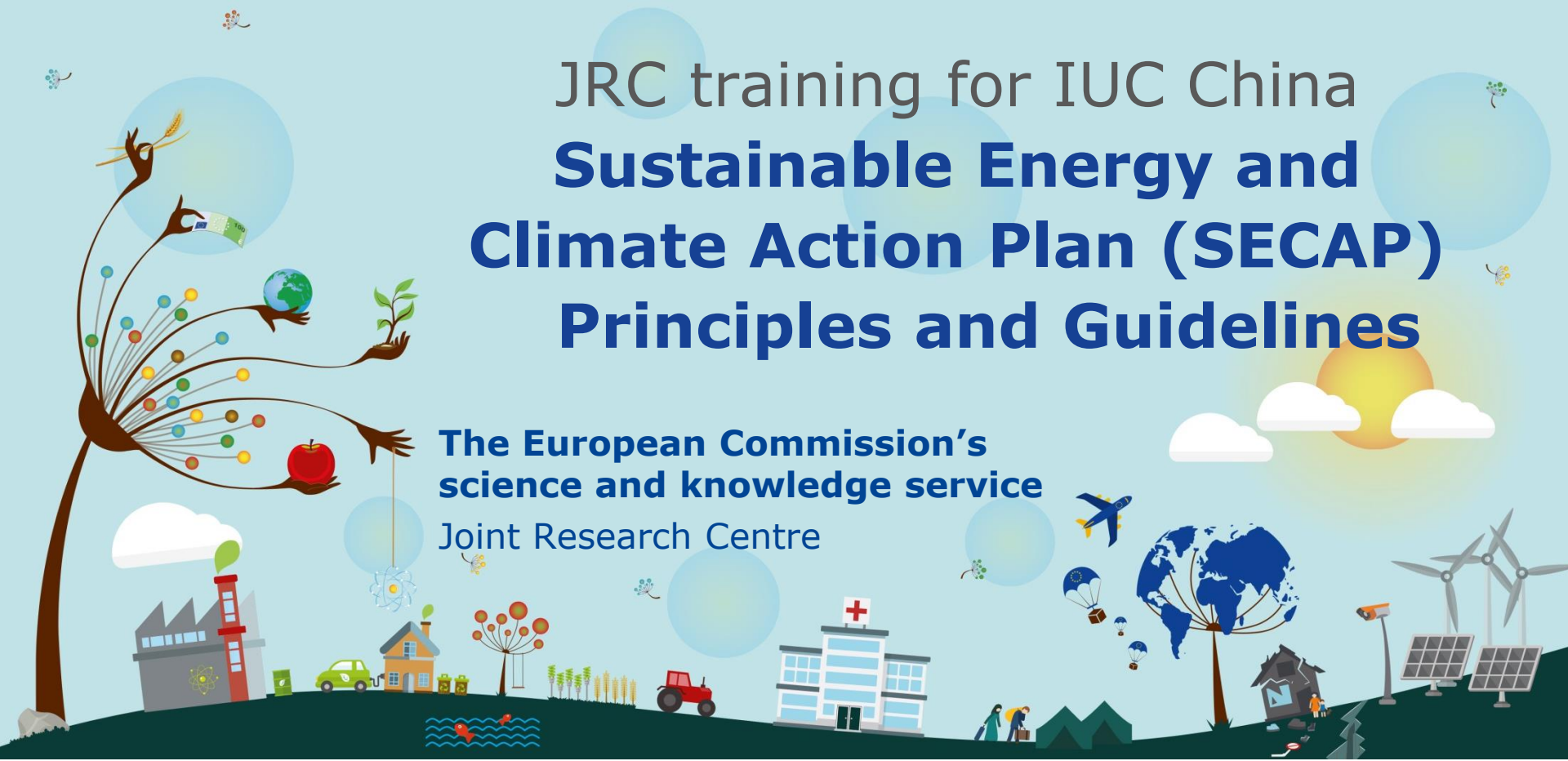


JRC training for IUC China

Sustainable Energy and Climate Action Plan (SECAP) Principles and Guidelines

The European Commission's science and knowledge service

Joint Research Centre

European Commission

The European Commission's science and knowledge service

Joint Research Centre

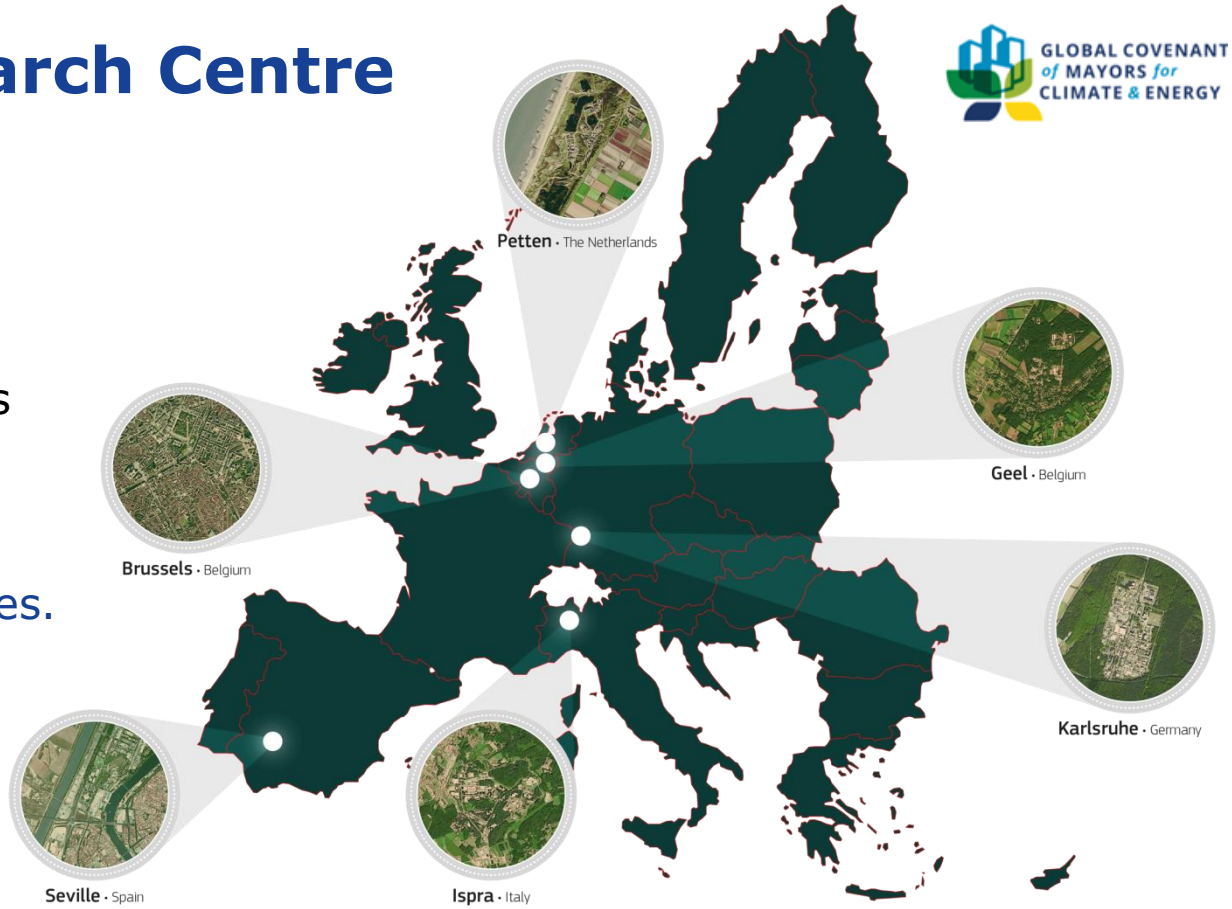
The 10 key principles of a Sustainable Energy and Climate Action Plan

21 September Brussels 2017

European Commission

The Joint Research Centre at a glance

3000 staff
Almost 75% are scientists and researchers.
Headquarters in Brussels and research facilities located in 5 Member States.



GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

European Commission

Role of the JRC

- Research on existing methodologies and tools for the development of a SEAP
- Development of the guidebook "How to develop a (SEAP)"
- Continuous improvement of data collection process
- Evaluation of submitted SEAPs, with feedback to Covenant cities
- Development of a specific monitoring template & instructions for signatories
- Overall assessment of the initiative and publication of reports
- Capacity building (technical trainings for cities and regions)

- **Covenant of Mayors is a platform for inter-institutional co-operation, built on the principles of subsidiarity**

- **Common objectives and support is fixed at EU level, but ACTION takes place on the local level**

"... By connecting with our European partners and reinforcing our commitment to such valuable initiatives as the Covenant of Mayors, we can work together in strengthening Europe's green economy…" *Emer Costello, Lord Mayor of Dublin (IR)*

"...It is important for me to be encouraged by others and maybe encourage people by our experience…"
Bo Frank, Mayor, Växjö (SE)

The 10 key principles

The principles are linked to the commitments taken by Covenant signatories and constitute key ingredients of success. They are described in the Guidebook "How to develop a SEAP", Part I, which is currently being updated.




I. Approval by the municipal council (or equivalent decision-making body)

Strong political support is essential to ensure the success of the process, from SE(C)AP design to implementation and monitoring

II. Commitment for a reduction of CO_2 emissions by at least 20% by 2020 and/or 40% by 2030

The SE(C)AP must specify the CO2 reduction objective of the local authority.

Ideally also:

- *A longer-term target (e.g. to 2050)*
- *Targets on energy savings or on local energy production from renewables should be specified*
- *Sector-specific targets*

Example of CoM Cities' objectives

Riga:
44% emission reduction by 2020

Ghent:
20% emission reduction by 2020
Carbon neutral by 2050

Amsterdam:
climate-neutral municipal organisation in 2015
40% emission reduction by 2020

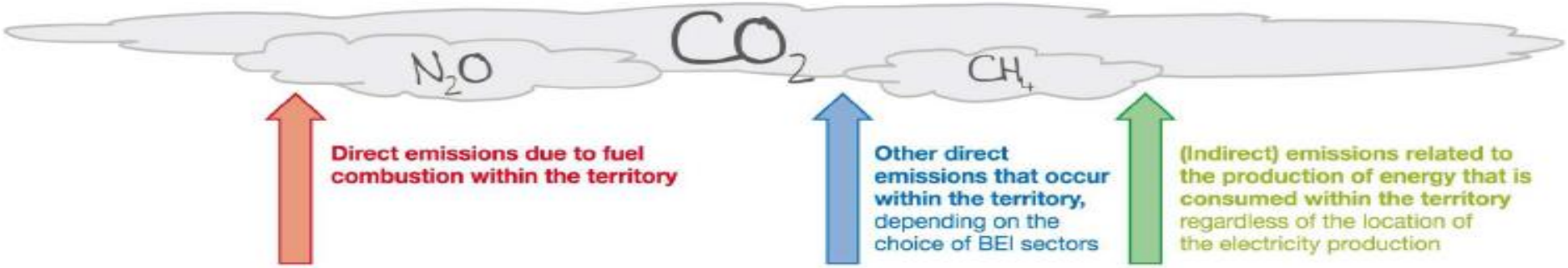
Gothenburg:
21% emission reduction by 2020
<2 tons/capita by 2050

III. CO_2 baseline emission inventory (BEI), risks and vulnerabilities assessment (RVA)

A sound knowledge of the local situation is necessary → carry out an assessment of the current framework which includes:

- *CO_2 baseline emission inventory (BEI)*
- *Risks and vulnerabilities assessment (RVA)*

- *The data collection process should be well documented*



IV. Comprehensive measures that cover the key sectors of activity

The SEAP has to contain a coherent set of measures covering the key sectors of activity

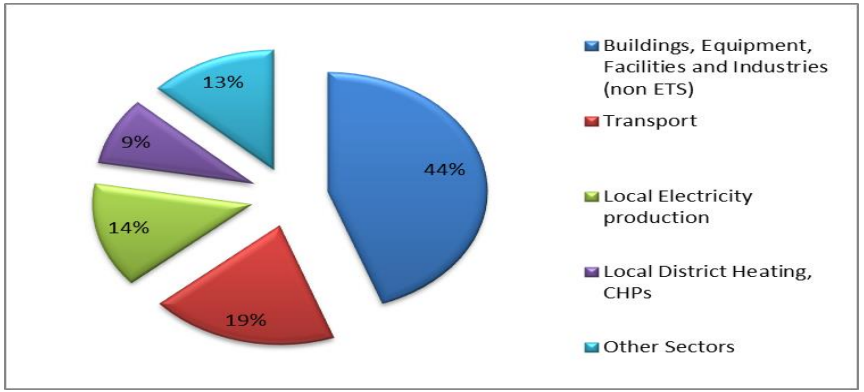
Before starting the elaboration of actions and measures, the establishment of a long-term vision with clear objectives is highly recommended.

Priority areas for action EU CoM: Measures in the field of EE and RES

The choice of sectors to tackle and of specific measures to implement is entirely left to the responsibility of the Signatory, depending on:

- **political mandate** of the Mayor
- **national framework** (regulations, grants, incentives, etc.)
- **size of the local authority** (availability of human & financial resources, expertise, etc.)

Breakdown of expected GHG emissions reduction by field of action in 2020



But also…

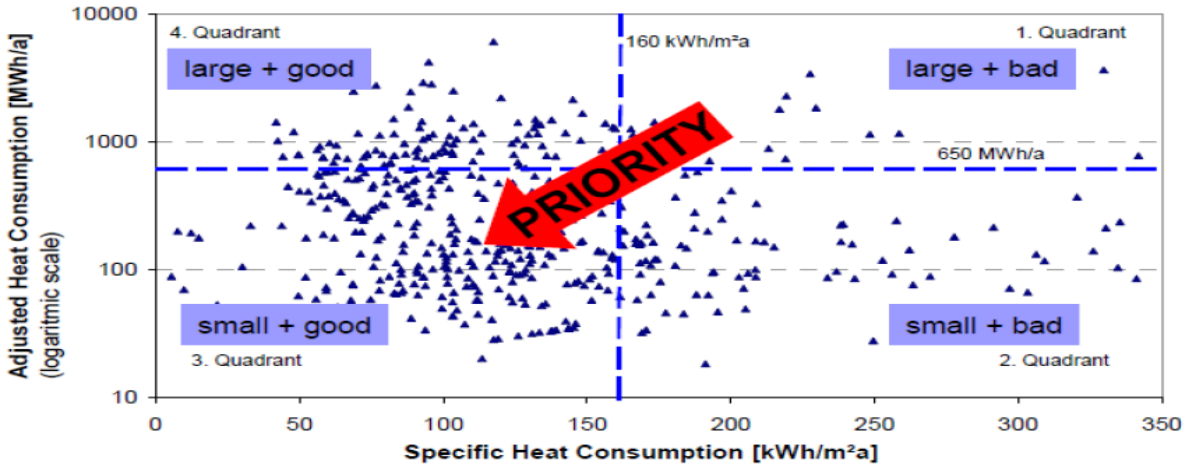
- Strategic urban planning:
  - The SE(C)AP can be an instrument to prevent rapid and uncontrolled city growth, by promoting mixed land use and encouraging sustainable mobility.

    Ex. Stockholm: efficient social planning, anticipating the increased demand for housing and transportation

- Working with citizens and stakeholders:
  - The SE(C)AP development and implementation requires coordination with citizens and other actors, consensus-building approaches, reduced duplication of efforts.

Example
Munich (1,4 million inh.): Energy saving concept

50 % of the city's municipal buildings stock examined to identify potential for energy savings



Highest priority given to the renovation of properties in quadrant 1: high relative saving potential, but also a high absolute saving potential.

V. Strategies and actions until 2020 or 2030 (and possibly beyond)

The plan must contain a clear outline of the strategic actions that the local authority intends to take in order to reach its commitments in 2020 or 2030. It has to contain:

Long-term strategy and goals

Detailed measures for the next 3-5 years which translate the long-term strategy and goals into actions, with assigned responsibilities, cost estimations, impact estimations

Example

Stockholm (830000 inh.):

- *90 % of buses will be powered by renewable fuels before the end of 2020*
- *100% of newly registered private cars should be independent of fossil fuels by 2020*
- *The bus fleet will be fossil fuel-free by 2025*

VI. Mobilization of all municipal departments involved

The SE(C)AP should outline which structures are in place or will be organised in order to implement the actions and follow the results.

It should also specify what are the human resources made available.

Example

4) Staff capacity allocated

SEAP preparation*:

	Full-time equivalent job(s)
☑ Local authority	8
☐ Local/regional energy agency	
☑ External consultant	5
☑ Covenant Territorial Coordinator	1
☐ Other	

In each municipality/city, different civil servants are involved in CoM. In total 1 FTE is reached by each participating municipality/city with less than 15.000 inhabitants for SEAP preparation and implementation. Municipalities and cities with more than 15.000 inhabitants reach 2 FTE.

Example

The city management office is responsible for the administration of the SEAP and the Environment and health administration is responsible for developing and following up the SEAP.

Consultants aid in conducting background research and communication with some stakeholders.

A steering committee for development of the SEAP consists of representatives from the city management office, city development administration, traffic and waste administration, city planning administration and real estate administration.

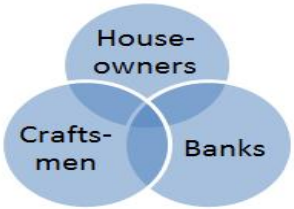
VII. Engagement of all relevant stakeholders and empowerment of citizens

The plan has to describe how the civil society has been involved in its elaboration, and how they will be involved in implementation and follow up.

Build support from
STAKEHOLDERS:
if they support the SEAP nothing should stop it!

Sonderborg (75000 inh.): Project ZERO

Shift in focus in the elaboration and implementation of their plan:



From: the municipality initiating and proposing actions consulting the stakeholders

To: the municipality takes the role of a partner together with all interested parties in developing a vision for the local community

Public-private partnership called ProjectZERO:

ZEROcarbon community by 2029:

CO_2-neutral growth and sustainable urban development

VIII. Financing

A plan cannot be implemented without financial resources. The plan should identify the key financing resources that will be used to finance the actions

Example

7) Foreseen financing sources for the implementation of your SEAP			Please specify the %
	☑ **public**		
		☑ Local Authority's own resources	54
		☑ National Funds and Programmes	36
		☑ EU Funds and Programmes	0
	☑ **private**		
		☑ Private	10
			100

IX. ***Monitoring and reporting***

The SE(C)AP should contain a brief outline on how the local authority intends to ensure the follow-up of the actions and monitor the results

- *For each action, progress based indicators should be defined*
- *Regular adjustments of the actions based on new opportunities/findings*

X. SE(C)AP submission and filling the template

Covenant signatories commit to:

submitting their SEAPs within 1-year following adhesion

submitting their SECAPs within 2-year following adhesion

The SE(C)AP must be uploaded in national language via the Covenant of Mayor's website + online SEAP template in English.

The template has to be filled carefully with sufficient level of detail, and should reflect the content of the SE(C)AP.

An adaptation of the 10 key principles might be needed in order to better suit the different reality of local authorities in **other regions of the world**, compared to EU signatory cities.

Which key principles are already applicable?

Which ones need to be reconsidered?

The European Commission's science and knowledge service

Joint Research Centre

Baseline Emission Inventory (BEI)

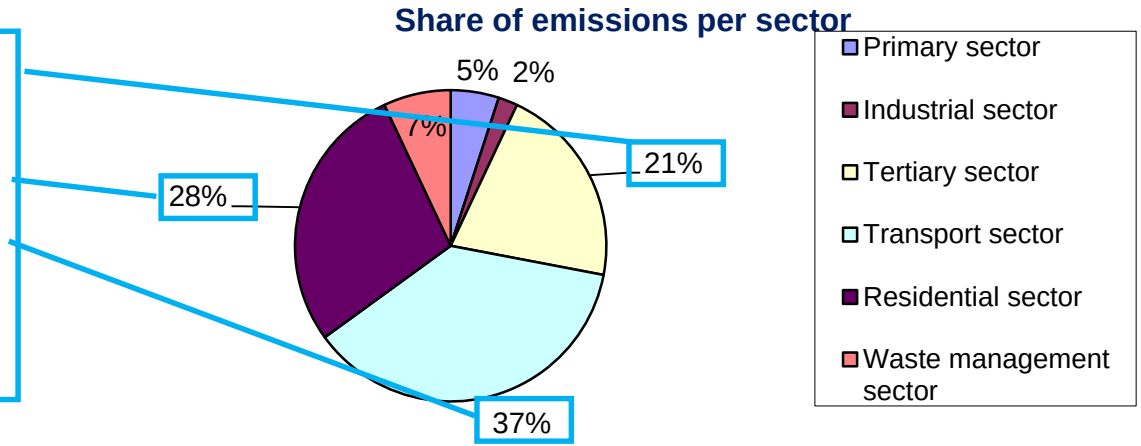
21 September Brussels 2017

European Commission

CoM emission inventory: Main principles

BEI quantifies the amount of CO_2 emitted due to final energy consumption in given activity sectors on the municipality's territory within a calendar year and it helps to select the appropriate actions.

Three sectors represent 86% of the emissions of the city

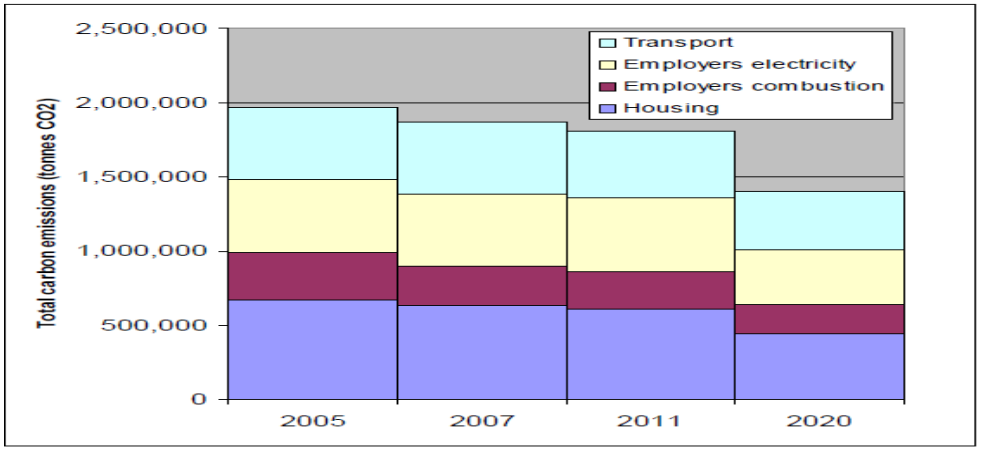


Example: Castelldefelds (Spain)

CoM emission inventory: Main principles

- Emission Inventories as a **tool** to support the deployment and monitoring of local energy and climate policies;
- **Bottom-up approach** in activity data collection;
- **Simplicity and flexibility:** the approach can be adapted to the specific situation of local authorities (city size, level of expertise, political mandate, etc.);
- Main focus on **CO_2** emissions associated with local **energy consumption;**
- **Four key sectors** to be accounted for in the BEI and targeted by SE(C)AP measures:
  - Municipal buildings & public lighting
  - Residential buildings
  - Tertiary buildings
  - Transport

The BEI shows where the local authority is at the beginning of the planning process, and the successive monitoring inventories will show the progress towards the objective.

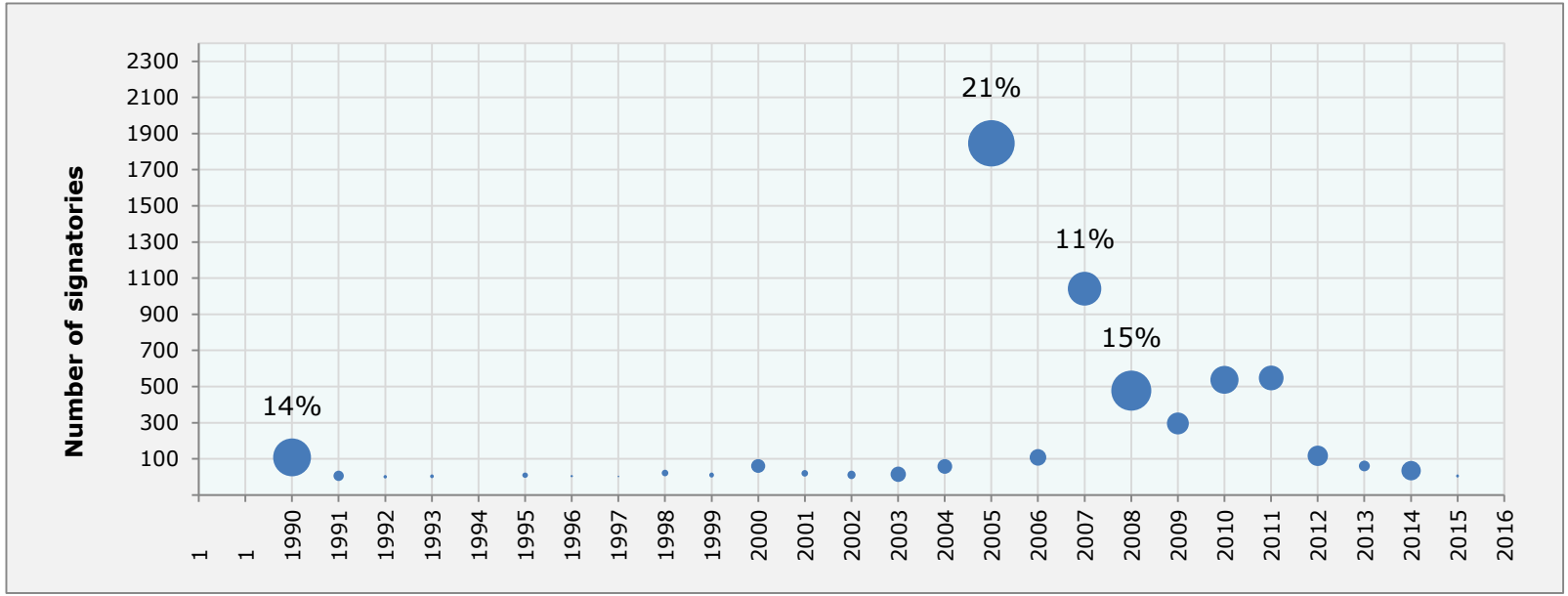


Example: Sunderland, UK

The base year

- The base year is the reference year for setting the objective.
- The Covenant's goal is to contribute to the EU commitment to reduce GHG emissions by 20 % by 2020 and by 40% by 2030 compared to 1990.
- The recommended baseline year is 1990.
- If data availability is insufficient, then a subsequent year must be chosen.

The base year



Data from CoM BEI dataset (N=5,403, 97% from EU28) at 4th of September 2016, Kona A. et al., 2016
The population covered in the corresponding SEAPs is represented in relative terms by the size of the bubble..

The base year

For the territorial extensions of the Covenant beyond EU borders, the local economic situation was taken into account when recommending the base year.

For example for CoM East - originally covering countries from Eastern Europe and Central Asia - the recommendation is to use a more recent year which is representative of the current economic situation.

Definition of the boundary of the inventory

It is set by the administrative boundaries of the local authority signatory of the Covenant.

The majority of CoM signatories are municipalities, but there are also higher administrative units (e.g. provinces, regions, counties).

It coincides with the territory where the final energy is consumed and the one tackled by the SE(C)AP measures.

The signatory might choose not to tackle through any measures, sectors which are otherwise included in the inventory (not recommended). Nevertheless the target applies to all emissions included in BEI.

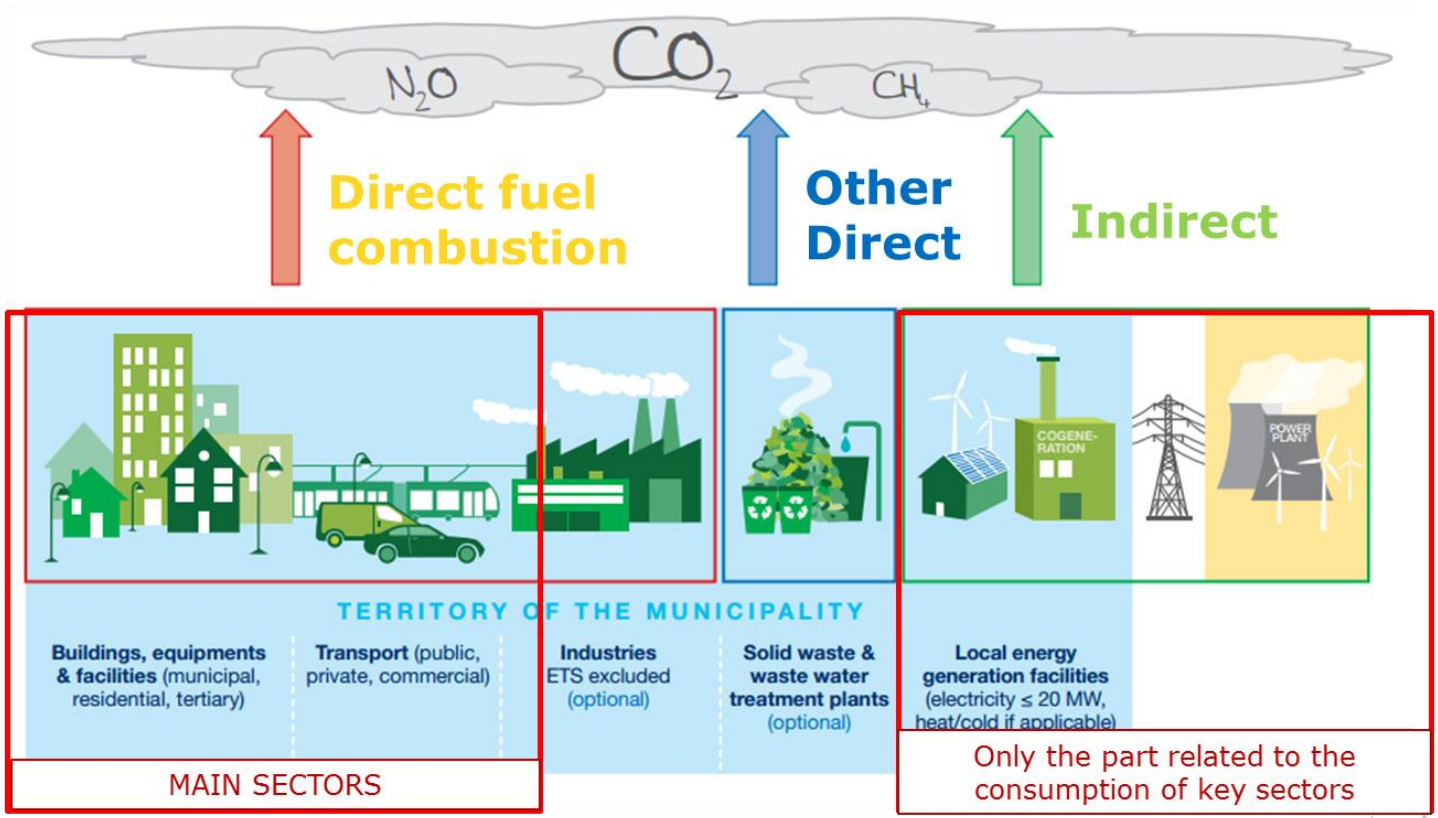
Covenant of Mayors activity sectors

Two key principles

1) The Covenant follows essentially (but not exclusively) a territorial approach, looking at the GHG emissions on the territory of the local authority.

2) The focus of the Covenant is on Final Energy Consumption and promoting distributed generation from renewable sources.

Targeted emissions



Not exhaustive inventory

Steps in building an emission inventory

1.) Identifying the emission sources and collect activity data:

- Final energy consumption:
  - in buildings, equipment/facilities and industries
  - in transport

- Local generation of grid distributed energy (electricity, heat, cold)

Considered indirectly, via emission factors, if included in SECAP

- Other emission sources (not related to energy consumption) (e.g. waste …)

Only emissions reported, no activity data required

2.) Choosing the emission factors

3.) Calculating the GHG Emissions

CoM activity sectors

Buildings, equipment/ facilities

- Municipal
- Tertiary (commercial & non-municipal services)
- Residential

Urban transport (municipal, public, private)

STRONGLY RECOMMENDED

= the CoM EU key sectors

Local production of grid distributed energy:

- Electricity
- Heat/Cold

RECOMMENDED IF IN SEAP

Other energy related sectors:

- Industries not involved in the EU ETS*
- Agriculture, Forestry, Fisheries (only energy consumption)
- Other road transportation (e.g. highways)

Non energy related sectors:

- Wastewater and/or solid waste treatment (non energy related)

** European Union Emissions Trading System (EU ETS)*

Focus on sectors that can be directly influenced by local policies

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

European Commission

CoM activity sectors

Industries involved in the EU ETS **EXCLUDED**

Aviation, Shipping,

Agriculture

(non energy related: enteric fermentation, fertilizer application, etc…)

A more comprehensive list of sectors to be included in the BEI is provided in the CoM Guidebook (JRC, 2010).

Key concepts and calculation rules

Activity Data * **Emission factors** = **Emissions**

electricity consumed in municipal buildings [$MWh_{electricity}$]

Find the proper data related to your local authority

amount of CO_2 emitted per MWh electricity [$tCO_2/MWh_{electricity}$]

Most emission factors can be found in the Guidebook and in technical literature

total amount of CO_2 emitted from electricity [tCO_2]

Key concepts and calculation rules

Activity data (AD)

AD quantifies the human activity occurring in the territory of the local authority.

Examples of activity data are:

- oil used for heating in residential buildings [MWh_{fuel}]
- electricity consumed in municipal buildings [$MWh_{electricity}$]
- heat consumed by residential buildings [MWh_{heat}]

It is strongly recommended to use **data relevant for the local territory**! If the inventory is built with national averages, the subsequent inventories will not show the effect of the actions implemented at local level!

Key concepts and calculation rules

Emission factors (EFs)

EFs are coefficients which quantify the emission per unit of activity. The emissions are estimated by multiplying the EF with the corresponding activity data.

Examples of EFs are:

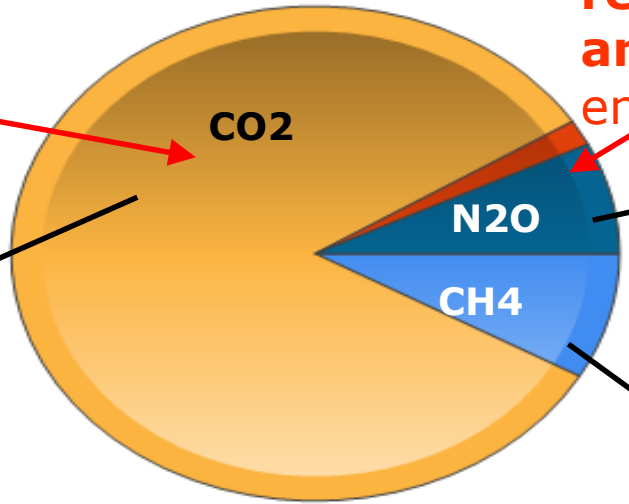
- amount of CO_2 emitted per MWh of oil consumed [tCO_2/MWh_{fuel}]
- amount of CO_2 emitted per MWh electricity [$tCO_2/MWh_{electricity}$]
- amount of CO_2 emitted per MWh heat consumed [tCO_2/MWh_{heat}]

Choice of Greenhouse Gases (GHG)

Inclusion (in CO_2 eq) **recommended if actions are planed in related** emitting **sectors**

Mandatory

Combustion & usage of fossil fuels



Agriculture (77%)
Industry (8%)

Agriculture (49%)

Waste (31%)

Fugitive emissions (15%)

Share of greenhouse gases EU27 – (EEA, 2009)

GHGs and Emission factors

If GHG other that CO_2 are included in the BEI, then it is necessary to convert the amount of CH_4 or N_2O into CO_2 equivalents multiplying by Global Warming Potential coefficients:

TABLE 3. CONVERSION OF CH_4 AND N_2O TO CO_2-EQUIVALENT UNITS	
MASS OF GHG AS T COMPOUND	MASS OF GHG AS T CO_2-EQUIVALENT
1 t CO_2	1 t CO_2-eq
1 t CH_4	21 t CO_2-eq
1 t N_2O	310 t CO_2-eq

IPCC, Second Assessment Report

GHGs and Emission factors

Choice of emission factors

- **Standard emission factors, according to IPCC guidelines (Intergovernmental Panel on Climate Change) approach:**
  Based on the Carbon content of fuels.

  Advantages:
  - ✓ Simple;
  - ✓ In line with international reporting (UNFCC, Kyoto protocol…).

- **LCA (Life Cycle Analysis) emission factors:**
  Includes embodied emissions that occur upstream (e.g. emissions required to extract, transform, transport the fuel up to the city).

  Advantages:
  - ✓ Gives a better view of the global impact of the activities occurring in the territory

GHGs and Emission factors

TABLE 4. STANDARD CO_2 EMISSION FACTORS (FROM IPCC, 2006) AND CO_2-EQUIVALENT LCA EMISSION FACTORS (FROM ELCD) FOR MOST COMMON FUEL TYPES		
TYPE	STANDARD EMISSION FACTOR [t CO_2/MWh]	LCA EMISSION FACTOR [t CO_2-eq/MWh]
Motor Gasoline	0.249	0.299
Gas oil, diesel	0.267	0.305
Residual Fuel Oil	0.279	0.310
Anthracite	0.354	0.393
Other Bituminous Coal	0.341	0.380
Sub-Bituminous Coal	0.346	0.385
Lignite	0.364	0.375
Natural Gas	0.202	0.237
Municipal Wastes (non-biomass fraction)	0.330	0.330
Wood (a)	0 – 0.403	0.002 (b) – 0.405

(CoM West Guidebook: table 4, p. 62)

Emission Factors for fuels and renewable heat

In general, **biomass/biofuels** are a form of renewable energy, the use of which does not have an impact on the CO_2 concentration in the atmosphere. However, this is the case only if biomass/biofuels are produced in a **sustainable manner**.

In the absence of national regulations regarding the sustainability of biomass/biofuels, the local authority might use the criteria set in the **Directive 2009/28/EC** on the promotion of the use of energy from renewable sources. Only biomass/biofuels that meet these criteria should be considered as renewable in the context of the CoM.

Emission Factors for electricity

In order to calculate the CO_2 emissions to be attributed to electricity consumption it is recommended to use the national emission factor or the European one (NEEFE) [tCO_2/MWh].

What if there is some *local electricity production* AND the local authority wants to take action in this field?

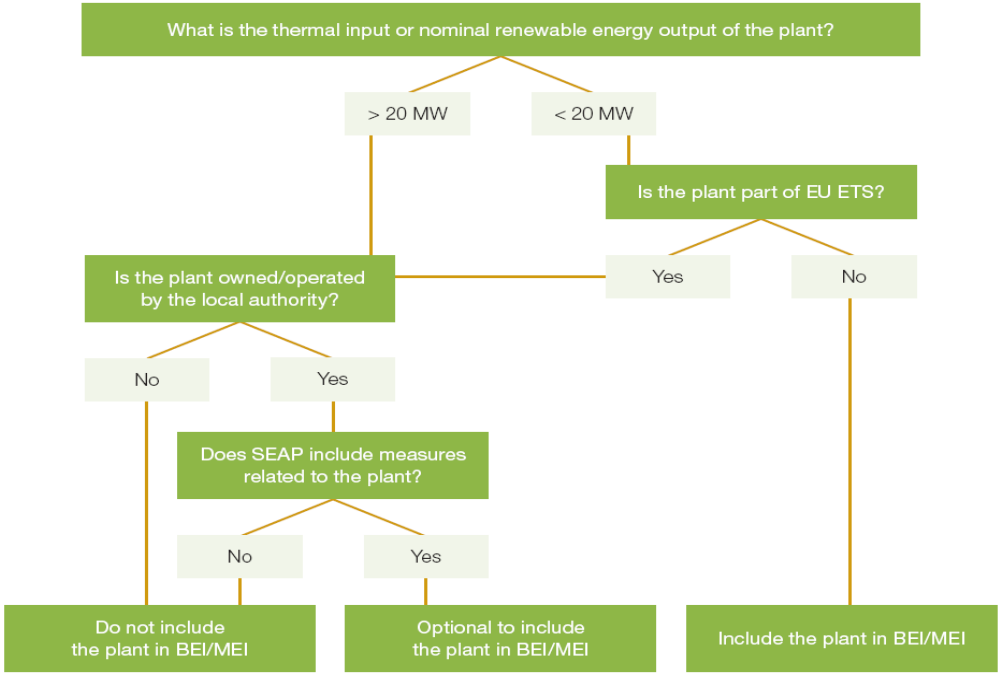
The municipality can correct the national emission factor with the local production of electricity by calculating the **local emission factor for electricity consumption (EFE)**

Steps in calculating the Local Emission Factor for electricity

1.)Deciding which local electricity production units should be included in the inventory according to the following decision tree:

Large (> 20 MW) Plants that are not operated by the local authority are not considered to be «local»

CoM West Guidebook, p. 64



Steps in calculating the Local Emission Factor for electricity

2.) Calculating the Local Emission Factor for electricity:

$$EFE = \frac{[(TCE - LPE - GEP) * NEEFE] + CO_2LPE + CO_2GEP}{TCE}$$

EFE = Local Emission Factor for Electricity
TCE = Total Consumption of Electricity
LPE = Local Production of Electricity
GEP = Green Electricity Purchased by the local administration
NEEFE = National (or European) Emission Factor for Electricity

Steps in calculating the Local Emission Factor for electricity

EFs for heat

…if there is some heat sold / distributed as a commodity to end users? (e.g. district heating)

A local emission factor for heat (EFH) has to be calculated

$$EFH = \frac{CO_2LPH + CO_2IH - CO_2EH}{LHC}$$

LPH = local heat production
IH = imported heat
EH = exported heat
LHC = local heat consumption

CoM West Guidebook: p.67

The European Commission's science and knowledge service

Joint Research Centre

Preparation of a Sustainable Energy &Climate Action Plan (SEACAP)

Minimum requirements for climate adaptation reporting

21 September Brussels 2017

European Commission

Reporting requirements

The Sustainable Energy and Climate Action Plan (SECAP) and its Monitoring fields constitute the reporting framework of the Covenant of Mayors initiative. It has been developed by the Covenant of Mayors and Mayors Adapt Offices - together with the Joint Research Centre of the European Commission - and in collaboration with a group of practitioners from local and regional authorities. This Excel-based template is an offline working version of the official online template which has to be completed in English and submitted online via "My Covenant": http://www.eumayors.eu/sign-in_en.html The online vesion of this template should be available as of 2017. Please note that it is not possible to import the data entered in this Excel into the online platform.

Reporting Guidelines

SEAP guidebook

Urban Adaptation Support Tool

Commitments:

- ☐ 2020 CO_2 reduction
- ☐ 2030 CO_2 reduction
- ☐ Long-term CO_2 reduction
- ☐ Climate Adaptation

Colour codes:

- Mandatory input cells
- Optional input cells
- Output cells
- Pre-filled cells
- Definition — Definitions (visible when clicking)
- Monitoring Fields

Template Structure & Minimum Reporting Requirements:

Template Structure		Minimum Reporting Requirements: At the registration stage	Within 2 years	Within 4 years (and then every 2 years)	Link to Tab
	Strategy	optional	*	*	
Mitigation	Emission Inventories	optional	* (BEI)	* (MEI every 4 years)	
Mitigation	Mitigation Actions	optional	*	*	
Mitigation	Mitigation Report				
Mitigation	Monitoring Report				
Adaptation	Adaptation Scoreboard	*	*	*	
Adaptation	Risks and Vulnerabilities	optional	*	*	
Adaptation	Adaptation Actions	optional	optional	* (min. 3 Benchmarks)	
Adaptation	Adaptation Report				
Adaptation	Adaptation Indicators				

* mandatory

Objectives

→ **IDENTIFY & ASSESS** local climate and energy challenges and priorities
→ **MONITOR & REPORT** progress towards commitments
→ **INFORM & SUPPORT** decision-makers
→ **COMMUNICATE** results to general public
→ **ENABLE** self-assessment & **FACILITATE** experience-sharing with peers
→ **DEMONSTRATE** local achievements to policy-makers

Developed by: Covenant of Mayors & Mayors Adapt Offices, Joint Research Centre of the European Commission

Published in: July 2016

Home | Strategy | BEI | MEI1 | MEI2 | Mitigation Actions | BoE | Mitigation Report | Monitoring Report | Adaptation Scoreboard | Risks & Vulnerabilities | Adaptation Actions | Adaptation Report | Adapta

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European Commission

Overall strategy

1. COMMON FOR MITIGATION AND ADAPTATION
2. MEDIUM AND LONG TERM TARGETS
3. GENERAL VISION
4. ADMINISTRATIVE PRINCIPLES, STAFF, STAKEHOLDERS..
5. FIRST ECONOMIC INDICATORS
6. FIRST SIGNATORY SELF ASSESMENT

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Mitigation actions

Summary of the energy action plan developed and submitted by the signatory

Include actions tackling the CoM sectors, trying to reduce the total emissions by the selected year in at least 40%.

- Actions can be grouped by sectors
- Business and usual approach (BAU)
- Administrative fields
- Economic fields
- Data fields
- Synergies with adaptation ("Adaptigation")

The more accurate , the better
(but just some fields mandatory)

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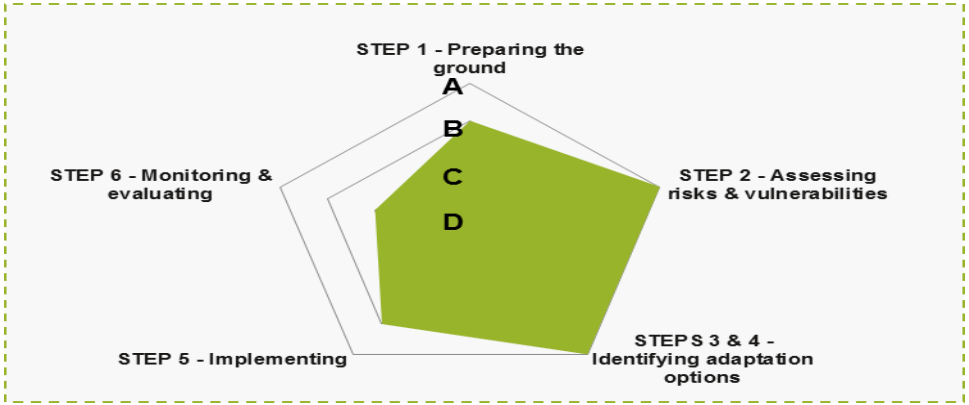
Adaptation scoreboard

Adaptation self- assessment
QUALITATIVE APPROACH

Overview of the capacity, status and principals of the Risk and vulnerability study developed



From SECAP of GHENT (Belgium)

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RISK and VULNERABILITIES ASSESMENT

Summary of the risk and vulnerability assessment developed and submitted by the signatory

- Qualitative systems
- Drop menu based
- Main sections:
  - Climate hazard
  - Vulnerabilities
  - Impacts

Climate Hazard Type	Current hazard risk level	Expected change in intensity	Expected change in frequency	Timeframe	Risk-related indicators
Extreme Heat	Low	Increase	Increase	Long-term	
Extreme Cold					
Extreme Precipitation	Moderate	Increase	Decrease	Medium-term	
Floods	Moderate	Increase	Increase	Medium-term	Pluvial flooding
Sea Level Rise	Moderate	Increase	Increase	Medium-term	
Droughts					
Storms	Moderate	Decrease	Decrease	Medium-term	Severe wind, rain storm
Landslides					
Forest Fires					
ther [please specify]	[Drop-Down]	[Drop-Down]	[Drop-Down]	[Drop-Down]	

rows that do not concern your local ⓘ To be completed for the climate hazards that concern your local authority only. ⓘ Click here to see examples of risk-related indicators

From municipality of Bologna SECAP

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Adaptation actions

Five key requirements

1. Identification of current and future climatic hazards
2. Identification of critical infrastructure
3. Active stakeholder participation
4. Avoid maladaptation
5. Estimate implementation action costs

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Adaptation actions

Summary of the adaptation actions proposed in the plan

Same scheme as for mitigation
Synergies with mitigation

Adaptation Actions

500 characters left

2) Adaptation Actions

ⓘ List your adaptation actions in the table below. Actions can be comprehensive or representative, taken from one or more of the documents cited by the local authority in the section above.

Sector	Title (max. 120 chars)	Short description (max. 300 chars)	Responsible body/department	Implementation timeframe		Implementation status	Select as Key Action (☼)	Sta
				Start	End			
Other	Developing indicators for monitoring, review and risk prevention within the Municipal Strategy for Adaptation to Climate Change (EMAAC)	It allows you to frame the future response to all kinds of events, impacts and vulnerabilities identified for the municipality.	Municipality of Barreiro	2016	Not known	Ongoing	[Please select]	
Water	Monitoring and analysis of the Tagus-Sado aquifer, incorporating the potential impacts arising from climate change (lack of scenarios and / or contamination of the aquifer - only producer of drinking water in the region)	Regional study in order to assess / monitor the Tagus-Sado aquifer for research on the potential effects of climate change on groundwater	Municipality of Barreiro	2016	Not known	Ongoing	[Please select]	
Other	Education and awareness of adaptation to climate change in schools and for the general population	Awareness of the impacts generated by the climatic events that affect the municipality of Barreiro, and better perception of the type future vulnerabilities, responses and adaptation needs the most significant (sea level rise, excessive rainfall, strong winds and heat waves).	Municipality of Barreiro	2016	Not known	Ongoing	[Please select]	
Land Use Planning	Systems of water retention basins, the	Promoting a naturalized infrastructure in some cases with double function, retention of rainwater and leisure, will allow for a sustainable solution	Municipality of Barreiro	2011	Not known	Ongoing	[Please select]	

From municipality of Barreiro SECAP

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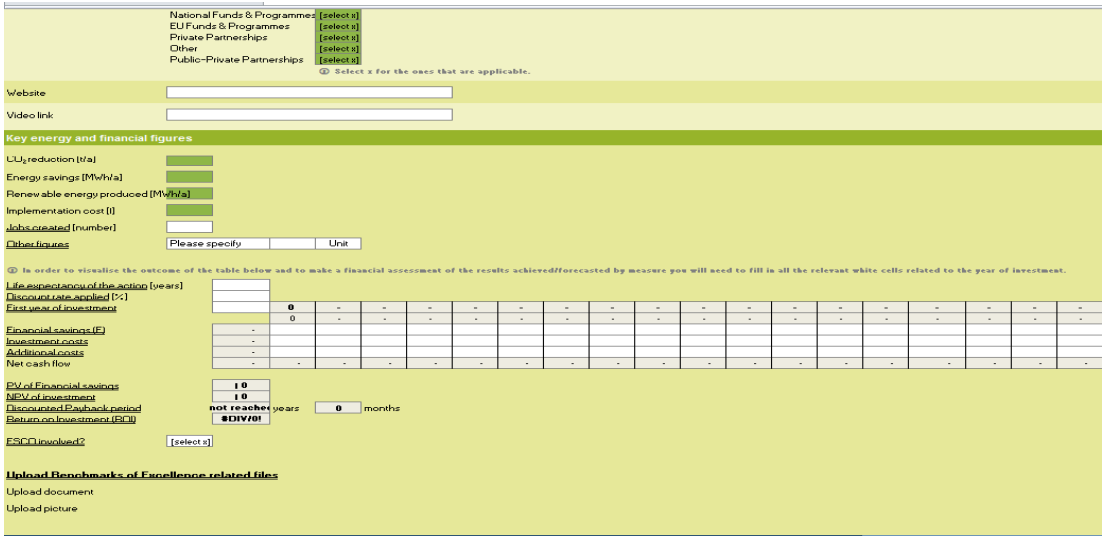
BOE

Benchmark of excellence

Signatories need to select 3 mitigations measures/actions
On those, a first approach is applied to obtain financial figures to assess the economic potential of the initiative



National Funds & Programmes [select x]
EU Funds & Programmes [select x]
Private Partnerships [select x]
Other [select x]
Public-Private Partnerships [select x]
Select x for the ones that are applicable.

Website
Video link

Key energy and financial figures

CO_2 reduction [t/a]
Energy savings [MWh/a]
Renewable energy produced [MWh/a]
Implementation cost [€]
Jobs created [number]
Other figures | Please specify | Unit

In order to visualise the outcome of the table below and to make a financial assessment of the results achieved/forecasted by measure you will need to fill in all the relevant white cells related to the year of investment.

Life expectancy of the action [years]
Discount rate applied [%]
First year of investment | 0

Financial savings (€)
Investment costs
Additional costs
Net cash flow

PV of Financial savings | € 0
NPV of investment | € 0
Discounted Payback period | not reached | years | 0 | months
Return on Investment (ROI) | #DIV/0!

ESCO involved? [select x]

Upload Benchmarks of Excellence related files

Upload document
Upload picture

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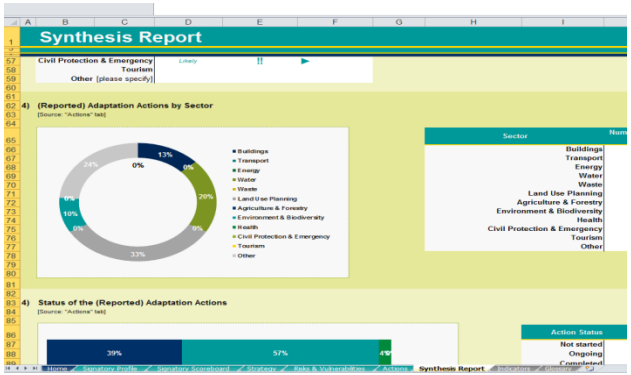
Monitoring reports

For mitigation and adaptation

Automatically generated figures showing the progress **regarding commitments, estimations and achievements made by the signatory**

Mitigation report. City of Pamplona, Spain



Adaptation report. City of Ghent,Belgium

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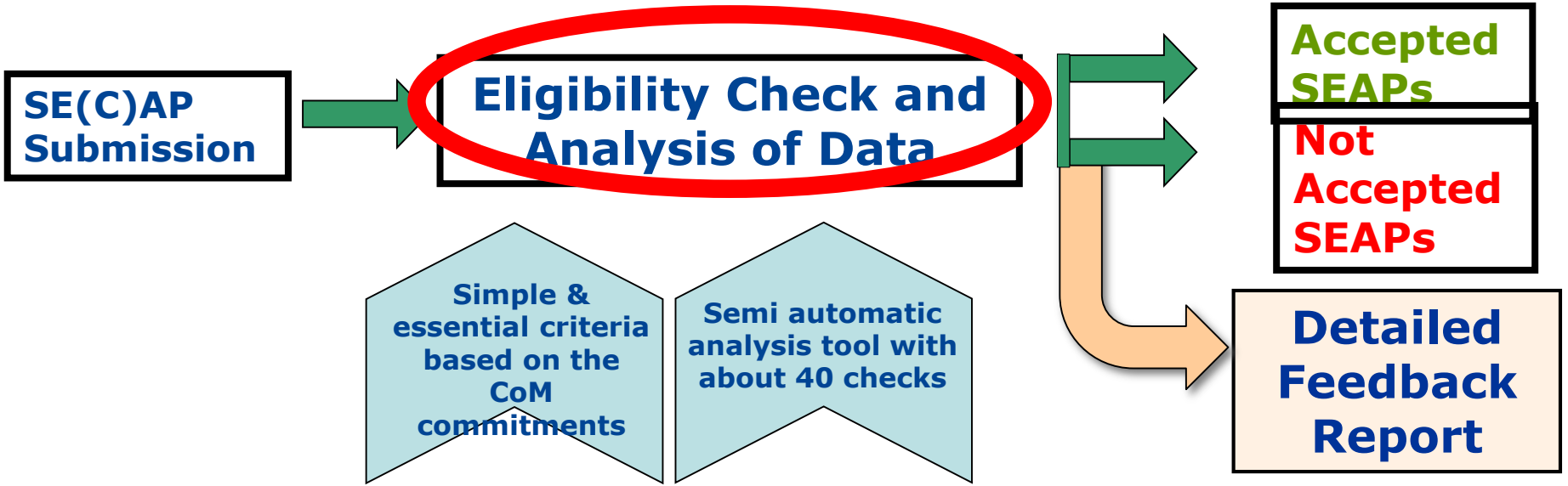
SECAP validation and CoM monitoring requirements in the EU Covenant

21 September Brussels 2017

European Commission

The SE(C)AP Evaluation Process



The SE(C)AP Evaluation Process

3 steps

1. **Eligibility check**

To check that the SE(C)AP is consistent with the Covenant formal commitments and principles (as defined in the commitment document)

2. **Data coherence check**

To check that the data in the template are coherent and complete (mainly based on a computer-assisted analysis)

3. **Feedback report**

To provide the Signatory with the results of the analysis and concrete recommendations for improvement

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The SE(C)AP Evaluation Process

Eligibility check

1. The SE(C)AP must be **approved by the municipal council** or equivalent body
2. The SE(C)AP must contain a clear reference to the **CO_2 reduction objective by 2020** (>=20%) and/or **by 2030** (>=40%)
3. The **results of BEI** and of the climate **R&VA** must be provided
4. The SE(C)AP must include a **set of actions in the key sectors** of activity
5. The SE(C)AP **template** must be **correctly filled-in**
6. The **data** provided must be **coherent and complete**

Data coherence check

SECAPs that do not comply with all the above criteria cannot be accepted

Sectors / Fields of action	
Municipal & public lighting	√
Residential	√
Tertiary	√
Transport	√
Local energy production	Optional
Local heat/cold production	Optional
Industries (excl. ETS sector)	Optional
Other sectors	See guidebook

4 KEY SECTORS whose inclusion is highly recommended

For mitigation, to be eligible a SE(C)AP must include:

✓**BEI,** covering at least 3 out of 4 key sectors

✓**A list of concrete measures**, covering at least the municipal sector and one or more other key sectors

Signatories commitment

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

ANNEX I

THE COVENANT OF MAYORS STEP-BY-STEP PROCESS & GUIDING PRINCIPLES

A COMMON ROADMAP FOR A SHARED VISION:

In order to meet their mitigation and adaptation targets, Covenant of Mayors Signatories commit to a series of steps:

STEPS \ PILLARS	MITIGATION	ADAPTATION
1) Initiation and baseline review	Preparing a **Baseline Emission Inventory**	Preparing a **Climate Change Risk and Vulnerability Assessment**
2) Strategic target setting & planning	Submitting a **Sustainable Energy and Climate Action Plan (SECAP)** and mainstreaming mitigation and adaptation* considerations into relevant policies, strategies and plans within two years following the municipal council decision	
3) Implementation, monitoring and reporting	**Report progress** every second year following the SECAP submission in the initiative's platform	

** The adaptation strategy should be part of the SECAP and/or developed and mainstreamed in (a) separate document(s). Signatories can opt for the format of their choice – see the "adaptation pathway" paragraph hereafter.*

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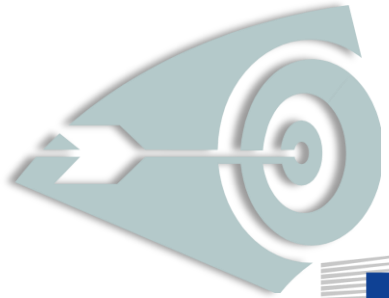
Why is monitoring important?

- To monitor how actions defined in SE(C)APs are progressing and evaluate their effects towards the targets

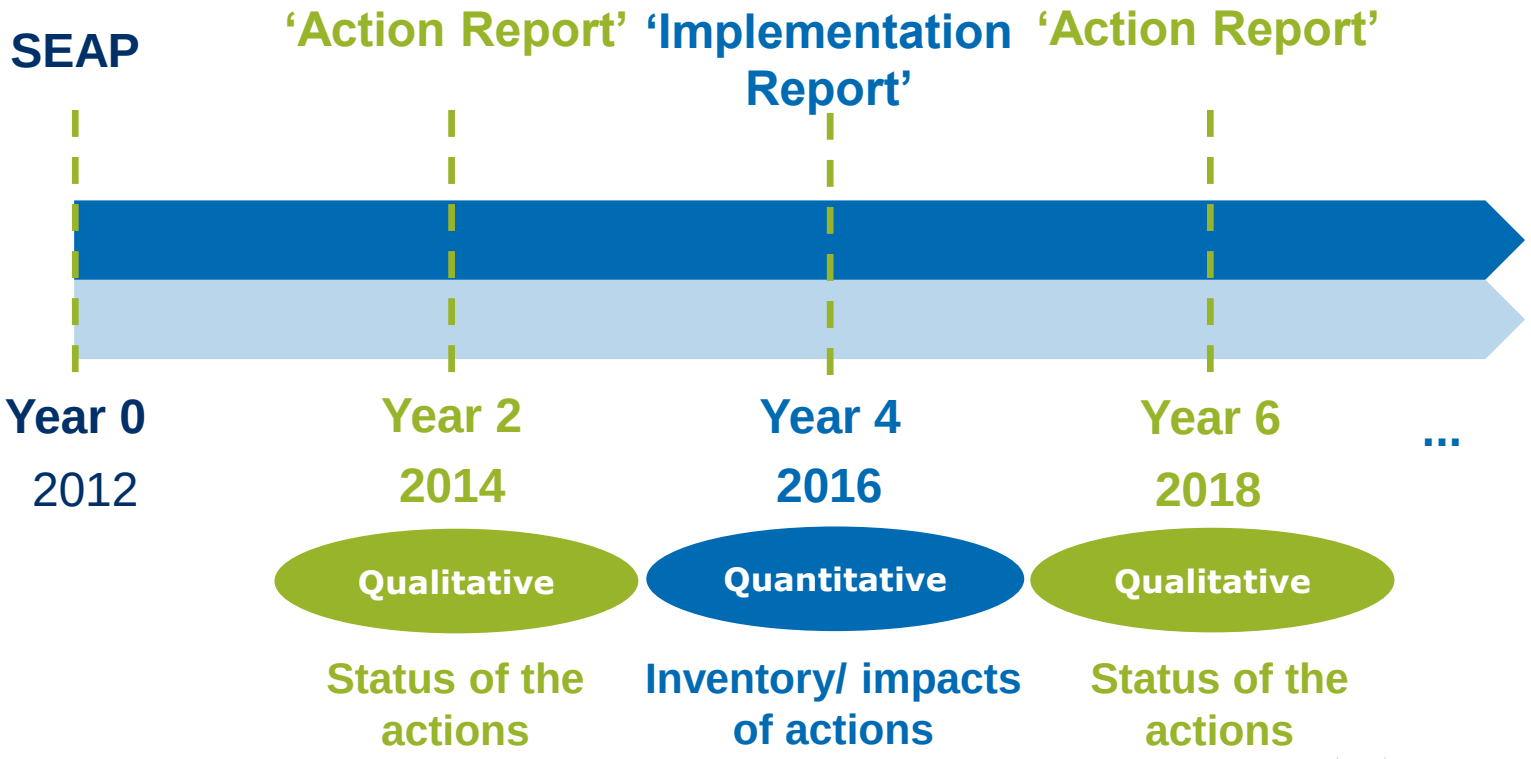
- To identify the need of adjustments to the plan, e.g. corrective measures

- To take new opportunities not initially foreseen, e.g. changes to the national/international context

Is the signatory on track to reach the target?



CoM monitoring requirements



What is monitored under the CoM

Based on quantitative reports

Trends analysis

- **Energy consumption**
- **Share of biofuels on total fuel consumption**
- **Share of local energy production on total energy consumption**
- **Emissions**

Performance indicators

In the context of the Covenant, the main indicators are those linked to energy consumption or level of emissions per unit of measure, e.g.:

- Per capita energy consumption, by fuel and mode [MWh/capita]
- Carbon intensity of transport [t CO_2/pkm] or [t CO_2/Vkm]

Other suggested indicators:

- Public transport ridership [pkm/capita]
- Car passenger traffic [pkm/capita]
- Number of vehicles passing fixed point per year/month
- % of population living within 400 m of a bus service
- …

Progress-based indicators

Examples [1]

Municipal - Residential - Tertiary Buildings	
Building envelope	Number/surface area of buildings insulated [-/m2]
Energy efficiency in space heating and hot water	Number of boilers replaced [-]
Energy efficient lighting systems	Number of lamps replaced [-]
Energy efficient electrical appliances	Number of electrical appliances replaced [-]
Renewable energy for space heating and hot water	Surface area of solar thermal panels installed [m2]
Integrated action	Number/surface area of buildings retrofitted [-/m2]
ICT	Number of buildings with smart meters installed [-] / Number of new buildings with domotic systems [-]
Behavioural changes	Number of participants in awareness raising campaigns [-] / Number of CFLs distributed [-]

Progress-based indicators

Examples [2]

Municipal - Public - Private Transport	
Cleaner/efficient municipal vehicles	Number of vehicles replaced [-]
Municipal fleet - efficient driving behaviour	Example: no. of courses given on total planned (%)
Cleaner/efficient public transport	Number of new buses purchased [-]
Public transport infrastructure, routes and frequency	Network extension (km) / Number of services per day [-]
Electric vehicles infrastructure	Number of charging points [-]
Car sharing	Number of car share vehicles and locations [-]
Walking &cycling	Number of bicycle parking spaces [-]
ICT	Number of roads with Variable Speed Limits (VSB) introduced [-] / Number of teleworking schemes in place [-]
Efficient driving behaviour	Example: no. of courses/campaigns realised on total planned (%)

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Challenges of data collection and management

21 September Brussels 2017

Guiding principles of the CoM approach

- **Scientific soundness** → knowledge of starting point (BEI)
- **Territorial approach**
- **Focus on FINAL energy consumption:**
  - In Buildings, equipment/facilities (and industries):
    - → Municipal sector (exemplary role of the local authority)
    - → Residential sector
    - → Tertiary sector
  - Transport

Actions on Energy Efficiency and implementation of Renewable Energies




GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

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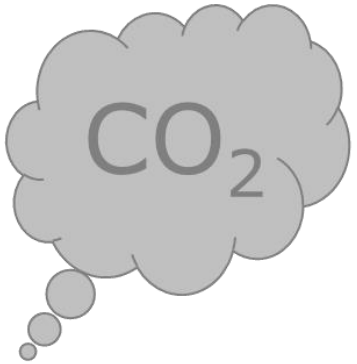
Bottom-Up *versus* Top-Down approaches

- Ideally a full **Bottom-Up** approach should be followed
- **Top-Down** approaches might not give an accurate picture of the municipality

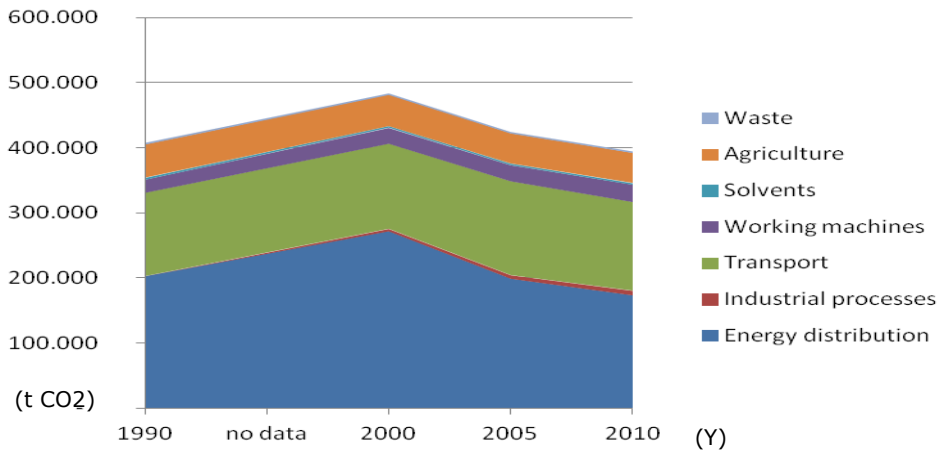


Will the Monitoring Emission Inventories capture the results of local actions?

CHALLENGES IN DATA COLLECTION

Structure of national/regional statistical data

1. Activity sectors



Sweden

2. CoM sectors

- Municipal Buildings, equipment/ facilities
- Tertiary Buildings, equipment/ facilities
- Residential Buildings, equipment/ facilities
- Public lighting
- Industries (non ETS)
- Municipal Fleet
- Public transport
- Private and Commercial transport

CoM

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An example of a German signatory, where is the issue..?

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

Legend of colours and symbols:

Green fields are compulsory | Grey fields are non editable

A. Final energy consumption

Please note that for separating decimals dot [.] is used. No thousand separators are allowed.

Category	FINAL ENERGY CONSUMPTION [MWh]															
			Fossil Fuels								Renewable energies					Total
	Electricity	Heat cold	Natural gas	Liquid gas	Heating oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
BUILDINGS, EQUIPMENT / FACILITIES & INDUSTRIES																
Municipal buildings, equipment/facilities		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tertiary (non municipal) buildings, equipment/facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential buildings	Data	Data	Data												Data	Data
Public lighting		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industries (excluding industries involved in the EU Emission trading scheme - ETS)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	2564000	856000	3617000	0	4475000	0	0	0	318000	0	0	0	0	0	0	1183000
TRANSPORT																
Municipal fleet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Public transport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Private and commercial transport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	138000	0	0	0	0	0	5360000	0	0	0	0	0	0	0	0	5498000
TOTAL	2702000	856000	3617000	0	4475000	0	5360000	0	318000	0	0	0	0	0	0	1732800

Municipal purchases of certified green electricity (if any) [MWh]:

0

European Commission

Overview of data quality

- Energy consumption of buildings, vehicles, lighting systems and other facilities operated by **municipality** is usually adequately registered

- Energy consumption data in **residential & commercial** sector are of a poor quality

- Data on **Local Heat and Electricity Production** may be hard to find when plants are privately operated

- **Transport** sector estimations of emissions are based on statistics and very often outdated assumptions

Overview of data quality

- Data reporting remains a major challenge for signatories and the level of details in the templates shows a certain country dependence
- For templates with a good level of details:
  - **Electricity** consumption and its split by Covenant sub-sectors are generally reported
  - When relevant, data on **Natural Gas** consumption are indicated, even though the split by Covenant sub-sectors can be more challenging
- Split by **Covenant sub-sectors** may be a challenge
- Energy consumption data in **Private/Commercial Transport** are usually challenging

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Suggestions on data collection

We want to look at energy-related emissions 'cities' are 'fully accountable' for…

1. **Energy-related …some sectors are not the focus of the CoM!**
   - Food and consumer goods;
   - Deforestation;
   - Fugitive emissions…

   Is the methodology and data allowing to evaluate emissions over time available?

2. **Full accountability… e.g. how do we deal with electricity?**
   - The majority of the electricity consumed in municipalities is generally produced elsewhere;
   - CO_2 emissions are accounted for using regional or national EFs which **should be kept constant** throughout the years;
   - In case of local electricity production a **Local Emission Factor** should be calculated.

   …and with sectors LAs cannot influence (Aviation, heavy industry)?

   ⇨ Generally to **be excluded**

Suggestions on data collection

Focussing on the TRANSPORT sector

Municipal and public transport

Private and commercial transport

- Traffic Monitoring Systems
- Fuel sales within the territory

→ *Corrections and data analysis are needed:*

- *Interurban transportation;*
- *Vehicles registered in the territory;*
- *Tourism?*

Data collection: tips from CoM

Projects co-funded under Intelligent Energy Europe Programme addressing the specific challenges in data collection for the Covenant signatories:

- **MeShaRtility project** (**Measure** and **share** data with utilities for the Covenant of MaYors), duration: April 2012- April 2015, target region: EU in general, specifically addressing 12 countries: Bulgaria, Croatia, Cyprus, Estonia, Germany, Italy, Latvia, Malta, Poland, Romania, Slovenia, Spain, http://www.meshartility.eu/en/

Summary report about good data sharing practices at EU level, *2015*

The report can be downloaded from: http://www.meshartility.eu/images/documents/pl/ICLEI_meshartility_report_EN_210x297_Screen_2.pdf

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Data collection: tips from CoM

Projects co-funded under Intelligent Energy Europe Programme **addressing** the specific **challenges in data collection** for the Covenant signatories:

- **Data4Action project,** duration: March 2014- February 2017, target area: EU28, http://data4action.eu

  Data4Action, aims to foster **win-win energy data exchange collaboration** models between public authorities and energy data providers moving from bilateral data exchange cooperation agreements **to regional «one-stop shop» data centres (« Observatories»).**

Data Access Guidebook for Sustainable Energy Actions Plans, 2016,
The report can be downloaded from:
http://www.fedarene.org/wp-content/uploads/2017/01/576-Data-Access-Guidebook-rx15.pdf

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National initiative

Centralized data collection at national level are facilitating data collection at local level

- Netherlands and Denmark have developed tools which provide energy and climate data per activity sector, broken down at least at municipal level.
- Cyprus Energy Agency has developed a tool which provides the local authorities with all the energy consumption information required in order to establish their CO2 inventory.
- The main aim of these tools was to assist the local authorities in implementing and monitoring local energy and climate action plans.
    - *Climate Monitor, Netherlands, since 2009, www.klimaatmonitor.databank.nl*
    - *Municipal Carbon Inventory Tool, Denmark, since 2008, http://www.ens.dk/undergrund*
    - *Cyprus Energy Agency website: http://www.cea.org.cy/app/CEA_energy.html*

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Regional initiative

Covenant supporters play a key role in helping small and medium size local authorities to collect the data

- Energy data base of the province of Limburg:

The province of Limburg with partners established a data base containing the results of Baseline Emission Inventory, Renewable energy scan, Sustainable building scan and a Set of climate indicators prepared for each of the Limburg (44) municipalities. This was done to encourage municipalities to sign the Covenant of Mayors and draft up a SEAP (Sustainable Energy Action Plan). By doing this, the province of Limburg wants to reach their goal, set in 2008: becoming climate neutral in 2020" *

**Improving access to local energy data. Lessons learnt and recommendations from the meshartility project", 2015*
http://www.meshartility.eu/images/documents/D6.7_Final_brochure.pdf

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Conclusions

- Energy consumption data has to be **relevant** to the particular situation of the municipality (**national averages will not** reflect in the subsequent monitoring inventories the effect of the actions implemented at local level!)
- The data collection process requires time and resources. Planning is crucial!
- **Sources** of data (see guidebook page 70)
  - **Invoices** (e.g. for the own buildings of the local authority)
  - Market operators (energy suppliers, **grid operators**)
  - **Ministries** (energy, statistics, environment), agencies, regulatory authorities
  - Surveys addressed to energy consumers

Conclusions

- Good quality and **reliable** data is essential
- The **availability** and **sources** of energy data are country/region dependent
- **Difficult** to assess the consumption of energy vectors that are **not distributed via a grid** (heating oil, biomass …). Surveys are often required to complement this data.
- Importance of **utilities** /**energy suppliers** / **grid operators**: **they own** the **primary data** !!!
- **Territorial coordinators** (e.g. supporting structures) and other National/ regional authorities can play a **key role** in collecting data and making it available to local authorities
- **Aggregated data** is not enough: need data for each energy vector, for community, for **each category of customer** (households, public sector, industry, services)
- Data related to **transport** and mobility: **difficult** to be estimated

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