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JRC SCIENCE AND POLICY REPORTS

How to develop a Sustainable Energy Action Plan (SEAP) in the Eastern Partnership and Central Asian Cities — Guidebook

*PART I – The SEAP process,
step-by-step towards the –
20 % target by 2020*

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2014



Joint
Research
Centre

Report EUR 26820 EN

European Commission

Joint Research Centre
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EUR 26820 EN

ISBN 978-92-79-39994-7

ISSN 1831-9424

doi: 10.2790/36843

Luxembourg: Publications Office of the European Union, 2014

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Abstract

This Guidebook is tailored to the specific needs of the Eastern Partnership and central Asian countries, which are still recovering from economic reform. As such, various specific indicators were calculated for the 11 Newly Independent States and a Business as Usual scenario was developed projecting the growth of their economy, and the increase in CO₂ emissions for 2020 as a result of a 'do nothing' stance in terms of policies and the environmental regulations scenario.

The current guidebook provides detailed step-by-step recommendations for the entire process of elaborating a local energy and climate strategy, from initial political commitment to implementation. It is divided into 3 parts:

- Part I relates to the description of the overall SEAP process and covers the strategic issues;
- Part II gives guidance on how to elaborate the Baseline Emission Inventory;
- Part III is dedicated to the description of technical measures that can be implemented at local level by the local authority in the different sectors of activity;

The guidebook provides a flexible but coherent set of principles and recommendations. The flexibility will allow local authorities to develop a SEAP in a way that suits their own circumstances, permitting those already engaged in energy and climate action to come on board of the Covenant of Mayors, while continuing to follow the approaches they have used before with as little adjustments as possible.

PREFACE

This Guidebook is a revision of the Guidebook 'How to develop a Sustainable Energy Action Plan (2010)', focusing on the 11 Newly Independent States or the Eastern Partnership of the European Union. It has been realised with the support and input of many experts from municipalities, regional authorities, agencies, city networks and private companies. We thank all those who have provided input and contributions and helped to shape the document

INTRODUCTION — About this Guidebook

The Covenant of Mayors (CoM) is a major European initiative involving local authorities in the field of sustainable energy and climate mitigation. By joining this initiative, towns, cities and regions voluntarily commit to reducing their overall carbon dioxide (CO₂) emissions by at least 20 % below reference levels by 2020 through the implementation of the measures described in their Sustainable Energy Action Plans (SEAPs). The political commitment undertaken by all the Covenant signatories is declared in the CoM core text ⁽¹⁾, which has to be approved by the municipal council (or equivalent decision making body).

The CoM should be regarded by local authorities as a way to implement a more sustainable local energy policy, to reduce dependency on fossil fuels, to improve security of energy supply, and to contribute to climate change mitigation. Achieving the ambitious Covenant goals requires a systematic approach to reducing the energy consumption of local communities, and to fostering the use of endogenous renewable energy sources to meet local energy demand. In other words, it involves developing local sustainable energy policies and setting up community-wide energy management systems.

The methodology for the preparation of the SEAPs has been developed to address the European context and has been described in detail in the Guidebook *How to develop a Sustainable Energy Action Plan (2010)*. Since 2010, the CoM initiative has come to involve six Eastern Partnership countries (Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine) and five central Asian countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) in the implementation of local sustainable energy policies. The SEAP preparation methodology has been adapted to address the specific circumstances of these countries. The present Guidebook is a revised version of the aforementioned Guidebook, with modifications to the methodology to better address the requirements of Eastern Partnership and central Asian cities.

The purpose of the present Guidebook is to help the CoM signatories to reach the commitments they have taken by signing the Covenant, and in particular to prepare within one year following their official acceptance:

- a Baseline Emission Inventory (BEI)
- a Sustainable Energy Action Plan (SEAP)

The BEI is a prerequisite to developing a SEAP, as it will provide knowledge of the nature of the entities emitting CO₂ on the municipality's territory, and will thus help select the appropriate actions. Inventories conducted in later years will help determine if the actions provide sufficient CO₂ reductions and if further actions are necessary.

In this framework, Eastern Partnership and central Asian signatories can commit to an emissions reductions target by 2020 not only in reference to the emissions computed in a BEI but also on the basis of their projections of emissions for the target year following a business-as-usual (BAU) scenario.

The current Guidebook provides detailed, step-by-step recommendations for the entire process of developing a local energy and climate strategy, from initial political commitment to implementation. It is divided into three parts.

- Part I describes the overall SEAP process and covers the strategic issues;
- Part II gives guidance on how to establish the BEI;
- Part III is dedicated to the description of technical measures that can be implemented at the local level by the local authority in the different sectors of activity.

The Guidebook provides a flexible yet coherent set of principles and recommendations. The flexibility will allow local authorities to develop a SEAP in a way that suits their own circumstances. The number of topics covered by this Guidebook is quite large. This is why some of them are approached in a rather general manner, providing links to further readings and information.

The Joint Research Centre ⁽²⁾ (JRC) — Institute for Energy and Transport (IET) and Institute for Environment and Sustainability (IES) — of the European Commission has been assigned the task of scientific and technical support to the CoM. This Guidebook has been developed by the JRC, in collaboration with the Directorate-General EuropeAid Cooperation and Development (DG DEVCO) of the European Commission, the Covenant of Mayors East Office (CoMO), and the support and input of many experts. These guidelines are a deliverable of the agreement between the JRC and DG DEVCO in the framework of the CoM.

This document is intended to help beginner towns/cities/regions to initiate the process and guide them through it.

¹ See http://www.eumayors.eu/IMG/pdf/covenantofmayors_text_en.pdf online.

² See JRC website (<http://iet.jrc.ec.europa.eu/energyefficiency/covenant-mayors>).

Further information and support:

If you do not find the desired information in the present Guidebook, you can refer to the '[Frequently Asked Questions](http://www.eumayors.eu/faq/index_en.htm)' section available on the Covenant website (http://www.eumayors.eu/faq/index_en.htm) or in the Russian version of the Covenant website (www.soglasheniemerov.eu/support/faq_ru.html). In addition, an e-learning tool is available via the signatories' restricted area 'My Covenant', accessible through the following links: http://www.eumayors.eu/sign-in_en.html and http://www.soglasheniemerov.eu/sign-in_ru.html (please note that a password is required).

In addition, a helpdesk has been set up to provide Covenant signatories with information and guidance on the preparation and implementation of both their BEI and their SEAP.

Signatories Helpdesk: info-east@eumayors.eu or phone: +380 322721950

For general or technical inquiries by telephone, please call:

- Tbilisi office: + 995 790158080
Address: Tbilisi, Georgia, Str. Chavchavadze 74.
- Lviv office: + 380 322721950
Address: Lviv, Ukraine, str. Ogienko, 12, office 1-A

ACKNOWLEDGEMENTS

This Guidebook is a revised version of the Guidebook *How to develop a Sustainable Energy Action Plan (2010)* that has been realised with the support and input of many experts, from municipalities, regional authorities, agencies, city networks and private companies. We thank all those who have provided input and contributions and helped to shape the document in the right direction.

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ACRONYMS

| | |
|----------------------|--|
| BAU | Business-as-usual |
| BEI | Baseline Emission Inventory |
| CO ₂ | carbon dioxide |
| CO ₂ -eq. | CO ₂ -equivalent |
| CEE | Central and eastern Europe |
| CH ₄ | Methane |
| CoM | Covenant of Mayors |
| CoMO | Covenant of Mayors East Office |
| CoM | Covenant of Mayors |
| DHC | District heating/cooling |
| DG DEVCO | Directorate-General EuropeAid Cooperation and Development of the European Commission |
| DG ENER | Directorate-General for Energy |
| DG ENV | Directorate-General for Environment |
| DG INFSO | Directorate-General for Information Society & Media |
| DG RTD | Directorate-General for Research and Innovation |
| DG TREN | Directorate-General for Energy and Transport |
| EIB | European Investment Bank |
| EE | Energy efficiency |
| EBRD | European Bank for Reconstruction and Development |
| ETS | Emission Trading Scheme |
| | European Union |
| EU | European Union Emissions Trading Scheme |
| EU-ETS | Greenhouse gas |
| GHG | International Energy Agency |
| IEA | Information and communication technologies |
| ICT | Intelligent Energy Europe |
| IEE | Institute for Energy and Transport at Joint Research Centre of the European Commission |
| IET | Institute for Environment and Sustainability at Joint Research Centre of the European Commission |
| IES | Institute for Environment and Sustainability at Joint Research Centre of the European Commission |
| IPMVP | International Performance Measurement and Verification Protocol |
| IT | Information technology |
| JRC | Joint Research Centre of the European Commission |
| LAREAs | Local and regional energy agencies |
| M&V | Measurement and verification |
| MEI | Monitoring Emission Inventory |
| NGVs | Natural gas vehicles |
| NGOs | Non-governmental organisations |
| PV | Photovoltaics |
| RES | Renewable energy sources |
| SEAP | Sustainable Energy Action Plan |
| SEC | Social Entrepreneur Corporations |
| SUTP | Sustainable Urban Transport Planning |
| WB | World Bank |

CHAPTER 1. THE SUSTAINABLE ENERGY ACTION PLAN — The ten key principles to keep in mind when preparing a SEAP

1.1 What is a SEAP?

The Sustainable Energy Action Plan (SEAP) is a key document that shows how the Covenant of Mayors (CoM) signatory will reach its commitment by 2020. It uses the results of the Baseline Emission Inventory (BEI) to identify the priority fields of action and opportunities for reaching the local authority's greenhouse gas (GHG) (hereafter called CO₂ for simplicity) emissions reductions target. It defines concrete reduction measures, together with time frames and assigned responsibilities, which translate the long-term strategy into action. Signatories commit themselves to submitting their SEAPs within the year following adhesion.

The SEAP should not be regarded as a fixed and rigid document, as circumstances change, and, as the ongoing actions provide results and experience, it may be useful/necessary to revise the plan on a regular basis.

Remember that opportunities to undertake emissions reductions arise with every new development project to be approved by the local authority. The impacts of missing such an opportunity can be significant and will last for a long time. This means that energy efficiency and emission reduction considerations should be taken into consideration for all new developments, even if the SEAP has not yet been finalised or approved.

1.2 Scope of the SEAP

The CoM concerns action at the local level within the competence of the local authority. The SEAP should concentrate on measures aimed at reducing the CO₂ emissions and final energy consumption by end users. The Covenant's commitments cover the whole geographical area of the local authority (town, city and region). Therefore, the SEAP should include actions concerning both the public and private sectors. However, the local authority is expected to play an exemplary role and therefore to take outstanding measures related to the local authority's own buildings and facilities, vehicle fleet, and so on. The local authority can decide to set the overall CO₂ emissions reductions target either as 'absolute reduction' or 'per capita reduction' (see Chapter 5 of Part II of this Guidebook).

The main target sectors are buildings, equipment/facilities and urban transport. The SEAP may also include actions related to local electricity production (development of photovoltaics (PVs), wind power, combined heat and power (CHP), improvement of local power generation), and local heating/cooling generation. In addition, the SEAP should cover areas where local authorities can influence energy consumption over the long term (such as land-use planning), encourage markets for energy-efficient products and services (public procurement), and contribute to changes in consumption patterns (working with stakeholders and citizens)⁽³⁾. On the contrary, the industrial sector is not a key target of the CoM, so the local authority may choose whether or not to include actions in this sector. In any case, plants covered by the ETS (European CO₂ Emission Trading Scheme) should be excluded, unless they were included in previous plans of the local authority. A detailed description of the sectors to be covered in the BEI is provided in Part II of this Guidebook.

1.3 Time horizon

The time horizon of the CoM is 2020. Therefore, the SEAP has to contain a clear outline of the strategic actions that the local authority intends to take in order to reach its commitments by 2020. The SEAP may cover a longer period, but in this case it should contain intermediate values and objectives for the year 2020.

As it is not always possible to plan in detail the concrete measures and budgets for such a long time span, the local authority may distinguish between:

- a vision, with goals until 2020, including firm commitments in areas like land-use planning, transport and mobility, public procurement, standards for new/renovated buildings, etc.;
- detailed measures that translate the strategy and goals into actions.

Both the vision and the detailed measures will be an integral part of the SEAP.

³ Note that the effect of such long-term actions is not easy to evaluate or measure separately. Their effect will be reflected in the CO₂ emission inventory of the sector(s) they relate to (buildings, transport, etc.). In addition, note that 'green purchases' not related to energy consumption cannot be taken into consideration in the inventory.

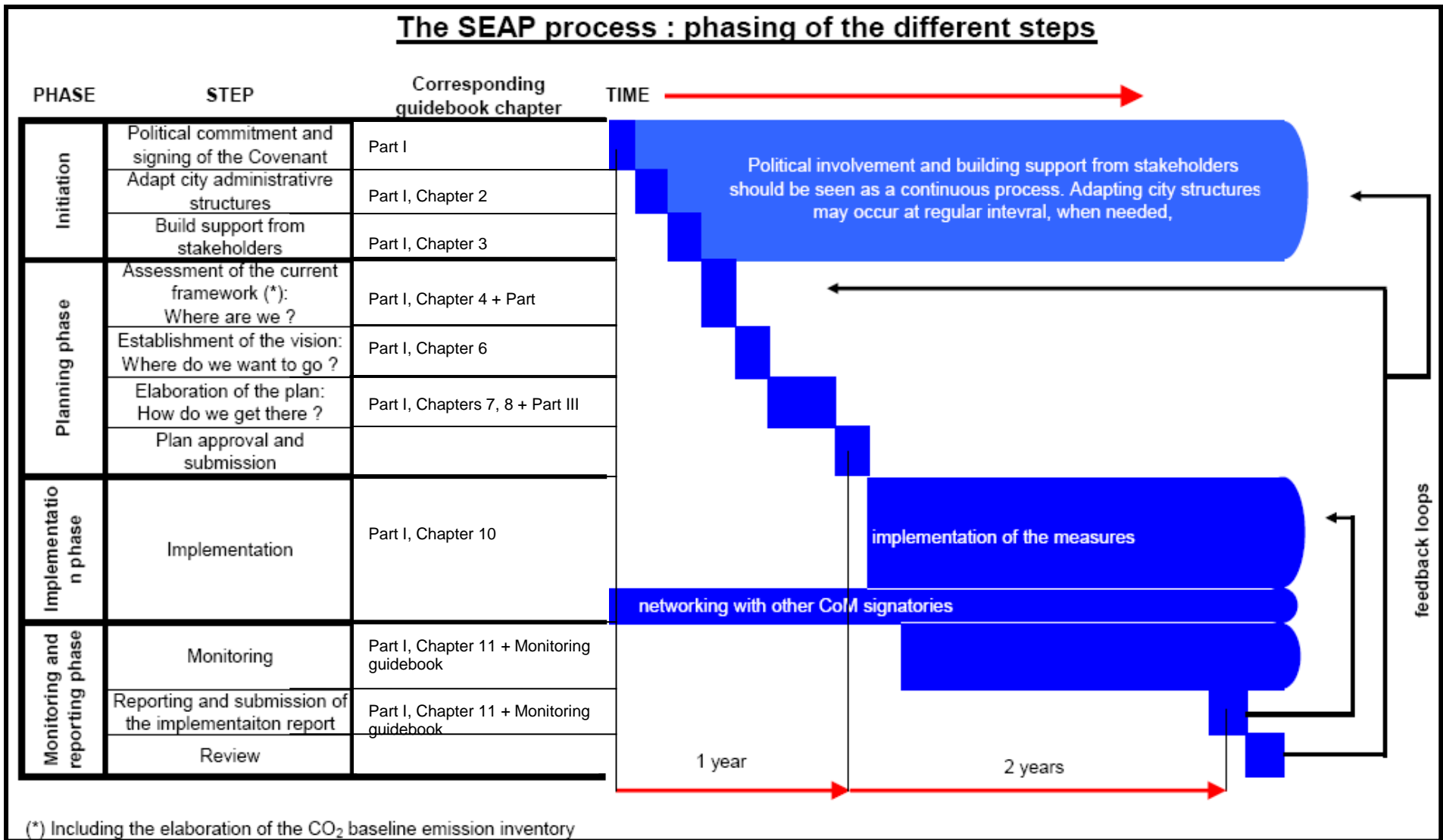
For example, as a long-term strategy, the local authority could decide that all cars purchased for the municipal fleet should be biogas operated. Of course, the municipality cannot vote the budget for all cars that will be purchased up until 2020, but they can include this measure in the plan and evaluate its impact until 2020, as a result of the estimated future purchases of cars by the municipality. For the duration of the local authority's political mandate, this measure should be presented in very practical terms, with budgets, identification of financing sources, etc.

It is also strongly suggested that measures related to the local authority's own buildings and facilities are implemented first, in order to set an example and motivate the stakeholders.

1.4 The SEAP process

The following chart details the key steps for elaborating and implementing a successful SEAP. As shown in the graph, the SEAP process is not a linear one, and some steps may overlap with others. Besides, it is possible that some actions may have started before the adhesion to the Covenant (not shown in the graph).

The SEAP process : phasing of the different steps



1.5 Human and financial resources

SEAP elaboration and implementation requires human and financial resources. Local authorities may adopt different approaches.

- Using internal resources; for example, by integrating the tasks in an existing department of the local authority involved in sustainable development (e.g. Local Agenda 21 office, environmental and/or energy department).
- Setting up a new unit within the local administration (approx. 1 person/100 000 inhabitants).
- Outsourcing (e.g. private consultants, universities, etc.).
- Sharing one coordinator among several municipalities, in the case of smaller local authorities.
- Getting support from regional energy agencies or Supporting Structures, such as National and Territorial Coordinators (described in Chapter 2.3).

Note that the human resources allocated to the SEAP may be highly productive from a financial point of view, via savings on the energy bills, and access to European funding for the development of projects in the field of energy efficiency (EE) and renewable energy sources (RES).

In addition, extracting as much as possible resources from the inside offers the advantages of higher ownership, cost savings and supporting the very materialisation of a SEAP.

1.6 SEAP template and SEAP submission procedure

Covenant signatories commit to submitting their SEAPs within the year following adhesion and to providing periodic implementation reports outlining the progress of their action plan.

The SEAP must be approved by the municipal council (or equivalent decision-making body) and uploaded in the national language via the 'My Covenant'⁴ (online password-restricted area). Covenant signatories will be required, at the same time, to fill in an online SEAP template in English or Russian. This will allow them to summarise the results of their BEI as well as the key elements of their SEAP.

Moreover, the template is a valuable tool that provides visibility to the SEAP and thus facilitates its assessment, as well as the exchange of experience between the Covenant signatories. Highlights of the information collected will be shown online in the CoM website (<http://www.eumayors.eu>). The Russian version of the CoM website can be accessed through <http://www.soglasheniemerov.eu> online.

Should a group of neighbouring CoM cities want to elaborate a common SEAP and BEI, they are allowed to do so according to one of the following options (find out more in the FAQ section⁵):

- Option 1: each signatory of the group individually commits to reducing CO₂ emissions by at least 20 % by 2020

In this case, the group can submit one joint SEAP document, but each city has to fill in its own SEAP template. The objective of reducing 20 % of the CO₂ emissions by 2020 is not shared by the group of cities as it remains an individual objective of each signatory. The emissions reductions corresponding to the common measures proposed in the SEAP will be divided among each city sharing these measures.

- Option 2: the group of signatories collectively commits to reducing CO₂ emissions by least 20 % by 2020

In this case, the emissions reductions target is a commitment shared among the different authorities composing the group. Therefore, ONE single SEAP template needs to be filled in by the group of signatories. This option aims at fostering inter-institutional cooperation by facilitating joint approaches with neighbouring authorities. It is particularly recommended for small- and medium-sized municipalities lacking human and/or financial resources. The group should be composed of municipalities within the same territorial area, indicatively with less than 10 000 inhabitants each. The joint SEAP has to be approved by the municipal council (or equivalent decision-making body) of each involved signatory and uploaded by the group onto

⁴ http://www.covenantofmayors.eu/sign-in_en.html

⁵ See http://www.eumayors.eu/support/faq_en.html?id_faq=60 online.

a shared profile via 'My Covenant'⁶ (restricted area). More information on this can be found in Addendum 1 to the SEAP Guidebook (⁷).

Table 1. Summary of the two options

| Covenant Steps: | Option 1: | Option 2: |
|---|---------------------------------------|------------------|
| 20 % CO ₂ reduction target: | Individual target | Shared target |
| Submission of the SEAP template: | Individual | 1 for the group |
| Submission of the SEAP document: | >> 1 joint SEAP << | |
| Publication of the results in the online catalogue: | 1 per Signatory | 1 for the group |

If municipalities are interested in joining the CoM as a 'group of signatories', please contact the Covenant of Mayors East Office (⁸).

The SEAP template is available online as an Internet-based tool that the Covenant signatories are required to fill in themselves. Detailed information on how to fill in the SEAP template is available by clicking on the [Instructions](#) link directly accessible in the 'My Covenant' (⁹).

A public copy of the SEAP template in Microsoft[®] Excel format and supporting instructions document are available in Russian and English in the CoM website library (http://www.eumayors.eu/library/documents_en.htm).

1.7 Recommended SEAP structure

The Covenant signatories could follow the structure of the SEAP template when preparing their SEAPs. The suggested content is:

- 1) SEAP Executive Summary;
- 2) Overall strategy
 - A. CO₂ emissions reductions target;
 - B. Long-term vision including priority areas of action, main trends and challenges;
 - C. Organisational and financial aspects
 - Coordination and organisational structures created/assigned;
 - Staff capacity allocated;
 - Involvement of stakeholders and citizens;
 - Overall estimated budget;
 - Foreseen financing sources for the implementation of your action plan;
 - Planned measures for monitoring and follow-up;
- 3) BEI and related information, including data interpretation (see Part II of this Guidebook, Chapter 5 Reporting and documentation);
- 4) Planned actions/measures for the full duration of the plan (2020)
 - Strategy, goals and commitments until 2020;
 - Short-/medium-/long-term actions

⁶ http://www.covenantofmayors.eu/sign-in_en.html

⁷ See

http://dl.dropboxusercontent.com/u/55952327/Addendum%201%20to%20the%20SEAP%20Guidebook_Joint%20SEAP%20option%202.pdf online.

⁸ Contact details are presented in the Introduction section of this Guidebook.

⁹ This document is available via the signatories' restricted area 'My Covenant', accessible through the following links: http://www.eumayors.eu/sign-in_en.html and http://www.soglasheniemerov.eu/sign-in_ru.html (please note that a password is required).

For each measure/action, please specify (whenever possible):

- description;
- responsible body (department, person or company);
- implementation timeframe (start–end time);
- estimated implementation cost (EUR);
- estimated energy savings and/or renewable energy production (MWh/year);
- estimated CO₂ emissions reductions (tonnes/year).

1.8 Level of detail

The level of detail in the description of each measure/action is to be decided on by the local authority. However, bear in mind that the SEAP is at the same time:

- a working instrument to be used during implementation (at least for the next few years);
- a communication tool towards the stakeholders;
- a document that is agreed at the political level by the various parties in charge within the local authority: the level of detail should be sufficient to avoid further discussion at the political level over the meaning and scope of the various measures.

1.9 Key elements of a successful SEAP

- ✓ Build support from stakeholders: if they support your SEAP, nothing should stop it! Conflicting stakeholders' interests deserve special attention
- ✓ Secure a long-term political commitment
- ✓ Ensure adequate financial resources
- ✓ Do a proper CO₂ emissions inventory as this is vital. What you do not measure you will not change
- ✓ Integrate the SEAP into day-to-day life and management of the municipality: it should not be just another nice document, but part of the corporate culture!
- ✓ Ensure proper management during implementation
- ✓ Make sure that your staff has adequate skills, and if necessary offer training
- ✓ Learn to devise and implement projects over the long term
- ✓ Actively search and take advantage of experiences and lessons learned from other cities that have developed a SEAP.

1.10 Ten key elements to keep in mind when preparing your SEAP

As a summary of what is presented in this Guidebook, here are the 10 essential principles that you should keep in mind when elaborating your SEAP. These principles are linked to the commitments taken by the Covenant signatories and *constitute* key ingredients of success. Failure to meet these principles may prevent SEAP verification.

1. Adaptation of city structures

One of the ingredients of success is that the SEAP process should not be conceived by the different departments of the local administration as an external issue, but that it is to be integrated in their everyday life. This is why 'adapt city structures' is another key CoM commitment⁽¹⁰⁾. The SEAP 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 human resources are to be made available.

2. Mobilisation of civil society

To implement and achieve the objectives of the plan, the adhesion and participation of civil society is essential⁽¹¹⁾. The mobilisation of civil society is part of the CoM commitments. The plan has to describe how civil society has been involved in its elaboration, and how its members will be involved in the implementation and follow up.

3. CO₂ Baseline Emission Inventory (BEI)

The SEAP should be elaborated based on a sound knowledge of the local situation in terms of energy and GHG emissions. Therefore, an assessment of the current framework should be carried out⁽¹²⁾. This includes the establishment of a CO₂ BEI, which is a key CoM commitment⁽¹³⁾. The BEI has to be included in the SEAP.

The BEI and subsequent inventories are essential instruments that allow the local authority to have a clear vision of the priorities for action, to evaluate the impact of the measures and determine the progress towards the objective. It allows signatories to maintain the motivation of all parties involved, as they can see the results of their efforts. Here are some specific points of attention:

- The BEI has to be relevant to the local situation; that is, based on energy consumption/production data, mobility data, and others within the territory of the local authority. Estimates based on national/regional averages would not be appropriate in most cases as they do not allow the local authority to capture their efforts to reach its CO₂ targets.
- The methodology and data sources should be consistent through the years.
- The BEI must cover at least those sectors in which the local authority intends to take action to meet the emissions reductions target; that is, all sectors that represent significant CO₂ emissions sources: residential, municipal and tertiary buildings and facilities, and transport.
- The BEI should be accurate, or at least represent a reasonable vision of the reality.
- The data collection process, data sources and methodology for calculating the BEI should be well documented (if not in the SEAP, then at least in the local authority's records).

4. Commitment for a reduction of CO₂ emissions by at least 20 % by 2020

The SEAP must contain a clear reference to the signatory's own core commitment for a reduction of CO₂ emissions by 2020. This commitment needs to be at least 20 % and based on reference levels, which are defined on the basis of a BEI.

Eastern Pacific signatories will have three options for setting their emissions reductions objective:

- as an absolute reduction;
- as a per capita reduction;

¹⁰ See Chapter 2 of Part I of the SEAP Guidebook for guidance on city structures adaptation.

¹¹ See Chapter 3 of Part I of the SEAP Guidebook for guidance on the mobilisation of civil society.

¹² See Chapter 4 of Part I of the SEAP Guidebook for guidance on assessment of the current framework.

¹³ See Part II of the SEAP Guidebook for guidance on how to elaborate the CO₂ emissions inventory.

- on the basis of a business-as-usual (BAU) scenario; that is, as an absolute reduction compared to forecast CO₂ emissions in 2020 (see Chapters 5 of Part I and Part II of this Guidebook).

Contrary to the recommendation indicated in the SEAP Guidebook for the European countries, in the case of the Eastern Partnership and central Asian signatories the use of a recent baseline year is highly recommended. The main reason is that local authorities often have difficulties in retrieving reliable data to compile an inventory for 1990.

An additional reason for avoiding the choice of such a year as the baseline might appear for signatories who want to include industries in their SEAPs, as most of the post-Soviet countries have experienced an economic downturn in the 1990s. Hence, those industrialisation levels cannot be related to the current ones.

Some local authorities considering amongst other factors the proximity of the year 2020 might have a longer term CO₂ reductions target (for example by 2030). In this case, they should set an intermediary objective by 2020 for the reasons of comparability.

5. Comprehensive measures that cover the key sectors of activity

The commitment taken by the signatories concerns the reduction of the CO₂ emissions *in their respective territories*. Therefore, the SEAP has to contain a coherent set of measures covering the key sectors of activity: not only the buildings and facilities that are managed by the local authority, but also the main sectors of activity in the territory of the local authority, such as residential sector, tertiary sector, public and private transport, and industry (optional)⁽¹⁴⁾. Before starting the elaboration of actions/measures, the establishment of a long-term vision with clear objectives is highly recommended⁽¹⁵⁾. The SEAP guidebook contains many suggestions of policies and measures that can be applied at the local level⁽¹⁶⁾.

6. Strategies and actions until 2020

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. It has to contain:

- the strategy and goals until 2020, including firm commitments in areas like land-use planning, transport and mobility, public procurement, and standards for new/renovated buildings;

- detailed measures for the next 3–5 years that translate the long-term strategy and goals into actions. For each measure/action, it is important to provide a description, the responsible body, the implementation timeframe (start–end, major milestones), the estimated implementation cost and foreseen financing source, the estimated energy savings and/or renewable energy production, and the associated estimated CO₂ emissions reductions.

7. 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⁽¹⁷⁾.

8. SEAP approval by the municipal council (or equivalent decision-making body)

Strong political support is essential to ensure the success of the process, from SEAP design to implementation and monitoring⁽¹⁸⁾. This is why the SEAP must be approved by the municipal council (or equivalent decision-making body).

9. SEAP submission and filling in the template

Covenant signatories commit to submitting their SEAPs within the year following adhesion. The SEAP must be uploaded in the national language (or in English) via the CoM website. Signatories are required, at the same time, to fill in an online SEAP template either in Russian or English. This will allow them to summarise the results of their BEI as well as the key elements of their SEAP.

¹⁴ See Part II of the SEAP Guidebook for more advice on the sectors to be covered.

¹⁵ See Chapters 5 and 6 of Part I of the SEAP Guidebook for guidance on the establishment of a vision and objectives.

¹⁶ In particular, see Chapter 7 of Part I, and Part III.

¹⁷ See Chapter 8 of Part I of the SEAP Guidebook for guidance on how to finance the SEAP.

¹⁸ See Chapter 9 of Part I of the SEAP Guidebook for guidance on political commitment.

The template has to be filled in carefully with a sufficient level of detail, and should reflect the content of the SEAP, which is a politically approved document. A specific instruction document for filling in the template is available on the Covenant website.

10. Monitoring and reporting

Regular monitoring using relevant indicators followed by adequate revisions of the SEAP allows for evaluation of whether the local authority is achieving its targets, and for adopting corrective measures if necessary. CoM signatories are therefore committed to submit an 'Implementation Report' every second year following the submission of the SEAP. A Monitoring SEAP template and the respective instructions document will be published in 2013. The SEAP should contain a brief outline on how the local authority intends to ensure a follow-up on the actions and to monitor the results (¹⁹).

¹⁹ See Chapter 11 of Part I of the SEAP Guidebook for guidance on monitoring and reporting.

CHAPTER 2. ADAPTING ADMINISTRATIVE STRUCTURES

Devising and implementing a sustainable energy policy is a challenging and time-demanding process that has to be systematically planned and continuously managed. It requires collaboration and coordination between various departments in the local administration, such as energy, environmental protection, land-use and spatial planning, economics and social affairs, buildings and infrastructure management, mobility and transport, budget and finance, and procurement. In addition, one of the challenges for success is that the SEAP process should not be conceived by the different departments of the local administration as an external issue, but that it has to be integrated in their everyday life: mobility and urban planning, management of the local authority's assets (buildings, municipal fleet, public lighting, etc.), internal and external communication, and public procurement among others. In the case of a complex city structure, where a city consists of several municipalities (with their administrative buildings and transport fleets), cooperation between the municipalities and city administration is also required.

A clear organisational structure and assignment of responsibilities are prerequisites for the successful and sustainable implementation of the SEAP. A lack of coordination between the various policies, local authority departments and external organisations has been a considerable shortcoming in the energy or transport planning of many local authorities.

This is why *Adapting city structures, including allocation of sufficient human resources* ⁽²⁰⁾ is a formal commitment of those signing the CoM.

Therefore, all Covenant signatories should adapt and optimise their internal administrative structures. They should assign specific departments with appropriate competencies as well as sufficient financial and human resources to implement the CoM commitments.

2.1 How to adapt administrative structures

Administrative structures should be adapted to benefit from the collaboration of existing units/departments and various stakeholders, such as i) city administration; ii) public enterprises; iii) energy suppliers: public and private; iv) citizens and non-governmental organisations (NGOs); v) business sector and chambers of trade, commerce and craft; vi) universities and professional associations of, for example, engineers and architects; and vii) well known experts (more information about stakeholders is offered in Chapter 3 of this Guidebook).

At the beginning of the SEAP elaboration process, a Covenant team leader should be appointed. The coordinator is the key person for implementation of the action plan, guiding the preparation and implementation of the SEAP. He/she must have full support of the local political authorities and from the hierarchy, as well as the necessary time availability and the budgetary means to carry out his/her tasks. In large cities, he/she could even have a dedicated unit at their disposal, with several staff. Depending on the size of the local authority, one or more persons dedicated to data collection and CO₂ emissions inventory may also be necessary.

Organisational structures that have already been created for other related policies (energy management unit, Local Agenda 21 coordination, etc.) may be used in the context of the CoM, as described in the example of the City of Lviv in Sub-section 7.2.6.

In other cases, organisational change in a municipal administration may be required, establishing a department or a unit for energy efficiency, renewable energy and other sectors. This unit can, at a later stage (after a SEAP has been prepared), undertake the responsibility for overall energy management of the public buildings owned by the city, as indicated in the example of the city of Zagreb in Section 2.2.

As an example of simple organisation structure, two groups may be constituted, as follows.

- A steering committee comprised of politicians and senior managers. Its mission would be to provide strategic direction and the necessary political support for the process.
- One or several working group(s), made up of the energy planning manager, key persons from various departments of the local authority, public agencies, and others. Their task would be to undertake the actual SEAP elaboration and follow-up work, to ensure stakeholders' participation, to organise monitoring, to produce reports, and undertake other relevant

²⁰ Parts of this chapter are adapted from <http://www.movingsustainably.net/index.php/movsus:mshome> — developed by the Union of the Baltic Cities Environment and Sustainable Development Secretariat and part-funded by the European Union. Further information about capacity building and previous experiences are available on the MODEL project webpage (<http://www.energymodel.eu>).

activities. The working group(s) may be opened to the participation of non-municipal key actors directly involved in SEAP actions.

Both the steering committee and the working group(s) need a distinct leader, although they should be able to work together. Moreover, the objectives and functions of each one of these groups must be clearly specified. A well defined meeting agenda and a project-reporting strategy are recommended in order to have a good command over the SEAP process.

It is essential that sustainable energy management is integrated with the other actions and initiatives of the relevant municipality departments, and it must be ensured that it becomes part of the overall planning of the local authority. Multi-departmental and cross-sectoral involvement is required, and organisational targets need to be in line and integrated with the SEAP. The establishment of a flow chart, indicating the various interactions between departments and actors, would be useful to identify the adjustments that may be necessary with regard to the local authority's organisation. As many key municipal players as possible should be assigned responsible roles to ensure strong ownership of the process in the organisation. A specific communication campaign may help reach and convince the municipal workers in different departments.

Moreover, adequate training should not be neglected in different fields, such as technical competencies (energy efficiency, renewable energies, efficient transport, etc.), project management, data management (lack of skills in this field can be a real barrier!), financial management, development of investment projects, and communication (how to promote behavioural changes, etc.). Linking with local universities can be useful for this purpose.

2.2 Examples from Covenant signatories

Following are two examples of structures that the cities of Zagreb (Croatia) and Munich (Germany) set up for developing and implementing their local energy strategies.

City of Zagreb: In 2009, the City Office for Energy, Environment and Sustainable Development was established to prepare and implement the Zagreb SEAP. The Head of this Office has been appointed as Coordinator of the entire process regarding preparation and implementation of the SEAP.

In addition, two advisory bodies were established to guide the process of the Zagreb SEAP realisation:

- Energy Council, as an advisory body;
- coordination body for the coordinating and monitoring of SEAP implementation.

The tasks of the Energy Council were assigned as follows:

- monitoring of the entire process regarding SEAP preparation and implementation;
- revision of the SEAP;
- analysis of the proposals for amendment of the SEAP (concerning specific measures and actions);
- participation in the preparation of reports to the city government and general public, and presenting of results achieved by implementing SEAP measures and actions;
- communication with stakeholders involved in SEAP implementation;
- reviewing of the reports to the European Commission, and presenting of results regarding implementation of the SEAP.

The members of the Energy Council of the city of Zagreb are prominent representatives from the University of Zagreb and other educational institutions, city administration, Energy Agency from Nord-West Croatia and from Zagreb Holding Ltd., as well as well known experts from the sectors of energy, architecture, civil engineering, urban planning, traffic and municipality infrastructure.

Organization structure

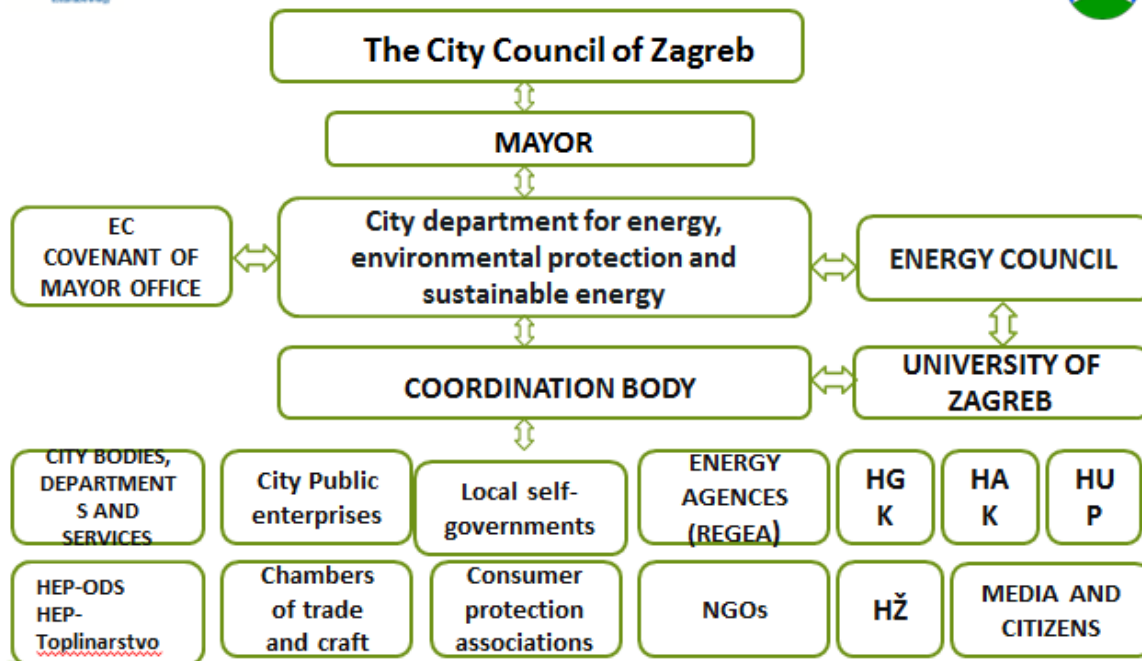


Figure 1. Organisation structure of the city of Zagreb for implementation of the SEAP

The coordination body was tasked with the following mission:

- coordinating the entire process of SEAP implementation and re-establishing priority measures and activities;
- determination and implementation of the communication strategy of the city of Zagreb;
- systematic monitoring of SEAP implementation and analysis of results;
- coordinating the preparation of periodical reports, and presenting SEAP implementation results.

The members of the coordination body are the employees of the City Office for Energy, Environment and Sustainable Development, representatives from other city departments that are in charge of implementation of the SEAP, Zagreb Holding Ltd. and prominent experts.

City of Munich:

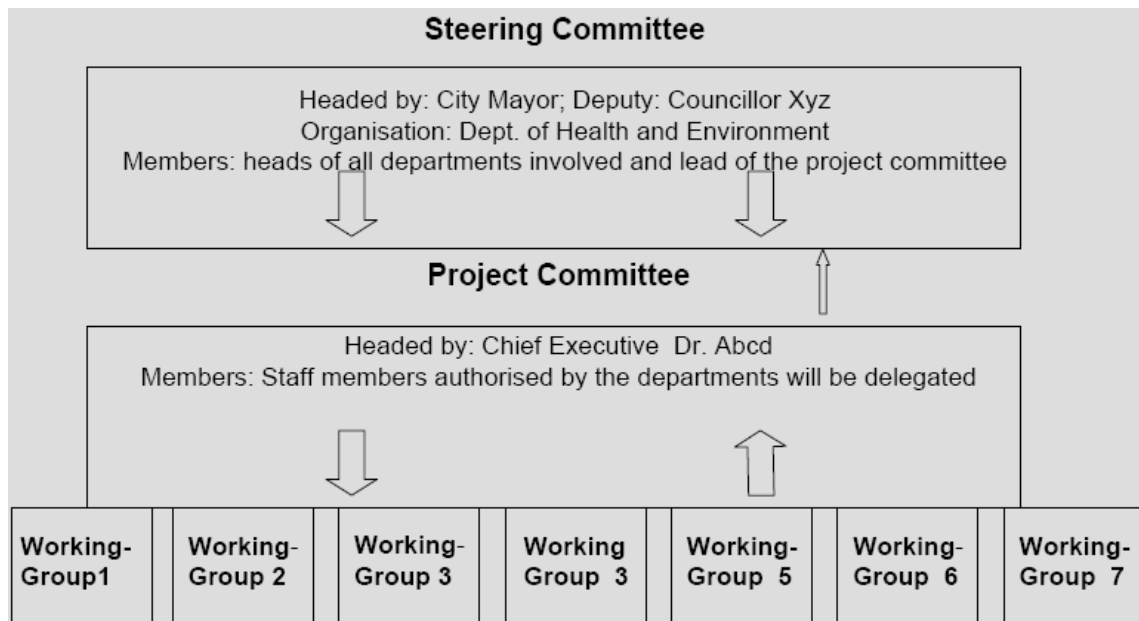


Figure 2.2. Administrative structure of the city of Munich

Working groups are divided by sector, for example: housing, transport, business and public sector, and education and awareness. These can be further divided into sub-sections, depending on the project programme. For example, a working group on 'business and public sector' can be divided into waste reduction, energy conservation, water conservation, new building standards, procurement and other smaller groups.

2.3 External support

Depending on their size and human resources availability, local authorities may benefit from the assistance of Supporting Structures or energy agencies. It is even possible for them to subcontract some specific tasks (e.g. compilation of a BEI) or to use interns (Masters or PhD students can do much of the work associated with the collection of data and entry into a GHG calculation tool to produce the BEI).

→ Supporting Structures

Local authorities, which do not have sufficient skills or resources to draft and implement their own SEAP, should be supported by administrations or organisations with such capacities. Supporting Structures are in a position to provide strategic guidance and financial and technical support to local authorities with the political will to sign up to the CoM, but lacking the skills and/or the resources to fulfil its requirements.

Supporting Structures can also maintain close contact with the European Commission and the CoM East Office to ensure the best possible implementation of the Covenant. Thus, Supporting Structures are officially recognised by the Commission as key allies in conveying the message and increasing the impact of the Covenant.

There are two types of Supporting Structures — Territorial and National Coordinators.

1. **Territorial Coordinators** are sub-national decentralised authorities — including provinces, regions and public groupings of municipalities.
2. **National Coordinators** are national public bodies — including national energy agencies and ministries dealing with energy.

Supporting Structures can offer direct technical and financial assistance such as:

- mobilising technical expertise in order to help Covenant signatories preparing their BEI or SEAP;
- developing or adapting methodologies for preparing the SEAP, taking into account the national or regional context;

- identifying financial opportunities for SEAP implementation;
- training local officials, who will be the final SEAP owners.

→ Energy agencies

Local and regional energy agencies (LAREAs) have been active in local energy policy for decades and their knowledge and expertise could be very useful for the Covenant signatories, especially those lacking the relevant technical capacities.

In fact, one of the first activities of each agency is to prepare an energy plan, or to update existing ones in the geographical area covered by the agency. This strategic process usually comprises several steps, including the collection of energy data, the establishment of an energy balance, and the development of short-, medium- and long-term energy policies and plans. Hence, Covenant signatories can expect their LAREAs to give wide-ranging advice on all energy aspects, as well as useful technical assistance in the design of their BEI and SEAP.

ADDITIONAL RESOURCES

1. Ireland's national energy agency (SEI) provides a link with guidance to *Resourcing the Energy Management Programme* (<http://www.sustainableenergyireland.ie/uploadedfiles/EnergyMAP/tools/01-10a%20Resourcing%20the%20Energy%20Management%20Programme%20v1.0.pdf>).
2. The adaptation of Zagreb's municipality structure is described in the Zagreb SEAP available in the Croatian language on the webpage of the CoM (http://helpdesk.eumayors.eu/docs/seap/455_1322232262.pdf).
3. A description of implementing the energy management system of Lviv can be found at <http://www.enefcities.org.ua/Municipal%20energy%20management%20system%20in%20Lviv.pdf> online.

CHAPTER 3. BUILDING SUPPORT FROM STAKEHOLDERS ⁽²¹⁾ AND THE MOBILISATION OF CIVIL SOCIETY

All members of society have a key role in addressing the energy and climate challenge with their local authorities. Together, they have to establish a common vision for the future, define the paths that will make this vision come true, and invest the necessary human and financial resources.

Stakeholders' involvement is the starting point for stimulating the behavioural changes that are needed to complement the technical actions embodied in the SEAP. This is the key to a concerted and coordinated way of implementing the SEAP.

The views of citizens and stakeholders should be known before detailed plans are developed. Therefore, citizens and other stakeholders should thus be involved and be offered the opportunity to take part in the key stages of the SEAP elaboration process: building the vision, defining the objectives and targets, setting the priorities, and so on. There are various degrees of involvement: 'informing' is at one extreme whilst 'empowering' is at the other. To realise a successful SEAP, it is highly recommended to seek out the highest level of participation of stakeholders and citizens in the process.

Stakeholders' participation is important for various reasons:

- participatory policymaking is more transparent and democratic;
- a decision taken together with many stakeholders is based on more extensive knowledge;
- broad consensus improves the quality, acceptance, effectiveness and legitimacy of the plan (at the least it is necessary in order to make sure that stakeholders do not oppose some of the projects);
- a sense of participation in planning ensures the long-term acceptance, viability and support of strategies and measures;
- SEAPs may sometimes get stronger support from external stakeholders than from the internal management or staff of the local authority.

For these reasons, to mobilise the civil society to take part in developing the action plan is a formal commitment of those signing the CoM.

3.1 Who are the stakeholders?

The first step is to identify the main stakeholders. Stakeholders are those:

- whose interests are affected by the issue;
- whose activities affect the issue;
- who possess/control information, resources and expertise needed for strategy formulation and implementation;
- whose participation/involvement is needed for successful implementation.

The following table shows the potential roles that the local authority and the stakeholders can play in the SEAP process outlined in Chapter 1.

²¹ Parts of this chapter are adapted from <http://www.movingsustainably.net/index.php/movsus:mshome> — developed by the Union of the Baltic Cities Environment and Sustainable Development Secretariat and part-funded by the European Union.

The SEAP process: the main steps — role of the key actors

| PHASE | STEP | ROLE OF THE ACTORS | | |
|--------------------------------|---|--|---|---|
| | | Municipal council or equivalent body | Local administration | Stakeholders |
| Initiation | Political commitment and signing of the Covenant | Make the initial commitment. Sign the Covenant of Mayors. Provide the necessary impulse to the local administration to start the process. | Encourage the political authorities to take action. Inform them about the benefits (and about the necessary resources). | Put pressure on the political authorities to take action (if necessary). |
| | Adapt city administrative structures | Allocate sufficient human resources and make sure adequate administrative structures are in place. | | |
| | Build support from stakeholders | Provide the necessary impulse for stakeholders' participation. Show that you consider their participation and support to be important. | Identify the main stakeholders, and decide what channels of communication/participation you want to use. Inform them about the process that is going to start, and collect their views on it. | Express their views, explain their potential role in SEAPs. |
| Planning phase | Assessment of the current framework: Where are we? | Make sure the necessary resources are in place for the planning phase. | Conduct the initial assessment, collect the necessary data, and elaborate the CO ₂ Baseline Emission Inventory. Make sure the stakeholders are properly involved. | Provide valuable inputs and data, and share the knowledge. |
| | Establishment of the vision: Where do we want to go? | Support the elaboration of the vision. Make sure it is ambitious enough. Approve the vision (if applicable). | Establish a vision and objectives that support the vision. Make sure it is shared by the main stakeholders and by the political authorities. | Participate in the definition of the vision, and express their views on the city's future. |
| | Elaboration of the plan: How do we get there? | Support the elaboration of the plan. Define the priorities, in line with the vision previously defined. | Elaborate the plan: define policies and measures in line with the vision and the objectives, establish budget and financing, timing, indicators and responsibilities. Keep the political authorities informed, and involve stakeholders. Make partnerships with key stakeholders (if necessary). | Participate in the elaboration of the plan. Provide input and feedback. |
| | Plan approval and submission | Approve the plan and the necessary budgets. | Submit the SEAP via the CoMO website. Communicate about the plan. | Put pressure on the political authorities to approve the plan (if necessary). |
| Implementation phase | Implementation | Provide long-term political support to the SEAP process. | Coordinate the implementation plan. Make sure each stakeholder is aware of their role in the implementation. | Each stakeholder implements the measures that fall under their responsibility. |
| | | Make sure that the energy and climate policy is integrated in the everyday life of the local administration. | Implement the measures that fall under the responsibility of the local authority. Be exemplary. Communicate about your actions. | Put pressure on/encourage the local administration to implement the measures under its responsibility (if necessary). |
| | | Show interest in the plan implementation, encourage stakeholders to act, and be the example. | Motivate the stakeholders to act (information campaigns). Inform them properly about the resources available for EE and RES. | Changes in behaviour, EE and RES action, general support for SEAP implementation. |
| | | Networking with other CoM signatories, exchanging experience and best practices, establishing synergies and encouraging their involvement in the Covenant of Mayors. | | Encourage other stakeholders to act. |
| Monitoring and reporting phase | Monitoring | Ask to be informed regularly about the advancement of the plan. | Proceed to a regular monitoring of the plan: advancement of the actions and evaluation of their impact. | Provide the necessary inputs and data. |
| | Reporting and submission of the implementation report | Approve the report (if applicable). | Report periodically to the political authorities and to the stakeholders about the advancement of the plan. Communicate about the results. Every second year, submit an implementation report via the CoMO website. | Provide comments on the report and report on the measures under their responsibility. |
| | Review | Ensure that plan updates take place at regular intervals. | Periodically update the plan according to the experience and the results obtained. Involve the political authorities and the stakeholders. | Participate in plan update. |

Following is a list of potentially important stakeholders in the context of a SEAP:

- Local administration: relevant municipal departments and companies (municipal energy utilities, transport companies, etc.);
- Local and regional energy agencies;
- Financial partners such as banks, private funds, ESCOs ⁽²²⁾;
- Institutional stakeholders: chambers of commerce, chambers of architects and engineers;
- Energy suppliers, utilities;
- Transport/mobility players: private/public transport companies, etc.;
- The building sector: building companies, developers;
- Businesses and industries;
- Supporting Structures and energy agencies;
- NGOs and other civil society representatives;
- Representatives of civil society, including students, workers, etc.;
- Existing structures (Local Agenda 21, etc.);
- Universities;
- Knowledgeable persons (consultants, etc.);
- Where relevant, representatives of national/regional administrations and/or neighbouring municipalities to ensure coordination and consistency with plans and actions that take place at other levels of decision making;
- Tourists, where the tourist industry represents a large share of the emissions.

3.2 How to engage stakeholders in participation

Participation can be obtained through a variety of methods and techniques, and it may be useful to make recourse to a (professional) animator as a neutral moderator. Different levels of participation and tools may be considered ⁽²³⁾:

| | Degree of involvement | Examples of tools |
|---|------------------------------|---|
| 1 | Information and education | brochures, newsletters, advertisements, exhibitions, site visits |
| 2 | Information and feedback | telephone hotline, website, public meetings, teleconferences, surveys and questionnaires, staffed exhibitions, deliberative polls |
| 3 | Involvement and consultation | workshops, focus groups, forums, open house |
| 4 | Extended involvement | community advisory committees, planning for real, citizen's juries |

Some practical tips:

- ✓ Think big: Do not focus on the usual contacts.
- ✓ Get decision makers on board.
- ✓ Choose an appropriate facilitator/moderator.
- ✓ Some stakeholders can have conflicting interests. In this case, it is advisable to organise separate workshops for each particular group in order to understand the conflicting interests before bringing them together.
- ✓ In order to raise the interest of citizens, it is recommended to use visual tools (GIS tool showing the energy efficiency of various districts of the local authority, aerial thermography showing thermal losses of individual buildings, or any simple model that helps depict the data being presented).
- ✓ Attract media attention.

The roles and responsibilities of each player have to be specified. Partnerships with key actors are often necessary in developing and implementing a successful SEAP. Further communication about SEAP implementation results will be necessary to maintain the motivation of stakeholders.

²² ESCO is the acronym for Energy Services Companies.

²³ Adapted from Petts, P. and Leach, B., *Evaluating methods for public participation: literature review*, Bristol Environment Agency, 2000.

Awareness raising example — Events

Rustavi, Georgia

On 28 and 29 February, 2012 the Energy Efficiency Centre in Georgia (EECG) in partnership with the self-governing Rustavi city organised the awareness raising event 'Let's save Energy', through the organisation of Intelligent Energy Days in Rustavi city as part of the project 'Energy Saving Initiative in the Building sector in Eastern Europe and the central Asian Countries' financed by the European Commission. This event had a non-formal educational character and included seminars at five public schools and the replacement of light bulbs in kindergartens.

Awareness raising example — Education and consultation

Kamyanets-Podilskiy, Ukraine

The municipality of Kamyanets-Podilskiy has plans to raise the awareness of enterprise owners by conducting initial energy audits of their premises at no charge. Based on audit findings, recommendations will be provided to reduce energy consumption in the industry sector. Furthermore, meetings and trainings are planned to inform and educate entrepreneurs on energy-efficiency measures.

Other initiatives include informative programmes for dwellers of the residential sector, emphasising good practice examples in mass media. Such case studies will focus on implementing straightforward actions towards reducing energy consumption and the application of modern technologies, highlighting their effectiveness and financial benefits. The energy efficiency office of the Department of Housing Policy, Roads and Infrastructure has been assigned to implement these activities.

Specific attention was given to the assessment of project documentation submitted to the Office of Urban Development and Architecture. Projects on construction and reconstruction of urban developments will be reviewed from the viewpoint of prospective energy savings and the application of modern technologies and materials.

Awareness raising example — Local energy forum

A local energy forum is a local authority-driven participatory process, which engages local stakeholders and citizens to work together in order to prepare and implement common actions that can be formalised into an Action Plan. Such forums are already used by some Covenant signatories. For example, ***Almada (Portugal)*** organised a local energy forum and invited all interested companies and organisations in order to gather ideas and project proposals that could contribute to their Action Plan. A partnership with a local energy agency and a university was established to develop their plan. Similarly, the city of ***Frankfurt (Germany)*** asked the forum participants to make their own contributions to meet common energy targets and propose concrete actions to be carried out.

3.3 Communication

Communication is an essential means to keeping stakeholders informed and motivated. Therefore, a clear communication strategy should be integrated in the SEAP. Before initiating a communication campaign, some information should be specified in order to maximise the impact of the action.

- Specify the message to be transmitted and the effect to be produced (desired outcome).
- Identify the key audience.
- Establish a set of indicators to evaluate the impact of the communication (head count at a seminar, surveys — quantitative/qualitative, hits on website, feedback, e-mails, etc.).

- Specify the most appropriate communication channel(s) (face-to-face — most effective form of communication, advertising, mail, e-mail, Internet, blogs, talks/meetings, brochures, posters, newsletters, printed publications, media releases, sponsorship, etc.).
- Specify planning and budget.

Communication can also be internal to the local authority: setting up internal communication means may be necessary to improve collaboration between the departments involved within the local authority.

ADDITIONAL RESOURCES

1. The Belief Project produced a comprehensive guide on how to *Involve stakeholders and citizens in your local energy policy* through energy forums (<http://www.managenergy.net/resources/916>).
2. The Employers' Organisation (EO) for local government produced a toolkit to assist local authorities and their partners towards more effective collaborative working (<http://www.lgpartnerships.com/>).
3. The Partner Foundation for Local Development has developed training for elected leaders. See Handbook 4, the Councillor as Communicator (http://www.fpdl.ro/publications.php?do=training_manuals&id=1).
4. Interesting information about communication strategy can be found in the Energy Model project in step 9, named 'Programme implementation' (<http://www.energymodel.eu>).

CHAPTER 4. ASSESSMENT OF THE CURRENT FRAMEWORK: WHERE ARE WE?

4.1 Analysis of relevant regulations

Within a municipality, there are sometimes conflicting policies and procedures. A first step is to identify the existing municipal, regional and national policies, plans, procedures and regulations that affect energy and climate issues within the local authority. The mapping and analysis of these existing plans and policies is a good starting point towards better policy integration.

The next step is to go through and check and compare the objectives and goals in the identified documents with the ones for a sustainable energy policy. The aim is to establish whether these objectives and goals are supporting or conflicting.

Finally, the local authority should invite all the relevant actors and stakeholders to discuss the conflicts identified. They should try to reach an agreement on the changes that are necessary to update policies and plans, and clearly establish who should put them into practice and when. The relevant actions should be planned (when possible) and the list of actions to be taken should be included in the SEAP. Changes may take time to show their beneficial effects, but should nevertheless be endorsed by the political leadership.

4.2 Baseline review and Baseline Emission Inventory

Energy consumption and CO₂ emissions at the local level are dependent on many factors: economical structure (industry/service oriented and nature of the activities), level of economic activity, population, density, characteristics of the building stock, usage and level of development of the various transport modes, citizens' attitudes, climate, and others. Some factors can be influenced in the short term (like citizens' attitudes), while others can only be influenced in the medium or long term (energy performance of the building stock). It is useful to understand the influence of these parameters, how they vary in time, and identify those upon which the local authority can act (in the short, medium and long terms).

This is the purpose of a baseline review: establish a clear picture of 'where we are', a description of the city's current situation in terms of energy and climate change.

A baseline review is the starting point for the SEAP process from which it is possible to move to relevant objective-setting, elaboration of an adequate action plan and monitoring. The baseline review needs to be based on existing data. It should map relevant legislations, existing policies, plans, instruments and all departments/stakeholders involved.

Completing a baseline review requires adequate resources in order to allow the datasets to be collated and reviewed. This assessment permits elaborating a SEAP that is suited to the emerging issues and specific needs of the local authority's current situation.

The aspects to be covered can be either quantitative (evolution of energy consumption, etc.) or qualitative (energy management, implementation of measures, awareness, etc.). The baseline review allows signatories to prioritise actions and then to monitor the effects based on relevant indicators. The most demanding element is to build a complete CO₂ emissions inventory, based on actual energy consumption data (refer to Part II of this Guidebook, which provides guidance on how to collect the energy data and how to elaborate the CO₂ emissions inventory). Detailed steps for conducting the baseline review are presented in Table 2.

Contrary to the recommendation outlined in the SEAP Guidebook for European countries, in the case of the Eastern Partnership and central Asian signatories the use of a recent baseline year is highly recommended. The main reason is that local authorities often have difficulties in retrieving reliable data to compile an inventory for 1990.

An additional reason for avoiding the choice such a year as the baseline year might appear for signatories who want to include industries in their SEAPs, as most of the post-Soviet countries experienced an economic downturn in the 1990s. Hence, those industrialisation levels cannot be related to the current ones.

Table 2. Detailed steps for conducting the baseline review

1. Select the review team — preferably the inter-sectoral working group.

At this stage you should decide what degree of stakeholder involvement you prefer for this process. As stakeholders generally possess a lot of valuable information, their involvement is highly recommended (see Chapter 2 of this Guidebook on Adapting administrative structures).

2. Assign tasks to team members.

Consider the competencies as well as the availability of each member of the group in order to assign them tasks that they will be able to perform.

3. Establish review schedule.

Indicate realistic start and end date of all data collection activities.

4. Identify the most important indicators to be included in the assessment. The following elements should be covered:

- ✓ What is the energy consumption and CO₂ emissions of the different sectors and actors present in the territory of the local authority, and what are the trends? (See Part II).
- ✓ Who produces energy and how much? Which are the most important sources of energy? (See Part II).
- ✓ What are the drivers that influence energy consumption?
- ✓ What are the impacts associated with energy consumption in the city (air pollution, traffic congestion, etc.)?
- ✓ What efforts have already been made in terms of energy management and what results have they produced? Which barriers need to be removed?
- ✓ What is the degree of awareness of officials, citizens and other stakeholders in terms of energy conservation and climate protection?

In Annex I, we provide a table with more detailed specifications of the aspects that could be covered in the assessment.

5. Collect the baseline data.

This requires the collection and processing of quantitative data, the establishment of indicators, and the gathering of qualitative information using document review and interviews/workshops with stakeholders. The selection of datasets needs to be based on criteria that are agreed on with stakeholders, who will be actively involved in contributing data. Part II of this Guidebook provides guidance for the collection of data related to energy consumption.

6. Compile the CO₂ Baseline Emission Inventory.

Based on energy data, the CO₂ BEI can be compiled (see Part II of this Guidebook).

7. Analyse the data.

It is not enough just to collect data: data needs to be analysed and interpreted in order to inform policy. For example, if the baseline review shows that energy consumption is increasing in a specific sector, try to understand why it is so: population increase, increased activity, increased usage of some electrical devices, etc.

8. Write the self-assessment report — be honest and truthful; a report that does not reflect reality serves no purpose.

The baseline review can be carried out internally within the local authority as a self-assessment process, but combining the self-assessment with an external peer review can add additional value to the process. Peer review offers an objective third-party review of achievements and future prospects. Peer reviews can be carried out by external experts who work in other cities or organisations in similar fields of expertise. It is a cost-effective method and often a more politically acceptable alternative to consultants.

Some local authorities considering, amongst other factors, the proximity of the year 2020, might have a longer term CO₂ reductions target (for example by 2030). In this case, they should set an intermediary objective by 2020 for reasons of comparability.

Some important characteristics of a BEI are described here:

- The BEI has to be relevant to the local situation; that is, based on energy consumption/production data, mobility data, and others. Estimates based on national/regional averages would not be appropriate in most cases, as they are unlikely to be representative of the specific territorial circumstances and will not represent a relevant starting point for measuring the efforts made by the local authority to reach its CO₂ targets.
- The methodology and data sources should be consistent throughout the years; that is, the same methodology used to prepare the BEI should be adopted to elaborate the subsequent inventories.
- The BEI must cover at least the sectors in which the local authority intends to take action to meet the emissions reductions target; that is, all sectors that represent significant CO₂ emissions sources (see Chapter 7 of Part I).
- The BEI should be accurate, or at least represent a reasonable vision of the reality.
- The data collection process, the data sources and the methodology for calculating the BEI should be well documented (if not in the SEAP, then at least in the local authority's records).
- In the case of Eastern Partnership and central Asian signatories, it is highly recommended to include the monitoring of energy expenditure both in the BEI and in the subsequent inventories. The energy expenditure represents the final price that a municipality pays per year for purchasing thermal energy (that is, energy in the form of heat) and electricity.

In Annex II, you will find a list of suggested aspects to be covered in the baseline review.

Based on the data collected and on the different sets of hypotheses, it may be relevant to establish scenarios — for example, how would energy consumption and CO₂ emissions evolve under current policies, and what would be the impact of the projected actions.

4.3 SWOT analysis

A SWOT analysis is a useful strategic planning tool that can be applied in the SEAP process. Based on the findings of the baseline review, it allows one to determine the Strengths and Weaknesses of the local authority in terms of energy and climate management, as well as the Opportunities and Threats that could affect the SEAP. This analysis can help to define priorities when devising and selecting SEAP actions and measures.

ADDITIONAL RESOURCES

1. The Model project provides some guidance on how to build different scenarios (http://www.energymodel.eu/IMG/pdf/IL_4_-_Baseline.pdf).
2. The Managing Urban Europe 25 project gives detailed instructions on how to prepare a baseline review (based on sustainability management) (http://www.localmanagement.eu/index.php/mue25:mue_baseline).
3. The Charity Village website (<http://www.charityvillage.com>) provides additional guidance on SWOT Analysis (https://charityvillage.com/Content.aspx?topic=how_to_conduct_a_swot_analysis&last=550).
4. The 'businessballs' website provides free resources on SWOT analysis, as well as examples (<http://www.businessballs.com/swotanalysisfreetemplate.htm>).

CHAPTER 5. COMMITMENT TO A REDUCTION OF CO₂ EMISSIONS BY AT LEAST 20 % BY 2020

The SEAP must contain a clear reference to the signatory's own core commitment for a reduction of GHG emissions by 2020. This commitment needs to be relevant to at least a 20 % reduction, which is achieved through the implementation of the SEAP for the areas of activity relevant to the local authority's mandate (described in Chapter 7). The reduction target is defined in comparison to the baseline year, which is set by the local authority and used to compile the BEI. The local authority can decide to set the GHG emissions reductions target either in relation to the BEI (in baseline year) or a BAU reference scenario.

The use of a BAU scenario is the main novelty envisaged for the Eastern Pacific signatories of the CoM. It aims to allow those municipalities that are on a rapid economic growth path to develop their economies in a sustainable manner. It is therefore foreseen that such signatories will see their GHG emissions increase over the years, but it is expected that they will limit such increase as much as possible through the implementation of adequate energy policies and climate protection measures.

The signatories from the Eastern Partnership and central Asian countries have three options to set their GHG emissions reductions target, as indicated in the following table.

| 2020 target basis | GHG target reduction |
|----------------------|------------------------|
| BEI in baseline year | Absolute Per capita |
| 2020 BAU projection | Absolute |

- Setting the target on the basis of the BEI:
 - as an absolute reduction, compared to the overall emissions accounted in the BEI (referring to tonnes of CO₂ or tonnes of CO₂-equivalent (CO₂-eq.));
 - as a per capita reduction, compared to the total per capita emissions accounted in the BEI (referring to tonnes of CO₂ per capita or tonnes of CO₂-eq. per capita).

The per capita option allows signatories to take into account both a sharp decrease and a sharp increase in population within their territory. In case of a strong decrease in population over the years, the signatory is highly recommended to choose a per capita objective.

- Setting the target on the basis of a BAU scenario, calculated starting from the results of the BEI and foreseeing CO₂ emissions for the territory of the local authority in 2020 (referring to tonnes of CO₂ or tonnes of CO₂-eq.).

When preparing a BAU scenario, Eastern Partnership signatories have two options:

- develop their own approach, whose technical and scientific soundness will be analysed by the Joint Research Centre (JRC).

From open source information, several emissions projection tools and instruments for energy policy analysis and climate mitigation assessments are available. For example, the city of Tbilisi has developed its BAU scenario using the LEAP tool (Long range Energy Alternatives Planning System) ⁽²⁴⁾. However, each municipality is free to develop its own approach if human resources, and financial and technical capabilities allow for it.

- use the national coefficients developed by the JRC, and provided in the Part II of this Guidebook.

National coefficients for BAU projections, developed at the Institute for Environment and Sustainability (IES) of the JRC, can alternatively be used. These were developed using the Emission Database for Global Atmospheric Research (EDGAR) within the CIRCE project ⁽²⁵⁾.

²⁴ For more information, see *Long range Energy Alternatives Planning System: An Introduction to LEAP*, 2008 (<http://www.energycommunity.org/documents/LEAPIntro.pdf>).

²⁵ For more information, see:

- Doering, U.M., Janssens-Maenhout, G., van Aardenne, J.A., Pagliari, V., *Climate Change and Impact Research in the Mediterranean Environment: Scenarios of Future Climate Change*, CIRCE report D.3.3.1, IES report 62957, 2010.

The POLES method (Prospective Outlook for the Long term Energy Systems)⁽²⁶⁾ that considers energy consumption increase due to population and economic growth was also employed. Starting from present data, the BAU scenario projects the evolution of energy and emissions levels until 2020, under the hypothesis of continuing current trends in population, economy, technology and human behaviour, without the implementation of a SEAP or any other national or local policy measures (Janssens-Maenhout et al., 2012)⁽²⁷⁾. The table of national coefficients is provided in Part II of this Guidebook for each country (Table 8, Part II)⁽²⁸⁾. The signatories can select their national coefficient according to the chosen baseline year. The coefficient indicates the relative increase in GHG emissions between the baseline year and 2020. For example, in the case of Georgia, the coefficient is 1,66 when year 2005 is selected as the baseline year. This implies that to obtain a value for GHG emissions in the year 2020, the emissions in the baseline year (i.e., 2005) have to be multiplied by 1,66.

In other words:

$$Emissions_{co2}^{2020} = Emissions_{co2}^{2005} \cdot 1,66 \quad (1)$$

In general terms:

$$Emissions_{co2}^{2020} = Emissions_{co2}^{Base_line_year} \cdot K \quad (2)$$

Where: K is the coefficient from Part II of this Guidebook selected according to the chosen baseline year, $Emissions_{co2}^{Base_line_year}$ are the emissions in the baseline year.

More information about the BAU scenario can be found in Part II of this Guidebook.

The soundness of the BAU scenario should be monitored by the signatories themselves as well as by the JRC at least once before the year 2020. This is to allow for evaluation of the reliability of the principles on which basis the BAU projections were made. In the event that this assessment highlights a strong deviation between BAU predictions and the actual situation, the actions and measures foreseen by the SEAP should be revised and an adjustment of the political target might become advisable.

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- Pozzer, A., Zimmermann, P., Doering, U.M., van Aardenne, J., Tost, H., Dentener, F., Janssens-Maenhout, G., Lelieveld, J., 'Effects of business-as-usual anthropogenic emissions on air quality', *Atmos. Chem. Phys. Discuss.*, Vol. 12, 2012, pp. 8617–8676. doi:10.5194/acpd-12-8617-2012

²⁶ For more information on the POLES model, see Russ, P., Wiesenthal, T., van Regenmorter, D., Ciscar, J.C., *Global Climate Policy Scenarios for 2030 and beyond. Analysis of Greenhouse Gas Emission Reduction Pathway Scenarios with the POLES and GEM-E3 models*, JRC Reference report EUR 23032 EN (<http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=1510>).

²⁷ The BAU scenario was developed based on the energy consumption projections with an in-house European Commission model for energy-related activity increase. For more information related to the hypothesis assumed and the indicators taken into consideration when calculating the national coefficients, please refer to the JRC Report *An approach with a Business-as-Usual scenario projection to 2020 for the Covenant of Mayors from the Eastern Partnership*, 2012 (http://edgar.jrc.ec.europa.eu/com/JRC-IES_CoM-East_report_BAUprojections2.pdf).

²⁸ For more information on the elaboration of these coefficients, see <http://edgar.jrc.ec.europa.eu/com/index.php> online.

CHAPTER 6. ESTABLISHMENT OF A LONG-TERM VISION WITH CLEAR OBJECTIVES: STRATEGIES AND ACTIONS UNTIL 2020

6.1 The vision: Towards a sustainable energy future

A further step to undertake to make your municipality in line with the CoM's energy efficiency objectives is to establish a vision. The vision for a sustainable energy future is the guiding principle of the local authority's SEAP work. It points out the direction in which the local authority wants to head. A comparison between the vision and the local authority's current situation is the basis for identifying what action and development is needed to reach the desired objectives. The SEAP work is a systematic approach to gradually get closer to the vision.

The vision serves as the uniting component that all stakeholders can refer to; meaning everyone from leading politicians to citizens and interest groups. It can also be used for marketing the local authority to the rest of the world.

The vision needs to be compatible with the CoM commitments; that is, it should imply that the 20 % CO₂ emissions reductions in the 2020 target will be reached (at the minimum). But it could also be more ambitious than that. Some cities already plan to become carbon-neutral in the long run.

The vision should be realistic but still provide something new, add real value and break some old boundaries that do not have real justification any more. It should describe the desired future of the city and be expressed in visual terms to make it more understandable for citizens and stakeholders.

It is warmly recommended to involve stakeholders in the process to get more new and bold ideas and also to use stakeholder participation as the starting point of behavioural change in the city. Besides, stakeholders and citizens may provide a strong support to the process as they sometimes want stronger action than what other levels of government are prepared to support.

Example of a vision from local authorities

Polotsk, Belarus

'These days, the issue of energy efficiency and energy saving has become of crucial importance to us. Our people are now becoming more aware of what they, as citizens, can do in order to join the global fight against climate change, make their city a green and lovely place to live in, and save money — both from their own pockets and from the municipal budget. Thus, intentions of citizens and actions of the municipality are closely tied up. We wish energy efficiency and energy saving in our city to keep up with latest experiences and best practices that exist in Europe. The Sustainable Energy Action Plan is, in fact, the embodiment of how these state-of-the-art practices are applied in Polotsk in accordance with local needs of the city and its people. The Sustainable Energy Action Plan will help us to complement activities of the annual Energy Saving Plan with such important domains as work with population, land-use planning, etc.'

Rustavi, Georgia

'The vision of future of the city ... implies significantly recovered environment with new way of life with effective energy use, lots of parks and ecologically healthy infrastructure — improved roads, transport scheme and 'green ways'. What is the most important: the tendency of economic recovery shall continue after 2020 — on the basis of raised environmental awareness of the public and entrepreneurs, as well as acknowledgement of the vivid economic benefit of energy efficiency.'

6.2 Setting objectives and targets

Once the vision is well established, it is necessary to translate it into more specific objectives and targets for the different sectors in which the local authority intends to take action. These objectives and targets should be based on the indicators selected in the baseline review (see Section 5.2 of Part II of this Guidebook).

Such targets and objectives should follow the principles of the SMART acronym: Specific, Measurable, Achievable, Realistic, and Time-bound. The concept of SMART objectives became popular in the 1980s as an efficient management concept.

To set SMART targets, use the following guide:

1. **Specific** (well defined, focused, detailed and concrete) — ask yourself: What are we trying to do? Why is this important? Who is going to do what? By when do we need it done? How are we going to do it?
2. **Measurable** (kWh, time, money, %, etc.) — ask yourself: How will we know when this objective has been achieved? How can we make the relevant measurements?
3. **Achievable** (feasible, actionable) — ask yourself: Is this possible? Can we get it done within the timeframe? Do we understand the constraints and risk factors? Has this been done (successfully) before?
4. **Realistic** (in the context of the resources that can be made available) — ask yourself: Do we currently have the resources required to achieve this objective? If not, can we secure extra resources? Do we need to reprioritise the allocation of time, budget and human resources to make this happen?
5. **Time-Bound** (defined deadline or schedule) — ask yourself: When will this objective be accomplished? Is the deadline unambiguous? Is the deadline achievable and realistic?

6.3 Examples of SMART objectives ⁽²⁹⁾

| Type of instrument | Examples of SMART targets |
|-----------------------------|--|
| Energy performance standard | <p>S: Focus on specific product or product group</p> <p>M: Performance characteristics aimed for / set baseline</p> <p>A: Performance standard links to best available product on the market and is regularly updated</p> <p>R: Best available product is accepted by the target group</p> <p>T: Set clear target period</p> |
| Subsidy scheme | <p>S: Focus on a specific target group and on specific technologies</p> <p>M: Quantified energy savings target / set baseline</p> <p>A: Minimize freeriders</p> <p>R: Link the savings target to the available budget</p> <p>T: Link the energy savings target to a target period</p> |
| (Voluntary) Energy audit | <p>S: Focus on a specific target group</p> <p>M: Quantify the targeted audit volume (m², number of companies, % of energy use etc.) / set baseline</p> <p>A: Encourage to implement recommended measures, e.g. by offering financial incentives.</p> <p>R: Ensure that sufficient qualified auditors have been assigned and financial incentives are in place to carry out audits</p> <p>T: Link the quantified target to a target period</p> |

In practice, a potential SMART target could be: '15 % of the dwellings will be audited between 1/1/2010 and 31/12/2012'. Then, it is necessary to check every condition of being SMART. For example, the answer could be:

*'It is **Specific** because our action (energy audits) and target group (dwellings) is well defined. It is **Measurable** because it is a quantified target (15 %) and because we have a system in place to know the number of audits actually carried out. It is **Achievable** because there is a financial incentive scheme that allows people to be reimbursed and because we will organise communication campaigns about audits. It is **Realistic** because we have trained 25 auditors that are now well qualified, and we have verified that this number is sufficient. It is **Time-bound** because the time-frame is well defined (between 1/1/2010 and 31/12/2012).'*

²⁹ See <http://www.aid-ee.org/documents/SummaryreportFinal.PDF> (April 2007) online.

Some Tips

- ✓ Avoid putting 'raising awareness' as an objective. It is too big, too vague and very difficult to measure.
- ✓ Add the following requirements to the objectives:
 - understandable — so that everyone knows what they are trying to achieve;
 - challenging — so everyone has something to strive for.
- ✓ Define specific targets for 2020 for the different sectors considered and define intermediate targets (at least every four years, for instance).

ADDITIONAL RESOURCES

1. The European Sustainable Development Network publishes a study on (SMART) Objectives and Indicators of Sustainable Development in Europe. See http://www.sd-network.eu/?k=quarterly%20reports&report_id=7 online.

CHAPTER 7. SEAP ELABORATION AND MEASURES FOR KEY SECTORS OF ACTIVITY

7.1 Comprehensive measures that cover the key sectors of activity

The core part of the SEAP relates to the policies and measures that will allow signatories to reach the objectives that have been previously set (see Chapter 6 of Part I of this Guidebook on Establishment of a Long-Term Vision with Clear Objectives).

SEAP elaboration is only one step in the overall process and it should not be considered as an objective in itself, but rather as a tool that allows one to:

- outline how the city will look like in the future, in terms of energy, climate policy and mobility (the vision);
- communicate and share the plan with stakeholders;
- translate this vision into practical actions, assigning deadlines and a budget for each of them;
- serve as a reference during the implementation and monitoring process.

It is desirable to create a broad political consensus for the SEAP in order to ensure its long-term support and stability, regardless of changes in the political leadership. Discussions will be needed at the highest level to agree on the way in which stakeholders and political groups will be involved in SEAP elaboration.

Also remember that the work does not finish after drafting the SEAP and its formal approval. On the contrary, this moment should be the start of the concrete work of putting the planned actions into effect. A clear and well structured SEAP is essential for this (i.e. all actions should be carefully designed and properly described, with timing, budget, sources of financing and responsibilities, etc).

Some chapters of this Guidebook (section 7.2 on dealing with policies and measures applicable to a SEAP, as well as Part III of the Guidebook) will provide you with useful information in order to select and devise adequate policies and measures for your SEAP. Adequate policies and measures are dependent on the specific context of each local authority. Therefore, defining measures that are suited to each context is also highly dependent on the quality of the assessment of the current framework (see Chapter 4 on Assessment of the Current Framework).

Following is a list of recommended steps for drafting a successful SEAP.

- Make a prospective list of best practices

In addition to the resources on policies and measures provided in this Guidebook (see section 7.2 Policies and measures applicable to a SEAP), it may be useful to identify what best practices (successful examples) have delivered effective results in similar contexts in reaching similar targets and objectives to those set by the municipality, in order to define the most appropriate actions and measures. In this sense, joining a network of local authorities can be very helpful.

- Set priorities and select key actions and measures

Different kinds of actions and measures may contribute to the achievement of the objectives. Undertaking the entire list of possible actions will often surpass the current capabilities of the local authority, in terms of costs, project management capacities and other considerations or constraints. In addition, some of them may be mutually exclusive. This is why an adequate selection of actions within a given time horizon is necessary. At this stage, a preliminary analysis of the possible actions is necessary: what are the costs and benefits of each of them (even in qualitative terms)?

To facilitate the selection of measures, the local authority may rank the possible measures according to importance in a table summarising the main characteristics of each action: duration, level of required resources, expected results, associated risks, and so on. The actions may be broken down into short-term actions (3–5 years) and long-term actions (towards 2020).

Specific methods for the selection of priorities are available ⁽³⁰⁾. In simple terms, you should:

- define which criteria you want to consider for the selection of measures (investment required, energy savings, employment benefits, improved air quality, relevance to the overall objectives of the local authority, political and social acceptability, etc.);
- decide which what you give to each criterion;
- evaluate each criterion, measure by measure, in order to obtain a 'score' for each measure;

³⁰ See, for example, http://www.energymodel.eu/IMG/pdf/IL_6_-_Priorities.pdf online.

- if necessary, repeat the exercise in the context of various scenarios in order to identify the measures whose success is not scenario-dependent (see Chapter 3 on Building Support from Stakeholders and Mobilisation of Civil Society).

Such an evaluation is a technical exercise, but it definitely has a political dimension, especially when selecting the criteria and their respective weighting. Therefore, it should be carried out in a careful manner, and be based on relevant expert and stakeholders' opinions. It may be useful to refer to various scenarios (see Chapter 4 on Assessment of the Current Framework).

- Carry out a risk analysis ⁽³¹⁾

The selection of actions and measures should also be based on a careful estimation of the risks associated with their implementation (especially when significant investments are planned): how likely is it that an action fails or does not bring the expected results? What will be the impact on the objectives? And what are the possible remedies?

Risks can be of a different nature:

- project-related risks: cost and time overruns, poor contract management, contractual disputes, delays in tendering and selection procedures, poor communication between project parties, etc.;
- government-related risks: inadequate approved project budgets, delays in obtaining permissions, changes in government regulations and laws, lack of project controls, administrative interference, etc.;
- technical risks: inadequate design or technical specifications, technical failures, poorer than expected performance, higher than expected operation costs, etc.;
- contractor-related risks: inadequate estimates, financial difficulties, delays, lack of experience, poor management, difficulty managing nominated subcontractors, poor communication with other project parties, etc.;
- market-related risks: increases in wages, shortages of technical personnel, materials inflation, shortages of materials or equipment, variations in the prices of various energy carriers, etc.

Risks may be assessed using conventional quality management techniques. Finally, remaining risks have to be evaluated and either accepted or rejected.

- Specify the timing, clear responsibilities, budget and financing sources of each action

Once the actions have been selected, it is necessary to plan them carefully so that they can become a reality. For each action, specify:

- the timing (begin date and end date);
- the person/department responsible for implementation;
- the modality of financing. As municipalities' resources are scarce, there will always be competition for available human and financial resources. Therefore, efforts should continuously be made to find alternative sources of human and financial resources (see Chapter 8 on Financing Sustainable Energy Action Plans);
- the modality of monitoring: identify the kind of data that need to be collected in order to monitor the progress and results of each action. Specify how and by whom the data will be collected, and who will compile the findings. See Chapter 11 on Monitoring and Reporting Progresses for a list of possible indicators.

To facilitate implementation, complex actions could be broken down into simple steps, each of them having its own timing, budget, person responsible, and so on.

- Draft the SEAP

At this stage, all the information should be available to complete the SEAP. A suggested table of content is presented in Chapter 1.

- Approve the SEAP and its associated budget

Formal approval of the SEAP by the municipal council is a mandatory requirement of the Covenant. In addition, the local authority should allocate the necessary resources in the annual budget and whenever possible make commitments for the forward (3–5 year) planning budget.

³¹ Further information on risks and project management can be found in scientific literature. This information on risk management is based on Shen, L.Y., Platten, A., Deng, X.P., 'Role of public-private partnerships to manage risks in the public sector project in Hong Kong', *International Journal of Project Management*, Vol. 24, No 7, 2006, pp. 587–594.

➤ Perform regular SEAP reviews

Continuous monitoring is needed to follow SEAP implementation and progresses towards the defined targets in terms of energy savings/CO₂ emissions reductions, and eventually to make corrections. Regular monitoring followed by adequate adaptations of the action plan allows for the initiation of a continuous improvement cycle. This is the 'loop' principle of the project management cycle: Plan, Do, Check, Act. It is extremely important that progress is reported to the political leadership. SEAP revision could for example occur every second year, after the implementation report has been submitted (mandatory, as per the CoM commitments).

7.2 Choice of the key sectors of activity for the preparation of a relevant SEAP

The definition of the emissions inventories and knowledge of the local situation as well as of the future perspectives of the territory are essential for identification of the priority areas of intervention and the selection of relevant measures aimed at reducing CO₂ emissions within the territory. In principle, it is anticipated that most SEAPs will cover the so-called 'key sectors' that are taken into account within the inventory:

- municipal buildings, equipment/facilities;
- tertiary buildings, equipment/facilities;
- residential buildings;
- transport.

Nevertheless, the recommendation is to include all the sectors mentioned above and as many other relevant fields of action as possible, namely:

- local energy production and district heating;
- waste & wastewater treatment facilities (when present within the territory);
- public lighting;
- land-use planning;
- industry (if present within the territory);
- public procurement of products and services;
- working with citizens and stakeholders.

In particular, addressing district heating⁽³²⁾ and waste & wastewater treatment facilities (within the territory) is considered important for Eastern Pacific signatories. District heating and cogeneration reduce more emissions of particulates and other local or regional pollutants such as nitrogen oxides and sulphur dioxide compared to individual heating units because the former tend to be much more efficient⁽³³⁾. In addition, it is usually much less expensive and more practical to reduce or capture emissions at central heating plants than in small boilers in individual homes. Emissions from the decomposition of organic waste (including sewage and residual waters) involve the release of biogas that contains highly emitting gas — methane (CH₄). Therefore, biogas recovery is a good opportunity to contribute to the reduction of GHG emissions. Further information on technical measures can be found in Part II of this Guidebook.

³² A relevant document on district heating is *COMING IN FROM THE COLD: Improving District Heating Policy in Transition Economies*, available at <http://www.iea.org/> online. Published by the International Energy Agency, this report aims to help governments design policy approaches that can effectively address the key challenges facing the district heating sector: more efficient, environmentally friendly district heating. It provides a recommendations on supply and demand policy sequencing, highlights steps to be taken for better regulation or for introducing the competition.

³³ See *COMING IN FROM THE COLD: Improving District Heating Policy in Transition Economies*, published by the International Energy Agency (<http://www.iea.org/>).

ADDITIONAL RESOURCES

1. The JRC published a review of existing methodologies and tools for the development and implementation of SEAPs in European municipalities (http://re.jrc.ec.europa.eu/energyefficiency/pdf/CoM/Methodologies_and_tools_for_the_development_of_SEAP.pdf).
2. In 2006, Climate Alliance developed a 'Compendium of Measures' helping to develop a climate change strategy at the local level. Local authorities have the possibility to choose a set of measures in those fields they are more interested in and decide on the level of ambition (that will help to define the indicators of achievement) for each field (http://www.climate-compass.net/fileadmin/cc/dokumente/Compendium/CC_compendium_of_measures_en.pdf). There are also case studies based on the different areas of action relevant to the SEAP (<http://www.climate-compass.net/cases.html>).

7.3 Policies and measures applicable to your SEAP

The CoM concerns action at the local level within the competence of the local authority. This section provides suggestions and examples of policies and measures that can be adopted by the local authority in order to reach the SEAP's objectives. It concentrates on 'policy' actions that will generally deliver CO₂/energy savings over the longer term; for example, via subsidies, regulations and information campaigns.

The establishment of the baseline review (Chapter 4), and in particular knowledge of the share of the various economic sectors in the total CO₂ emissions, will help the municipality to define priorities and select relevant measures in order to cut CO₂ emissions. As the share of emissions per sector is specific for each city, three different examples are presented below.

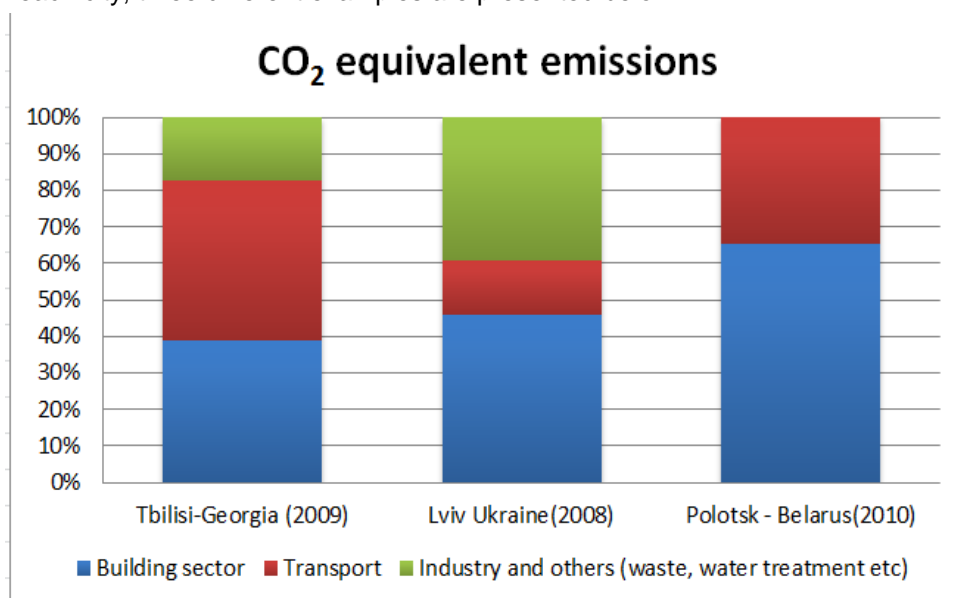


Figure 1 The share of CO₂ emissions per sector for Tbilisi, Lviv and Polotsk Source: information extracted from values of the climate Action Plans of Tbilisi, Lviv and Polotsk.

Policies and measures aimed at reducing CO₂ emissions at the local level can be categorised in different ways, for example:

- the sectors addressed (residential, industry, transport, etc.);
- whether they are addressed by the local administration itself or not;
- the type of instrument used (financial support, regulation, communication and information, demonstration, etc.);
- the type of impact on the energy consumption and production patterns: energy efficiency of equipment, buildings, cars, etc., more rational behaviour (e.g. turning off lights, increased usage of public transport), cleaner energy (e.g. use of renewable energies, biofuels).

This section provides information on policies related to the key target sectors of the Covenant: buildings and transport, usage of renewable energies and CHP, and covers the key fields of action: land-use planning, public procurement, working with citizens, and information and communication technologies (ICT). Several practical examples of policies and measures adopted by European municipalities as well as links to relevant initiatives (in Europe and beyond) are also provided as they might be inspirational for other cities in the development of their SEAPs.

Some references to the European regulatory framework are made throughout the chapter as they are of specific interest for Moldova and Ukraine. Being members of the Energy Community (EnC)⁽³⁴⁾, these countries have to integrate three directives⁽³⁵⁾ into their national legislations.

ADDITIONAL RESOURCES

1. A study carried out for the European Commission and coordinated by the Fraunhofer Institute provides information on energy-saving potentials in various sectors (2009). See

³⁴ More information on the EnC can be found at http://www.energy-community.org/portal/page/portal/ENC_HOME_online.

³⁵ Directive 2006/32/EC, Directive 2010/31/EC and Directive 2010/30/EC.

http://ec.europa.eu/energy/efficiency/studies/doc/2009_03_15_esd_efficiency_potentials_final_report.pdf online.

2. The AID-EE project provides guidelines for the monitoring, evaluation and design of energy-efficiency policies (2006). See

<http://www.aid-ee.org/documents/000Guidelinesforthemonitoringevaluationanddesign.PDF> online.

3. The AID-EE project also provides information on the overall impact assessment of current energy-efficiency policies and potential 'good practice' policies (2007). See

http://www.aid-ee.org/documents/WP5_AID-EE_Final_000.pdf online.

7.3.1 Buildings sector

Buildings are responsible for 40 % of total EU energy consumption and are often the largest energy consumer and CO₂ emitter in urban areas. Therefore, it is crucial to devise efficient policies addressing emissions associated with energy consumption in this sector.

The policies and measures allowing for the promotion of energy efficiency and renewable energies in buildings depend on the type of buildings, their usage, age, location, ownership (private/public, etc.), and if the building is an existing one or in project-phase. For example, historic buildings may be protected by law, so the number of options to reduce energy consumption is quite restricted.

The main energy usages in buildings are: maintaining an adequate indoor climate (heating, cooling, ventilation and humidity control), lighting, production of sanitary hot water, cooking, electrical appliances and elevators.

Key factors that affect energy consumption in buildings are the following:

- performance of the building envelope (thermal insulation, building tightness, surface and orientation of the glazed surfaces, etc.);
- behaviour (how we use the buildings and its equipment in our day-to-day life);
- efficiency of the technical installations;
- quality of the regulation and maintenance of the technical installations (are the technical installations managed and maintained in such a way as to maximise their efficiency and minimise their overall usage?);
- ability to benefit from heat gains in the winter and limit them in the summer (appropriate summer comfort strategy);
- ability to benefit from natural lighting;
- efficiency of electrical appliances and lighting.

Recourse to RES will not result in a reduction of energy consumption, but will ensure that the energy used in the building has a lower impact on the environment.

In this section, we first provide policy suggestions applicable at the local level to the buildings sector as a whole. In Part III of the Guidebook, we provide specific considerations related to different situations: new buildings, existing buildings, public buildings, historical buildings and others. The technical measures that can be implemented to increase the efficiency of buildings are also described in Part III of this Guidebook.

The Energy Performance of Buildings Directive (2010/31/EC) is a key regulatory instrument that is meant to boost the energy performance of the building sector. We suggest the local authorities get informed about the specific rules that apply in their country, and take maximum advantage of those aimed at improving the performance of their building stock (e.g. local authorities could make use of the standards developed at national/regional level to impose more stringent energy performance requirements than those applicable at national/regional level — this will be developed below).

Following are some suggestions of policies that can be implemented at the local level in order to boost energy efficiency and renewables in buildings ⁽³⁶⁾. For more examples, please refer to Annex III.

Regulations for new/renovated buildings:

- Adopt stricter global energy performance standards than those applicable at national/regional level, especially if such standards are not particularly demanding. Depending on the national/regional regulatory context, local authorities may be able to adopt such standards in their urban planning rules and regulations. Global energy performance standards leave many options open to building designers to choose how they will reach the objectives set. In principle, architects and building designers should be familiar with those norms, as they apply to the entire national/regional territory. Generally, fewer options exist to reduce energy consumption with

³⁶ USAID — Energy Efficiency in Buildings in Tajikistan. The project aims at demonstrating the potential of RES and EE technologies for improved heating services in the urban residential sector of Tajikistan <http://www.carecnet.org/>

refurbishments than for new buildings; therefore, the requirements are generally less stringent. Eventually they may be adjusted according to the building's characteristics.

- Adopt specific standards for building components (thermal transmittance of the envelope, of windows, efficiency of the heating system, etc.). This option has the advantage of being simple to understand and guarantees the minimal performance of the components, even if the overall performance cannot be achieved.
- Impose the inclusion of some components that will help to improve the energy efficiency (shading devices, presence of meters that record the energy consumption, heat recovery devices for mechanical ventilation, etc.). This can be done as a general rule that would apply to all new buildings, or could be imposed on a case-by-case basis, according to a building's characteristics (e.g. impose the installation of shading devices for buildings with a significant glazing surface oriented towards the south).
- Impose a certain quantity of renewable energy production/usage, in particular in public buildings.
- Adopt energy performance standards for renovation works that are not considered as 'major renovation' by national/regional law, and for which no energy performance standards apply.

Enforcement of regulations:

- Ensure that the energy performance standards are respected in practice and apply penalties if necessary. It is recommended to adopt both 'on paper' and 'on site' verifications. The presence of a representative of the authority at some point during construction/renovation works will clearly show that the authority is taking the regulations seriously, and will help to improve the practices of the construction sector at the local level.

Financial incentives and loans:

- The local authority could complement the financial support mechanisms existing at national or regional levels with extra financial incentives for EE or RES. Such a scheme could focus on the global energy performance of buildings (e.g. the incentive could be proportional to the difference between a minimal threshold of energy performance, calculated according to the existing national/regional standards, and the level of performance actually achieved), or could be used to support specific techniques that the local authority would consider of particular relevance for new buildings, considering its own context and objectives (thermal insulation, RES, etc.). The latter option is particularly relevant for renovated buildings, for which the precise calculation of overall energy performance is generally less easy than for new buildings. Ideally, the financial incentive would cover (part of) the difference between the cost of 'standard construction work' and a construction/renovation that is considered as energy efficient.
- In addition, the local authority could provide financial support for the purchase of energy efficient equipment that allows the reduction of energy consumption of buildings (efficient light bulbs, efficient appliances, etc.).
- Although financial incentives do reduce the cost of investment related to EE, investors (either citizens, private companies, etc.) still have to face up-front payments. To facilitate the access to capital, the local authority may liaise with local banks and financial institutions so that low-interest loans are available for EE or RES.

Even if the budgets that the local authority can devote to such subsidies is not immense, they could still make a great difference in terms of citizens' motivation: with proper communication, such subsidies could be seen as a clear sign that the local authority is willing to achieve success in the field of energy and climate policy, and that it is willing to support its citizens in this direction.

Information and training:

- Make the relevant stakeholders (architects, building developers, construction companies, citizens, etc.) aware of the new energy performance requirements for buildings, and provide them with some motivating arguments (the savings on the energy bills can be highlighted, as well as the benefits in terms of comfort, environmental protection, etc.).
- Inform the general public and key stakeholders about the importance and benefits of behaviour favouring the reduction of energy consumption and CO₂ emissions.

- Involve local companies: they may have an economic interest in the EE and renewable energy business.
- Inform stakeholders about the resources available. For example, where can the information be found, what are priority measures, who can provide proper advice, how much does it cost, how can households do proper work by themselves, what are the tools available, who are the local competent architects and entrepreneurs, where can the necessary materials be purchased locally, what are the available subsidies? This could be done via info days, brochures, an information portal, an information centre, a helpdesk and other means.
- Organise specific info and training sessions for the architects, workers and construction companies: they must become familiar with the new design and construction practices and regulations. Specific training could be organised to cover basic issues (basic building thermal physics, how to properly install thick insulation layers) or more specific issues that are often neglected (thermal bridges, building air tightness, natural cooling techniques, etc.).
- Make sure the tenants, owners and managers of new and renovated buildings are informed about the building's features: what makes this building energy efficient, and how to manage and operate the equipment and facilities offered in order to obtain good comfort and minimise the energy consumption. All the technical information needs to be passed on to technicians and maintenance companies.

Promote successes:

Encourage people to build efficient buildings by offering them recognition. For example, buildings significantly above the legal standards of energy performance could be made visible by, among other means, a label, open day visits, an exhibition at the town hall, an official ceremony and signposting on the local authority's website. The energy performance certificate, which is a requirement of the Energy Performance of Buildings Directive (see above), could be used for this purpose (e.g. the local authority could organise a contest for the first 'Label A' buildings built in the municipality). Other standards can be used as well, such as 'passive house' standard.

Demonstration buildings:

Demonstrate that it is feasible to build energy-efficient buildings or to make renovation with high-energy performance standards. Show how it can be done. Some high-performance buildings could be open to the public and stakeholders for this purpose. It does not necessarily need to be a high technology building — the most efficient ones are sometimes the simplest ones: the problem with EE is that it is not always quite visible (think about thick insulation, for example). However, listening to the owner and the occupants talking about their experience, their reduced energy bills, their improved comfort and other advantages should already be worthwhile. Visits during construction stage could be interesting for training and educational purposes for construction companies and architects.

Promote energy audits:

Energy audits are an important component of EE policy as they enable identifying, for each audited building, the best measures allowing for the reduction of energy consumption. Therefore, the local authority could promote such audits via the dissemination of proper information, ensuring the availability of competent auditors (training, etc.), providing financial support for audits and other means (see Part III of this Guidebook for more information on energy audits).

Urban planning:

As explained in the dedicated section, urban planning is a key instrument to boost and plan refurbishments. In addition to setting energy performance standards, as mentioned above under 'regulation', urban regulations should be devised in such a way as not to deter EE and RES projects. For instance, long and complex authorisation procedures to install solar panels on the roofs of existing buildings will be a clear obstacle to RES promotion and should be avoided.

Increase the rate of refurbishment:

By accelerating the rate of buildings undergoing energy efficient refurbishments, the impact of the above measures on the energy and CO₂ balance will increase. Some of the above

measures, and in particular urban planning, financial incentives, loans or information campaigns about the benefits of energy efficient renovations, are likely to have such an effect.

Energy taxes:

Higher energy prices generally increase awareness and motivation towards energy savings. If the local authority has the legal power to do so, it may decide to levy taxes on energy. However, the social consequences of such a measure should be evaluated and debated thoroughly before such a decision is made. In addition, an adequate communication plan should be devised to ensure citizens understand and adhere to such a policy. The question related to the usage of tax revenues should also be dealt with in a very transparent manner (e.g. financing an EE support fund, financial compensation for vulnerable citizen groups, etc.).

Coordinate policies with other levels of authority:

A number of policies, instruments, tools in the field of EE of buildings and RES exist at regional and national levels. We recommend that the local authority has a good view of these, in order to avoid duplication, and to take maximum advantage of what already exists.

Some recommendations for public buildings:

Management of public buildings: a local authority often has control over a large number of buildings. Therefore, a systematic approach is recommended in order to ensure a coherent and efficient energy policy covering the entire building stock over which the local authority exercises control. Such an approach could:

- identify all buildings and facilities owned/managed/controlled by the local authority;
- collect energy data related to those buildings and set up a data management system;
- classify the buildings according to their energy consumption, both in absolute values and per square metre or other relevant parameters like: number of pupils for a school, number of workers, number of users for libraries and swimming pools, etc.;
- identify buildings that consume the most energy and select them for priority action;
- prepare an action plan (part of the SEAP) in order to progressively reduce the energy consumption of the building stock;
- nominate someone in charge of implementation of the plan!;
- verify that the commitments and obligations of the contractors, in terms of EE, are met in practice and apply penalties if this is not the case. Onsite verifications during construction are advisable (e.g. thick insulation that is not adequately placed will not be very efficient);
- recycle the savings: if the local authority's financial rules allow doing so, savings obtained through simple and low-cost measures could be used to finance larger EE investments (e.g. revolving funds; for further details see Chapter 8).

Table 3. Relevance of the policies exposed in this Guidebook related to different buildings' situations

| Policy instruments at the disposal of the local authority | Private buildings | | | Public buildings | | |
|---|-------------------|-----------|----------|------------------|-----------|----------|
| | New | Renovated | Existing | New | Renovated | Existing |
| Energy performance regulations | X | X | - | + | + | - |
| Financial incentives and loans | X | X | + | + | + | - |
| Information and training | X | X | X | X | X | X |
| Promote successes | X | X | + | X | X | + |
| Demonstration buildings | X | X | - | X | X | - |
| Promote energy audits | - | X | X | - | X | X |
| Urban planning and regulations | X | + | - | X | + | - |
| Increase the rate of refurbishment | - | X | - | - | X | - |
| Energy taxes | + | + | + | + | + | + |

| | | | | | | |
|---|---|---|---|---|---|---|
| Coordinate policies with other administration | X | X | X | X | X | X |
|---|---|---|---|---|---|---|

X = most relevant

+ = somehow relevant

- = low relevance

7.3.2 TRANSPORT ⁽³⁷⁾

As the number of vehicles is expected to grow in the coming years, national governments are becoming more and more aware of the need to devise specific measures in order to limit energy consumption in the transport sector. To this end, they have adopted regulations or plans that in some cases also address urban mobility.

Before the local authority proposes specific policies and measures concerning transport, an in-depth analysis of the local current situation is highly recommended. The actual means of transport and the possible connections or synergies with different means of transport must be well matched with the geographic and demographic features of the city and with the possibilities to combine different types of transport.

Effective, Sustainable Urban Transport Planning (SUTP) ⁽³⁸⁾ requires a long-term vision to plan financial requirements for infrastructure and vehicles, to design incentive schemes to promote high-quality public transport, safe cycling and walking, and to coordinate with land-use planning at the appropriate administrative levels. Transport planning should take into account safety and security, access to goods and services, air pollution, noise, GHG emissions and energy consumption, and land use, as well as cover passenger and freight transportation and all modes of transport. Solutions need to be tailor-made, based on wide consultation with the public and other stakeholders, and targets must reflect the local situation. This chapter aims to offer different possibilities to municipalities to build their own SUTP.

1. Reducing the need for transport ⁽³⁹⁾

Local authorities have the possibility to reduce the needs for transport. Following are some examples of policies to be implemented locally.

- Providing door-to-door access choices across the urban agglomeration. This objective may be reached through an appropriate combination of less flexible means of transport for long and medium distances and other more flexible means, such as bike hiring for short distances.
- Making efficient use of space, promoting a 'compact city' and targeting the urban development towards public transport, walking and cycling.
- Strengthening the use of ICT. Local authorities have the opportunity to use ICT to implement online administrative procedures and avoid the transport of citizens to fulfil their obligations with public administrations.
- Protecting existing short routes in the network in order to diminish the energy consumption of those less efficient or more necessary means of transport (i.e. massive public transport).

2. Increasing the attractiveness of 'alternative' transport modes

Increasing the modal share for walking, cycling and public transport can be achieved through a wide variety of plans, policies and programmes.

As a general principle linked to transport policies, managing the overall offer and demand of transport is essential to optimise the use of infrastructure and transport systems. This allows for making compatible the different means of transport such as bus, train, tramway and underground to take advantage of each one and avoid unnecessary overlapping.

Public transport

Increasing the modal share for public transport requires a dense network of routes that meets the mobility needs of people. Before implementing any transport policy, the local authority should

³⁷ For further information on the transport sector in Transport Research Knowledge Centre (TRKC), see <http://www.transport-research.info> online. The project was funded by the European Commission's Directorate-General for Energy and Transport (DG TREN) under the Sixth Framework Programme (FP6) for Research and Technological Development.

This chapter is based on the document *Expert Working Group on Sustainable Urban Transport Plans* provided by the International Association of Public Transport (UITP). See <http://www.uitp.org> online.

³⁸ For further information about SUTPs, see http://ec.europa.eu/environment/urban/urban_transport.htm online. In addition, the webpage http://ec.europa.eu/environment/urban/pdf/transport/2007_sutp_annex.pdf provides an important amount of information concerning local transport policies and good practices in several European cities.

³⁹ This paragraph has been developed using information from the Moving Sustainably Project that contains an interesting methodology aimed at implementing SUTPs. Further information is available at <http://www.movingsustainably.net> where it is possible to find a methodology to develop SUTPs.

determine the reasons/factors in why citizens/businesses are NOT using public transport. Therefore, it is essential to identify barriers to public transport use. Some examples (⁴⁰) of such barriers to bus use are:

- inconvenient stops and inadequate shelters;
- difficulty in boarding buses;
- infrequent, indirect and unreliable services;
- lack of information on services and fares;
- high cost of fares;
- long journey times;
- lack of practicability of connections between different modes of transport;
- fear of crime, particularly at night.

To increase the share of public transport among citizens, the local authority could implement the following measures:

- Develop a set of indicators measuring the access to public transport of citizens. Perform a comprehensive analysis of the current situation and adopt corrective actions to improve these indicators. The network should be attractive and accessible for all communities of interest and ensure that stops are sited within walking distance from key residential, commercial and tourist centres.
- A marketing strategy and service information availability should be integrated across public transport modes within 'travel to work' urban areas. The use of marketing enables a permanent improvement in all customer relations activities like sales, advertising, branding, network design, product (public transport) specifications, complaint management and customer service.
- Promote collective transport programmes for schools and businesses. This requires a forum with companies, unions and consumer associations in order to identify their needs, share the costs of the service and maximise the number of citizens with access to public transport.
- Provide an integrated public transport information service through a call centre, information centres, 24 hour information points and the Internet.
- Services need to be reliable, frequent, cost- and time-competitive, safe to use and perceived by the public as such. Therefore, an important communication effort is necessary to inform users about the advantages of using public transport with respect to other means of transport.
- Information about services needs to be 'real-time', widely available and include predicted arrival times (for arriving passengers, it is also possible to give information about connections). For example, displays may give passengers a countdown in minutes until the arrival of the next bus, as well as showing the stop name and current time.
- 'Public transport only' and priority routes will be essential policies. This will reduce travel time, which is one of the factors most considered by users when choosing among the different means of transport. Spatial planning should deliver the required loading factors to allow public transport to compete with car transport.
- Work in partnership with the district councils and others to ensure a high standard of provision and maintenance of the public transport infrastructure, including bus shelters and improved facilities at bus and rail stations.
- Create a suggestion box to consider the ideas of users and non-users in order to improve your service. Consider the possibility of creating a 'transport charter' according to the specific needs of a group of users.
- Create a Free Tourist Shuttle System with a fixed route and stops at a variety of popular tourist destinations. This would eliminate vehicle trips and parking spaces at popular destinations and provide an easy transportation alternative for tourists who are uncomfortable with a complex transit schedule.

It is important to keep in mind that choices are occasionally based on comparisons between public transport and car use. For instance, some actions aimed at increasing the share of public transport are not only linked to the measures undertaken in this sector, but also in other areas such as reducing the use of cars (e.g. public parking pricing policy). The monitoring results of public transport may be a valuable indicator to know the effectiveness of some policies mentioned in this chapter.

⁴⁰ These reasons exposed as an example stem from the document *Lancashire Local Transport Plan 2008-2010*, which can be downloaded at <http://www.lancashire.gov.uk/environment/> online.

Cycling ⁽⁴¹⁾

Increasing the modal share for cycling also requires a dense network of well maintained routes that are both safe to use and perceived by the public as such. Spatial and transport planning should treat cycling as an equal mode of transport, along with cars and public transport. This means reserving the space that is necessary for the 'cycling infrastructure', direct connections and ensuring continuity with attractive and secure cycle parking facilities at transport hubs (train and bus stations) and workplaces. Infrastructure design should ensure that there is a hierarchy of routes that are safe, attractive, well lit, signposted, maintained all year round, and integrated with green space, roads and the buildings of urban areas.

The international transport forum ⁽⁴²⁾ (Organisation for Economic Co-operation and Development (OECD)) has identified seven key policy areas ⁽⁴³⁾ in which authorities can act to promote cycling.

- Image of cycling: it is not only a leisure/sport activity but also a means of transport.
- Infrastructure: an integrated network of cycling paths connecting origins and destinations, and separate from motorised traffic, is essential to promote cycling.
- Route guidance and information: information such as number or colour of the cycling ways and distances in order to make them easy for cyclists to follow.
- Safety: approve standards for safe driving and avoid the mixture of bicycles and other heavy means of transport.
- Links with public transport: develop parking facilities at railway stations or tramway/bus stops. Rent bicycles at public transport and railway stations.
- Financial arrangements for cycling infrastructure should be considered.
- Bicycle theft: prevent theft by imposing electronic identification bicycles and/or the realisation of a national police registration for stolen bicycles ⁽⁴⁴⁾.

It is also recommended to increase Workplace Shower Facilities for cyclists. Facilitate bicycle commuting by requiring new developments to provide shower and changing facilities, and/or offer grant programmes for existing buildings to add shower facilities for cyclists.

The City of Lviv (Ukraine) is working to enhance its cycling infrastructure and to facilitate the use of bicycles. The aim is to increase the share of citizens using the bicycle as a regular transport mode ⁽⁴⁵⁾. To this end, a systematic approach has been adopted and covers:

- a working group composed of representatives of the city administration, of planning and design institutes, of NGOs and of other stakeholders meets regularly to initiate projects and activities and to monitor progress;
- the City Council approved a City Plan in 2010, followed by an Implementation Plan adopted by the Executive Committee of the city of Lviv: the Implementation Plan sets the target of 270 km of cycling infrastructure to be built by 2019;
- a cycling advisor has been appointed to coordinate and motivate the various actors towards successful implementation of the project;
- technical recommendations have been drafted and are continuously updated;
- the Council is actively pursuing additional funds;
- thanks to the support of NGOs and other partners, citizens' awareness is raised through specific activities.

⁴¹ More information about cycling policies, increasing bicycle use and safety, by implementing audits in European cities and regions, can be found on the ByPad project webpage <http://www.bypad.org> and at <http://www.astute-eu.org> online. Information on mobility management can be found at <http://www.add-home.eu> online. All these projects are supported by Intelligent Energy Europe. *National Policies to Promote Cycling*, OECD (<http://www.internationaltransportforum.org/europe/ecmt/pubpdf/04Cycling.pdf>).

⁴² See <http://www.internationaltransportforum.org> online. and <http://www.oecd.org/environment/greening-transport/>

⁴³ See <http://www.internationaltransportforum.org/europe/ecmt/pubpdf/04Cycling.pdf> online for *National Policies to Promote Cycling*, OECD — this document is addressed to national authorities, but most of the policies proposed in this document may be used or adapted by local authorities.

⁴⁴ Policies implemented by the Dutch Ministry of Transport, Public Works and Water Management. *National Policies to Promote Cycling*, OECD.

⁴⁵ More information can be found at <http://www.mobilnist.org.ua/en/velolev.html> online.

Walking

As previously stated for *Cycling*, increasing the modal share for walking requires a dense network of well maintained routes that are both safe to use and perceived by the public as safe to use. Spatial planning should reserve the space that is necessary for the 'walking infrastructure' and ensure that local services are sited within walking distance from residential areas.

Many urban areas have produced design manuals that provide detailed specifications for the practical tools and techniques that deliver high-quality, walking-friendly urban environments. Examples of such environments are 'pedestrian only zones' and 'low-speed zones' with lower vehicle speed limits that allow pedestrians and cars to safely share the same space. In these areas pedestrians always have priority over cars.

3. Making travel by car less attractive ⁽⁴⁶⁾

Walking, cycling and public transport can become more attractive alternatives if car travel becomes more difficult or expensive. Disincentives include:

Pricing ⁽⁴⁷⁾

By making car drivers pay a fee for driving in the city (centre), drivers can be charged some of the social costs of urban driving, thus also making the car a less attractive option. Experience from local authorities that implemented congestion charges shows that they can reduce car traffic considerably and boost the use of other transport modes. Pricing can be an effective instrument to reduce congestion and increase accessibility for public transport.

Parking management

Parking management is a powerful tool for local authorities to manage car use. They have several tools to manage parking such as pricing, time restrictions and controlling the number of available parking spaces. Parking time restriction for non-residents, for example, to two hours, is a proven tool to reduce commuting by car without affecting accessibility to urban shops.

The number of parking spaces is sometimes regulated by the local building act, demanding a certain number of parking spaces for new developments. Some local authorities have building regulations whereby location and accessibility by public transport influence the number of parking spaces allowed. Adequate pricing of urban parking lots is another important tool with similar potential to influence urban driving as congestion charging.

These types of actions should be done with the support of technical and social studies aimed at ensuring equal opportunities among the citizens.

4. Information and marketing

Local marketing campaigns that provide personally tailored information about public transport, and walking and cycling alternatives have been successful in reducing car use and increasing levels of public transport use. These campaigns should also use arguments of the health and environmental benefits provided by walking and cycling.

Information about how to start a campaign and where sources of information can be found are available in the report *Existing methodologies and tools for the development and implementation of SEAP on methodologies collection (WP1)*. The full version of this document can be downloaded from the Institute for Energy and Transport ⁽⁴⁸⁾ webpage. As an example of a successful awareness campaign, the European Commission's Directorate-General for Energy (DG ENER) organises every year the European Sustainable Energy Week (<http://www.eusew.eu>).

5. Reduce municipal and private vehicle fleet emissions

Municipal and private vehicles' emissions reductions may occur by using hybrid or other highly efficient technologies, the introduction of alternative fuels and promoting efficient driving behaviour.

⁴⁶ Measures aimed at making travel by car less interesting should be developed at the same time as those aimed at offering better alternatives to users. In order to avoid negative consequences, these types of measures should be debated and planned thoroughly.

⁴⁷ Further information on urban road user charging may found on the CURACAO — Coordination of Urban Road User Charging Organisational Issues — project webpage (<http://www.curacaoproject.eu>). This project has been funded by the European Commission through the FP6.

⁴⁸ See <http://iet.jrc.ec.europa.eu/energyefficiency/> online.

Among the main uses of green propulsion in public fleets are the following:

- Use hybrid or totally electric vehicles in public fleets. These types of vehicles use a fuel motor (hybrid vehicles) and an electric engine whose aim is the generation of power for motion. The electricity to be supplied to the vehicles is stored in batteries that can be recharged either by plugging the car into the electrical grid or producing the electricity on board, taking advantage of braking and the inertia of the vehicle when power is not demanded. Make use of fully electric vehicles in public transport and recharge them with renewable electricity.

According to the European Commission Directive 93/116/EC relating to the fuel consumption of motor vehicles, CO₂ emissions for two equivalent vehicles (combustion and hybrid) can be reduced by 50 % (for instance from 200 g/km to 100 g/km) ⁽⁴⁹⁾.

- Use biofuels in public fleets and make sure that vehicles acquired through public tenders accept the use of biofuels. The most common biofuels that can be supplied by the market are biodiesel, bioethanol and biogas. Biodiesel and bioethanol can be used in mixes in diesel and gasoline engines, respectively, whereas biogas can be used in natural gas vehicles (NGVs).

The use of biofuels in vehicles, according to the 2009/28/EC Directive, will reduce GHG emissions in the range of 30–80 % in comparison with fossil fuels over the entire vehicle life cycle. These values collected from the Directive's Annex V correspond to the case in which biofuels are produced with no net carbon emissions from land-use change.

- Like battery electric cars, if produced from renewable sources, hydrogen fuel cell vehicles generate virtually zero CO₂ emissions over the entire fuel pathway from production to use. Again, like charging electric cars, hydrogen will require the installation of new distribution and refuelling infrastructure. Public fleets are ideal applications as fleet vehicles typically return to a central base for garaging, fuelling and maintenance. Hydrogen buses and delivery vans are of special interest to cities, due to their zero emissions (ultra-low if combustion engines), low noise, extended operating range and comparable refuelling times in relation to diesel buses. Demonstrations have proved high levels of reliability and public acceptance. Development efforts continue with a view to further improving performance, durability and reducing lifetime costs.
- Promote low fuel consumption, hybrid and electric vehicles through a low taxation regime. This can be done dividing vehicles into different categories according to the priorities of the local authority.

In its Vehicles' Fiscal Ordinance, Madrid's City Council applies reductions of 50 %, 30 %, 20 % and 15 % the first 4 years to small cars and a 6 years' 75 % tax discount to hybrid vehicles. When the vehicle is fully electric, this 75 % discount is extended to its whole life.

These more energy-efficient vehicles can also be promoted by local authorities through the application of local incentives, such as:

- free parking;
- test fleet (companies can borrow an alternative fuelled vehicle for a week to try out the new technology, the efficiency, the refuelling, etc.);
- special lanes for alternative vehicles;
- access to city zones with restrictions for high-GHG-emitting cars — for example, cultural city centres and environmental zones;
- no congestion charges for clean vehicles;
- some examples of national incentives are tax reductions on fuel and on vehicles, and regulations that favour the use of alternative vehicles by companies;
- 'Environmental Loading Points' adjacent to pedestrian areas only open for alternative vehicles.

Efficient driving behaviour may reduce cars' GHG emissions up to 15 %. The European project ECODRIVEN (<http://www.ecodrive.org>) provides good practices for drivers. In the framework of the 2006/32/EC Directive, some European countries have through their National Energy Action Plans signed agreements with driving schools in order to spread the knowledge of efficient driving practices to citizens. Some of these training courses are not only addressed to car drivers, but also to truck drivers.

6. Smart transport

⁴⁹ Further information on car emissions can be found at <http://www.vcacarfueldata.org.uk/index.asp> and <http://www.idae.es/coches/> online.

Urban traffic control systems are a specialised form of traffic management that integrate and coordinate traffic signal control. The primary purpose of urban traffic control is to optimise overall traffic performance in accordance with the traffic management policies of the local authority. It uses the signal settings to optimise parameters such as travel time or stops.

Urban traffic control systems are either fixed-time, using programmes such as TRANSYT, or real-time, such as SCOOT⁽⁵⁰⁾. Widespread experiments have demonstrated the benefits of such systems; that is, efficiency gains improve the environment, queues and safety, with typical reductions in accidents of the order of 10 %. However, it is important to bear in mind that the potential for these benefits may be eroded by induced traffic.

In addition, the control systems may be used for the regulation of priorities of different interest groups such as pedestrians, cyclists, disabled persons or buses. For instance, these control systems can distinguish whether a bus is on time or late and to what degree. Depending on this analysis, the priorities of traffic regulation will be readjusted in order to minimise delays and make public transport by bus more effective.

Another possibility offered by control systems in big cities is 'Ramp Metering', which consists of a traffic management tool that regulates the flow of vehicles joining the motorway during busy periods. The aim is to prevent or delay the onset of flow breakdown. Benefits include ease of congestion and improvement in traffic flows, higher throughput during peak periods, smoother, more reliable journey times and improved energy consumption.

Tbilisi: In order to reduce traffic congestion, Tbilisi City Hall has introduced the Green Wave system at Pekini Avenue, allowing for an uninterrupted stream of vehicles through six intersections: before, around 2 100 cars per hour had to stop at 4 out of 6 different intersections. After the introduction of a new system, around 800 cars have to stop at only two intersections, thus increasing the speed of the traffic flow and reducing the amount of fuel used by vehicles⁽⁵¹⁾. In the near future, the Green Wave system will be introduced at other intersections. The municipality will create a Traffic Lights Management Centre that will ensure efficient electronic management of traffic lights throughout the whole city.

ADDITIONAL RESOURCES

1. European Commission Transport Webpage — Clean Urban Transport

This webpage covers a wide range of information on policies, programmes and tools about Urban Mobility and Clean and Energy Efficient Vehicles. See http://ec.europa.eu/information_society/activities/ict_psp/cf/expert/login/index.cfm online.

2. Eltis, Europe's web portal on transport

ELTIS supports the transfer of knowledge and exchange of experience in urban and regional transport. The database currently contains more than 1 500 good practice case studies, including cases from other initiatives and databases like EPOMM, CIVITAS, SUGRE, LINK, ADD HOME and VIANOVA. See <http://www.eltis.org> online.

3. The CIVITAS Initiative

The CIVITAS Initiative, launched in 2002, helps local authorities to achieve a more sustainable, clean and energy-efficient urban transport system by implementing and evaluating an ambitious, integrated set of technology- and policy-based measures. On the website, examples of successful implementation of sustainable transport initiatives can be found (<http://www.civitas-initiative.org>).

The GUIDEMAPS handbook is designed to support transport decision makers and designers in European cities and regions. A particular emphasis of the handbook is on using stakeholder engagement tools and techniques to overcome communication barriers in the transport decision-making process. It provides examples and indications of the relative costs of different tools and techniques related to project management and stakeholders' engagement

⁵⁰ TRL — Transport Research Foundation based in the United Kingdom (<http://www.trl.co.uk>).

⁵¹ Source: Sustainable Energy Action Plan — City of Tbilisi — 2011–2020.

(http://www.civitas-initiative.org/docs1/GUIDEMAPSHandbook_web.pdf).

4. **Sustainable Urban Transport in Eastern Europe and Central Asia (ECA) Region**

See <http://www.mobilnist.org.ua> online.

5. **LUTR-PLUME**

The LUTR website hosts the PLUME project (Planning and Urban Mobility in Europe), aiming at developing strategic approaches and methodologies in urban planning that all contribute to the promotion of sustainable urban development. The website contains state-of-the-art reports and synthesis reports related to many transport and mobility issues. See <http://www.lutr.net/index.asp> online.

6. **HITRANS**

HiTrans is a European project with the aim of facilitating the development of high-quality public transport in medium-sized European cities (populations 100 000–500 000). The project has produced best practice guides and guidelines for use by local authorities. **See** <http://www.hitrans.org> online.

7.3.3 District heating and distributed energy including renewables

This chapter is aimed at providing examples of municipal strategies for district heating/cooling systems (DHC) and use of RES to produce thermal energy. It also provides examples of policies to promote local electricity production, including renewable electricity production.

DHC⁵²) can bring many benefits when it is well managed: it can reduce emissions, enhance energy security and promote economic development. Many district heating systems in countries of CoM Eastern Partnership are approaching or have exceeded their operational life time and require modernisation or replacement. DHC might also require restructuration as it usually faces challenges of competitiveness, reforms on tariffs and regulations. In addition, DHC provides a proven solution to make efficient use of the many kinds of RES (biomass, geothermal, solar thermal) on a large scale and recycle surplus heat (from electricity production, fuel and biofuel-refining, waste incineration and from various industrial processes).

Renewable energy technologies offer the possibility to produce energy with a very low impact on the environment. DHC and cogeneration (or CHP) offer an energy-efficient way of producing heat and electric power for urban areas. To be cost effective and maximise impact, policies should focus on measures targeting areas with high heating and cooling loads.

Distributed electricity generation allows reductions in electricity transport and distribution losses and the use of microcogeneration and low-scale renewable energy technologies. Distributed energy generation associated with unpredictable (cogeneration, solar PV, wind, biomass, etc.) RES is becoming an important issue in the European Union (EU). The electricity grid must be able to distribute this energy to the final consumers when the resources are available, and rapidly adapt the demand or cover the energy required using more adaptable (e.g. hydro or biomass) technologies when the former are not available.

Although there are a wide range of policies to promote DHC and RES, some of them are under national or regional competences. For this reason, all the policies proposed in this chapter should be complemented by close cooperation with the different public administrations playing a role in this sector.

Local energy generation policies

1. Give support to the development of district heating

- Implement or encourage DHC, integrated RES (solar thermal, solar PV and biomass) or microcogeneration in social housing. This entails adapting the design of social buildings to the requirements of these technologies

Some examples:

District heating systems can use a variety of fuels and heat sources. Natural gas, coal fuel oil and renewable flues such as biomass and waste products can all serve as fuel inputs for district heating boilers and cogeneration plants. The efficiency of district heating could be improved by including the use of waste heat and waste products from industry. Some plants can operate on multiple flues — this is particularly true for heat-only boilers. For example, a heat plant might use biomass with supplemental gas or coal when temperatures are coldest, or natural gas with fuel oil as an emergency fuel.

Use of RES in district heating systems can be expanded. Biomass is the most important of the renewable flues; geothermal district heating can be beneficial in cold climates.

Approaches (regulation or competition) to balance supply and demand can be introduced or improved to ensure efficiency, equality and fairness.

2. Give a good example and support the development of local energy generation

⁵² IEA, *Coming in from the Cold. Improving District Heating Policy in Transition Economies*, 2004 (<http://www.iea.org/textbase/nppdf/free/2004/cold.pdf>) and IEA, *Cogeneration and District Energy – Sustainable energy technologies for today ... and tomorrow*, 2009 (<http://www.iea.org/files/CHPbrochure09.pdf>).

- Perform an analysis of the legal, physical (resources), social and economic barriers hindering local energy generation, and provide corrective actions (subsidies, regulation, campaigns, etc.).

Some examples:

Evaluation of geothermal energy potential considering legal and technical barriers of ground perforation and the environmental effect on the underground water layer.

With regard to the use of biomass, make a technical and economic evaluation of the potential of the biomass harvested in public spaces, companies and citizens' properties.

Bring waste incineration closer (as close as permitted by the local regulation) to cities rather than establishing them on the green field, in order to make sure heat demands are met by recovering the heat from the incineration plant in a DHC plant.

- Identify public and private high-thermal-energy-consuming buildings/facilities and design a high replication strategy to replace old heating plants by cogeneration or renewable energy installations (or a combined installation). Consider in the strategy not only technical aspects but also propose innovative financing schemes. Typical high-energy-consuming public facilities are swimming pools, sports facilities, office buildings, hospitals and retirement homes. For instance, the following actions (high replication potential) are proposed:

Substitution of a swimming pool's old heating plant with an installation of a combined solar thermal and biomass boiler, financed through an ESCO scheme.

Substitution of the old heating and cooling plants by trigeneration installations to provide the base demand of heat and cold throughout the year in municipal buildings.

These actions have a high replication potential in some private sectors such as the food industry, or hotels among others. For this reason, a strong communication policy is essential to share the results with the private sector.

- Introduce renewable energy installations' requirements (such as space for biomass supply and storage facilities of raw material to the biomass boiler or free space on flat roofs to facilitate the use of solar systems) in the design of new public buildings. When it is possible, implement DHC grids in public building areas.
- Show publicly the successes of renewable energy measures implemented in public buildings.

Install visual consoles indicating the amount of CO₂ emissions avoided for a simple and graphic way of showing the immediate effects of the action.

- Integrate utilities companies in the new projects of distributed energy generation in order to take advantages of their experience, and facilitate access to the grid and a large number of individual consumers.
- Promote pilot projects to test and show technologies and attract the interest of stakeholders.

Test non-spread technologies such as low-power absorption chillers or microcogeneration. Show the pilot installations and results (positive and negative) to the stakeholders.

3. Provide information and support to the stakeholders

- Organise informative meetings with stakeholders to demonstrate the economic, social and environmental advantages of EE and RES. Provide financial resources to consumer associations and NGOs to disseminate these benefits to final consumers. Consider promoting distributed energy generation as a marketing project in which it is essential that final consumers trust this product.
- Reach agreements with other public entities or associations, providing training courses focused on technical, environmental and financial issues to installers, consulting and engineering companies. As an example, training materials⁽⁵³⁾ may be found on European projects' webpages funded under Intelligent Energy Europe (IEE).
- Create an info-portal on the renewable energies and EE sectors in your city, with practical and timely information for citizens (where to buy biomass, where are the best areas to install wind energy or solar thermal/PV collectors, list of installers and equipment, etc.). Such a database may include information on best practices in your city.

⁵³ Training material can be downloaded from the ACCESS project, available at <http://www.access-ret.net> online.

- Offer free advice and support to stakeholders. More than 350 LAREAs all over Europe are already offering many relevant services. Therefore, take advantage of their knowledge and get in touch with the closest one.
- Motivate citizens to put aside organic waste, providing specific rubbish bins. Use it to produce biogas in waste treatment plants. Do the same in water treatment plants. Make use of the biogas produced in a cogeneration plant or in a biogas/natural gas public vehicles fleet ⁽⁵⁴⁾.

4. Set up regulations and actions that promote local energy generation projects

- Modify urban planning regulation to consider the necessary infrastructures required to conduct heat pipelines through public spaces in new urban development projects. In the case of DHC, apply the criteria used to install water, electricity, gas and communication pipelines.
- Adapt the administrative procedures to shorten the time required to obtain permits, and reduce local taxes when EE improvements or RES are included in the proposals. Declare these projects as 'Public Interest' and apply them with advantageous administrative conditions with respect to non-energy efficient projects. The development of a DHC implies not only major investments but also compliance with authorisation and licensing procedures. Long and uncertain negotiations with authorities can become a barrier. Administrative procedures for developing infrastructures should be clear, transparent and quick enough to facilitate the development of DHC projects.
- Contact networks of other local authorities or European/national/regional local authorities and produce a common proposal addressed to the relevant public authorities for new regulation for the promotion of distributed energy generation.
- When needed, set up regulations to clarify roles and responsibilities of all involved in selling and buying energy (for example, in those countries without experience and regulation on DHC). Check that duties and responsibilities have been clearly identified and that each involved party is aware of them. In the energy-selling sector, make sure the measurements of energy are in accordance with a recognised standard (e.g. that of the International Performance Measurement and Verification Protocol (IPMVP)). Transparency is a key aspect from the point of view of consumers and investors. It is suggested that the 'rules of the games' be in force as soon as possible. Convoke all stakeholders in order to obtain their views and have a good understanding of their interests and concerns.

5. Ensure the availability of space to achieve projects

- If needed, provide public space to install local energy generation installations. Some European local authorities offer a piece of land to private companies to rent with the aim of producing energy by means of PV collectors. The contract duration is established beforehand and the objective is to exploit large unused spaces to promote renewable energies.

Concrete example on promoting solar energy

In 2005, the city of Munich (Germany) received the 'Capital of energy-efficiency' award. As part of a comprehensive climate protection programme, the city offers the roof surfaces of its public buildings (mainly schools) for private PV investments. The city has developed a tendering scheme to select the investors.

Half of the scheme is reserved for citizens' groups. If there are several applicants for one roof, the winner is selected through a draw. The roofs are free of rent, but users sign a contract allowing them to use the roof under certain conditions. The users are required to pay a deposit over the contract period, are responsible for checking the condition of the roof surface and required to display the system to the public.

The last two calls allowed generating more than 200 000 kWh/year of PV electricity. The challenge of the call is to produce around 400 000 kWh/year of PV electricity, using the schools' buildings roofs (around 10 000 m² available for this call).

Source: Guide for local and regional governments, *Save the Energy, save the climate, save money*, CEMR, Climate Alliance, Energie-Cités, 2008 (http://www.ccre.org/bases/T_599_34_3524.pdf).

⁵⁴ For further information, see the NICHES+ project webpage at <http://www.niches-transport.org> online. This project is funded by the European Commission's Directorate-General for Research and Innovation (DG RTD) through the Seventh Framework Programme (FP7). The mission of NICHES+ is to promote innovative measures for making urban transport more efficient and sustainable, and to move them from their current 'niche' position into a mainstream urban transport application.

ADDITIONAL RESOURCES

1. International Energy Agency (IEA)

IEA's Programme of Research, Development, and Demonstration on District Heating and Cooling, including the integration of Combined Heat and Power (<http://www.iea-dhc.org/index.html>).

2. ELEP Project

European Local Electricity Production (ELEP) is a European project supported by Intelligent Energy Europe that offers technical and policies information, tools and best practices on local electricity generation (<http://www.elep.net>).

3. ST-ESCOs Project

Solar Thermal Energy Services Companies (ST-ESCOs), supported by Intelligent Energy Europe, offers technical and economic software tools aimed at studying the feasibility of ST-ESCO projects, guiding information and examples of best practices (<http://www.stescos.org>).

4. Intelligent Energy Europe programme

The Intelligent Energy Europe programme is the EU's tool for funding action to improve market conditions on terms of EE and usage of RES. Local energy generation is part of the target areas (http://ec.europa.eu/energy/intelligent/index_en.html).

5. ECOHEATCOOL Project

The overall purpose of this project, supported by Intelligent Energy Europe, is to communicate the potential of DHC to offer higher EE and higher security of supply with the benefit of lower CO₂ emissions (<http://www.ecoheatcool.org>).

6. Euroheat & Power

Euroheat & Power is an association uniting the CHP, DHC sector throughout Europe and beyond, with members from over 30 countries (<http://www.euroheat.org>).

7.3.4 Public procurement ⁽⁵⁵⁾

1. Green public procurement

Public procurement and the way procurement processes are shaped and priorities are set in the procurement decisions offer a significant opportunity for local authorities to improve their overall energy consumption performance.

Green public procurement means that public contracting authorities take environmental considerations into account when procuring goods, services or works. **Sustainable public procurement** goes even further and means that the contracting authorities take into account the three pillars of sustainable development — the effects on environment, society and economy — when procuring goods, services or works.

Energy efficient public procurement allows improving EE by setting it as relevant criteria in the tendering and decision-making processes related to goods, services or works. It applies to the design, construction and management of buildings, the procurement of energy-consuming equipment, such as heating systems, vehicles and electrical equipment, and also to the direct purchase of energy; for example, electricity. It includes practices such as life cycle costing ⁽⁵⁶⁾, the setting of minimum EE standards, the use of energy efficient criteria in the tendering process and measures to promote energy efficiency across organisations.

Energy efficient procurement offers public authorities and their communities social, economic and environmental benefits.

- By using less energy, public authorities will reduce unnecessary costs and save money.
- Some energy-efficient goods, such as light bulbs, have a longer lifetime and are of higher quality than their cheaper alternatives. Purchasing them will reduce valuable time and effort involved in frequently replacing equipment.
- Reducing CO₂ emissions as a result of energy efficient procurement will help public authorities to decrease their carbon footprint.
- Through leading by example, public authorities help to convince the general public and private businesses of the importance of EE.

The interest in developing green public procurement is not only in relation to its impact in terms of CO₂ emissions reductions, whose average (see study *Collection of statistical information on Green Public Procurement in the EU* ⁽⁵⁷⁾) carried out for the European Commission's Directorate-General for Environment (DG ENV) is 25 %, but also in terms of its financial impact, whose average is 1,2 % of savings. Following are some examples of EE measures proposed in high-priority product groups:

| Product group | Examples of public procurement requirement |
|----------------------------------|---|
| Public transport | Purchase low-emission buses and public fleet vehicles. The buses have to be equipped with driving-style meters to monitor fuel usage. |
| Electricity | Increase the share of electricity from renewable sources going beyond national support schemes. This measure can be completed by including the purchase of EE services; for example, ESCOs. |
| IT products | Purchase of environmentally friendly information technology (IT) goods that meet the highest EU energy standards for energy performance. Provide training to users on how to save energy using their IT devices. |
| Building construction/renovation | Use of localised RES. Impose high efficiency standards that reduce a building's energy consumption (see Chapter 1 in the Part III of this Guidebook). |

⁵⁵ Source: European Commission DG ENV. See http://ec.europa.eu/environment/gpp/index_en.htm www.iclei-europe.org/deep and <http://www.smart-spp.eu> online.

⁵⁶ Life cycle costing refers to the total cost of ownership over the life of an asset. This includes acquisition (delivery, installation, commissioning), operation (energy, spares), maintenance, conversion and decommissioning costs.

⁵⁷ This study can be downloaded from http://ec.europa.eu/environment/gpp/study_en.htm online. The report presents the statistical information and conclusions about the investigation done in the seven most advanced European Countries in green public procurement. It was found that the CO₂ emissions savings was in the range – 47 % / – 9 % and the financial impact was in the range – 5,7 % / + 0,31 %.

Green, sustainable or energy efficient public procurement are highly recommended. However, in the context of the CoM, only measures related to energy efficient public procurement will be reflected in the CO₂ emissions inventories. In fact the CoM is mainly focusing on energy consumption and on emissions that occur within the territory of the local authority.

The new Directive 2009/33/EC on the promotion of clean and energy-efficient vehicles requires that lifetime impacts of energy consumption, CO₂ and pollutant emissions are taken into account in all purchases of public transport vehicles. Member States shall bring into force the necessary laws to comply with this Directive by 4 December 2010.

Purchases of public transport vehicles represent a key market of high visibility. The application of this Directive can therefore promote a broader market introduction of clean and energy-efficient vehicles in the cities and reduce their costs through economies of scale, resulting in a progressive improvement of the whole vehicle fleet.

2. Joint Public Procurement ⁽⁵⁸⁾

Joint procurement (JP) means combining the procurement actions of two or more contracting authorities. The key defining characteristic is that there should be only one tender published on behalf of all participating authorities. Such JP activities are not new — in countries such as Sweden and the United Kingdom, public authorities have been buying together for a number of years — though in many European countries, especially in the South, there is often very little or no experience in this area.

There are several very clear benefits for contracting authorities engaging in JP arrangements.

- **Lower prices** — combining purchasing activities leads to economies of scale. This is of particular importance in the case of a renewable energy project whose costs may be higher than conventional projects.
- **Administrative cost savings** — the total administrative work for the group of authorities involved in preparing and carrying out one rather than several tenders can be substantially reduced.
- **Skills and expertise** — joining the procurement actions of several authorities also enables the pooling of different skills and expertise between the authorities.

This model for public procurement requires agreement and collaboration among different contracting authorities. Therefore, a clear agreement on needs, capacities, responsibilities, and the common and individual legal framework of each party is a must.

Good practice example: JP of clean vehicles in Stockholm ⁽⁵⁹⁾

The city of Stockholm and other public administrations organised a JP of clean cars. The city worked to introduce a large number of clean vehicles and mopeds to the fleet of vehicles used for city purposes. In 2000, there were around 600 clean vehicles operating in the city. There was a plan to increase the number of clean vehicles in the region to about 10 000 by around 2010. The most common fuels are ethanol and biogas, and the clean vehicles are expected to use 60 % environmental fuels and the remainder petrol or diesel and electricity. More filling stations for environmental fuel will be required to enable clean vehicles to use fuels other than petrol and diesel. By 2050, it is expected that all cars will have been replaced by clean vehicles.

CO₂ reduction: 2005: 1 600 tonnes per year – 2030/2050: 480 000 tonnes per year

Costs: SEK 6 million per year (around EUR 576 000)

3. Green electricity purchasing ⁽⁶⁰⁾ (for this chapter the input from CoM East experts is much appreciated)

The liberalisation of the European energy market offers local authorities the possibility of freely choosing their energy provider. According to the Directive 2001/77/EC, electricity produced from RES or green electricity can be defined as: 'electricity produced by plants using only renewable energy sources, as well as the proportion of electricity produced from renewable energy sources in hybrid

⁵⁸ Guidelines for the implementation of green public procurement and joint public procurement can be found on the webpage of the LEAP project (<http://www.iclei-europe.org/index.php?id=3113>). This project is funded by the European Commission's DG ENV through a project called LIFE (<http://ec.europa.eu/environment/life/index.htm>).

⁵⁹ From Stockholm's action programme against GHG emissions (2003).

⁶⁰ For further information, see <http://www.procuraplus.org> online.

plants also using conventional energy sources and including renewable electricity used for filling storage systems, and excluding electricity produced as a result of storage systems'.

In order to be sure that the electricity supplied comes from a RES, consumers have the possibility to request guarantees of origin certificates of the electricity. This mechanism has been foreseen in the Directive 2001/77/EC. The supplier has also the possibility to provide independent proof of the fact that a corresponding quantity of electricity has been generated from renewable sources, or produced by means of high-efficiency cogeneration.

Previous experience of green electricity purchase performed by the German public administration included the following specifications in the call for tenders:

- i) 100 % of electricity to come from RES as defined by European Directive 2001/77/EC.
- ii) The RES-E supply to be combined with certified CO₂ reduction during the delivery period, meaning that:
 - a) CO₂ reductions achieved during the delivery period have to amount to at least 30 % of the amount of average power supply during the same period; and
 - b) proof of the levels of CO₂ reductions realised through new plants (i.e. plants coming into operation in the year of actual supply) must be provided. Proof must be given through the provision of specific data record sheets.
- iii) Guarantee of Origin: The origin of the electricity must be clearly traceable and based on identifiable sources. In case there are various sources, the split between the sources must be clearly explained. Special data record sheets serve to provide proof of the origin of the electricity and the expected CO₂ reductions achieved during the delivery period. The bidder may supply renewable electricity from plants that are not mentioned in the contract; however, they must also meet the targeted levels of CO₂ reductions indicated in the bid.
- iv) Exclusion of subsidised supply: The supplier is required to confirm in the form of a self-declaration that the power supply has not been subsidised, either entirely or partly at domestic or international level.
- v) During the award phase, additional points were awarded to the supplier whose bid went beyond the minimum requirement of achieving CO₂ reductions of 30 %, compared to the existing energy mix in Germany at that time. The most economically advantageous bid was determined from the best price–performance ratio.

Price differences between conventional and green electricity depend on the status of liberalisation, the features of the national support schemes and the existence of green electricity suppliers. Green electricity is often more expensive, although price differences are narrowing substantially, and there are cases where green electricity is even available at a cheaper rate. Green electricity has proved to be a product group that is available for public procurement on a competitive basis.

ADDITIONAL RESOURCES

1. European Commission — DG ENV

The webpage of DG ENV of the European Commission offers guidelines, good practices, previous experiences, links and FAQs concerning green public procurement (http://ec.europa.eu/environment/gpp/index_en.htm).

2. ICLEI — Procura⁺

Procura⁺ is an initiative of ICLEI that provides further information on green public procurement (<http://www.procuraplus.org>).

3. SENTERNOVEM

SenterNovem has developed criteria and practical instruments to implement sustainable procurement to incorporate sustainability in procurement processes and tendering procedures (<http://www.senternovem.nl/sustainableprocurement/index.asp>).

4. CLIMATE ALLIANCE — PRO-EE

The project 'Public procurement boosts Energy Efficiency' (Pro-EE) aims to improve EE through sustainable public procurement. It develops model procedures and networking approaches that can be implemented by any public authority in Europe (<http://www.pro-ee.eu/materials-tools.html>).

7.3.5 Urban & land-use planning

Land-use planning has a significant impact on the energy consumption in both the transport and building sectors. Strategic decisions concerning urban development, such as avoiding urban sprawl, influence the energy use within urban areas and reduce the energy intensity of transport. Compact urban settings may allow more cost-effective and energy-efficient public transport. Balancing housing, services and work opportunities (mixed use) in urban planning have a clear influence on the mobility patterns of citizens and their energy consumption. Local and regional governments can develop sustainable mobility plans and encourage a modal shift towards more sustainable transport modes.

Building shape and orientation play an important role from the point of view of heating, cooling and lighting. Adequate orientation and arrangement of buildings and built-over areas make it possible to reduce recourse to conventional air conditioning. Planting trees around buildings to shade urban surfaces, and green roofs to reduce their temperature, can lead to substantial reductions in energy consumption for air conditioning. Proportion between width, length and height, as well as its combination with the orientation⁽⁶¹⁾ and proportion of glazed surfaces, should be studied in detail when new urban developments are proposed. In addition, sufficient green areas and planting trees next to the building can lead to a reduction in the energy needs and then reduce GHGs.

There are also examples of local authorities that have started to develop CO₂-free settlements or even set up an overall objective to become 'fossil fuel free'. CO₂-free settlements mean retrofitting districts in such a way that they do not consume fossil fuels.

Urban density is one of the key issues influencing energy consumption within urban areas. In Table 4, the effects (both positive and negative) of density are considered. As can be seen in the table, urban density may have conflicting effects.

Table 4. Positive and negative effects of urban density on energy consumption⁽⁶²⁾

| Parameters | Positive effects | Negative effects |
|--------------------------------|---|---|
| Transport | Promote public transport and reduce the need and length of trips by private cars | Congestion in urban areas reduces fuel efficiency of vehicles |
| Infrastructure | Shorten the length of infrastructure facilities such as water supply and sewage lines, reducing the energy needed for pumping | |
| Vertical transportation | - | High-rise buildings involve lifts, thus increasing the need for electricity for vertical transportation |
| Ventilation | - | A concentration of high-rise and large buildings may impede urban ventilation conditions |
| Thermal performance | Multi-unit buildings could reduce the overall area of the building's envelope and heat loss from the buildings. Shading among buildings could reduce solar exposure of buildings during the summer period | - |
| Urban heat island | - | Heat released and trapped in urban |

⁶¹ Yezioro, A., Capeluto, I.G., Shaviv, E., 'Design guidelines for appropriate insolation of urban squares', *Renewable Energy*, Vol. 31, 2006, pp. 1011–1023.

⁶² This table has been extracted from Hui, S.C.M., 'Low energy building design in high-density urban cities', *Renewable Energy*, Vol. 24, 2001, pp. 627–6401.

| | | |
|----------------------------|---|---|
| | | areas may increase the need for air conditioning The potential for natural lighting is generally reduced in high-density areas, increasing the need for electric lighting and the load on air conditioning to remove the heat resulting from the electric lighting |
| Energy systems | District cooling and heating systems, which are usually more energy efficient, are more feasible as density is higher | - |
| Use of solar energy | - | Roof and exposed areas for collection of solar energy are limited |
| Ventilation energy | A desirable air-flow pattern around buildings may be obtained by proper arrangement of high-rise building blocks | - |

Urban planning is a key instrument allowing the establishment of EE requirements for new and renovated buildings.

Groningen (the Netherlands)

Since the 1960s, the municipality of Groningen has been way ahead in its traffic plans and spatial planning policies, implementing urban policies that have led to a car-free city centre and a mixed public space, with all areas easily reachable by bicycle.

The basic concept used in urban planning was based on the 'compact city' vision, which placed an integrated transport system high on the municipal agenda. The main objective was to keep the distances between home and work, or home and school relatively short, so that the use of public transport forms a good alternative to the private car in terms of travelling time. The residents should have opportunities to shop for their everyday needs in their own neighbourhoods, while the city centre should serve as the main shopping centre. Sports facilities and schools should be close to the living areas.

A series of sound transportation policies has been developed to favour walking, public transport and predominantly cycling. A traffic circulation plan divided the city centre into four sections and a ring road was built encircling the city and reducing access to the centre by car. During the 1980s and 1990s, a parking policy was strictly implemented. Car parking with time restrictions was introduced in a broad radius around the city centre. Park and ride areas were created combined with city buses and other high-quality public transport. Investments in cycling infrastructure have been made to expand the network of cycling lanes, improving, among others, the pavements and bridges for cyclists, and offering many more bike parking facilities. Cooperation and participation by the local population or particular social groups has been sought in relation to various actions. In addition, an extension of the travel management policy, based on a regional mobility plan, has been prepared in cooperation with provincial and national decision makers. This has resulted in a city centre that is entirely closed off to cars; it is only possible to travel between sectors by walking, bicycle or public transport.

Concrete results? See <http://www.fietsberaad.nl/library/repository/bestanden/document000113.pdf> online.

Sources: EAUE database 'SURBAN - Good practice in urban development' and the 'Fiets Beraad' website (<http://www.fietsberaad.nl>).

Urban regulations should be devised in such a way as not to deter EE and RES. For instance, long and complex authorisation procedures will be a clear obstacle to RES and EE promotion and should be avoided. Such considerations should be integrated into the local authorities' urban planning schemes.

Quick tips:

- ✓ Introduce energy criteria in planning (land use, urban, mobility planning)
- ✓ Promote mixed use (housing, services, jobs)
- ✓ Plan to avoid urban sprawl:
 - Control the expansion of built areas
 - Develop and revitalise old (deprived) industrial areas
 - Position new development areas within the reach of existing public transport lines
 - Avoid 'out-of-town' shopping centres
- ✓ Plan car-free or low-car–use areas by closing areas to traffic or introducing congestion charge schemes, etc.

ADDITIONAL RESOURCES

1. Document: *Community Energy; Urban Planning for a low carbon future*
(http://www.chpa.co.uk/news/reports_pubs/Community%20Energy-%20Urban%20Planning%20For%20A%20Low%20Carbon%20Future.pdf).

7.3.6 Integration of an energy management system based on ISO 50001:2011

'Most energy efficiency in buildings, industry and other sectors is achieved through changes in **how energy is managed** in a facility, rather than through installation of new technologies,' by M. Matteini (United Nations Industrial Development Organization) ⁽⁶³⁾.

Putting in place an energy management system in accordance with international standards (such as ISO 50001) can be an excellent way to do this. Energy Management Standard ISO 50001 describes a framework and best practice methodology to integrate EE into daily management practices. Section 12.2 in the Part III of this Guidebook relates to the description of standard ISO 50001.

In general, energy management systems provide the following:

- A framework for understanding significant energy uses: evaluating energy use for all major facilities and functions in the organisation, and establishing a baseline for measuring future results of efficiency efforts.
- Action plans for continually improving energy performance. A detailed action plan is required for the systematic implementation of energy performance measures, and is regularly updated to reflect recent achievements, changes in performance and shifting priorities.
- Structure and organisational framework to sustain energy performance. The support and cooperation of key people at different levels within the organisation should be gained. Success frequently depends on the awareness, commitment and capability of the people implementing the projects.
- Improvements over time and change of personnel. Evaluation results and information gathered during review processes are used to create new action plans, identify best practices and set new performance goals.

Energy management systems can help to achieve the following:

- management focus on EE issues;
- systematic activity on improvement of EE;
- obligation to train and raise awareness;
- obligation to provide resources;
- continuity through changes in personnel.

Figure 2 shows the possible model of an energy management system according to ISO 50001 ⁽⁶⁴⁾.

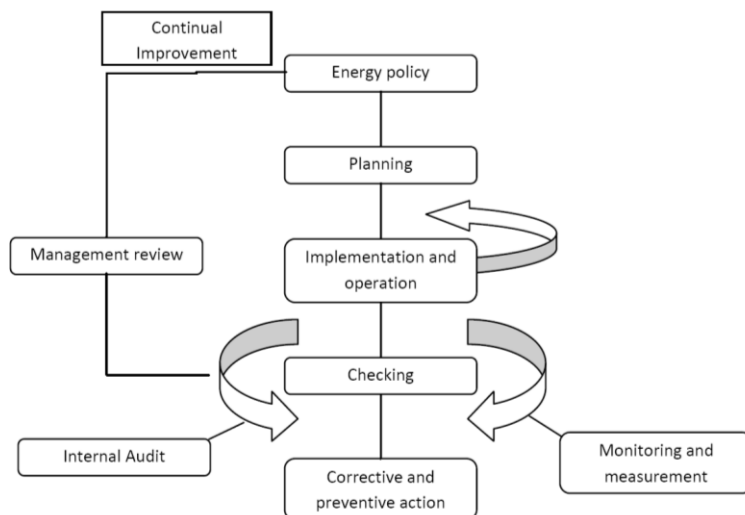


Figure 2. A model of an energy management system according to ISO 50001

The model in Figure 2 is based on the 'loop' principle of the project management cycle: Plan, Do Check and Act. It can be applied in any organisation, including a public authority. Such a cycle can

⁶³ Matteini, M., United Nations Industrial Development Organization (<http://www.iso.org/sites/iso50001launch/documents.html>).

⁶⁴ Guidelines 'How to develop a Sustainable Energy Action Plan integrated with an Energy Management System based on ISO 50001:2011', directed by SOGESCA s.r.l., supported by Intelligent Energy Europe, 2013.

also be implemented for managing a SEAP; for example, to follow SEAP implementation and the progress of planned actions. More information about this can be found in the list of recommended steps for drafting successful SEAPs (Section 7.1 of this Guidebook).

For an energy management system, the project management cycle (Plan, Do, Check and Act) can be detailed as follows:

The **first step, 'Plan'**, is dedicated to setting up a commitment for the continuous improvement of energy planning. Goals for an energy management system are to be established to guide daily decision making, and represent the basis for tracking and measuring progress. It is also important to create an action plan that defines technical steps and targets, and that determines roles and resources.

The following requirements are to be implemented in this step by the organisation that decides to follow ISO 50001 standards:

- establish the goals of an energy management system;
- approve the energy policy;
- identify and prioritise energy uses;
- identify and understand applicable legal requirements;
- list and prioritise improvement opportunities;
- identify a set of actions suited for measuring energy performances and energy performances improvements;
- measurable objectives for energy performances improvement.

To implement the abovementioned steps, the current performance of energy systems should be assessed, which involves evaluating energy use for all major facilities and establishing a baseline to measure future results of efficiency efforts. The general concept for energy use analysis and obtaining the energy baseline is indicated in Figure 3⁽⁶⁵⁾. The local authority should collect accurate and comprehensive energy consumption data related to buildings and facilities. Detailed steps for conducting the baseline review are presented in Chapter 4 of this Guidebook, while principles of data collection are described in Part II of this Guidebook.

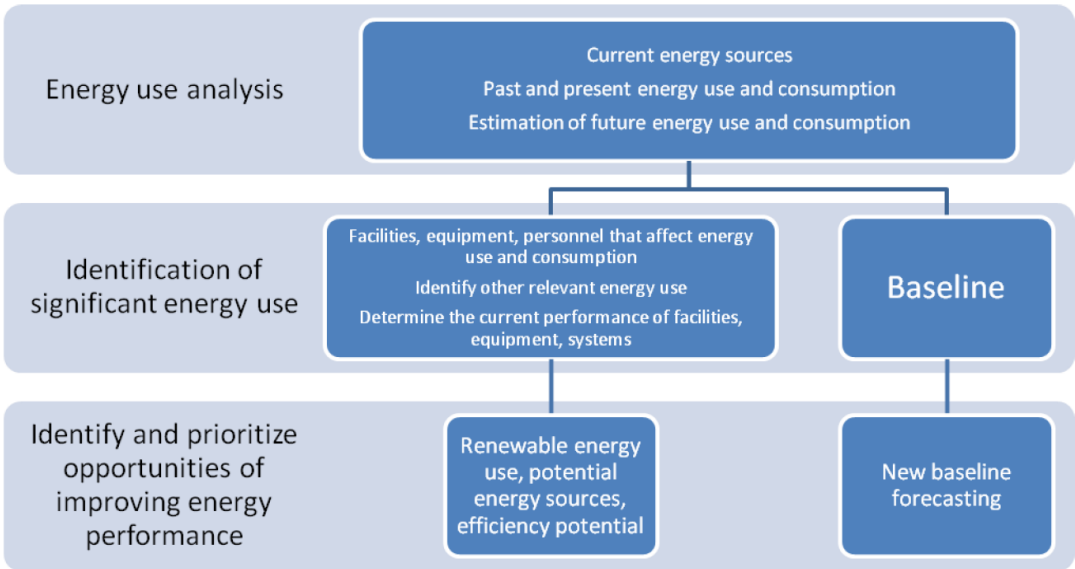


Figure 3. Energy use analysis and baseline

The **second step, 'DO'**. For the implementation of the action plan established in the previous step, an energy team should be built, including the allocation of resources and responsibilities. Furthermore, the importance of communicating and posting goals is strongly emphasised as it can motivate staff to

⁶⁵ Guidelines 'How to develop a Sustainable Energy Action Plan integrated with an Energy Management System based on ISO 50001:2011', guidelines directed by SOGESCA s.r.l., supported by Intelligent Energy Europe, 2013.

support energy management efforts throughout the organisation. The support should be built in for energy management initiatives/goals at all levels of the organisation.

According to ISO 50001 standard, the following requirements are to be implemented in this step:

- form an energy team with determined roles, resources and responsibilities;
- assign tasks and grant competence;
- coordinate and manage internal and external communication;
- define and control documentation related to an energy management system;
- establish proper operational control.

The communication methods and strategy suggested for supporting the SEAP (suggested in Chapter 3 of this Guidebook) may be coupled with methods applied in energy management systems.

The next **steps, 'CHECK' and 'ACT'**, involve evaluating the progress of planned activities, and providing recognition of achievements to those who helped the organisation. This motivates staff and brings positive exposure to the energy management programme. Training activities, access to relevant information and transfer of successful practices should also be implemented along with a tracking system for monitoring progress.

According to the ISO 50001 standard, the following requirements are to be implemented:

- monitor and measure energy consumption;
- compare regular and expected consumption;
- assess energy policy objectives;
- manage non conformities, corrective measures and preventive measures;
- control records;
- plan and carry out an internal audit of the energy management system;
- review the energy management system.

This approach helps to monitor the progress of planned activities in the organisation, thus contributing to the performance of regular SEAP reviews, which are described in the list of recommended steps for drafting successful SEAPs (see Section 7.1 of this Guidebook).

Following is an example of a structure that the city of Lviv set up for developing and implementing its local energy strategies.

Example, city of Lviv

The city of Lviv has implemented an energy management system in the public sector for several years now. This system has enabled the monitoring and controlling of energy consumption of public buildings in the Lviv municipality. Furthermore, it helped local authorities to arrange retrofitting of individual public buildings that the energy management system identified as particularly inefficient, and to present the effects of this modernisation to the residents, as well as communicate such success stories to all citizens.

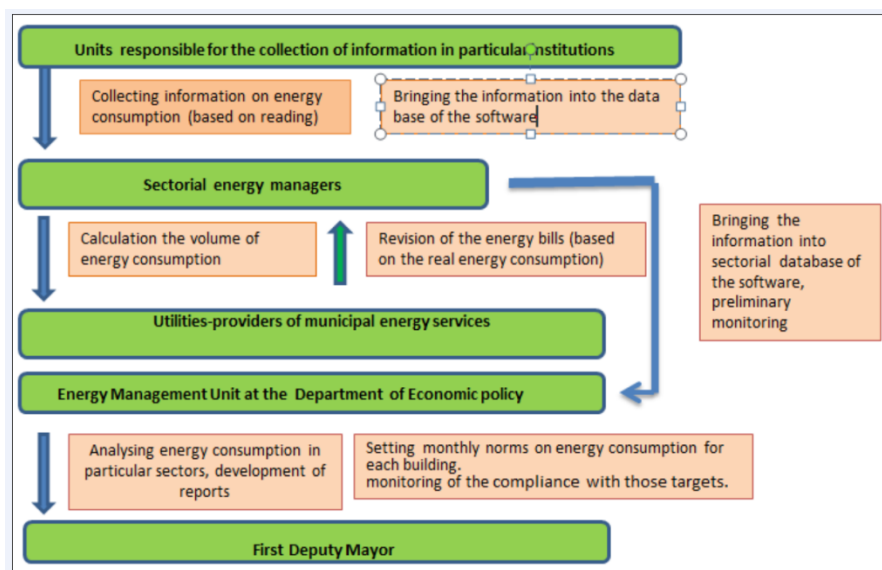


Figure 4. Diagram of the energy management system of the city of Lviv ⁽⁶⁶⁾

The data were gathered in a database that recorded monthly energy consumption for 503 public buildings from 2006, and evaluated by various departments/units: branch energy managers, Unit of Energy Management of Economic Division, and the first deputy mayor. Thus, with application of the energy management system, the information has become available for decision makers. The benefits of implementing the energy management system included establishing benchmarks for monthly energy use for all buildings. This was performed considering the values measured in the previous years and relevant changes in the technical parameters of the buildings. Compliance with the energy consumption targets in individual buildings was analysed and discussed at the monthly meetings of the energy management team in the Lviv municipality.

An energy management system can help in the process of SEAP preparation and further implementation, especially in the public building sector. More information about the energy management system in buildings and organisations can be found in Chapter 5 of Part III of this Guidebook.

Some key benefits of why to use an energy management system to support SEAP development and implementation include the following:

- Introduces an **'energy culture'** within the local government;
- Ensures **cooperation between different offices** and departments;
- Helps to plan, implement and monitor the SEAP actions that involve the public authority directly;
- Supports **data collection** and rationalisation;
- Introduces the concept of **continuous improvement**, fostering the **'process'** approach of the SEAP.

⁶⁶ For further information about the energy management system of Lviv, see <http://www.enefcities.org.ua/Municipal%20energy%20management%20system%20in%20Lviv.pdf> online.

7.3.7 Information and communication technologies

In developing your SEAP, it is essential to take advantage of the key role that can be played by ICT in the creation of a low-carbon society.

ICT plays a key role in the dematerialisation of our daily way of life. The substitution of high-carbon products and activities with low-carbon alternatives, for example, replacing face-to-face meetings with video conferencing or paper with e-billing, could play a substantial role in reducing emissions. Like e-commerce, e-government could have a significant impact on reducing GHG emissions.

Currently, the largest opportunity identified within dematerialisation is teleworking — where people work from home rather than commute to an office. Dematerialisation could also reduce emissions indirectly by influencing employees' behaviours, building greater awareness of climate change and creating a low-carbon culture throughout businesses; it is acknowledged that these impacts are less quantifiable. Dematerialisation at the very least provides alternatives, allowing individuals to control their carbon footprint in a very direct way.

Finally, ICT also has a key role in enabling efficiency: consumers and businesses cannot manage what they cannot measure. ICT provides solutions that enable us to 'see' our energy and emissions in real-time and provide the means for optimising systems and processes to make them more efficient.

Following are some examples of measures that could be implemented at the local level.

- Stimulate an open debate with relevant stakeholders in relevant areas with a high potential impact like energy-smart homes and buildings, smart lighting, personalised public transport, etc.
- Bring together stakeholders in the ICT and energy domains to create synergies and new forms of collaboration. For example, liaise with utilities providers in order to ensure adequate promotion and the usage of smart metering. Make sure the selected smart meters provide a proper balance between additional cost to the customer and potential benefits in terms of energy savings, or promote the delivery of broadband infrastructure and collaborative technologies enabling the widest and most efficient usage of e-technologies.
- Develop e-government, teleworking, teleconferencing and other remote applications for meeting obligations within the local administration and promote its usage.
- Integrate ICT to improve EE in public buildings, public lighting and transport control.
- Better management of the local authority's vehicle fleet: implement eco-driving (real-time ⁽⁶⁷⁾), route optimisation, and fleet management and supervision.
- Monitor and make more visible GHG emissions and other environmental data to citizens. This real-time monitoring provides the means to study emissions patterns, track progress and consider/implement interventions ⁽⁶⁸⁾.
- Demonstrate that local authorities can lead by practical example by ensuring that a city's own ICT infrastructure and digital services have the smallest possible carbon footprint. Promote these practices to the private sector and wider community.

It is important to appreciate that ICT itself has a carbon footprint; however, green ICT policies need to be in place to ensure that ICT remains a solution to, and not a part of, the climate change problem.

ADDITIONAL RESOURCES

1. The European Commission's DG CHNECT webpage contains a large amount of information about the possibilities of ICT in SMART Buildings (http://ec.europa.eu/information_society/activities/sustainable_growth/index_en.htm).

⁶⁷ With information on traffic density, weather, alternative routes, and other.

⁶⁸ Contact details and further information available at <http://www.euocities.eu> and <http://www.clicksandlinks.com> online.

CHAPTER 8. FINANCING SUSTAINABLE ENERGY ACTION PLANS

8.1 Introduction

The unprecedented mobilisation of the CoM signatories to contribute to strategic climate and energy policy objectives generates specific financing instruments, aimed at supporting pioneering cities and regions' efforts towards the implementation of measures.

From Moldova to Turkmenistan and from Azerbaijan to Kazakhstan, the financial opportunities available to municipalities can be very different from one country to another. Many international financial institutions are present in the CoM East region with supporting programmes, and some of them have already been contracted by municipalities to develop plans for improving EE and reducing CO₂ emissions at the community level. In some CoM East countries, many financial institutions are active in the field of sustainability, either providing technical support or financial support. In order to provide guidance to the municipalities, so called 'donor-fiches' are established for each country with specific information on the donors and other supporting organisations. These donor-fiches are available through the CoM East website in the respective local language (⁶⁹), and are updated on a regular basis depending on the availability of new information.

The country-specific donor-fiches will attempt to review both public and private funds available for EE and carbon abatement projects, and provide an overview on the possible activities of commercial financing institutions supporting the funding of sustainable energy investment programmes related to the CoM. The donor-fiches are not intended to provide a complete and detailed inventory of the existing financing mechanisms for EE and carbon abatement projects in each country that committed to the CoM East, as it would be impossible to cover all the detailed aspects in a short snapshot such as this. Therefore, they contain a list of the major financial mechanisms and projects that have been implemented and, where available, some information on the ESCOs' market in each country.

The data reported in the donor-fiches for the country sheets comes from various sources, including information provided by experts during CoM East working groups, presentations and comprehensive studies on the topic.

This chapter will attempt to describe the most common financial mechanisms and funding schemes available at EU and international levels to the CoM East signatories in this region. However, due to their diversity, the dissimilar economic situation and a restrictive public finance law currently in place in some of these countries, not all the financial mechanisms described in this chapter are applicable to these countries since they are not yet fully established in their markets.

8.2 Initial considerations

A SEAP's successful implementation requires sufficient financial resources. It is therefore necessary to identify available financial resources, as well as the schemes and mechanisms for getting hold of these resources in order to finance SEAP actions.

EE financing decisions must be compatible with public budgeting rules. For example, the cash generated by EE improvements and reductions in the energy bill may lead to a reduction of financial resources in the following budgeting period. This is due to the fact that most often EE projects are financed via capital expenditure budgets, where energy bills are paid from operational budgets.

The local authority should allocate the necessary resources in the annual budgets and make firm commitments for the years to come. As municipality resources are scarce, there will always be competition for available financial funding. Therefore, efforts should be continuously made to find alternative sources of resources. Regarding multi-annual commitment, different political parties should give their approval by consensus in order to avoid disruption in the development of the SEAP when a new administration is elected.

Successful SEAP actions will reduce the long-term energy costs of the local authority, inhabitants, companies and, in general, all stakeholders. In considering the costs of SEAP actions, local authorities should also consider their co-benefits: benefits to health, quality of life, employment, attractiveness of the city, etc.

Local authorities may be tempted to opt for EE projects with short paybacks. However, this approach will not capture the majority of potential savings available through energy retrofits. Instead, it is recommended that all profitable options are included and in particular those that yield a rate of return

⁶⁹ The donor-fiches are available through the CoM East website (<http://www.soglasheniemerov.eu>).

higher than the interest rate of the investment capital. This approach will translate into greater savings over the long term.

Quick paybacks on investments mean too often that organisations do not pay attention to life cycle costing. Payback time shall be compared with the lifespan of the goods to be financed. For instance, a 15-year payback time period cannot be considered long when it comes to a building with a lifespan of 50–60 years.

8.3 Creating bankable projects ⁽⁷⁰⁾

A bankable project is a clearly documented economically viable project. Building a bankable project starts with sorting out the pieces that make a project economically attractive. Initially, it is required to examine the project's key components, make sure that each aspect is properly assessed and that the plan to effectively manage that aspect is clearly presented. Each component carries a risk factor, and each risk factor carries a price tag. An effective ESCO or financial consulting expert knows how to assess each part of a financial project.

When a financing project is studied by a bank, the objective is to know the level of risk through an assessment procedure. A technical energy audit is not enough for this purpose. Other aspects such as the engineering skills (of an ESCO or the municipal energy agency, for instance) or the level of commitment of each party are crucial to making this project attractive for the bank. For instance, some general requirements may be that the technology is well proven, well adapted to the region and pegged to produce an Internal Interest Rate greater than 10 % ⁽⁷¹⁾.

8.4 Financial support

8.4.1 Funding by international financial institutions

This section describes the most frequent and general financing mechanisms used to fund renewable energy and EE projects at national, regional and municipal levels. Other specific programmes, such as European funding and Facilities, and the role played by the European Bank for Reconstruction and Development (EBRD) are also described. Further information on the EU funding programmes can also be found on the webpage of the CoM Office (<http://www.eumayors.eu>) and in the Russian version of the Covenant website (<http://www.soglasheniemerov.eu>).

8.4.1.1 EU Funds and programmes

The EU provides funding and grants for a broad range of projects and programmes.

One of the first financial engineering tools created under the drive of the Covenant was the European Local Energy Assistance (ELENA) facility, financed by the IEE programme and initially implemented by the European Investment Bank (EIB), with the objective of supporting the technical costs associated with developing, structuring, tendering and launching large sustainable energy investment programmes. The EU together, with the EIB, is currently evaluating the possibility of expanding ELENA towards the east. It will draw on the experience of the existing facility, but should also take into account the needs of the new market.

Furthermore, there are a number of relevant programmes funded by the EU that support the participation of Eastern Partnership and central Asian cities in the CoM; that is, Inogate that is operational in Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan ⁽⁷²⁾.

8.4.1.2 The role played by the EBRD

The EBRD fosters transition to market economies in countries from central and eastern Europe (CEE) to central Asia and north Africa, supporting municipal sustainable energy projects in the countries of its operation.

⁷⁰ For further information on financing, see http://sefi.unep.org/fileadmin/media/sefi/docs/publications/pfm_EE.pdf online.

⁷¹ Further information on how to produce bankable EE projects may be found in the *Bankable Energy-Efficiency Projects (BEEP) — Experiences in Central and Eastern Europe* brochure, downloadable from http://www.dena.de/fileadmin/user_upload/Download/Dokumente/Publikationen/internationales/BEEP_Project_Brochure.pdf online.

⁷² See http://www.inogate.org/index.php?option=com_content&view=article&id=46&Itemid=72&lang=en online.

Despite rising energy prices in the region, significant amounts of energy are being wasted (through outdated and inefficient equipment, and a lack of monitoring and control devices) and RES are under-utilised.

The EBRD recognises the enormous need for investment in energy sustainability in its countries of operations and has developed financing facilities specifically dedicated to medium- and small-scale EE and renewable energy investment projects.

By engaging the local financial sector, many of the barriers that prevent the identification and financing of sustainable energy investment opportunities can be overcome. Sustainable Energy Financing Facilities (SEFFs) — one component of the Bank's Sustainable Energy Initiative — are being successfully implemented through approximately 60 local banks in 15 countries. At the end of 2011, in total, the EBRD had made available EUR 1.9 billion in funding for SEFFs ⁽⁷³⁾.

How the EBRD Facility works

The EBRD lends funds to local banks that are willing to participate in a Facility and that meet standard EBRD eligibility criteria. A project implementation team, together with the local banks, creates awareness about the Facility and how potential borrowers can apply. The local banks assess the creditworthiness of potential borrowers that apply for the Facility. The project implementation team provides free-of-charge advice (usually based on an energy survey at the potential borrower's site) to help identify and evaluate EE and renewable energy investment opportunities. The project implementation team works together with the local banks to assess the eligibility of the potential borrowers' loan applications.

The local banks take lending decisions, which, if positive, result in loans at commercial rates. Loan amounts vary depending on the Facility and the investment opportunity. Some investments may additionally be assessed by specialists for carbon credit opportunities under the Joint Implementation, Clean Development Mechanism or EU ETS. Some of the EBRD Facilities existing in the CoM East countries are listed below.

Armenia: <http://www.armseff.org> — USD 20 million of EBRD funding for small-scale EE and renewable energy projects of small and medium-sized enterprises (SMEs). The Facility is supported by technical assistance from the Austrian ETC Energy Efficiency Fund.

Moldova: <http://www.moseff.org> — EUR 20 million of EBRD funding for small-scale EE and renewable energy projects of SMEs, including commercial buildings. The Facility is supported by grant funding and technical assistance from the European Union.

Ukraine: <http://www.ukeep.org> — USD 50 million of EBRD funding for small-scale EE and renewable energy projects of SMEs. The Facility is supported by technical assistance from the European Union. Also, EUR 150 million of EBRD funding for EE and renewable energy in industry. The Facility is supported by technical assistance from the Austrian Federal Ministry of Finance and the Swedish International Development Agency.

Georgia: <http://www.energocredit.ge> — EUR 20 million of EBRD funding for EE and renewable energy projects in the industrial and residential sectors. The Facility is supported by technical assistance from the Canadian International Development Agency, the Early Transition Countries Fund and the United Kingdom Sustainable Energy Initiatives Fund.

Kazakhstan: <http://www.kazseff.kz> — EUR 50 million of EBRD funding for EE and renewable energy projects in industry. Technical assistance is supported by the UK-EBRD Sustainable Energy Fund, the Norwegian Ministry of Foreign Affairs, the Japan-Europe Cooperation Fund and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

8.4.2 Financial mechanisms: Revolving funds, third-party financing schemes, leasing, ESCO, Cross-border ESCO, PICO, public-private partnerships (PPPs)

⁷³ See <http://www.ebrd.com/downloads/research/factsheets/seff.pdf> online.

8.4.2.1 Revolving funds ⁽⁷⁴⁾

This is a financial scheme aimed at establishing sustainable financing for a set of investment projects. The fund may include loans or grants and aims at becoming self-sustainable after its first capitalisation.

The objective is to invest in profitable projects with short payback time, to be repaid, and to use the same fund to finance new projects. It can be established as a bank account of the owner or as a separate legal entity. The interest rate generally applied in the capitalisation of revolving funds is lower than the market one or even 0 %. Grace periods are also frequent for the periodic payment of revolving funds.

There are several parties in a revolving fund: the owners can either be public or private companies, organisations, institutions or authorities. The operator of the fund can either be its owner or an appointed authority. External donors and financiers provide contributions to the fund in the form of grants, subsidies, loans or other types of repayable contributions. The borrowers can either be the project owners or contractors. According to the conditions of the revolving fund, savings or earnings gained from projects should be paid back to the fund within a fixed period of time, at certain time intervals.

8.4.2.2 Third-party financing schemes

Perhaps the easiest way for municipalities to undertake comprehensive building energy retrofits is to allow someone else to provide the capital and to take the financial risk. With these alternative methods of financing, high financing costs may be expected to reflect the fact that the debt is registered on someone else's balance sheet. However, the interest rate is only one factor among many that should be considered when determining the suitability of a project-financing vehicle.

8.4.2.3 Leasing ⁽⁷⁵⁾

The client (lessee) makes payments of principal and interest to the financial institution (lessor). The frequency of payments depends on the contract. The stream of income from the cost savings covers the lease payment.

This can be an attractive alternative to borrowing because the lease payments tend to be lower than the loan payments; it is commonly used for industrial equipment. There are two major types of leases: capital and operating.

- **Capital leases** are instalment purchases of equipment. In a capital lease, the lessee owns and depreciates the equipment and may benefit from associated tax benefits. A capital asset and associated liability appears on the balance sheet.
- In **operating leases**, the owner of the asset owns the equipment and essentially rents it to the lessee for a fixed monthly fee. This is an off-balance sheet financing source. It shifts the risk from the lessee to the lessor, but tends to be more expensive for the lessee.

8.4.2.4 Energy Services Companies ⁽⁷⁶⁾

ESCOs are described in 'Technical measures' in Part III of this Guidebook. An ESCO usually finances energy-saving projects without any up-front investment costs for the local authority. The investment costs are recovered and a profit is made from the energy savings achieved during the contract period. The contract guarantees a certain amount of energy savings for the local authority, and provides the possibility for the city to avoid facing investments in an unknown field. Once the contract has expired, the city owns a more efficient building with less energy costs.

Often, the ESCO offers a performance '**guarantee**', which can take several forms. The guarantee can revolve around the actual flow of energy savings from a retrofit project. Alternatively, the guarantee can stipulate that the energy savings will be sufficient to repay monthly debt service costs. The key

⁷⁴ Further information on the EBRD-Dexia-Fondelec Revolving Fund can be found at <http://www.ebrd.com/new/pressrel/2000/17feb15x.htm> and in the document *Financing Energy Efficient Homes of the International Energy Agency (IEA)* (http://www.iea.org/Papers/2008/cd_energy_efficiency_policy/2-Buildings/2-FinancialBarrierBuilding.pdf).

⁷⁵ Leaseurope (<http://www.leaseurope.org/>) is an association of car leasing European companies.

⁷⁶ Extended information is available in the 'Publications' section of <http://re.jrc.ec.europa.eu/energyefficiency/> and at http://www.worldenergy.org/documents/esco_synthesis.pdf online. In addition, the International Energy Agency's Task XVI offers a wide range of information about competitive energy services at <http://www.ieadsm.org/ViewTask.aspx?ID=16&Task=16&Sort=0#ancPublications3> online.

benefit to the building owner is the removal of **project non-performance risk**, while keeping the operating costs at an affordable level.

Financing is arranged so that the energy savings cover the cost of the contractor's services and the investment cost of the new and more energy-efficient equipment. The repayment options are negotiable.

Measurements and verification of the energy and savings produced are critical for all the parties involved in the project. Therefore, a protocol ⁽⁷⁷⁾ aimed at working with common terms and methods to evaluate the performance of efficiency projects for buyers, sellers and financiers will be essential. As mentioned in Chapter 7, the IPMVP is an international set of standardised procedures for the measurement and verification (M&V) of savings in EE projects (also in water efficiency). This protocol is widely accepted and adapted.

8.4.2.5 Cross-border ESCO cluster

Cross-border ESCO clusters are large scale projects at national and international levels in the areas of the following energy resources: oil, gas, coal, electricity, emission quotas, transportation, EE and energy savings, demand response services, renewable energy services, smart autonomous energy supply systems.

Amongst the CoM East countries, the main international players in the ESCOs market can be considered as being Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. The benefits of the successful operation of ESCOs in some of these developing countries have been highlighted by the following aspects: the reduction of payments for energy resources, the increase in EE and a decrease in energy consumption, the optimisation of equipment performance, and a quality improvement in the products and services.

8.4.2.6 ESCO Interacting model or Public Internal Performance Commitments (PICO) ⁽⁷⁸⁾

Besides the large private ESCO sector, a public ESCO sector called 'Interacting model', or Public Internal Performance Commitments (PICO), has mainly been used in Germany.

In the PICO model, a department in the public administration acts as a unit similar to an ESCO in function for another department. The ESCO department organises, finances and implements EE improvements mostly through a fund made up of municipal money and by using existing know-how. This allows for larger cost savings and the implementation of less profitable projects, which would be ignored by a private ESCO ⁽⁷⁹⁾. However, these projects lack the energy savings guarantee, because there are no sanction mechanisms within a single organisation (even though PICO includes saving targets). This can result in lower effectiveness of the investments. Nevertheless, this scheme increases activity for energy savings.

8.4.2.7 Public-private partnerships ⁽⁸⁰⁾

In this case, the local authority uses a concession scheme under certain obligations. For instance, public administration promotes the construction of a zero-emission swimming pool or a DHC installation by allowing a private company to run it, revolving the profits on the initial investment. This kind of contract should be flexible in order to allow the private company to extend the contract in case of unexpected payback delays. Moreover, a frequent due diligence is also recommended in order to follow up on the evolution of incomes.

An example of government-led third-party financing is the Social Entrepreneur Corporations (SEC) in Kazakhstan and Entrepreneur Corporations (SEC) in Kazakhstan or the Spanish IDAE model, which has been financing renewable projects in Spain since the late 1980s. IDAE identifies a project, provides the capital to a developer to construct it (or install the new energy-efficient equipment), and recovers its investment, plus the cost of its services, out of the energy production or savings. In other words, IDAE finances all the costs and assumes the technical responsibility of the investment. At the end of the contract, the project developer and user of the installation own(s) all the capital assets. In most instances, the government agency IDAE works as an ESCO and has invested EUR 95 million in

⁷⁷ The protocol may be downloaded for free at <http://www.ipmvp.org> online.

⁷⁸ See http://www.eceee.org/EEES/public_sector/PROSTappendix8.pdf online.

⁷⁹ Irrek et al., 2005, PICOligh project is a project supported by the European Commission through the programme SAVE. More information is available at <http://www.iclei-europe.org/?picolight> online.

⁸⁰ Successful worldwide public-private partnerships examples can be found in the document *Public-Private Partnerships: Local Initiatives 2007*, available at http://www.theclimategroup.org/assets/resources/ppp_booklet.pdf online.

renewable energy projects and leveraged another EUR 104 million for 144 projects under the third-party finance mechanism.

CHAPTER 9. POLITICAL COMMITMENT: The SEAP document must be approved by the municipal council or equivalent decision-making body

To ensure the success of the process (from SEAP design to implementation and monitoring), it is essential that sufficient empowerment and support is provided at the highest political level. The signing of the CoM by the municipal council (or equivalent decision-making body) is already a clear and visible sign of commitment. In order to reinforce the political support, it may be useful to offer a reminder regarding the many benefits that SEAP implementation can bring to local authorities (see Annex II).

Why do mayors join the Covenant?

Gigi Ugulava, Mayor of Tbilisi, Georgia:

'By signing the Covenant of Mayors, Tbilisi will become an energy-efficient city and it undertakes this engagement to create better living conditions for its citizens. Tbilisi will also share its experience with other local authorities and get inspiration from their commitments.'

Liudmyla Dromashko, Mayor of Pervomajsk, Ukraine:

'Participating in the Covenant of Mayors gave us a chance to review the city's energy priorities and to set up the energy saving measures plan for 10 years. The SEAP became a guide to our strategy of reducing energy consumption, CO₂ emissions and of improving the quality of life.'

The key decision makers of the local authority should further support the process by allocating adequate human resources with a clear mandate and sufficient time and budget to prepare and implement the SEAP. It is essential that they are involved in the SEAP elaboration process so that it is accepted and backed up by them. Political commitment and leadership are driving forces that stimulate the management cycle. Therefore, they should be sought out from the very beginning. The formal approval of the SEAP by the municipal council (or equivalent decision-making body), along with the necessary budgets for the first year(s) of implementation, is another key step.

As the highest responsible entity and authority, the municipal council must be closely informed of the follow-up of the implementation process. An implementation report should be produced and discussed periodically. In the context of the Covenant, an implementation report has to be submitted every second year for evaluation, monitoring and verification purposes. If necessary, the SEAP should be updated accordingly.

Finally, the key decision makers of the local authority could also play a role in:

- integrating the SEAP vision with the other actions and initiatives of the relevant municipality departments and making sure it becomes part of the overall planning;
- assuring the long-term commitment to implementation and monitoring, along the full duration of the SEAP;
- providing support for citizens' participation and stakeholders' involvement;
- ensuring that the SEAP process is 'owned' by the local authority and the residents;
- networking with other CoM signatories, exchanging experiences and best practices, establishing synergies and encouraging their involvement in the CoM.

There is no single route leading to political commitment. Administrative structures, patterns of political approval and political cultures vary from country to country. For such reasons, the local authority itself is best suited to know how to proceed to raise the political commitment needed for the SEAP process; that is, who to contact and in which order (Mayor, municipal council, specialised committees, etc.).

Suggestions on how to ensure the necessary local commitment:

- ✓ Provide the mayor and key political leaders with informative notes about the benefits and resources needed for SEAP. Make sure documents presented to the political authorities are short, comprehensive and understandable
- ✓ Brief major political groups
- ✓ Inform and involve the general public/citizens and other stakeholders
- ✓ Make a strong reference to other decisions taken by the municipal council in this field (related strategies and plans, Local Agenda 21, etc.)
- ✓ Take advantage of windows of opportunity, for example when the media is focusing on climate change issues
- ✓ Inform clearly about the causes and effects of climate change along with information about effective and practical responses
- ✓ Highlight other benefits than the contribution to mitigating climate change (social, economic, employment, air quality, etc.). Keep the message simple, clear and tailored to the audience
- ✓ Focus on measures on which the agreement of the key actors can be obtained.

ADDITIONAL RESOURCES

1. **MUE-25 PROJECT** The project 'Managing Urban Europe-25 (MUE-25)' provides some suggestions on how to build political commitment (http://www.mue25.net/Political_Compmitment_200907_t1z4D.PDF.file).
2. The Policy Network, in its publication *Building a low carbon future: The politics of climate change*, dedicates a chapter to political strategies for strengthening climate policies, available at <http://politicsofclimatechange.files.wordpress.com/2009/06/building-a-low-carbon-future-pamphlet-chapter-05.pdf> online.

CHAPTER 10. SEAP SUBMISSION AND IMPLEMENTATION

10.1 SEAP submission

Covenant signatories commit to submitting their SEAP within the year following adhesion. The submission process takes place via the signatories' restricted area 'My Covenant' and is completed when:

- the SEAP document, officially approved by the local authority, has been uploaded. This can be submitted in the national language ⁽⁸¹⁾;
- the SEAP template has been duly completed in all its parts, in Russian or in English. This template summarises the key elements of the SEAP, namely the overall strategy, the BEI and the actions defined to reach the target. It is of paramount importance that the template well reflects the content of the politically approved document. A specific instruction document for filling in the template is available on the CoM website ⁽⁸²⁾.

10.2 SEAP implementation

The implementation of the SEAP is the step that takes the longest time, efforts and financial means. Whether the SEAP will be successfully implemented or remain a pile of paperwork depends to a high degree on the human factor. The SEAP needs to be managed by an organisation that supports people in their work, where there is an attitude of ongoing learning, and where mistakes and failures are opportunities for the organisation and individuals to learn. If people are given responsibility, encouragement and resources and are motivated, things will happen.

During the implementation phase, it will be essential to ensure both good internal communication (between different departments of the local authority, the associated public authorities and all the persons involved (e.g. local building managers) as well as external communication (citizens and stakeholders). This will contribute to awareness raising, increase the knowledge about the issues, induce changes in behaviour, and ensure wide support for the whole process of SEAP implementation (see Section 3.3 on Communication).

The monitoring of progress and energy savings/CO₂ emissions reductions should be a continuous task (see next chapter). Finally, networking with other local authorities developing or implementing a SEAP will provide additional value towards meeting the 2020 targets by exchanging experiences and best practices, and establishing synergies. Networking with potential CoM signatories, and encouraging their involvement in the CoM is also recommended.

Some tips to put a SEAP into practice:

- ✓ Adopt a project management approach: deadline control, financial control, planning, deviations analysis and risk management. Use a quality management procedure ⁽⁸³⁾.
- ✓ Divide the project into different parts and select persons responsible.
- ✓ Prepare specific procedures and processes aimed at implementing each part of the project. A quality system is a useful tool to make sure that procedures are in accordance with the objectives.
- ✓ Establish a score card system for tracking and monitoring your plan. Indicators such as percentage of compliance with deadlines, percentage of budget deviations, percentage of emissions reductions with the measures already implemented, and other indicators deemed convenient by the local authority may be proposed.
- ✓ Plan the follow-up with the stakeholders establishing a calendar of meetings in order to inform them. Interesting ideas could arise during these meetings or possible future social barriers could be detected.
- ✓ Anticipate future events and take into account negotiation and administrative steps to be followed by the public administration to start a project. Public projects usually require a long time to obtain authorisation and approvals. In this case, precise planning including security factors is convenient mainly at the beginning of SEAP implementation.
- ✓ Propose, approve and put into operation a training programme at least for those persons directly involved in the implementation.

⁸¹ When available, translations of the SEAP document into English and/or Russian can also be uploaded.

⁸² See http://www.eumayors.eu/mycovenant/docs/SEAP_template_instructions.pdf online.

⁸³ The European Energy Award (EEA). See <http://www.european-energy-award.org> online.

- ✓ Motivate your team. This point is highly connected to Chapter 3 on Building support. Internal people are important stakeholders.
- ✓ Frequently inform the city council (or equivalent body) and politicians in order to make them an important part of successes and failures and to get their commitment. This point has been considered as very important during experts' consultations, prior to developing this Guidebook.
- ✓ Some measures proposed in the SEAP may need to be tested before a massive implementation. Tools such as pilot or demonstration projects can be used to test the suitability of these measures.

CHAPTER 11. MONITORING AND REPORTING PROGRESSES

Regular monitoring using relevant indicators allows for evaluating whether the local authority is achieving its targets, and to adopt corrective measures if necessary. Signatories are therefore committed to submit an 'Implementation Report' every second year following the submission of the SEAP. At least every fourth year after SEAP submission this report has to be complemented by a Monitoring Emission Inventory (MEI). If a signatory chooses to set its objective on the basis of a BAU scenario, the soundness of the hypotheses underlying its definition should be checked at least once before 2020.

Monitoring is a very important part of the SEAP process. Regular monitoring followed by adequate adaptations of the Plan allows for initiating a continuous improvement of the process. As mentioned before, CoM signatories are committed to submit an 'Implementation Report' every second year following the submission of the SEAP 'for evaluation, monitoring and verification purposes'. A specific monitoring SEAP template and instructions document will be published further on.

The Implementation Report should include an updated CO₂ emissions inventory (MEI). Local authorities are encouraged to compile CO₂ emissions inventories on an annual basis (see Part II, Chapter 5 on Reporting and documentation).

However, if the local authority considers that such regular inventories put too much pressure on human or financial resources, it may decide to carry out the inventories at longer intervals. But local authorities are recommended to compile a MEI and report on it at least every 4th year, which means submitting alternatively every 2 years an '**Action Report**' — without MEI (years 2, 6, 10, 14, etc.) and an '**Implementation Report**' — with MEI (years 4, 8, 12, 16, etc.). The **Implementation Report** contains quantified information on measures implemented, their impacts on energy consumption and CO₂ emissions, and an analysis of the SEAP implementation process, including corrective and preventive measures when this is required. The **Action Report** contains qualitative information about the implementation of the SEAP. It includes an analysis of the situation and qualitative, corrective and preventive measures.

As previously mentioned, some indicators are needed in order to assess the progress and performance of the SEAP. Even if a monitoring and reporting document will be published further on, some indicators are suggested in this Guidebook to give an orientation on the type of monitoring parameters that may be used.

Table 5. Possible indicators to monitor the SEAP implementation

| SECTOR | INDICATORS | **DATA COLLECTION DIFFICULTY | DATA COLLECTION | POSITIVE TREND |
|-----------|---|------------------------------|--|----------------|
| Transport | Number of public transport passengers per year | 1 | Agreement with a public transport company. Select representative lines to monitor. | ↑ |
| | Kms of biking ways | 1 | City Council | ↑ |
| | Kms of pedestrian streets / Kms of municipal roads and streets | 1 | City Council | ↑ |
| | Number of vehicles passing fixed point per year/month (set a representative street/point) | 2 | Install a car counter on representative roads/streets | ↓ |
| | Total energy consumption in public administration fleets | 1 | Extract data from fuel suppliers' bills. Convert to energy. | ↓ |
| | Total energy consumption of renewable fuels in public fleets | 1 | Extract data from biofuels suppliers' bills. Convert to energy. Sum this indicator with the previous one and | ↓ |

| | | | | |
|--|---|---|---|---|
| | | | compare values. | |
| | % of population living within 400 m of a bus service | 3 | Carry out surveys in selected areas of the municipality. | ↑ |
| | Average Kms of traffic jams | 2 | Perform an analysis of traffic fluidity in specific areas. | ↓ |
| | Tonnes of fossil fuels and biofuels sold in representative selected gas stations | 1 | Sign an agreement with selected gas stations located within the municipality. | ↓ |
| Buildings | % of households with energetic label A/B/C | 2 | City Council, national/regional energy agency, etc. | ↑ |
| | Total energy consumption of public buildings | 1 | See Part II on Energy data collection. City Council | ↓ |
| | Total surface of solar collectors | 3 | See Part II on Energy data collection. City Council, regional/national public administrations (from grants) and selected areas for door-to-door surveys. | ↑ |
| | *Total electricity consumption of households | 2 | See Part II on Energy data collection. Selected areas for door-to-door surveys. | ↓ |
| | *Total gas consumption of households | 2 | See Part II on Energy data collection. Selected areas for door-to-door surveys. | ↓ |
| Local energy production | *Electricity produced by local installations | 2 | See Part II on Energy data collection. Regional/national public administrations (feed-in tariffs of certificates). | ↑ |
| Involvement of the private sector | Number of companies involved in energy services, energy efficiency and renewable energies business Number of employees in these businesses, turnover | 2 | City Council and regional/national public administrations. | ↑ |

| | | | | |
|---------------------------------------|--|---|--|---|
| Citizen involvement | Number of citizens attending to energy efficiency/renewable energies events | 1 | City Council and consumers associations. | ↑ |
| Green public procurement (GPP) | Establish an indicator for each category and compare with the typical value before implementing GPP. For example, compare kg CO ₂ /kWh of green electricity with the previous value. Use the data collected from all purchases to produce a single indicator. | 2 | City Council | ↑ |

Data collection frequency may be every 12 months ⁽⁸⁴⁾ by default.

* This data can be collected from utilities, tax offices (calculation of electricity consumption patterns analysing taxes paid for electricity) of the public administration or performing surveys in selected areas. Data collection from taxes can be feasible or not depending on the taxing mechanisms of each country.

** 1-EASY, 2-MEDIUM, 3-DIFFICULT

⁸⁴ In some cases, more frequent data collection may be better. In these cases, seasonal effects must be considered in order to perform a real analysis of the situation. Once the first year has been concluded, a monthly or quarterly inter-annual analysis may be carried out.

ANNEX I. SUGGESTIONS OF ASPECTS TO BE COVERED IN THE BASELINE REVIEWS

| SCOPE | KEY ASPECTS FOR ASSESSMENT |
|--|---|
| Energy structure and CO ₂ emissions | <ul style="list-style-type: none"> • Level and evolution of energy consumption and CO₂ emissions by sector and by energy carrier (see Part II). Global and per capita. |
| Renewable energies | <ul style="list-style-type: none"> • Typology of existing facilities of production of renewable energies. • Renewable energy production and trends. • Use of agricultural and forest biomass as RES. • Existence of bio-energetic crops. • Degree of self-supplying with renewable energies. • Potentialities for renewable energy production: solar thermal and PV, wind, mini-hydraulics, biomass, others. |
| Energy consumption and energy management in the local administration | <ul style="list-style-type: none"> • Level and change in the energy consumption of the local administration by sector (buildings and equipment, public lighting, waste management, wastewater treatment, etc.) and by energy carrier (see Part II). • Assessment of the EE of buildings and equipment using efficiency indexes of energy consumption (for example: kWh/m², kWh/m² • user, kWh/m² hours of use). This allows for identification of the buildings where there are more improvement potentialities. • Characterisation of the largest energy consumers among municipal buildings and equipment/facilities. Analysis of key variables (for instance: type of construction, heating, cooling, ventilation, lighting, kitchen, maintenance, solar hot water, implementation of best practices, etc.). • Assessing the types of lamps, lighting and energy-related issues in public lighting. Assessment of EE using efficiency indexes of energy consumption. • Degree and adequacy of energy management in public buildings/equipment and public lighting (including energy accounting and audits). • Established initiatives for improving energy saving and efficiency and results obtained to date. • Identification of potentialities for improvement in energy savings and efficiency in buildings, equipment/facilities and public lighting. |
| Energy consumption of the municipal fleet | <ul style="list-style-type: none"> • Evaluation of the composition of the municipal fleet (own vehicles and of externalised services), annual energy consumption (see Part II). • Composition of the urban public transport fleet, annual energy consumption. • Degree of the energy management of the municipal fleet and public transport. • Established initiatives for improving on reducing energy consumption and results obtained to date. • Identification of potentialities for improvement in EE. |
| Energy infrastructures | <ul style="list-style-type: none"> • Existence of electricity production plants, as well as DHC plants. • Characteristics of the electricity and gas distribution networks, as well as any district heat/cold distribution network. • Established initiatives for improving EE of the plants and of the distribution network and results obtained to date. • Identification of potentialities for improvement in EE. |
| Buildings | <ul style="list-style-type: none"> • Typology of the existing building stock: usage (residential, commerce, services, social, etc.), age, thermal insulation and other energy-related characteristics, energy consumption and trends (if available, see Part II), protection status, rate of renovation, tenancy, etc. • Characteristics and energy performance of new constructions and major renovations. • What are the minimal legal energy requirements for new constructions and major renovations? Are they met in practice? • Existence of initiatives for the promotion of EE and renewables in the various categories of buildings. • What results have been achieved? What are the opportunities? |

| SCOPE | KEY ASPECTS FOR ASSESSMENT |
|------------------------|---|
| Industry | <ul style="list-style-type: none"> • Importance of industry sector in the energy balance and CO₂ emissions — is it a target sector for our SEAP? • Existence of public and private initiatives addressed to promote energy saving and efficiency in industry. Key results achieved. • Degree of integration of energy/carbon management in industry businesses. • Opportunities and potentialities on energy saving and efficiency in industry. |
| Transport and mobility | <ul style="list-style-type: none"> • Characteristics of the demand of mobility and modes of transport. Benchmarking and major trends. • What are the main characteristics of the public transportation network? Degree of development and adequacy? • How is the use of public transportation developing? • Are there problems with congestion and/or air quality? • Adequacy of public space for pedestrians and bicycles. • Management initiatives and mobility planning. Initiatives to promote public transport, bicycle use and walking. |
| Urban planning | <ul style="list-style-type: none"> • Characteristics of existing and projected 'urban spaces', <u>linked to mobility</u>: urban density, diversity of uses (residential, economic activity, shopping, etc.) and <u>building profiles</u>. • Degree of dispersion and compactness of urban development. • Availability and location of the main services and facilities (educational, health, cultural, commercial, green space, etc.) and proximity to the population. • Degree and adequacy of integration of EE criteria in urban development planning. • Degree and adequacy of integration of sustainable mobility criteria in urban planning. |
| Public procurement | <ul style="list-style-type: none"> • Existence of a specific policy commitment on green public procurement. • Degree of implementation of energy and climate change criteria in public procurement. Existence of specific procedures, usage of specific tools (carbon footprint or others). |
| Awareness | <ul style="list-style-type: none"> • Development and adequacy of the activities of communication and awareness to the population and stakeholders with reference to EE. • Level of awareness of the population and stakeholders with reference to EE and potential savings. • Existence of initiatives and tools to facilitate the participation of citizens and stakeholders in the SEAP process, and the energy and climate change policies of the local authority. |
| Skills and expertise | <ul style="list-style-type: none"> • Existence of adequate skills and expertise among the municipal staff: technical expertise (EE, renewable energies, efficient transport, etc.), project management, data management (lack of skills in this field can be a real barrier!), financial management and development of investment projects, communication skills (how to promote behavioral changes, etc.) and green public procurement? • Is there a plan for training staff in these fields? |

Source: Methodology Guide for the revision of the Local Agenda 21 Action Plans in the Basque Country — UDALSAREA21 (Basque Network of Municipalities for Sustainability). See <http://www.udalsarea21.ent> online.

ANNEX II. BENEFITS OF SEAP

The local (political) authorities can obtain the following benefits in supporting SEAP implementation.

- Contribution to the global fight against climate change — the global decrease of GHGs will also protect the city against climate change effects:
 - by demonstrating commitment to environmental protection and efficient management of resources.
- Reduced municipal and private energy spendings:
 - by obtaining a clear, honest and comprehensive picture of budgetary outflows connected with energy use and an identification of weak points;
 - by increasing EE and savings on energy bills;
 - by securing future financial resources through energy savings and local energy production.
- Better quality of life by improving:
 - citizens' well-being due to reduced energy poverty;
 - human health due to reduced traffic congestion and improved air quality.
- Better provision of public services:
 - by developing a clear, holistic and realistic strategy for improving the current situation.
- Greater energy security:
 - by improving long-term energy independence of the municipality.
- Development of the local economy and employment benefits (for example, new jobs on retrofitting of buildings).
- Financial benefits through:
 - knowledge and experience on how to use available financial resources (local, EU grants and financing schemes);
 - experience on how to create bankable projects;
 - knowledge of implementing national policies and legislation (and EU policies, if applicable).
- Overall benefits cover:
 - improvement of local democracy by involving civil society, and reviving the sense of community around common projects;
 - improvement of the city's image, and gained political visibility during the process;
 - eventual synergies with existing commitments and policies;
 - benefits from networking with other CoM signatories.

ANNEX III. EXAMPLES OF MEASURES IN THE SECTORS RELEVANT TO THE COVENANT OF MAYORS

Icherisheher ('Old City') Azerbaijan

In July 2012, Icherisheher ('Old City'), the administrative body of Baku, the capital of Azerbaijan, agreed on the adherence of the Covenant. Icherisheher administrative staff have good experience in implementing energy efficient measures in the transport sector, and in street and building facade lighting systems. In the Old City there are 452 buildings (1 023 apartments) situated for approximately 4 000 inhabitants.

Activities carried out and flowing action by Icherisheher ('Old City'): an electronic entering system for vehicles has been recently introduced. The outcome has been a 4–5–fold reduction in the number of vehicles entering Old City from 3 500–4 000 to 800–1 000 per 24 hours. There are also limitations for the entry of trucks. Heavy trucks of 5 tonnes and over may enter only with special permission, while all others lighter than 5 tonnes have special hours when they are allowed to enter. At the same time, there is high potential for electricity savings on household and business use as well as on street and facade lightening systems. Icherisheher has started a project on the renovation of street lighting.

Under the EU-funded programme 'Supporting the participation of Eastern Partnership and central Asian cities in the Covenant of Mayors', Icherisheher will develop SEAP through the organisation of capacity development/training, conducting assessments required, public consultation, organisation of awareness-raising events (energy and transport days,) development and implementation of demonstration project, and participating in regional and global networks.

Gori, Georgia

Why did Gori join the CoM?

Mr Zviad Khmaladze — The Mayor of Gori District: 'Self-governing city of Gori is striving for the implementation of European values and standards. Thus, on July 13, 2012 the Municipality of Gori joined the Covenant of Mayors initiative in order to implement actions in energy efficiency and renewable energy leading to at least 20 % CO₂ emissions reductions by 2020. The savings that municipality will receive after reduction of the consumption of energy resources will be used for the implementation of the other projects in the city. The municipality of Gori hopes for the tight cooperation and assistance with COMO East Office in Tbilisi in order to implement above mentioned commitments.'

Since September 2012, the municipality of Gori has started data and information gathering for SEAP development. The municipality, with the support of the European Union, the World Bank (WB) and the Ministry of Regional Development and Infrastructure of Georgia, implemented the project 'Improvements in Housing and Infrastructure for Conflict Affected People'. In the framework of this project, the walls and floors of the IDP houses were insulated (for people affected by the conflict of August 2008, IDP settlements) in the Gori district.

Rustavi, Georgia

On 2 May 2011, the self-governing city of Rustavi joined the European common vision and signed the CoM agreement, making a commitment to reduce the city's GHG emissions by 2020 by at least 20 %, and to increase and improve the ecological environment of the city.

The city of Rustavi is one of the country's powerful industrial centres, where significant parts of the metallurgical, energy and chemical industries are concentrated. The course of rapid economic development undoubtedly requires consideration of the principles of sustainable development, formed by balance of economic, social and ecological development. Considering these principles, the Development Strategy of the city of Rustavi was developed in 2009, under which one of the priorities is improvement of ecological condition of the city.

The city's SEAP document was prepared in full compliance with the said strategy and reflects reduction of GHG emissions — one of the most important aspects of the improvement of ecological conditions within the obligations under the CoM. Reduction of GHG emissions, namely of CO₂ by 20 % by 2020 compared with the level of 2011 will significantly recover the climate of the city and improve the environment. Furthermore, implementation of the said Covenant will facilitate raising public awareness of environment protection, including entrepreneurs' provision, on the one hand, of further stability of sustainable development.

In the city of Rustavi, with the help of Swiss Agency, the first energy-efficient social hostel was built for 12 socially unprotected families, to replace non-energy-efficient housing for the same number of people. This innovative measure is considered as a short-term one and its implementation will significantly raise public awareness of EE and energy saving matters as well as increase motivation.

On 28 and 29 February 2012, the EECG in partnership with self-governing Rustavi city organised the awareness raising event 'Let's save Energy', through the organisation of Intelligent Energy Days in Rustavi city within the project 'Energy Saving Initiative in the Building sector in Eastern Europe and the central Asian Countries',

financed by the European Commission. The abovementioned event had a non-formal educational character that included seminars at five public schools and the replacement of light bulbs in kindergartens.

Tbilisi, Georgia

30 March 2010: Tbilisi City Hall, the first of the capitals of the EU Eastern Partnership, joined the CoM initiative and officially committed itself to developing a SEAP and BEI in one year. On 30 March 2011, Tbilisi City Hall officially submitted the documents in order to fulfil the obligations of the CoM. On 25 November 2011, the European Commission formally adopted an Action Plan on Sustainable Energy Tbilisi and a baseline inventory of GHG emissions.

16–22 June 2012: Europe celebrated EU Sustainable Energy Week (EUSEW 2012), a campaign that was organised by the European Commission's DG ENER, the European Agency for Competitiveness and Innovation, the European institutions, major energy actors and private companies.

The aim of the campaign was to promote the development of renewable energy and EE technologies and in this way remind the public at large of the renewable energy and EE potential for the mitigation of global and local environmental, social and economic problems. In the framework of the campaign 'Technological Exhibition of Renewable and Energy Efficient Technologies' (16–17 June 2012), the exhibition 'Sustainable Development in Paintings' (18–22 June 2012) was held.

Pilot project of Heat Pumps as one of the alternative energy sources at Tbilisi Kindergarten: in November 2012, the pilot project 'Popularization of Heat Pumps as one of the Sources of Alternative Energy and Completion of the Relevant Projects' was implemented in Tbilisi Kindergarten #155. The project was implemented by the NGO Renewable Energy Centre under the 'New Applied Technology Efficiency and Lighting Initiative/NATELI II' Project, supported by USAID to Georgia and managed by Winrock International Georgia.

The Kindergarten was selected based on the energy data collected every month by the Department of Economic Policy of the Tbilisi municipality. The pilot project envisaged the installation of two heat pumps, a water boiler and a heating network provided heating, cooling and hot water to the kindergarten using atmospheric air as the source of energy. The outdoor facade of the building was painted in two layers with special innovative ceramic paint additive. Thermal insulation of the building's attic was realised by special thermal pad, and two metal-plastic windows were installed in the attic.

Activities carried out and the flowing action by Tbilisi city with regard to the transportation sector cover:

- updating of the municipal vehicle fleet;
- optimisation of the bus vehicle fleet;
- involvement of the control centre for traffic lights;
- development of road infrastructure;
- installation of fluorescent lamps in public places inhabited by the building;
- improvements in public transport services;
- development of a tram network.

Polotsk, Belarus

The pilot SEAP action is the installation of high-efficiency LED street lights in the main avenue of the city, Frantsysk Skaryna Avenue. Not only is LED lighting an environmentally friendly solution, it is also a very profitable investment. LED lights use only 10 % of the energy consumed by incandescent lights, their lifetime is over 50 times longer and their maintenance is significantly cheaper. New street lights are accompanied by an information board with some facts about the installation's energy savings and an indication that this pilot action has been financed within an EU-funded project ⁽⁸⁵⁾.

Ukraine

Measures have been implemented in buildings for transforming the Market for Efficient Lighting in Ukraine. The goal of the project is to help transform the market towards more energy-efficient lighting technologies by removing barriers. The project aims at promoting a gradual phase-out of inefficient lighting products in residential and public buildings ⁽⁸⁶⁾.

EU programme of financial and technical cooperation with Ukraine. The list of projects includes key information on ongoing EU-funded projects on energy and water ⁽⁸⁷⁾.

⁸⁵ For more information, please see http://www.ciudad-programme.eu/grant_profile.php?lang=1&country_id=3&grant_id=14 online.

⁸⁶ More information can be found at <http://www.undp.org.ua/en/energy-and-environment/35-energy-and-environment-/1200-transforming-the-market-for-efficient-lighting-online>.

⁸⁷ See http://eeas.europa.eu/delegations/ukraine/projects/list_of_projects/projects_en.htm#water-energy online.

Municipal Heating reform in Ukraine. The USAID project cooperates with the government of Ukraine and local authorities to create a financially viable and stable district heating sector that delivers reliable and quality services to the population, public institutions and local industries (⁸⁸).

Dolyna, Ukraine

In the Dolyna SEAP, consulting services are foreseen for citizens in the field of EE at the city's communal centre for energy audits. Educational and informational events in the city — yearly 'Energy days' — are planned. They also involve residential buildings competitions in the field of EE to provide financial incentives for winners. Furthermore, the following activities are foreseen: regular publishing of material on EE and climate protection in the local media, installation of billboards throughout the city, and participation in exhibitions and open houses to promote energy-efficient technologies among the city's inhabitants.

Tajikistan

Energy Efficiency in Buildings in Tajikistan. The USAID programme project aims at demonstrating the potential of renewables and energy-efficient technologies for improved heating services in the urban residential sector of Tajikistan (⁸⁹).

⁸⁸ More information can be found at http://mhrp.org.ua/index.php?option=com_frontpage&Itemid=1 online.

⁸⁹ For more information, see <http://www.carecnet.org/programmes-and-activities/climate-change-and-sustainable-energy/energy-efficiency-in-buildings-in-tajikistan/?lang=en> online.

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European Commission

EUR 26820 EN – Joint Research Centre – Institute for Energy and Transport

**Title: How to develop a Sustainable Energy Action Plan (SEAP) in the Eastern partnership and central Asian cities,
Guidebook, Part I**

Authors: Irena Gabrielaitiene, Giulia Melica, Federica Paina, Paolo Zancanella, Strahil Panev, Paolo Bertoldi

Luxembourg: Publications Office of the European Union

2014 –94 pp. – 21.0 x 29.7 cm

EUR – Scientific and Technical Research series – ISSN 1831-9424

ISBN 978-92-79-39994-7

doi: 10.2790/36843

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doi: 10.2790/36843

ISBN 978-92-79-39994-7

