COVENANT OF MAYORS
Monitoring SEAPs: proposal and first results

Abstract:

Diputació de Barcelona became the first Covenant Coordinator (supporting structure). As a main result 190 municipalities have signed the Covenant and, from those, 158 have already drafted their SEAP. Nowadays (2012) there are nearly 100 SEAP that should have done its every two year's monitoring report. Diputació de Barcelona has developed a first proposal model to monitor SEAP that has already been tested by several municipalities.

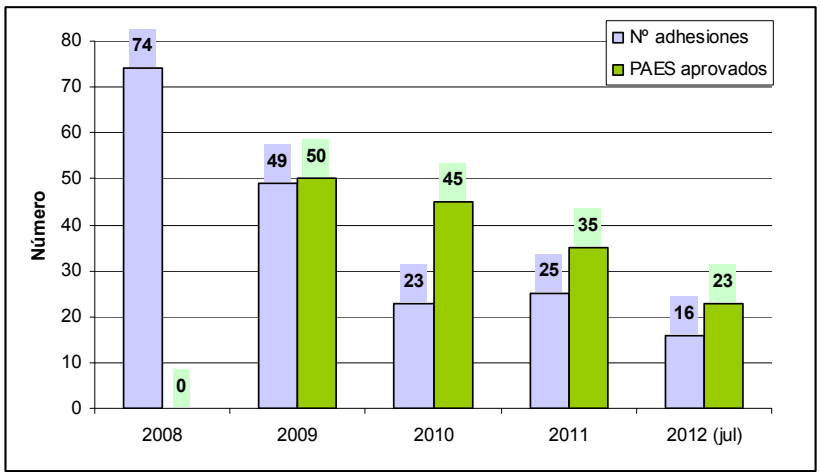
Three workshops with municipalities have been done in order to implement this monitoring system, and to update information on SEAPs from our databases. Those workshops have also served to improve the monitoring model with contributions from participating municipalities.

The summary monitoring report describes the proposed monitoring and analyzes the first results obtained. The monitoring proposal is based on a excel sheet format that is valid for both major towns (over 50,000 inhabitants) and small municipalities. The format is flexible enough to include estimated or real data and results are presented as a report.

Early results show that the greatest difficulties of the municipalities are in financing the actions and in the priorities of each local government. The implementation of renewable is scarce and most ongoing or implemented actions focus on those that the City can directly carry out such as the ones on municipal facilities and public lighting.

Starting point

Diputació de Barcelona became a Covenant Coordinator in 2008 (supporting structure by then). As a result it promoted the adhesion of the municipalities of the province to the Covenant, and currently there are 190 of 311 municipalities adhered.



As it can be observed between 2009 and 2010, 95 SEAPs were approved that should have conducted its biennial monitoring report between 2011 and 2012.

The municipalities in the province of Barcelona have made us repeated demands regarding the monitoring. At the time of establishing ourselves as a Covenant coordinator, we agreed to support in:

- Drafting SEAPs
  - We established a specific methodology
  - We provide guidelines and tools
  - We finance 100% SEAP drafting

- Communication and dissemination:
  - We give specific support during the European Union Sustainable Energy (workshops, cineforums, exhibitions, …)
  - We have developed specific guidelines for the Town Council and some citizenship oriented.

- Implementation of actions; we give:
  - Technical support to draft execution projects
  - Administrative and legal support to carry out actions
  - Support for the search for funding
  - Financial support

- **Monitoring SEAPs**

We believe that the "official" monitoring model will be the one arisen from of the Covenant of Mayors Office (CoMO). The CoMO has not yet developed a standardized monitoring model and it is foreseen it won't be ready until 2013, according to information published on the CoM website (www.eumayors.eu).

Thus, according to information received from the CoMO, we can establish what is and what is not clear in relation to monitoring:

We already know that:
- The standardized model will arise in 2013
- Municipalities that should do its SEAP monitoring will receive an email alerting them and specifying the deadlines, which are expected to be flexible.
- The biennial monitoring does not require an inventory. This inventory will be required for the fourth-year monitoring.
- **Although there is still no specific model, signatories are encouraged to do their own monitoring and upload it on the website of the Covenant, in each municipality profile.**

We still don’t know:
- What information is required in each monitoring report, both for the biennial monitoring and for the every four years one.
- Deadlines to do the monitoring
- What kind of monitoring report will be required to municipalities that in 2013 have a 4 year SEAP.
- Monitoring report format: pdf standardized report, spreadsheet, web template?

- Monitoring report delivery mechanism: although it has not been specified, it is expected to be similar to the SEAP's one, via the extranet page of the Covenant of Mayors.
- Language used in monitoring: Although it may seem a minor issue it is not if you consider that there are municipalities where no specific assigned technician exists or the technician does not know English.

At the same time many of the Covenant signatories have sent us their demand in relation to monitoring, either to comply with the provisions of the Covenant or to know and make known the state of development of its plan. There is, therefore, a fairly widespread concern among municipalities to know how they should do its monitoring.

Diputació de Barcelona, aware of this concern and to fulfil the commitment made with the signatories, has developed a model for monitoring the SEAPs. It should be noted that the creation of this model has been possible thanks to the databases of all SEAPs of which we are Covenant coordinators.

Requirements and criteria to develop the model

Diputació de Barcelona has developed a model to do the biennial monitoring of SEAPs to meet the demands of the municipalities.

The model should answer the following questions:

- Where are we in the implementation of SEAPs?
- Are we in the right direction?
- Positive aspects of the plan and things to improve. Improvement proposals.
- Monitoring should not be a goal in itself, it should be done in an agile way, because the objective is to serve for decision making regarding the SEAPs.

So the criteria for the model have been:

- **Suitable for all types of municipalities**. Barcelona province has 311 municipalities, of which 190 are adhered to Covenant (September 2012). There are small, medium and large municipalities, there are rural, industrial, and tourist towns, some have technicians and engineers full time while others have technicians or engineers just some hours per month or even don't have specific officers. Since the model must be able to be used by the full range of municipalities in the province; it should therefore be simple enough.

- **Informative**. Although simplicity is a must in turn it must indicate whether or not we are going in the right direction and at what point of SEAP implementation we are.

- **Flexible**. The variety of municipalities and SEAPs of the province is large. In some cases there may be a technician assigned to municipal energy management and monitoring of SEAP, but in many other municipalities there will not be any. In some cases there may have accurate data on the savings, while others do not. The model should be able to include real data but also provide an estimate of the savings.

- **Universal and known format**. The model should be raised based on widely known file formats and software; it should not generate the need for installation of new software.

- **Changes in the actions planned.** The SEAP is a dynamic plan, and biennial monitoring has to be made. If the plan is carried out, it is logical that new actions may arise that were not considered initially (emergence of new opportunities or new technologies), that some actions should be modified (biomass boilers in different facilities may be rethought into a district heating system, for example) or may even be rejected (rooftop photovoltaic dismissed by the technical causes found in a more detailed study, or actions that are no longer viable due to regulatory changes). The monitoring model must account for this dynamism, therefore it must have the ability to include new actions, modify or reject proposed ones. Depending on each municipality and, above all, the degree of modification or revision of the changes it may be approved by the Town Council Plenary.

- **Standardized monitoring report**. Even though each municipality can draft its own monitoring report from the information of the model, it might be interesting to have a standardized report model arisen directly when data are filled and as well as it establishes a minimum content.

- **Homogeneous format of the monitoring**. On the part of the Diputació, its interest in this standardization and homogenization lies in gathering all the information and be able to set a global monitoring report, with comparable data. It may also be interesting for local intercomparison. Data collection of SEAP allows us to update the databases of all the plans of the municipalities that we support, identify their strengths and weaknesses

- **Adaptable**. The model must be enough to know where you are in relation to the plan and in turn be simple, because the simpler it is the easier it will be to adapt to the future proposal of the CoMO. If the model was too complex adaptability to new formats would be lower. The ultimate goal is to limit the work of municipalities in relation to monitoring.

Monitoring model

From all the criteria mentioned, the Diputació de Barcelona began working on the development of a monitoring model. In the first phase we worked with different municipalities (Badalona, Granollers, Navas, Sant Celoni, Sant Just Desvern) to see if the approach was right and to make improvements.

From this work we completed the detailed proposal. The model is based on a spreadsheet (Excel workbook):

An index (*Índex*) to the list of worksheets:

1. *Instruccions* (Instructions)
2. *Entrada de dades general* (General data input)
3. *Entrada de dades de les accions* (Actions' data input)
4. *Portada de l'informe* (Report frontpage)

5. *Informe en català* (Catalan report)
6. *Informe accions Ajuntament en català* (Report on actions on municipal facilities)
7. *Informe en anglès* (English report)
8. *Per generar el pdf del informe* (instructions to generate a pdf file)

Sheets 2 and 3 are input data sheets, the rest are output sheets with the results presented as a report.

Instructions

This sheet briefly explains the operation of the Excel spreadsheet.

General data input (*ENTRADA_DADES_GRAL*)

These are general municipal data. We distinguish cells in blue and green. Each town is given its specific excel with their data (in blue) obtained from the databases of the SEAP we have, in Diputació de Barcelona. Although already filled, cells are correctable. This is important because with the return of the monitoring report we can update our databases with the correct information and detect errors. The green cells are the ones to fill.

There is a first part of objective data: population in 2005 (base year emissions inventory), county, date of adherence to Covenant, total emissions in 2005 emissions target in 2020, foreseen savings and planned productions.

Name of the municipality

Població 2005:	24.702 habitants	
Comarca:	Maresme	
Data adhesió al Pacte dels Alcaldes:	25/09/2008	
Data lliurament PAES a l'Oficina del Pacte:		
Data d'aprovació pel Ple	24/09/2009	
Data primer seguiment biennal:	9 juliol 2012	

Compromisos de reducció

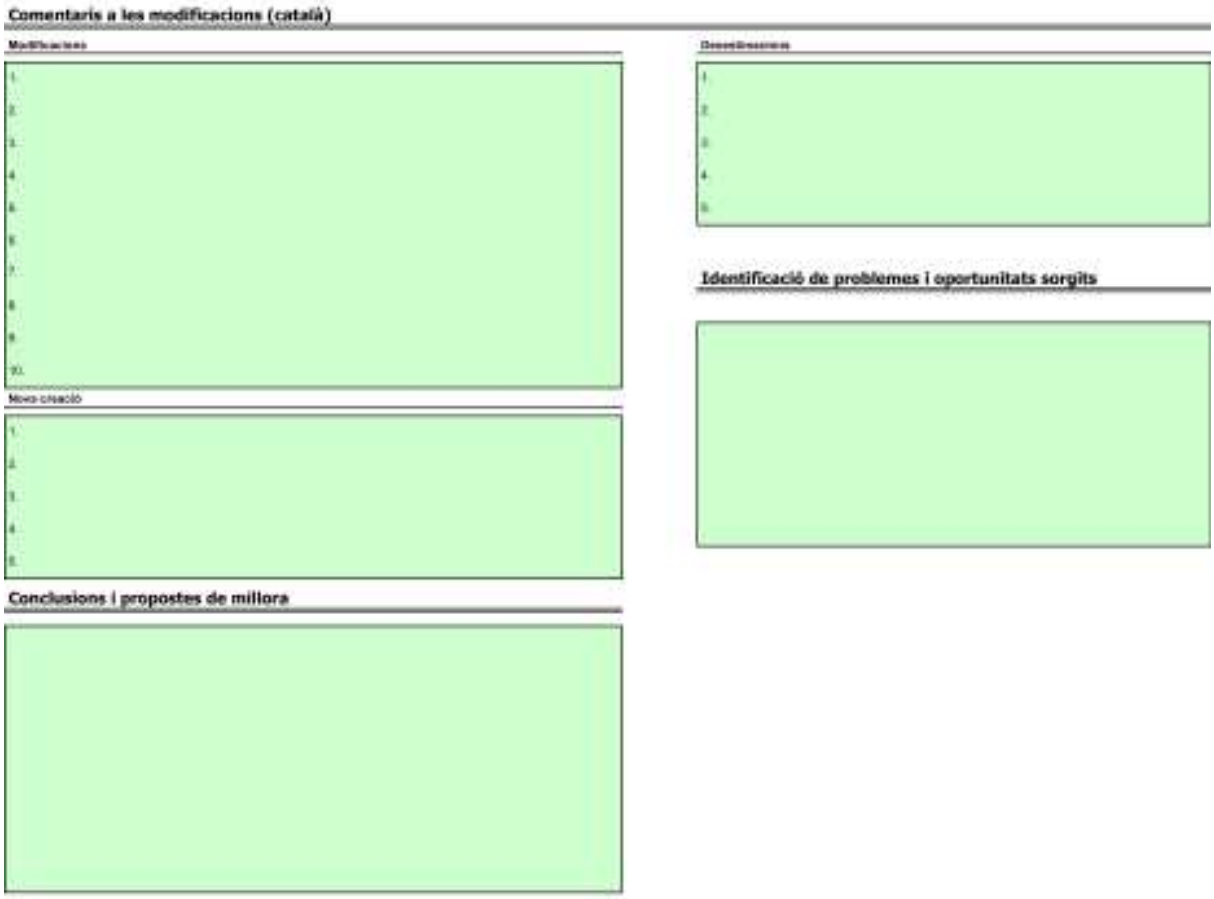
Emissions totals PAES (tCO_{2e})	105.239	**% estalvi emissions**
Objectiu emissions al 2020 (tCO_{2e})	84.292	**20%**
Objectiu emissions per habitant al 2020 (tCO_{2e}/hab)	3,41	
Emissions estalviades a 2020 (tCO_{2e}.)	20.947	
Estalvi energètic previst (kWh)	51.340.417	
Producció local d'energia prevista (kWh)	5.942.958	
Emissions ajuntament (2005)	1.782	
Emissions estalviades ajuntament al 2020 (tCO_{2e})	1.742	**98%**

Reduced emissions, energy savings and energy production are the result of the actions proposed in the SEAP. At the same spreadsheet and subsequent rows there is a section to enter more qualitative information:

- ***Comments on the amendments***:
  - Amendments: to explain what changes have been made.
  - New actions: section to identify the actions that have been incorporated as new ones.
  - Rejected actions: Details of the actions that have been dismissed.

- **Identification of problems and opportunities arisen**: This section is a qualitative aspect that depends on each particular experience. It is possible to write down technological, financial, regulatory, human resources available, etc. For instance, one could include a regulatory change that affects certain projects.

- **Conclusions and proposals for improvements:** Due to the results that may be obtained and to the identification of problems and opportunities, it should be established a series of conclusions and proposals to improve the plan, those proposals can range from the inclusion of new actions to the changes of organizational aspects.



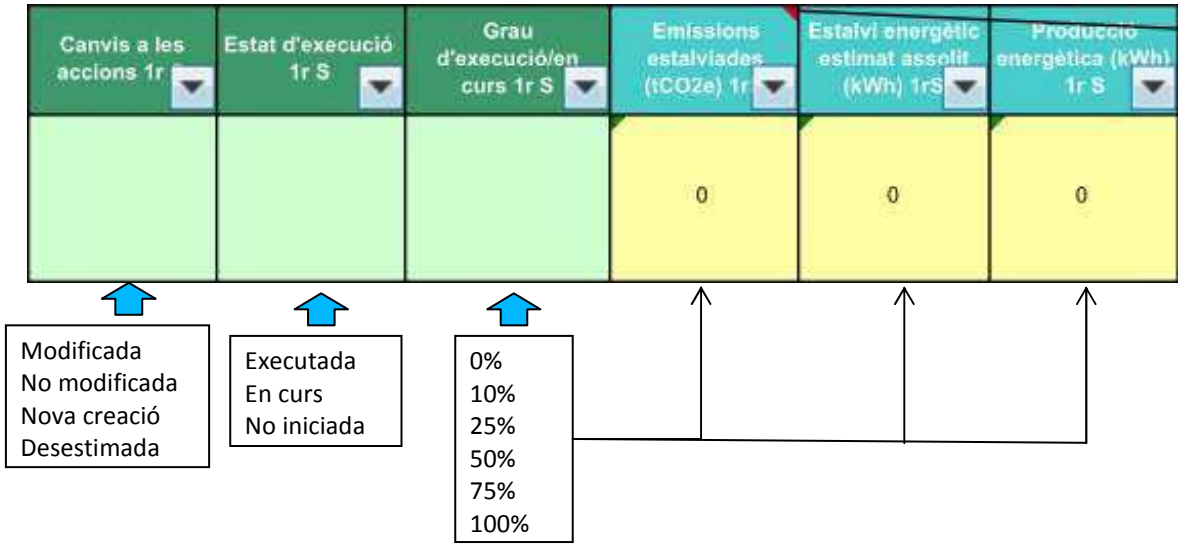
In the subsequent rows there are the same sections to be filled in English in case it is wanted that those aspects appear in the report in this language. In order to help, several translation websites are listed.

General data input (ENTRADA_DADES_ACCIONS)

This sheet includes a list of actions according to SEAP information available by Diputació de Barcelona. It includes information for each action: name, field and subfield of action, estimated emissions reductions, energy savings and production, if production: energy source, if the investor is or not the municipality and number of facilities affected.

The municipality will look that the information given is accurate; otherwise it must be corrected so Diputació de Barcelona can update its databases.

In the columns that follow there are three columns in green (to fill) and three more in yellow (AutoFill). For every action it must be indicated if there are changes (*Canvis a les accions 1r S*); execution status (*Estat d'execució 1r S*) and degree of execution (*Grau d'execució/en curs 1r S*). These are fold cells:



In the first column it shall be indicated if the action has been amended or not, if it is a new one or if it has been rejected. In the second cell it should be put if the action is *Not started*, *ongoing* or *done*. Obviously rejected actions will be "*Not started*" and finally the third cell indicates the approximate degree of implementation and it should serve to perform of the calculation the estimated energy and emissions savings and, if appropriate, the estimated production (subsequent cells, in yellow). It is important to note that these calculations are estimates but, in case the municipality has more real data, real numbers can be included as the cells are not blocked. This aspect is particularly important because it gives more flexibility to the model, which can be used whether data are accurate or not.

Results

The results are presented in different sheets as a report that can be transformed into a pdf file. A first sheet, ***informe_cat***, includes a summary of the status of the SEAP, degree of implementation, degree of fulfilment of the basic goals of SEAP, degree of implementation and emissions savings estimated by type of action.

Name of the municipality

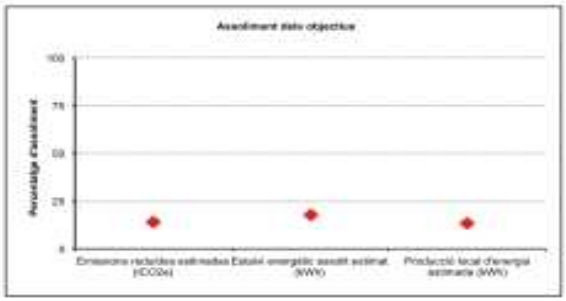
Població 2005:	27.627 habitants
Comarca:	Vallès Occidental
Data adhesió al Pacte dels Alcaldes:	26/11/08
Data lliurament PAES a l'Oficina del Pacte:	08/11/10
Data d'aprovació pel Ple	28/06/10
Data primer seguiment biennal:	08/11/10

Compromisos de reducció

Emissions totals (PAES)	126.150	
Objectiu emissions al 2020 (tCO_2)	115.775	28,78%
Objectiu emissions per habitant al 2020 (tCO_2/hab)	4,19	
Emissions estimades a 2020 (tCO_2)	80.576	
Estalvi energètic previst (MWh)	163.863,587	
Producció local d'energia prevista (MWh)	18.120,016	

Estimació del grau de compliment dels compromisos del Pacte

	Valor assolit	% respecte l'objectiu a assolir
Emissions reduïdes estimades (tCO_2)	4.281	10,6
Estalvi energètic assolit estimat (MWh)	28.183,322	17,2
Producció local d'energia estimada (MWh)	2.420,022	13,4



Comentaris a les modificacions

Modificacions

1. S'han modificat les accions de canvis d'enllumenat amb LED quantificant estalvis i costos
2. S'ha quantificat l'acció relativa a la implantació d'una Smart Grid
3. S'han quantificat els estalvis d'emissions de les accions de residus i aigua
4. S'han quantificat els estalvis energètics d'accions en què sí s'havia quantificat la reducció d'emissions.
5. S'han quantificat estalvis en les accions de normativa de construcció i plans de mobilitat o transport
6.
7.
8.
9.
10.

Desestimacions

1. S'ha desestimat la creació d'una plataforma o consorci amb el sector privat
2.
3.
4.
5.

Nova creació

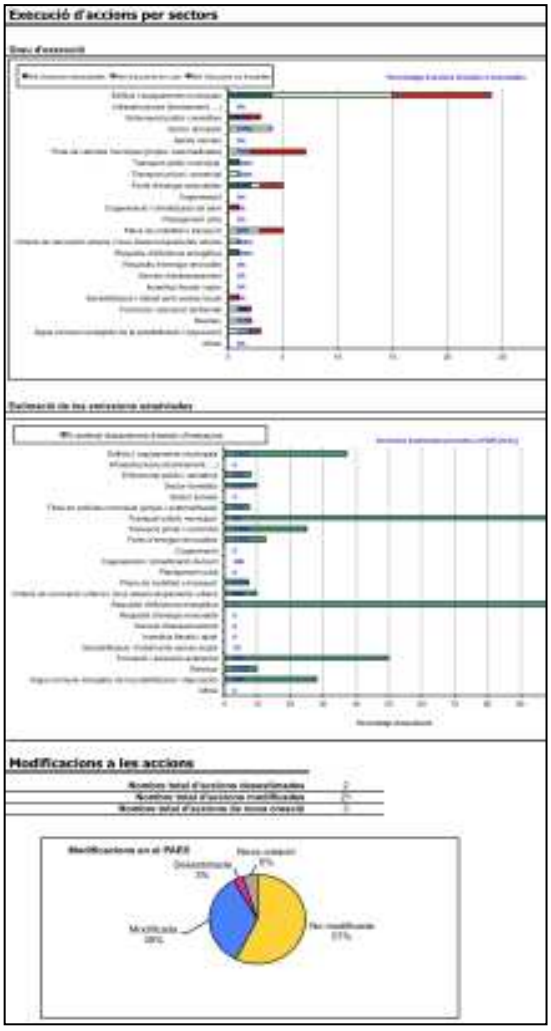
1.Renovació del parc mòbil privat
2. Gestor energètic municipal
3. Pla de mobilitat urbana
4.
5.

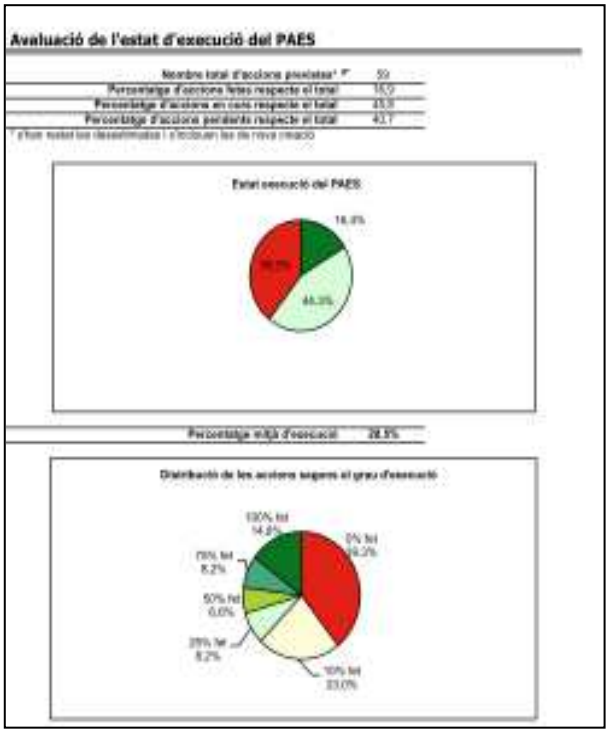
Identificació de problemes i oportunitats sorgits

L'anul·lació de les primes en fotovoltaiques ha deixat en stand by algunes accions que estan en estudi

Conclusions i propostes de millora

Potser caldrà reenfocar les FV en base a l'autoconsum. S'ha plantejat introduir la figura del gestor energètic per donar un major impuls al PAES





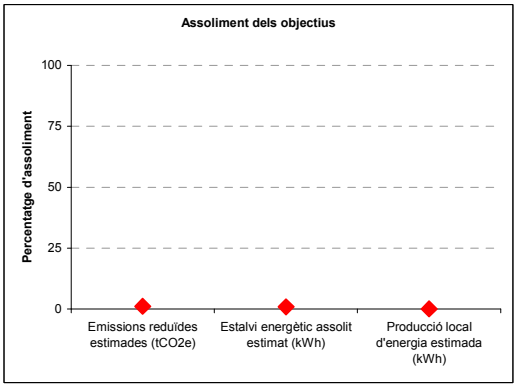
The sheet ***informe AJ_cat*** focuses on actions that affect more directly to the Town Council: municipal buildings, facilities, public lighting, fleet, public transport and renewable energy production in municipal buildings and facilities.

Compromisos reducció Ajuntament

Emissions ajuntament (2005)	1.782	
Emissions estalviades ajuntament al 2020 (tCO_{2e})	1.742	98%
Estalvi energètic previst (kWh)	2.826.947	
Producció local d'energia prevista (kWh)	892.428	

Estimació del grau de compliment dels compromisos del Pacte

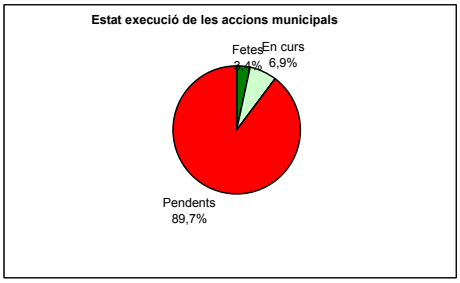
	Valor absolut	% respecte l'objectiu a assolir
Emissions reduïdes estimades (tCO_{2e})	19	1,1
Estalvi energètic assolit estimat (kWh)	24.663	0,9
Producció local d'energia estimada (kWh)	0	0,0



Avaluació de l'estat d'execució del PAES

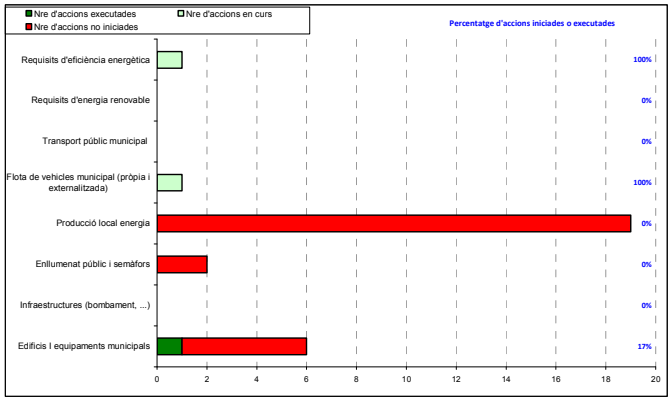
Nombre total d'accions previstes*	29
Percentatge d'accions fetes respecte el total	3%
Percentatge d'accions en curs respecte el total	7%
Percentatge d'accions pendents respecte el total	90%

* s'han restat les desestimades i s'inclouen les de nova creació

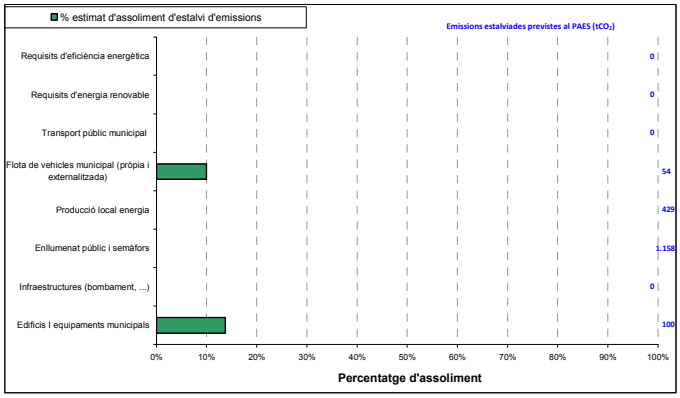


Execució d'accions segons tipologia

Grau d'execució



Estimació de les emissions estalviades



There is another sheet, ***report_eng***, with the same information of ***informe_cat*** in English.

This model has been presented to municipalities and we have made several workshops which have also been positive to include new considerations to the model or to correct errors.

Workshops with the municipalities

Diputació de Barcelona has created the model as a result of the demands of the signatories and its commitment to support the whole process of the Covenant of Mayors initiative, so it was important to let the model be known and to have the opinion of the municipalities to test its functionality.

In a first phase we developed an excel that was tested by several municipalities with quite different traits. Then, we included changes based on the comments and several improvements were made. Finally we started a series of workshops to test the model with the municipalities that had shown particular interest in having one.

There have been three workshops that have summoned a total of 51 different municipalities. In each session we featured the situation of monitoring in relation to the CoMO and basically we explained the operation of the spreadsheet. Each participant had the chance to use it and enter its own data, so we could discuss the problems found.

In order to know the opinion of the technicians, who will be responsible for monitoring, we have asked about possible improvements to the spreadsheet, some of which have already been included:

- Data not only in absolute but also in relative value, per capita: relative data are given for general outputs but the graphics are not generated per capita.

- Include more detailed results for the actions over which the Town Council can act directly: we have included a specific sheet with those results.

In each session it was debated the need to include aspects relating to the cost of the actions but there are technical difficulties in getting information and even determining what is included and not: For example, what is the cost of an installation of photovoltaic energy conducted by third parties and in which the Town Council cedes the space (with or without rent)? Costs affecting actions of private transport, residential and tertiary sectors which are assumed by the private sector wouldn't be included, according to the general opinion of municipal technicians, for instance. Due to the imprecision of the data that one would get, at the moment, it has been decided not to include this aspect, although, obviously, it could be incorporated.

Initial results

We have gathered results of the monitoring of 27 municipalities in the province of Barcelona in order to evaluate the status of the different SEAPs.

	Population	Number of municipalities
<1.000 hab	2.350	4
de 1.000 a 5.000 hab	12.310	5
de 5.000 a 20.000 hab	161.818	13
de 20.000 a 50.000 hab	50.695	2
> 50.000 hab	402.424	3
Total	**629.597**	**27**

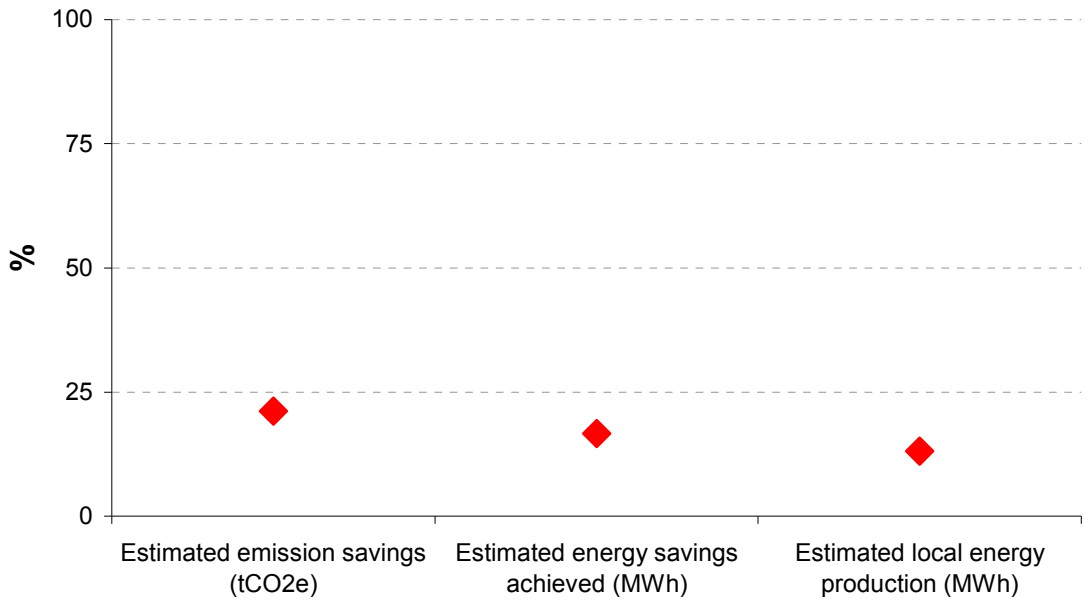
Year of the Sustainable Energy Action Plan approval

	Number of SEAP
2009	14
2010	7
2011	5
2012	1
	27

In the sample there are municipalities of different sizes and different characteristics, from very small ones to large, from rural municipalities to those a distinctly urban.

The estimated degree of fulfilment of the objectives of the Covenant , in percentage of the estimated total, is 21% compared with the foreseen emission savings, 17% in terms of reduction of energy consumption and 13% in terms of local energy production.

Degree of fulfilment of the commitments of the Covenant (%)



If we consider the degree of implementation of actions we find that 13% have been implemented and 39% are ongoing, nearly half remain to start, 48%. We evaluated a total of 1,411 actions.

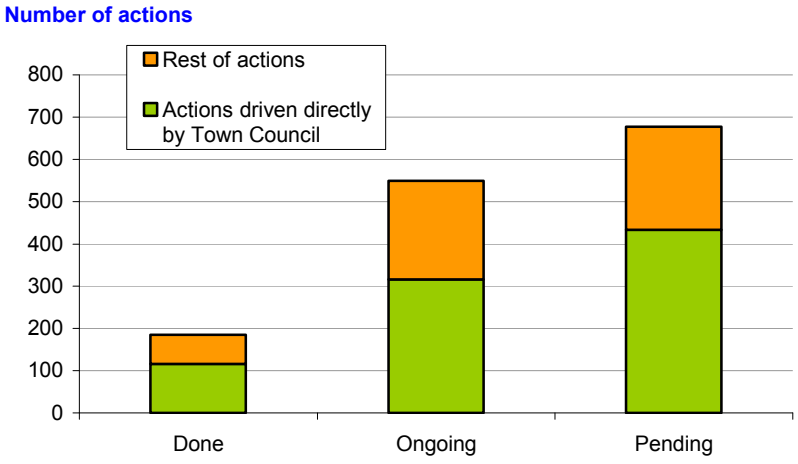
From the degree of implementation of actions, 0% (not started), 10%, 25%, 50% or 75% which are ongoing, and 100% of the executed ones, can establish an average implementation rate of SEAPs that stands in 26%, ie it has been performed a quarter of the scheduled work.

SEAP implementation degree

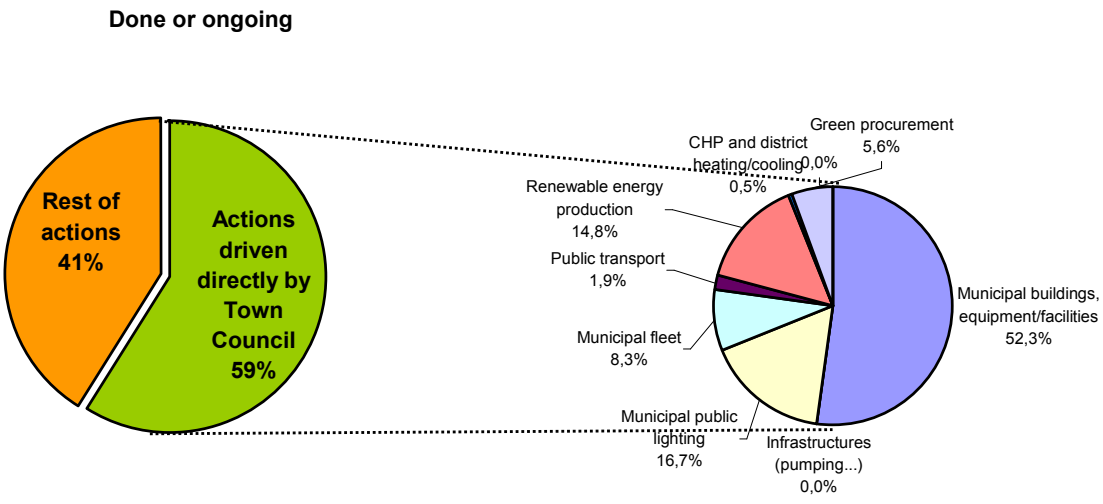
Year of SEAP approval	
2009	28,5%
2010	24,3%
2011	21,9%
2012	18,9%

How it is logical to expect, the older the SEAPs are, the higher it is its implementation degree.

The assessment by sectors shows that while, in absolute terms, the highest number of actions that have been implemented or are ongoing are those that affect directly the Town Council (buildings and facilities, public lighting, fleet of vehicles providing municipal services...), in relative terms actions to improve waste management are the most developed.

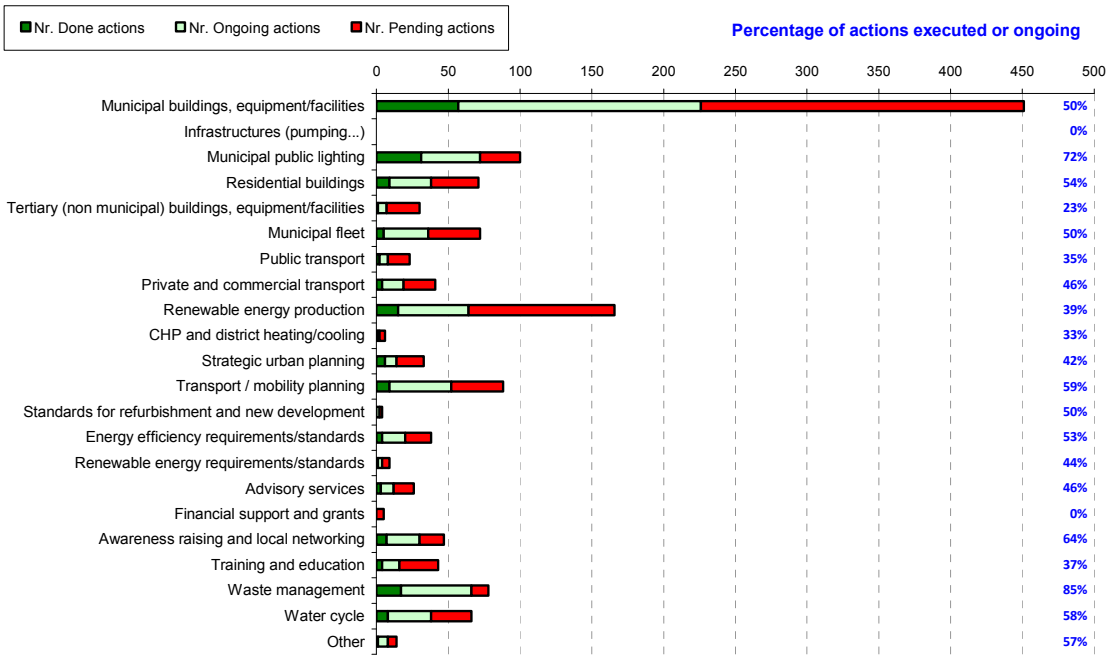


Most executed or ongoing action affect, as already said, to actions that can be directly implemented by the Town Council, dominating actions on buildings and facilities and public lighting.

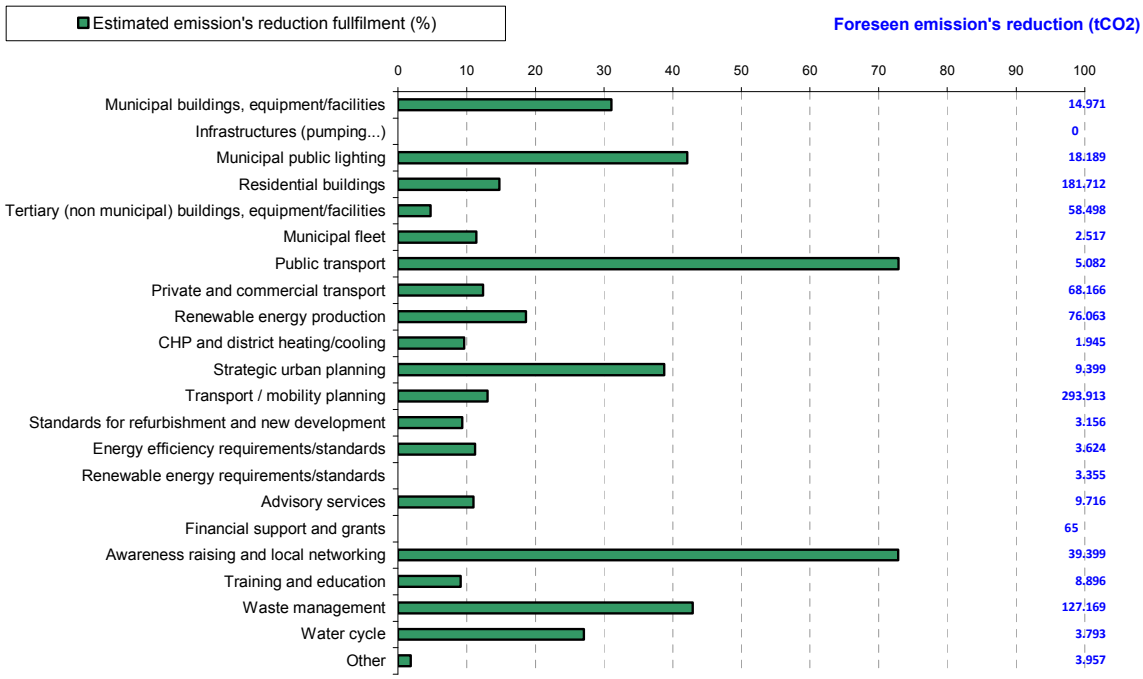


With respect to the local energy production implementation rates are low, partly due to the relatively high costs of the actions and the recent regulatory changes that cancel the feed-in tariff for renewable energy production.

Execution's degree

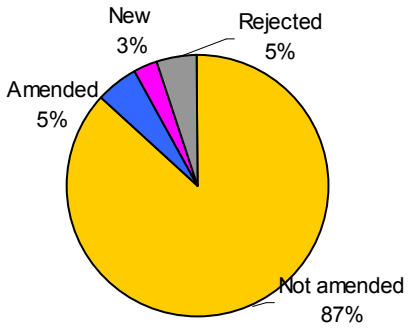


The implementation degree is not reflected, however, in the degree of emissions reduction, it could be explained because there are certain sectors where there are a large number of actions implemented or ongoing but their associated emissions reduction is clearly limited.



In many cases there have been carried out actions with low relative savings, sometimes the cause of this difference between implementation and emissions reduction can be a low implementation degree (below 50%) or because there are actions without associated savings (not quantified).

The monitoring also assesses changes in actions. A SEAP must be dynamic and flexible; certain actions may be modified by the reality or may be rejected. In turn new proposals may arise that were not taken into account when drafting the SEAP.



It can be seen that almost 90% of actions remain unchanged, the percentages of rejections and amendments are relatively low, as is the new actions' one.

Changes on SEAP actions

Number of rejected actions	74
Number of amended actions	79
Number of new actions	40

Although the percentage is a relatively low value, it may surprise having 74 rejected actions and 79 amended ones. In many cases actions that included photovoltaic installations have been rejected due to regulatory changes in Spain in this sector, cancelling feed-in tariffs.

Conclusions

According to the quantitative results evaluated most SEAPs have been implemented in a quarter, 26% implementation degree. The older they are, the greater the degree of implementation is, as expected. Therefore those approved in 2009 have an average implementation rate almost 29%.

Most actions executed or ongoing, 59%, are those in which the directly affects the Town Council, where they pay energy bills. Actions in municipal buildings and public lighting stand out.

This degree of implementation, however, is not reflected equally energy and emissions savings, neither in local energy production. In many cases actions that have been executed or are ongoing are low cost ones, with relatively high savings but with small savings when seen in absolute terms. Some other actions are difficult to quantify and

assess, like those focused on changing practices towards energy among citizens. In the 4th year monitoring report a new inventory is foreseen with more specific data in those sectors (transport, residential, tertiary) so a better assessment will be done.

With respect to the actions of local energy production there are different obstacles that have hindered its implementation:

- The relative costs of the actions are quite high (average of 300,000 € per action), even those with a quick payback require an initial investment that is difficult to assume for the municipalities.
- The change in regulations regarding renewable feed-in tariffs. Its temporary removal has meant that some projects (some in the bidding phase) were halted and some actions rejected. Most local energy production actions contemplated private sector involvement as an investor, because the municipalities do not have the necessary investment capacity. By withdrawing the feed-in tariff, the private sector has lost interest in this type of actions.

As already mentioned there is a section to include qualitative approaches, together with the comments from the technicians during the workshops allowed us to establish a number of qualitative results relating to why certain actions are not executed, and the difficulties encountered.

The first cause is a lack of funding for the actions, but it is not the only one. Therefore, regulatory changes, regarding to renewable energy projects, have paralyzed photovoltaic energy production actions. The internal municipal organization and the incipient assumption of the need for an energy management system in the municipalities are also shortcomings that hinder the development of the SEAPs.

On the other hand the current crisis and the rise in energy prices has encouraged some councils to consider energy efficiency measures a priority, therefore low cost actions with a relatively quick payback have been promoted.

As for the model itself in general, we have had favourable opinions. Municipal technicians find it easy to use and sufficiently informative to assess where they stand . It also requires them to review, update and assess actions' suitability. The amendments, rejections and new actions arising allow the SEAP adapt to the municipality reality.

Some technicians have suggested that the monitoring showed the efficiency of the actions but it should be defined the efficiency related to what: cost (for the Town Council, for the whole society, for the private sector? Municipal staff effort?)?, energy savings? Emissions savings? In any case, the model is not a closed one, new improvements can be made progressively.

Annex summary results

Diputació Barcelona

Pacte dels alcaldes per una energia sostenible local

Summary report on the monitoring of SEAPs of Barcelona Provincial Council

Main characteristics of monitored municipalities

	Population	Number of municipalities
<1.000 hab	2.350	4
de 1.000 a 5.000 hab	12.310	5
de 5.000 a 20.000 hab	161.818	13
de 20.000 a 50.000 hab	50.695	2
> 50.000 hab	402.424	3
Total	**629.597**	**27**

Year of the Sustainable Energy Action Plan approval

	Number of SEAP
2009	14
2010	7
2011	5
2012	1
	27

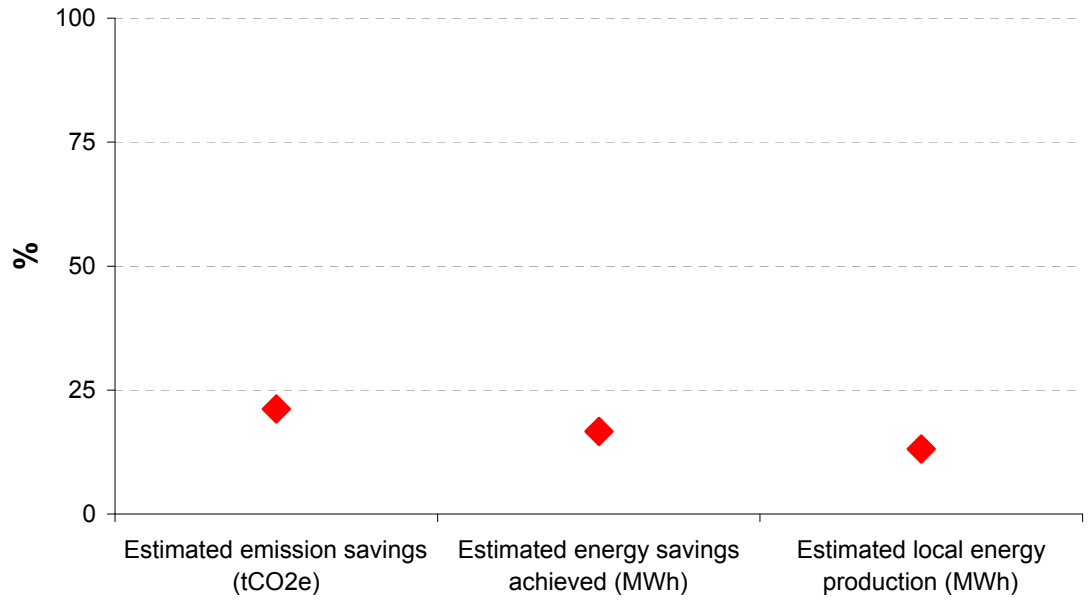
Reduction commitments

Total GHG emissions (SEAP tCO2)	3.986.702
Emission target 2020 (tCO2e)	23%
Emission target per inhabitant 2020 (tCO2e/hab)	4,85
Emission savings 2020 (tCO2e/hab.)	934.329
Energy savings (MWh)	1.939.956
Local energy production (MWh)	167.404

Estimated degree of fulfilment of the commitments of the Covenant

	Absolute value	% respect to the achieving objective
Estimated emission savings (tCO2e)	197.542	21,14
Estimated energy savings achieved (MWh)	323.554	16,68
Estimated local energy production (MWh)	21.933	13,10

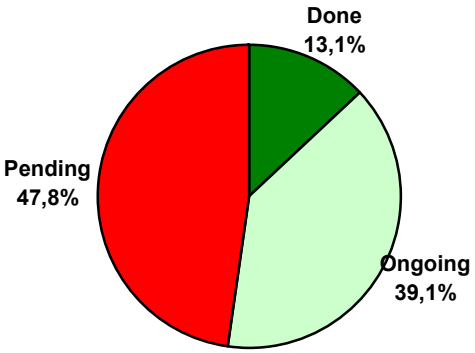
Degree of fulfilment of the commitments of the Covenant (%)



Assessing the status of SEAP implementation

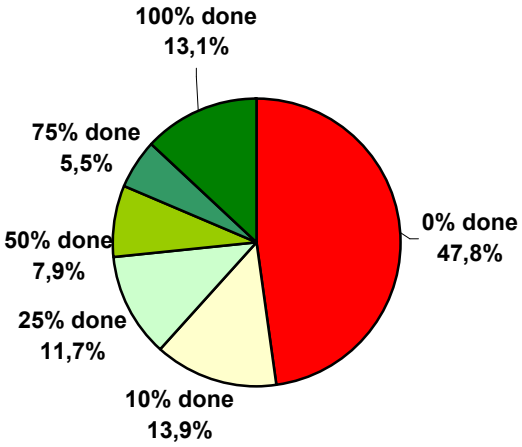
Number of total foreseen actions*	1.411
Percentage of actions already done	13,1%
Percentage of ongoing actions	39,1%
Percentage of pending actions	47,8%

* rejected actions have been removed and new ones added



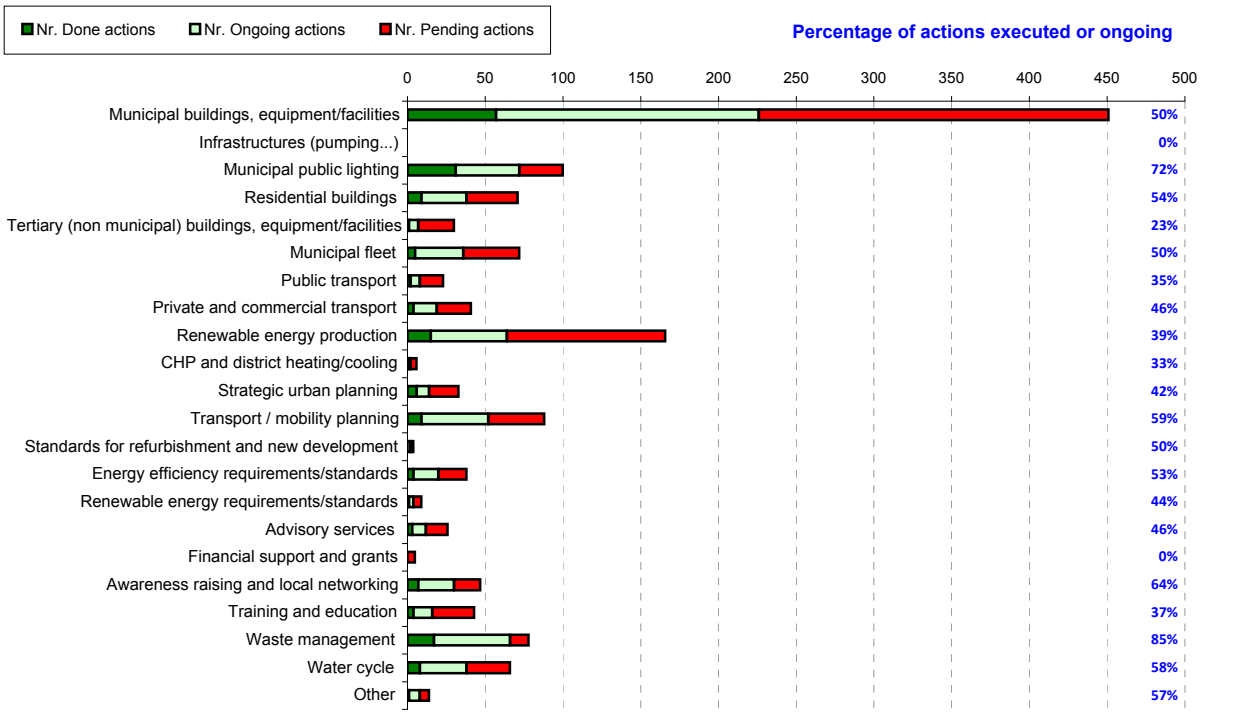
Average percentage of execution	**25,5%**

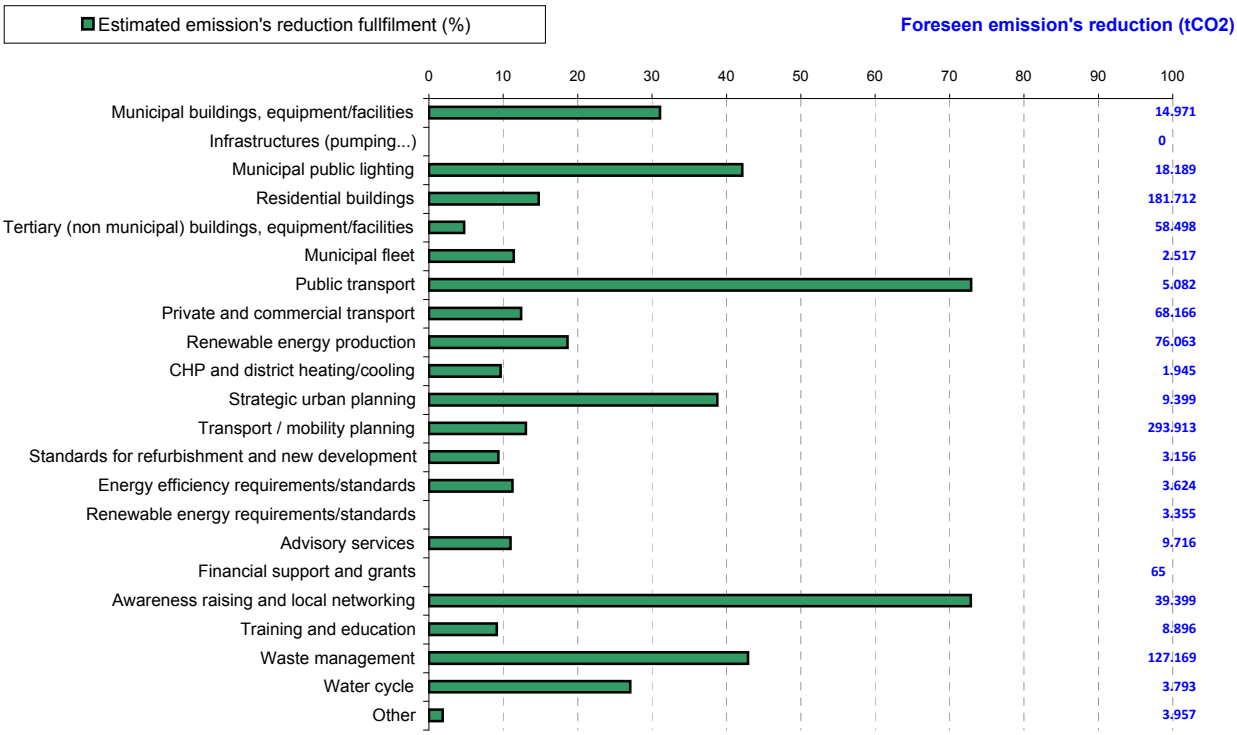
SEAP execution level

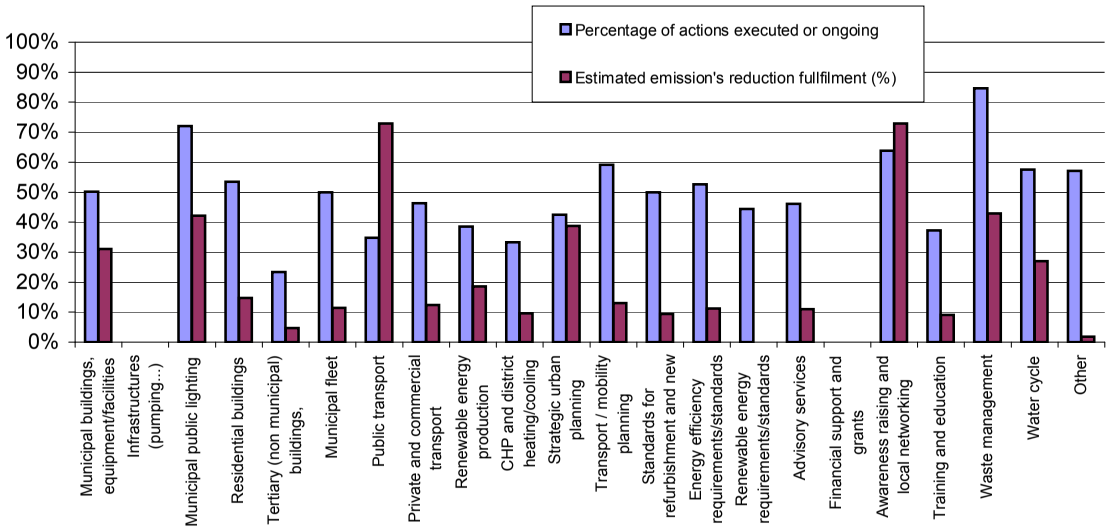


Actions' execution by sector

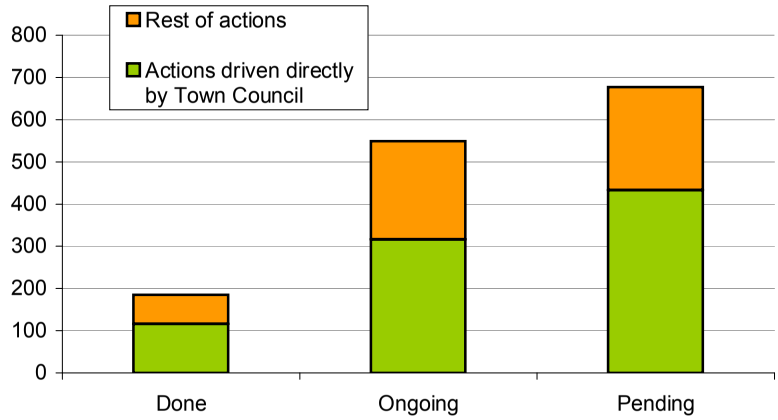
Execution's degree



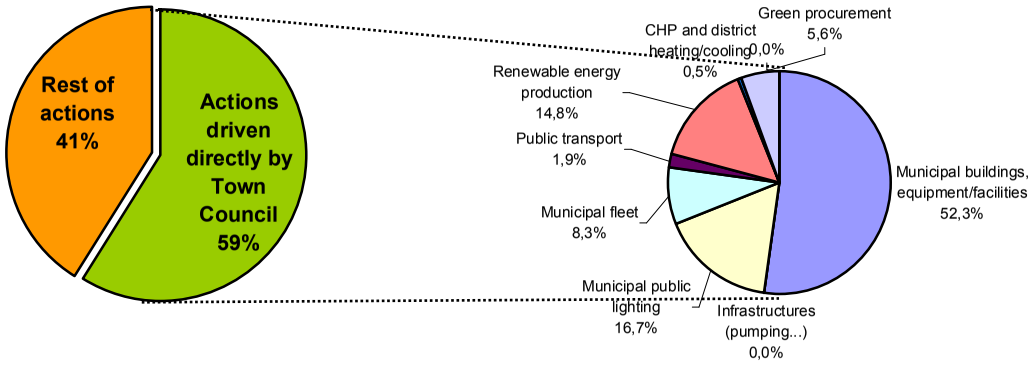




Number of actions



Done or ongoing



Changes on SEAP actions

Number of rejected actions	74
Number of amended actions	79
Number of new actions	40