Involving users

10 %

30 %





2. Some ideas for how to proceed.



Self-financing

Aids/Grants

Management and
behavioural practices
(high personnel
efforts, but very low
or no-cost)

Promote public -
private partnership
(an ESCO contract) or
renting / leasing



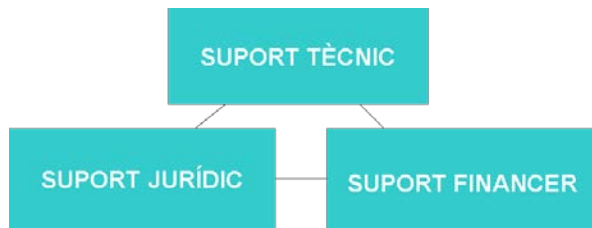


How can we carry out actions that need investment ?

Identifying actions (energy efficiency) that could generate, after a reasonable period, useful savings to finance the investment needed to implement them.

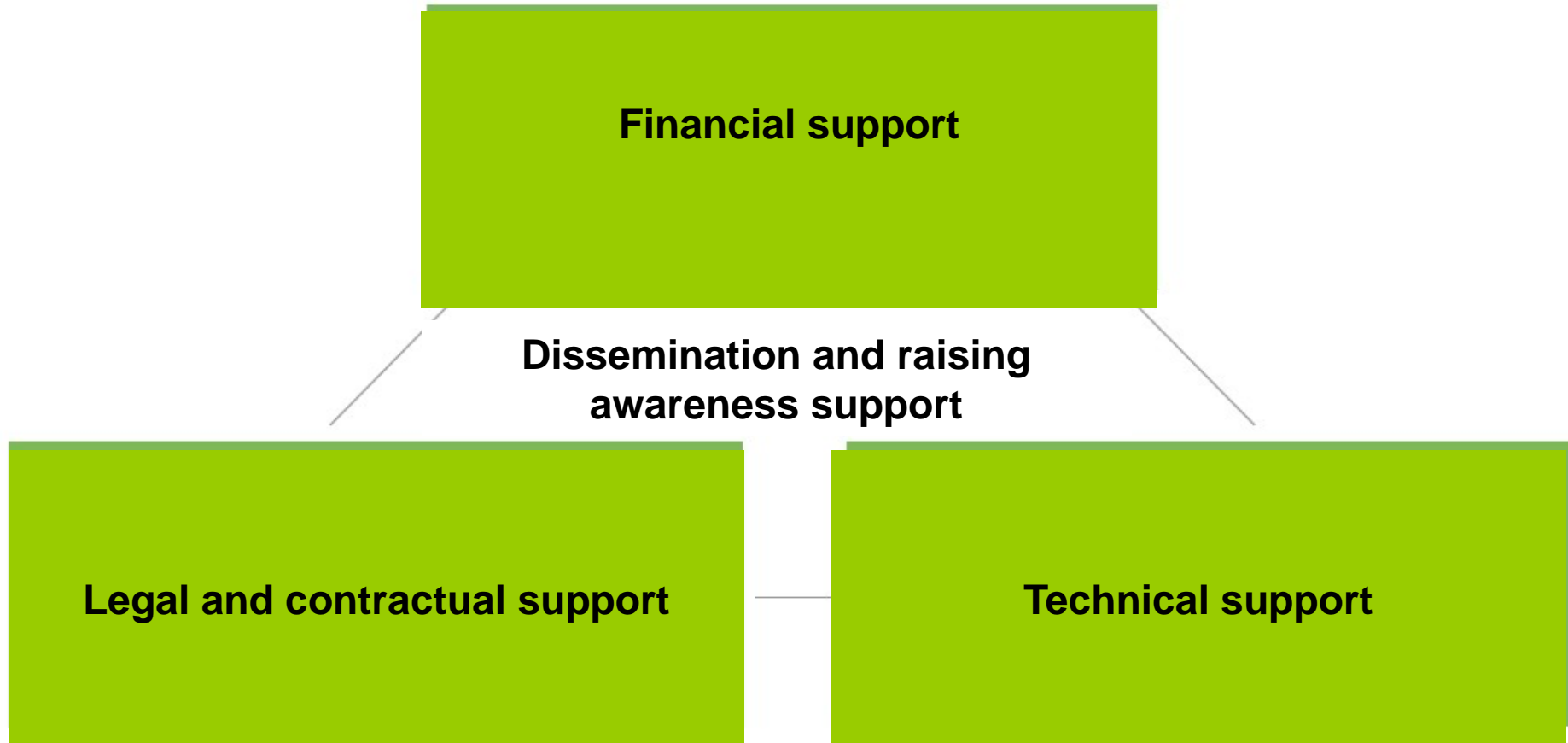
Developing financial (loans), contract (models tenders) and technical (feasibility studies)

mechanisms necessary to carry out these actions without generating costs or loans to local authorities.





Support model from DIBA





Various financial support:

IEE (now changing)

<http://ec.europa.eu/energy/intelligent/>

Intelligent Energy Europe: capacity and know-how

ELENA-EIB

<http://www.eib.org/products/elena/>

ELENA-KfW

<https://www.kfw.de/KfW-Group/About-KfW/Auftrag/Sonderaufgaben/Foerdkredite-EU/ELENA--European-Local-ENergy-Assistance/>

technical assistance to develop projects



ELENA-CEB

MLEI (IEE)

<http://www.coebank.org/Contenu.asp?arbo=161&theme=2&ChangeLangue=EN>

EEEF (European Energy Efficiency Fund)

<http://www.eeef.eu/home.html>

Smart cities and communities initiative (FP7; now changing)

http://ec.europa.eu/energy/technology/initiatives/smart_cities_en.htm

financing of investments

JESSICA

http://ec.europa.eu/regional_policy/thefunds/instruments/jessica_fr.cfm

ERDF

http://ec.europa.eu/regional_policy/thefunds/regional/index_en.cfm





Co-funded by the Intelligent Energy Europe Programme of the European Union



3. What are we doing in the province of Barcelona?

ELENA facility (REDIBA project) to facilitate energy investments in municipalities



Co-funded by the Intelligent Energy Europe Programme of the European Union



TECHNICAL SUPPORT

LEGAL SUPPORT

SUPPORT THROUGHOUT THE PROCESS

FINANCIAL SUPPORT



Beginning: May 2010

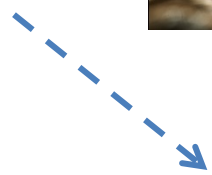
Ending: June 2014 (extension)



2,6 M€



50 M€



Staff : 586.000€

External experts: 2.080.500 €



**Diputació
Barcelona**



How do we work?

1. Questionnaire to collect basic data

2. Analysis

3. Meeting with the municipality

4. Commitment letter

5. External studies



Binding audits

Feasibility
study

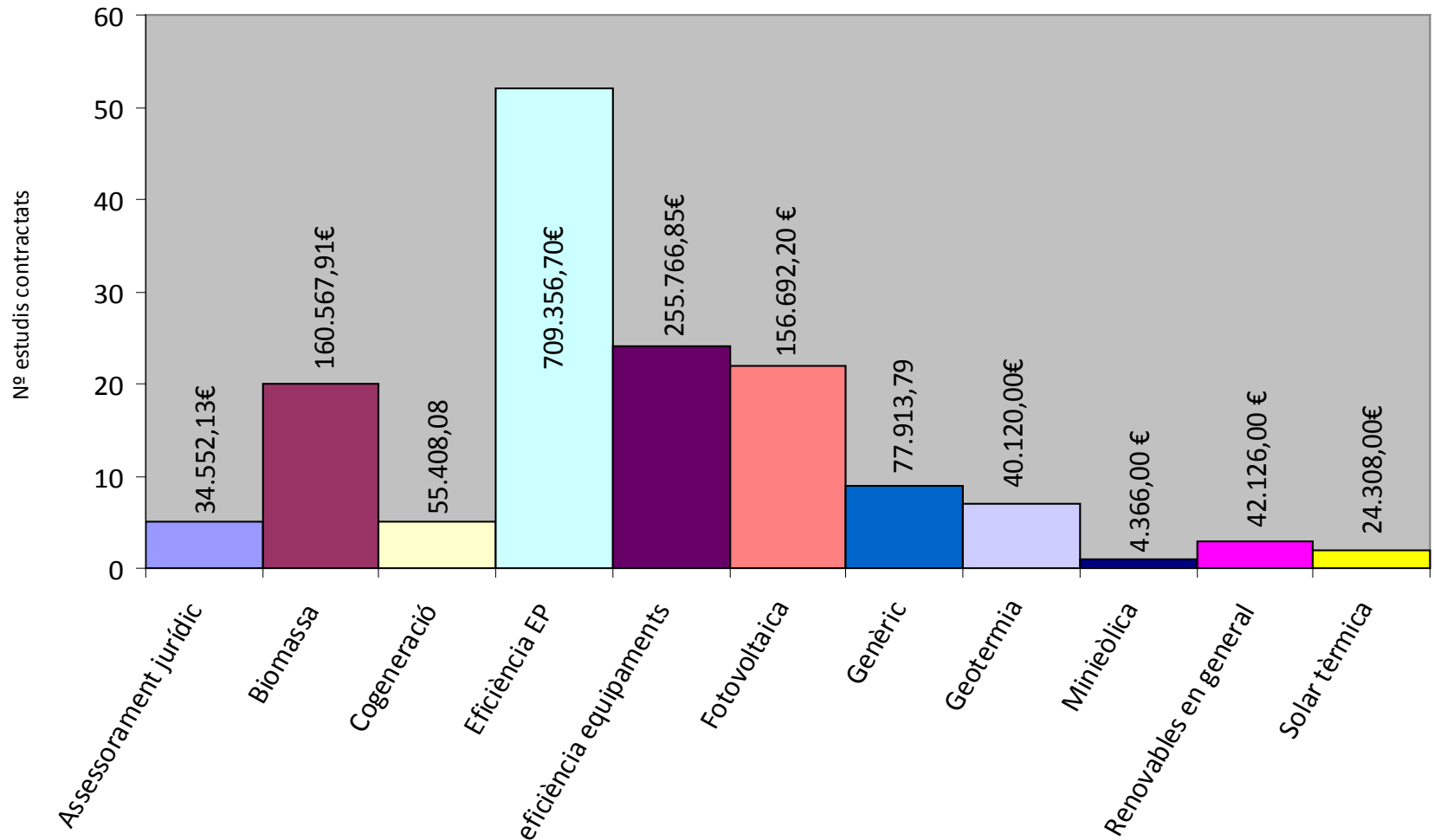
Writing
specifications





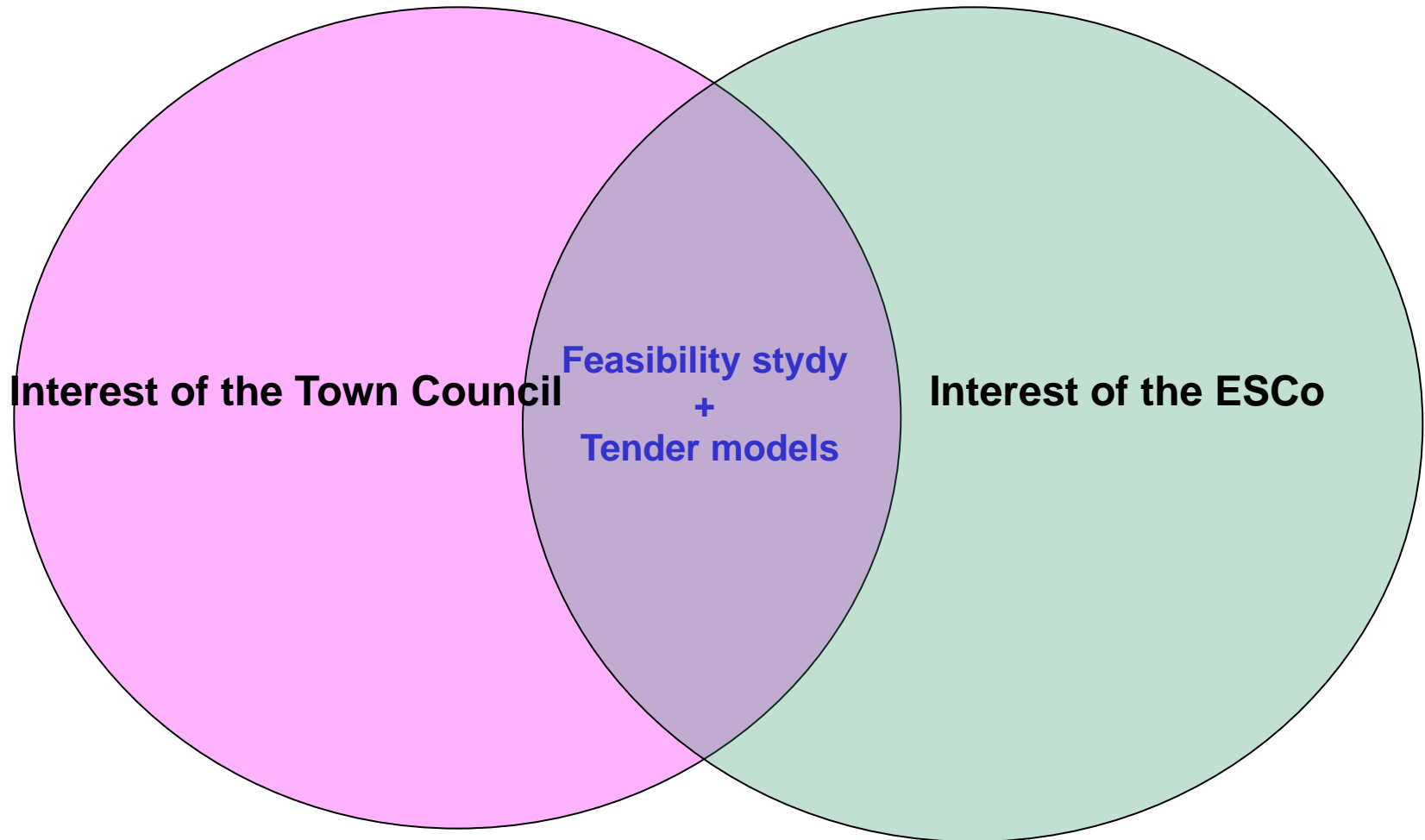
150 external studies

Estudis contractats per àmbits desde l'inici del Programa ELENA (maig 2010-novembre 2012)



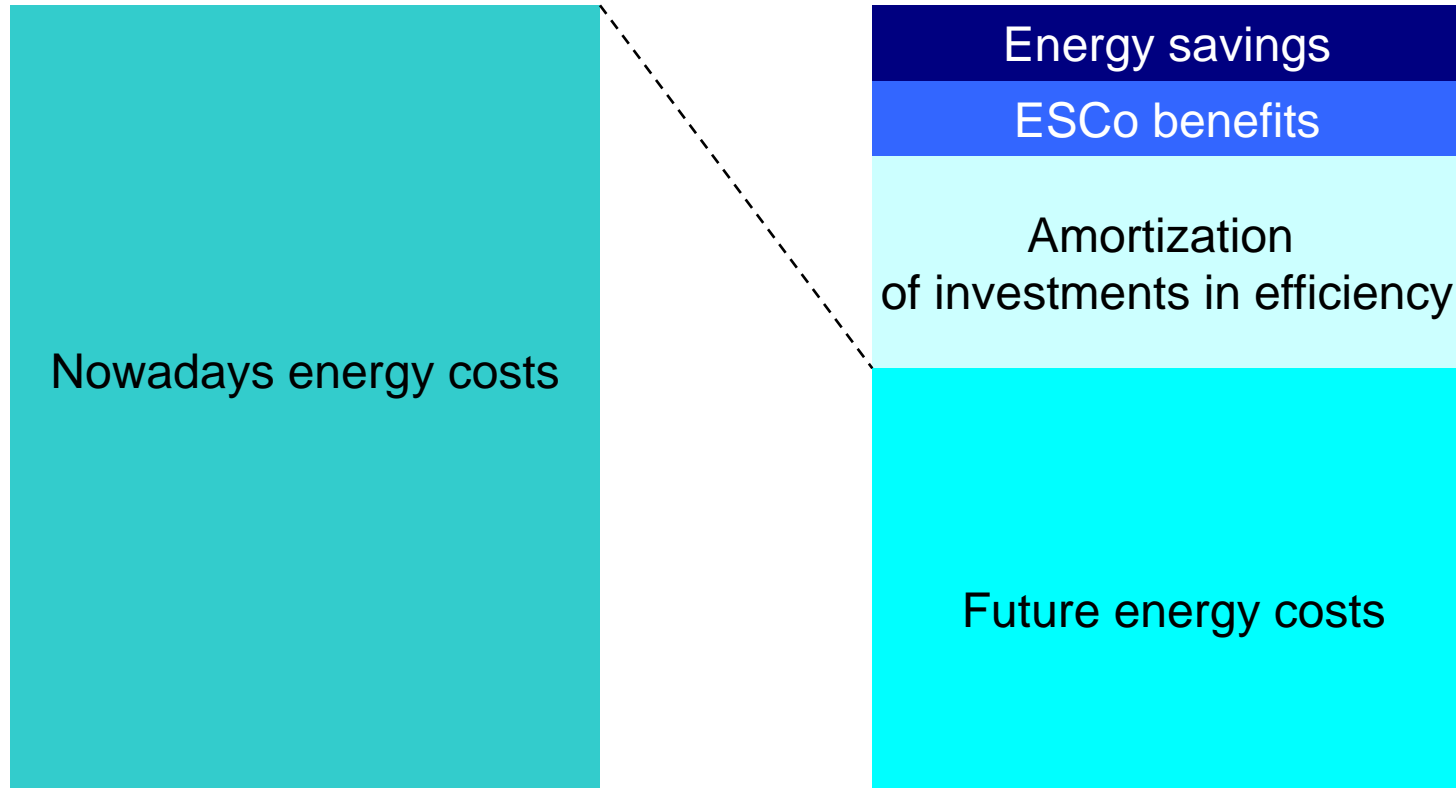


Desired scenario by an ESCo





ESCo mechanism





**The municipality
will pay less**



- Emergence of hidden costs.
- Performance improvement.
- Additional investments which are not strictly linked to energy efficiency

- What is sure is that:

**THE MUNICIPALITY IS NOT GOING TO PAY MORE THAN WHAT IT
WOULD HAVE PAID IF IT HAD DONE NOTHING**





Some considerations

energy supply is not included in the contract, changes in energy prices will be assumed by the municipality

Municipality will not spend more than if it had done nothing.

There is no single model for selecting an ESCO.

Electrical subscription can be included or not

It may be included improvements not related to energy efficiency

The baseline should not be closed nor has to be the only possible evaluation scenario.





2009-2011

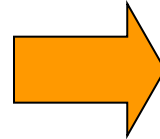
**Roofs rental for
PV installations**

**Energy efficiency
in public lighting**

Biomass heating

CHP

**Energy efficiency in
public buildings and facilities**



2012-2014

**Energy efficiency
in public lighting**

Biomass heating

**Energy efficiency in
public buildings and facilities**





Major barriers identified (in Spain)

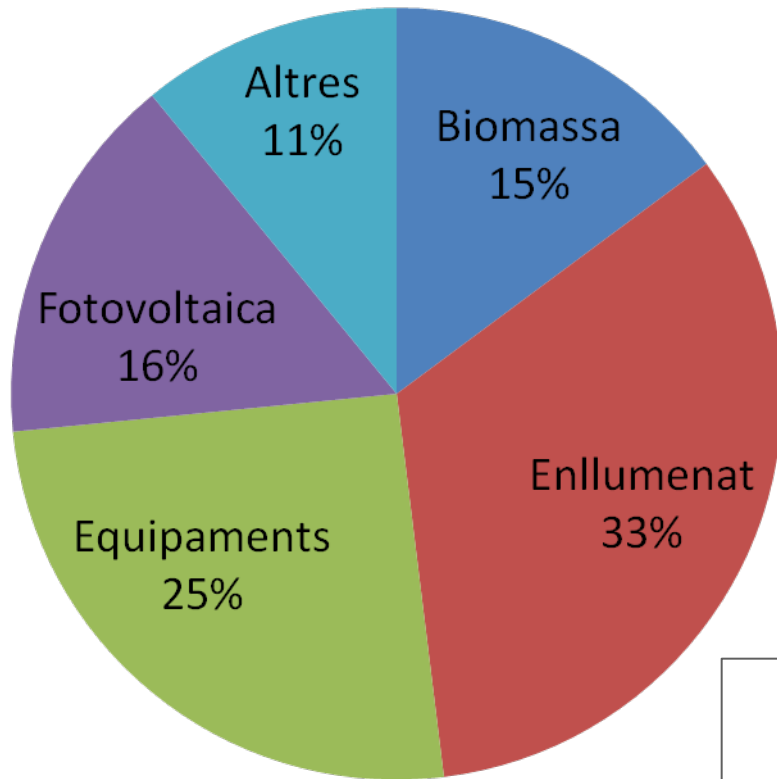
1. Financing scenario of renewable energy is changing and uncertain.
2. Very low indebtment capacity for local government in 2011, 2012 and 2013.
3. Low market experience in energy services by the public sector and lack of clear legal models to promote ESCOs.
4. Limited knowledge of this sector by local financial institutions and low willingness to take risks; excessive guarantees are required.
5. Resistance to change and focus on municipal propertis.
6. Weak interaction with the higher authorities.





Number of received
applications
(2010-2012):

256
applications



126 municipalites

163 contracts

RENTING

ESCo

MAINTENANCE with
INVESTMENT

OWN FUNDS'
INVESTMENTS





Public lighting



Initial audit. DIBA pays 100%.

Accompanying the tender process
(bid evaluation).



Benefits included in the model contract
(= legal support).

ESCo

RENTING

OWN FUNDS

MAINTENANCE with
INVESTMENT





Some proposals for action to improve energy efficiency and reduce the cost and consumption of public lighting that ESCOs can apply:

Price improvement of energy supply

- joint procurement....

Adapting purchased power

Technical improvements

- p ex: changing Mercury vapor to Sodium, halides and/or LED

Reduction of installed power

- p ex: from 250W, 150W and 100W to 150W, 100W and 70W

Reduction of operating hours, level regulation

- p ex: from 4.200 h/yr to 3.400 h/yr

Getting the most color rendering of white light

- p ex: from yellow sodium vapor lamps to white halides or LEDs





Public lighting projects

Cànoves i Samalús (2,865 inh.)

Duration : 10 ans

Contract volume : 0,5 M€

Savings: 518 000 kWh/yr

Replacing by LED

Martorelles (4,927 inh.)

Duration : 10 years

Total investment : 0,4 M€

Savings: 49 % kWh/yr, that is
20% €

Premià de Dalt (10,289 inh.)

Total investment : 0,3 M€

Economies : 1,3 MWh

Payback: 2 years

Tona (8,108 inh.)

Duration : 14 years

Total investment : 0,5 M€

Savings: 52% kWh/yr, that is 10% €

Sabadell (207,938 inh.)

(29 500 light points)

Duration : 10 years

Contract volume: 7,5 M€

Savings: 3,9 GWh/an

25% renewal by LED

Polinyà (8,106 inh.)

(2 000 light points)

Duration : 10 years

Contract volume: 0,4 M€

Savings : 410 000 kWh/yr

Without energy supply





ESCO biomass heating

- district heating system for the educational complex Trinitaris Vic.

Buildings	CEIP Trinitaris Escola Infantil, CEIP Trinitaris Escola Primaria, Casa de la Caridad Orfeon Vigata and Hotel d'entitats	
Heating power	500 kW	
Estimated energy demand	416,8 MWh	
Avoided GHG per year	158,4 tonnes	
Foreseen investment	472 000 €	
Estimated volume of the contract (withaout TVA)	1 344 286 €	
Duration	10 ans	
Enterprise	AGEFRED	



Maintenance plus investments contract

Type of contract: Services contract

Duration: 4+2 / 3+3 years

Observations: includes maintenance of facilities (buildings or lighting), with a very short return on investment (3 or 4 years). Sample investments: remote management of efficient equipment or situations in buildings with very inefficient lighting.

Examples: Argentona, Granollers, Manlleu, etc.





Leasing / renting

Type of contract : leasing

Duration : from 5 to 10 years (maximum) according to the amortization of the equipment.

Observations : Financing energy efficiency measures (monthly payment of renting / leasing done with the savings made).

Obtaining a change of equipment and maintenance.

There are some questions about the debt capacity at the time of termination of the contract.

Examples : Cànoves i Samalús





ESCo contract

Type of contract: public-private partnership (competitive dialogue), a mixed contract of supplies and services or special administration management.

Duration: depends on the investments amortization. Around 10 years.

Observations: facilities management with the necessary investments in energy efficiency by contract.

Examples: Tona, Martorelles, Sabadell, Polinyà, Santa Susanna, Vilassar de Mar, etc.





Projects done

Sant Salvador de Guardiola

Buildings	Town hall, school, civic center
Heating power	500 kW
Duration	12 + 1 year
Budget	47 179,46 €/year (without TVA)
Investement done according to EIB criteria (not including energy supply)	371 994 €



Other examples :

- Biomass district heating in Caldes de Montbui : Total investment 385,878 €, contract type: 4 years; leasing (crédit-bail)
- Masies de Roda : heating power 80 kW, total investment 66,677 €, turnkey contract (direct investment; own funds)





Energy efficiency in buildings

- **Sant Adrià de Besòs** : 6 buildings, total energy management. Writing a specifications' model.
- **Sabadell** : Whole energy management of 12 to 18 buildings.
- **Sentmenat** : 22 buildings.
- **Viladecans** : 24 buildings.
- **Gavà** : 5 buildings





Results 2012

▪ Economic impact

Total amount of the contacts developed **> 60 M€**

Investementst according to ELENA EIB criteria : **26 M€**

▪ Ecological impact

Saved energy **> 17 GWh/year**

Thermal energy production through biomass : **1 GWh/year**





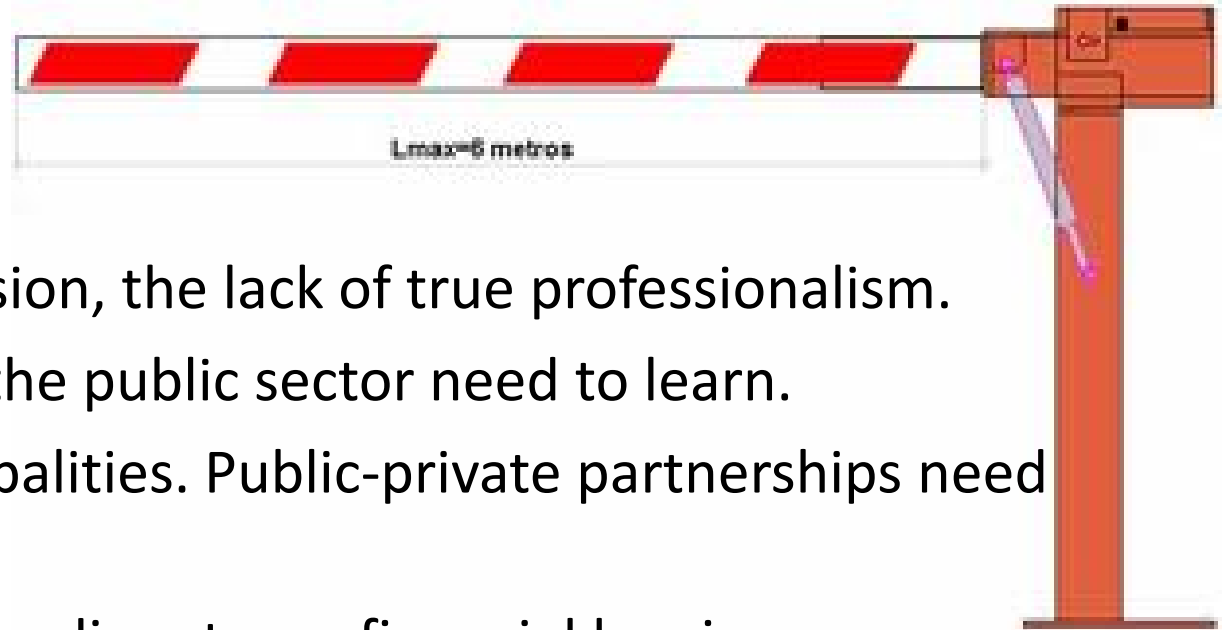
4. What have we learnt? Some conclusions

- Promoting innovative ideas in public administration needs **time**.
- Potential savings in the public sector is very high.
- The key elements of success depend not only on funds.



- There is a lack of models in the public sector.
- Features of public sector. Inertia refractory to new contract models. Fear of the unknown.





- Professional intrusion, the lack of true professionalism.
- Technicians from the public sector need to learn.
- Size of the municipalities. Public-private partnerships need a minimum size.
- In the short and medium term, financial barriers.



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