



How to develop a Sustainable Energy Action Plan integrated with an Energy Management System based on ISO 50001:2011

Guidelines

working paper

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1 Structure of these guidelines – EXECUTIVE SUMMARY

This guide aims to help Local Bodies, particularly Municipalities, in managing and implementing Energy management systems and a Sustainable Energy Action Plan – SEAP – in their local context, and to highlight benefits of simultaneously applying these two energy management tools.

The SEAP is the tool for achieving the formal commitment of towns, cities and regions that have signed the Covenant of Mayors¹ to reduce their CO₂ equivalent emissions beyond the 20% target.

The standard for Energy Management Systems is EN ISO 50001. ISO 50001 was approved in 2011, taking the place of the superseded European standard EN 16001:09.

A practical approach has been adopted whereby the ISO 50001 Standard requirements are presented and discussed in their application to the Public Administrations; moreover, concrete problems and aspects of the SEAP planning, implementation and maintenance are presented and developed under the perspective of EnMS (Energy Management System) implementation.

The connections between ISO 50001 and SEAP implementation processes are also analysed. This will help local bodies to apply ISO 50001 experience in SEAP planning and management, thus helping personnel involved in the actions to develop a common path for implementing and monitoring the SEAP.

The objectives of ISO 50001 and of SEAP are similar and coherent.

The introduction to ISO 50001 states that it *“enables that organization to take a systematic approach, in order to achieve continual improvement of energy performance, energy efficiency and energy conservation”*. The aim of ISO 50001 Standard is to support energy reviews and to address measurable improvements of energy performances.

On the other hand, the SEAP guidebook² has a symmetrical view: *“... It uses the results of the Baseline Emission Inventory to identify the best fields of action and opportunities for reaching the local authority’s CO₂ target reduction. It defines concrete reduction measures, together with time frames and assigned responsibilities, which translate the long-term strategy into action...”*

Moreover, the objective of ISO 50001 states that: *“This International Standard specifies requirements applicable to energy supply and energy uses and consumption, including measurement, documentation and reporting, design and procurement practices for energy using equipment, systems, processes, and personnel. This international Standard applies to all factors affecting energy use, which can be monitored and influenced by the organization”*; while for SEAP the goal is more precise: *“The SEAP should concentrate on measures aimed at reducing the CO₂ emissions and final energy consumption by end users.”*

In terms of targets as well as other aspects, SEAP and ISO 50001 match their purposes.

ISO 50001 may provide considerable help to Public Authorities in formalising measures and activities involved in implementing and monitoring SEAPs.

¹ More information about the Covenant of Mayor initiative is available at: www.eumayors.eu

² European Commission. How to develop a Sustainable Energy Action Plan (SEAP) – Guidebook. Luxembourg: Publications Office of the European Union. 2010 – 120 pp.

The ISO 50001 standard obliges organizations to establish criteria to control and evaluate results of planned activities in advance, to define shared suitable indicators, and to take decisions on measured results and quantified expected results. Accordingly ISO 50001 can provide crucial support to the Commission in obtaining a quantitative assessment of the reduction of CO₂ equivalent emissions achieved thanks to the approved SEAPs.

The following sections highlight the synergies between these two tools and how they can be used simultaneously to attain improved efficiency in their application. You should, however, refer to standard ISO 50001³ and the SEAP guidebook⁴ for their implementation.

The structure of these guidelines is as follows:

Chapter 2	Understanding ISO 50001:2011 EnMS and SEAP <ul style="list-style-type: none"> • EnMS according to ISO 50001 • SEAP according to the SEAP guidebook
Chapter 3	Implementation of ISO 50001 requirements to a Public Authority in tandem with a SEAP
Chapter 4	Integration of the ISO 50001 EnMS and/or the SEAP with existing management systems
Chapter 5	Examples of synergies between ISO 50001 EnMS and SEAP
Chapter 6	Glossary

TESTIMONIALS AND DIRECT EXPERIENCES FROM MUNICIPALITIES CAN BE FOUND IN THE ENERGY FOR MAYORS “WHY INTEGRATE a Sustainable Energy Action Plan with an ENERGY MANAGEMENT SYSTEM?” BROCHURE AVAILABLE AT: www.energyformayors.eu

³ ISO 50001 “Energy management systems. Requirements with guidance for use”.

⁴ European Commission. How to develop a Sustainable Energy Action Plan (SEAP) – Guidebook. Luxembourg: Publications Office of the European Union. 2010 – 120 pp.

2 Understanding ISO 50001:2011 EnMS and SEAP

2.1 Energy Management Systems according to ISO 50001:2011

2.1.1 Introduction

The general aim of the Standard is to help organizations establish and maintain:

- Energy review and baseline, knowledge of energy uses;
- Improvements in energy performance;
- Energy performance indicators (EnPI);
- A sound monitoring plan to measure performance and improvements, entailing cost reductions, improved competitiveness and GHG emission reduction.

When an organization develops its own EnMS and when a Certification Body is assessing how an EnMS conforms with ISO 50001, it is necessary to bear in mind that the aim is to help organizations save energy and not to produce new ineffective rules, procedures or records.

The standard contains requirements that can be verified objectively. This means they are not “guidelines”, but a standard suitable for third-party certification.

ISO 50001 does not establish absolute requirements for energy performance beyond the commitments in the energy policy of the organization to comply with legislation. Two organizations carrying out similar operations and with different energy performance levels may both comply with the standard.

In the following paragraphs, the guidelines describe steps for planning and implementing the EnMS, as well as providing suggestions for implementation of the standard.

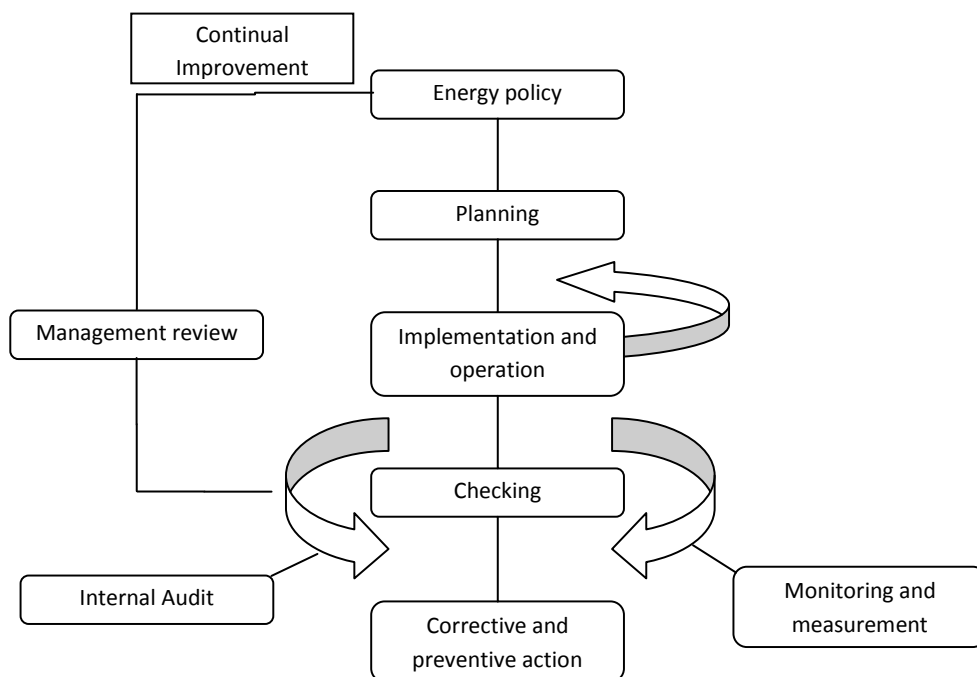
The presentation focuses on aspects of the EnMS that are directly related to improving and managing energy performance. In this way it will be easier to understand all the synergies between ISO 50001 and SEAP implementation.

ISO 50001 is suitable for implementing in any kind of organization; these guidelines will address comments and suggestions to aspects regarding general application in a Public Authority interested in using this standard to support SEAP management.

When reading the ISO 50001 standard, the organization must remember the following rules normally used to establish the requirements of a management system:

Requirements presented with “ shall ” are to be implemented wholly as requested by the standard.
Requirements presented with “ should ” are to be implemented, but may be implemented in an equivalent way, in order to achieve an equivalent result
“ Annex A ” of the standard is a guideline and may be used to understand how to implement the EnMS requirements and how to choose the best suited solution for each situation

The following picture shows the EnMS model according to ISO 50001.



A similar approach – based on the PDCA cycle (Plan, Do, Check, Act) - may be useful for applying inside the organization (in this case, the public authority) but also for managing an SEAP.

2.1.2 Plan

According to ISO 50001 requirements, the organization shall:

- establish EnMS scope and boundaries,
- approve the Energy Policy,
- identify and prioritize energy uses,
- identify and understand applicable legal requirements,
- list and prioritize improvement opportunities,
- identify a set of EnPIs suited for measuring energy performances and energy performances improvements,
- measurable objectives for energy performances improvement.

Establishing the ENMS and approving the Energy Policy	<p>Establishing the EnMS involves identifying and allocating rules and resources required to put the energy policy and energy objectives into practice.</p> <p>The objective of the EnMS and its boundaries shall be defined. This point is of great importance within the EnMS of a Public Authority since public bodies normally deal with direct energy usage (direct consumptions of energy) but – due to their own competences – they also deal with energy use of public and private third parties within their area.</p> <p>In order to guarantee proper sharing of knowledge on EnMS implementation and good communication of the EnMS requirements such as procedures, rules and responsibilities, it is advisable to document all relevant EnMS requirements in writing – on paper or in electronic form.</p> <p>The importance of documenting all aspects of the EnMS is relevant for a Public Authority. Any document produced by the organization to establish rules, responsibilities and any other relevant aspect of the EnMS shall be officially approved by the competent internal authority and communicated to the interested parties.</p> <p>Documents involving the responsibilities of other parties outside of the organization – such as improvement objectives shared with other private or public entities – should be formally accepted or approved by all parties involved.</p> <p>This energy policy takes the form of an official, publicly available statement of the organization’s commitment to comply with relevant legal requirements, to achieve energy management objectives and to reduce energy related emissions.</p> <p>The Energy Policy shall include the commitment to legal compliance, to the continual improvement of energy performance and to the availability of information and resources to achieve objectives. It shall support the purchase of energy-efficient products and services.</p> <p>The Policy shall be documented, approved by “Top Management”, communicated to all employees and to all people working on behalf of the organization; it shall be available to the public, and may be communicated steadily or on request.</p>
Identifying and prioritising energy uses	<p>The organization shall identify all elements of the activities, goods or services included in the objective of the EnMS – such as facilities, equipments and systems - that can affect energy use or energy consumption.</p> <p>Past and present energy consumption shall be included into the review.</p> <p>The parameters that can influence the energy consumptions shall be identified, such as the following examples:</p> <ul style="list-style-type: none"> • Heating consumption rates: <ul style="list-style-type: none"> • heated square meters • external temperature • expected internal temperature • Public transportation <ul style="list-style-type: none"> • number of passengers • extension of the public transport network <p>The organization shall also identify those persons whose activities can influence energy consumption rates; this is important for understanding how to address behaviour of these persons.</p> <p>The energy uses shall be “prioritized” “for further analysis”: this means that the Public</p>

	<p>Authority should create a sort of ranking (and criteria to enable it to do so) of energy uses; criteria may include entity of the consumption, technological evaluation, etc.</p> <p>This identification and prioritization shall be documented in the so-called “energy review”.</p>
Identifying and understanding applicable legal requirements	<p>The organization shall identify, read and understand legal requirements (laws, local regulations, international agreements, etc.) that can affect energy uses included in the EnMS objective.</p> <p>The organization should have one or more documents – preferably useful and suited for effective use (such as scheduling tools rather than simple lists to be updated) – that can demonstrate that the organization takes into account legal aspects when establishing the elements of the EnMS (procedures, controls, objectives, etc.).</p>
Listing and prioritising improvement opportunities	<p>The energy review shall provide the list of energy performance improvement measures that may be investigated for application as an output of all technical considerations carried out for each energy use. Measures may include projects, technological innovation, organizational improvements, process design, etc.</p> <p>The organization shall maintain and update a documented register listing opportunities for saving energy.</p> <p>The extent to which technical and economic aspects of single measures are investigated shall be a decision of the organization.</p> <p>The inclusion of a measure in the register of improvement opportunities is not a commitment to put it into practice.</p>
Identifying a set of Energy Performance Indicators (EnPIs)	<p>EnPIs are for providing quantitative measurement of energy performances. They may be simple parameters or more complex ratios or models.</p> <p>They should express relations between energy consumption parameters and parameters affecting energy consumption.</p> <p>ISO 50001 stipulates that the organization must make an evaluation of expected energy consumption for the future, in order to assess effects of planned projects. This evaluation can be supported by EnPIs.</p>
Establishing measurable objectives for energy performance improvements	<p>The organization shall establish and document objectives, targets and processes necessary to deliver results (action plans) in accordance with the organization's energy policy.</p> <p>The rate, extent and timescale of this continual improvement process are all determined by the organization in the light of priorities for energy uses, legal requirements, economic, technological and other circumstances.</p> <p>The goal of the organization is to be able to carry out reliable and extended measurements of energy consumption in order to be able to establish relevant measurable objectives and targets.</p> <p>For each objective, the public authority shall define timescale, responsibilities and a method for verifying achieved results. This shall be documented in order to grant resource availability, awareness of involved persons and effective information sharing.</p>

2.1.3 Do: implementation and operation

According to ISO 50001 requirements, the organization shall:

- establish resources, roles, responsibilities and authority
- grant competence
- manage internal and external communication
- define and control EnMS documentation
- establish proper operational control

Establishing resources, roles, responsibilities and authority	<p>Financial resources for the EnMS (measurements, improvements, etc.) as well as natural persons involved into the EnMS activities shall be identified within the official plans and budget of the organization.</p> <p>As part of the commitment to ensure that the EnMS is implemented, top management shall designate a specific management representative (or more than one) with clearly defined responsibility and authority for implementing the EnMS. The management representative should also have the responsibility for reporting to top management on</p>
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	<p>the performance and results of the system.</p> <p>In a Public Authority, Management Representative(s) should be formally designated with an official documented act, specifying tasks, responsibilities and authority.</p> <p>The Management Representative shall be competent and qualified in energy management.</p> <p>In a Public Authority, it is also recommended that Management Representatives be part of top management, or that they have a position whereby they manage their own human resources and can directly report to the top management.</p> <p>Other persons should be appointed to carry out different tasks, according to the needs of the EnMS; these persons should be formally appointed, and their tasks shall be documented.</p> <p>Examples of specific task for the EnMS are:</p> <ul style="list-style-type: none"> • analyse energy efficiency data and report to the management • prepare different alternative projects to reach energy consumption reduction targets • discuss with providers or with other external organizations to establish requirements for a new common project / installation <p>All roles and responsibilities established for the EnMS shall be communicated to all parties involved.</p>
<p>Granting competence</p>	<p>Each person who has a role in managing activities related to the EnMS shall possess the necessary skills and competence.</p> <p>These skills and competence should be verified before designating a person for a task and may be provided either by training, by proper experience or by other equivalent means.</p> <p>Managers dealing with energy aspects shall be fully competent for establishing pertinent objectives and procedures.</p> <p>The organization is responsible for ensuring that the competence is maintained in the time.</p> <p>All employees and persons working on behalf of the organization shall be aware of impacts of energy consumption and on their role within the EnMS. This may be ensured with training and/or by involving persons in measures and projects or with proper communication.</p>
<p>Managing internal and external communication</p>	<p>Energy performances and relevant information on the EnMS shall be communicated to persons working on behalf of the organization.</p> <p>When cooperating with other organizations, the Public Authority shall provide processes by which interested parties can make comments. It should consider extending communications to all parties involved in energy aspects or measures.</p> <p>Interface Departments, branches and persons should be identified and communicated.</p> <p>Communicating successful results of actions will provide strong motivation, and will confirm the commitment to energy saving.</p> <p>Irrespective of the communication about shared actions, according to ISO 50001 requirements, the Public Authority shall decide whether to communicate to external parties its energy performances and information about its EnMS.</p> <p>This decision should be shared among managers, directors and people working towards attaining energy efficiency and should be documented.</p> <p>If a decision is made to communicate, a communication plan shall be prepared and formally approved by the competent authority within the Public Body.</p>
<p>Defining and controlling EnMS documentation</p>	<p>The complexity and the level of detail of the documentation of the EnMS shall be defined by the organization on the basis of the size of the organization itself, the scope of the EnMS, and the nature and complexity of the activities.</p> <p>A Public Authority should base the EnMS rules for document management on its own existing rules for establishing, approving and distributing internal documentation.</p> <p>EnMS documents may include:</p> <ul style="list-style-type: none"> • the energy policy • energy review and baseline • objectives and targets • designations of persons to any task or responsibility relevant to the EnMS

	<ul style="list-style-type: none"> • procedures and technical instructions • records and results of energy performance monitoring • plans and projects • any other record, such as training and skills records <p>Documents may be in paper or electronic form.</p>
<p>Establishing proper operational control</p>	<p>The organization shall identify operations / activities linked with significant energy consumptions and shall plan those operations. It means:</p> <ul style="list-style-type: none"> • preventing situations that can result in a loss of energy; e.g.: establishing rules such as minimum temperatures in summer, maximum temperatures in winter • setting criteria for carrying out operations and maintenance; e.g.: scheduling boiler maintenance; setting up proper pressure and temperature for heating systems • taking energy efficiency into account when buying energy consuming equipments, goods, etc; (e.g. opting for condensation boilers, insulating windows and doors, etc) and when buying energy related services, such as heating or public lighting tenders • considering energy consumption rates when drafting projects, refurbishments, etc • providing appropriate communication on the above-listed aspects to all personnel members involved who are working on behalf of the organization

2.1.4 Checking

According to the requirements of ISO 50001, the organization shall:

- plan and carry out proper monitoring and measurement
- periodically evaluate compliance
- manage non conformities, corrective measures and preventive measures
- control records
- plan and carry out internal audit of the EnMS
- review the EnMS

<p>Planning and carrying out proper monitoring and measurement</p>	<p>ISO 50001 is strongly focused on energy consumption measurements and performance. The idea is that no action for improvement can be described, proposed, accepted and assessed if no adequate data can be provided for evaluation.</p> <p>Monitoring shall be set up for energy policies, objectives and targets, set of EnPIs, legal obligations and other requirements to which the organization subscribes.</p> <p>The organization shall define and implement an energy “metering plan”.</p> <p>The metering plan shall consider both parameters to describe energy consumption and those parameters that can affect energy consumption (energy factors), such as the external temperature. Parameters related to energy consumption and energy factors shall be clearly defined and established in order to define an effective metering plan.</p> <p>Energy consumption shall be assessed considering:</p> <ul style="list-style-type: none"> • the relationship between consumption and energy factors • the relationship between expected consumption and actual consumption <p>The result of this assessment will be used to investigate the effectiveness of the energy saving programmes and actions, of the new projects, etc.</p> <p>All data, trends, figures and comparisons used for the assessment shall be recorded and kept.</p> <p>It is vital for Public Authorities to have a clear grasp of which measurements are actually possible and reliable for monitoring, the available meters and metering systems, and whether these metering systems are appropriate for the metering needs of the planned activities and objectives.</p> <p>Tasks and responsibilities for data collecting, elaborating and assessing shall be defined and documented.</p>
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<p>Periodically evaluating compliance</p>	<p>The organization shall monitor compliance with legal obligations and other requirements to which the organization subscribes, related to the energy aspects. The evaluation of legal compliance may be carried out using specific check-lists, audit programmes and reports, scheduling activities and related checks. The legal compliance evaluation may overlap monitoring energy performances when a legal requirement is related to energy performance. The organization shall keep records of this evaluation.</p>
<p>Managing non-conformities, corrective measures and preventive measures</p>	<p>The organization shall ensure that if an established requirement is not fulfilled (non-conformity) the situation is investigated to understand the causes of the problem and to ensure that appropriate measures are taken. Requirements may be defined in the organization's energy policy, objectives, targets, programmes, documented procedures, rules and regulations, operational criteria, etc. The measure may be an immediate reaction to remove the effect of the non-conformity or it may be a corrective measure to prevent the non-conformity from repeating itself. Example: The air conditioner is turned on at 9 pm when people are not working</p> <ul style="list-style-type: none"> • Immediate reaction: <ul style="list-style-type: none"> • turn off the air conditioner • Corrective measures: <ul style="list-style-type: none"> • put a notice on the wall; • train people; • install a timer. <p>Measures shall be planned (with defined responsibilities) and monitored for completion and effectiveness shall be verified. Example: Corrective measure: train people Completed measure: all people have been trained Measure is effective: the air conditioners are always off at night The organization may plan one corrective measure to tackle more than one non-conformity when the causes are the same. Records of the non-conformity, causes, measures taken and their effectiveness shall be kept. It is important to note that a “non-conformity” is not for identifying personal responsibilities: non-conformities are to help the organization to understand weak points of the EnMS and address improvements.</p>
<p>Controlling records</p>	<p>The purpose of recording is to ensure that the necessary documentation is provided to demonstrate the achievement of targets, action plans and other requirements of the EnMS. Rules to keep records should be defined and shared.</p>
<p>Planning and carrying out an internal audit</p>	<p>The purpose of an internal audit is to carry out a systematic review of the management system and to assess whether the EnMS operates in accordance with the organization's own requirements together with those of the ISO Standard. Auditing is a process described in full in ISO 19011 standard. The following steps shall be planned:</p> <ul style="list-style-type: none"> • Define audit scope and objectives. • Define audit responsibilities (to manage the audit programme, to lead audits and to prepare audit reports, to assess audit results, etc.). • Define the competence required for the audit. • Define audit activities over a defined period (prepare the audit programme over – e.g. one year). Note: required competence, audit team, audit scope and objective, etc. are part of the audit programme • Prepare audit tools (check-lists). • Plan single audits to make persons, locations, documents, etc. available for auditing. • Carry out audits. • Prepare audit conclusions and report • Share and distribute the audit report.

	<p>An audit programme may include several single audits, focused on specific objectives or aspects to be audited.</p> <p>The required competence may be provided by a team of auditors or by a single auditor.</p> <p>Audit results and conclusions should be analyzed by the organization to plan corrective actions and to plan improvements of the management system.</p>
<p>Reviewing the EnMS</p>	<p>According to the ISO 50001 requirements, the purpose of the management review is to ensure suitability, adequacy and effectiveness of the EnMS. The management review shall be planned at predefined intervals, such as once or twice per year.</p> <p>Minutes of the management reviews shall be kept.</p> <p>Within the management review a list of items shall be discussed: review of energy aspects, energy performances, legal compliance, projected energy consumption for the subsequent period, etc.</p> <p>The management review shall also assess to what extent objectives and targets are being met.</p> <p>Output of the management reviews shall provide confirmation of the energy performance improvements for the latest period, changes in the EnMS and in the objectives, targets and/or programmes, and the allocation of the resources (money, personnel, competence and skills, instruments, etc.).</p> <p>The review requires individual elements and overall operation of the energy management system to be evaluated in a critical manner, in relation to the system's ability to comply with the energy policy and achieve the energy targets. It shall be the top management of the organization that reviews the system at specified intervals.</p> <p>The designated persons within the organization will prepare all data and information to allow Top Management to consider all relevant aspects and take the proper decisions.</p>

2.2 Sustainable Energy Action Plans according to SEAP guidebook

2.2.1 Introduction

This paragraph is a very short summary from the publication “How to develop a Sustainable Energy Action Plan (SEAP) – Guidebook ” from the Covenant of Mayors, European Union, 2010, with some practical examples extracted from the experience of the SEAP implementation in small municipality.

The Covenant of Mayors is a European initiative by means of which towns, cities and regions voluntarily commit to reducing their CO₂ emissions beyond the 20 % target. This formal commitment is to be achieved through the implementation of Sustainable Energy Action Plans (SEAPs). The purpose of the guidebook is to help Covenant of Mayors signatories to reach the commitments they have taken by signing the Covenant, and in particular to prepare a Baseline Emission Inventory (BEI) and a Sustainable Energy Action Plan (SEAP) within one year of their official adhesion.

BEI is a prerequisite for SEAP elaboration, as it will provide knowledge about the nature of the entities emitting CO₂ in the municipal area, and will accordingly help identify the appropriate measures. Inventories conducted in later years will make it possible to determine whether the actions provide sufficient CO₂ reductions and if further actions are necessary.

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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 measures to sign up for the Covenant of Mayors, while continuing to follow the approaches they have used before with as few adjustments as possible.

What is a SEAP?

The Sustainable Energy Action Plan (SEAP) is a key document that shows how the Covenant signatory will reach its commitment by 2020. It uses the results of the Baseline Emission Inventory to identify the best fields of action and opportunities for reaching the local authority's CO₂ reduction target. It defines concrete

reduction measures, together with timeframes and assigned responsibilities, which translate the long-term strategy into action. Signatories commit themselves to submitting their SEAPs within a year of signing up.

Scope of the SEAP

The Covenant of Mayors concerns action at 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, 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, etc.

The main target sectors are buildings, equipment/facilities and urban transport. The SEAP may also include actions related to local electricity production (development of PV, wind 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 in the long term (as land use planning), encourage markets for energy efficient products and services (public procurement), as well as changes in consumption patterns (working with stakeholders and citizens). On the contrary, the industrial sector is not a key target of the Covenant of Mayors, so the local authority may choose to include actions in this sector or not.

Example
For small municipalities, the main sectors where it can be possible to take measures to reduce GHG emissions by 20% is private building stock, where it will be possible to improve energy efficiency by refurbishment and Renewable energy sources –RES-implementation.

Time horizon

The time horizon of the Covenant of Mayors is 2020. As a result, 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 in 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 concrete measures and budgets for such a long time span in detail, the local authority may distinguish between:

- a vision, with long-term strategy and goals until 2020, including firm commitments in areas such as land-use planning, transport and mobility, public procurement, standards for new/renovated buildings etc.;
- detailed measures for the next 3-5 years which translate the long-term strategy and goals into actions.

Both the long-term vision and the detailed measures shall be an integral part of the SEAP. 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.

2.2.2 Recommended SEAP structure

The Covenant signatories could follow the structure of the SEAP template⁵ when preparing it.

The suggested contents are summarized in the following table. As suggested in paragraph 2.1 “ EnMS Implementation according to ISO 50001” the approach – based on the PDCA cycle (Plan, Do, Check, Act) - may be useful for application inside the organization (in this case, the public authority) but also for the management of a SEAP.

PDCA approach PLAN DO CHECK ACT	Recommended SEAP structure	PDCA approach PLAN DO CHECK ACT
PLAN	1. SEAP Executive Summary	
	2. Overall strategy <ul style="list-style-type: none"> A. Objective(s) and Targets B. Current framework and vision for the future Example A vision of the future which covers social, economic and environmental development. <ul style="list-style-type: none"> C. Organizational and financial aspects: <ul style="list-style-type: none"> • coordination and organizational structures created/assigned; • staff capacity allocated; • involvement of stakeholders and citizens; • budget; • foreseen financing sources for the investments within your action plan; • planned measures for monitoring and follow-up. Example Different tools such as a database can be set up to register all the energy-related activities developed during subsequent years in the private sector e.g. a building energy refurbishment, a solar heating installation, a boiler replacement. This data will contribute to the overall vision of energy efficiency improvement during the time horizon of SEAP activities.	
	3. Baseline Emission Inventory and related information, including data interpretation ⁶	
DO	4. Planned actions and measures for the full duration of the plan (2020) <ul style="list-style-type: none"> • long-term strategy, goals and commitments until 2020; • short/medium term actions. For each measure/action, please specify (whenever possible): <ul style="list-style-type: none"> - description - department responsible, person or company - timing (end-start, major milestones) - cost estimation - estimated energy saving/increased renewable energy production - estimated CO₂ reduction. Example Energy efficient consumer behaviour. A project can be set up with the aim of monitoring energy consumption during a long period and sharing best practices identified with each other in order to improve behaviour.	
ACT	feedback from SEAP implementation	

⁵ suggested structure of the SEAP is provided in a template available at: http://www.eumayors.eu/support/library_en.html

⁶ see Part II of the SEAP Guidebook, chapter 5 Reporting and documentation.

3 Implementation of ISO 50001 requirements to a Public Authority in tandem with a SEAP

3.1 Role and responsibilities of Top Management

3.1.1 Scope of the EnMS supporting a SEAP

FROM ISO 50001 STANDARD

4.1 General Requirements.

The organization shall:

(...)

b) establish and document the scope and boundaries of its EnMS

(...)

Establishing the purpose of the EnMS means defining which of the organization’s activities (or Public Authority competences) the EnMS shall apply to.

When a Public Authority signing the Covenant wants to support the SEAP implementation by adopting the ISO 50001 standard, the boundaries of the EnMS – i.e. the energy aspects to be addressed within the EnMS – shall be documented and approved by the “Top Management” of the Public Authority and communicated to all interested parties.

Top Management may document the EnMS scope within the Energy Policy, within the EnMS manual or in any other EnMS document that has been approved at the appropriate level of authority.

Below are examples to help understanding the importance of this point.

<ul style="list-style-type: none"> it might be stipulated that the EnMS will cover only direct internal energy consumptions (for lighting, electric and electronic equipments, heating)
<ul style="list-style-type: none"> it might be stipulated that the EnMS will deal– in addition – with the energy consumption of suppliers when operating on the organization’s premises
<ul style="list-style-type: none"> it might be stipulated that the EnMS will also consider, within its scope, the energy aspects of the controlled / participated public and private companies
<ul style="list-style-type: none"> it might be stipulated that the EnMS will deal with energy aspects in the area of competence falling under its own competence; for example, when the authority charged for municipal waste management decides to extend the scope of its EnMS to waste collection and transportation, waste incineration and / or landfilling, biogas recovery, waste recycling, etc.
<ul style="list-style-type: none"> it might be stipulated that the EnMS will cover all energy aspects and consumptions in the territory of competence of the Public Authority.

The wider the scope of the EnMS, the more the EnMS is suited to support SEAP implementation.

This means that if I want to activate SEAP and EnMS together I have to change the traditional boundaries of action of the EnMS towards the entire urban context.

A further aspect for defining EnMS boundaries correctly is to consider the following point of the Commission’s Guidelines for SEAP implementation:

“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-sector involvement is required, and organizational 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 to the local authority’s organization. As many key municipal players as possible should be assigned responsible roles to ensure strong ownership of the process in the organization.”

We can expect that SEAP actions will - in most cases - involve many sectors of human activities, such as industry, trade, private and public buildings, transports, energy production, etc. and that many Departments and branches of the Public Authority will have competence for the SEAP actions. It’s strongly recommended that any management system within a Public Authority shall involve all the local Authority’s sectors.

3.1.2 Extension in time of the Top Management commitment

WHY IS ISO 50001 USEFUL FROM THIS STANDPOINT?

From ISO 50001 standard:

“ ...

4.2 Management responsibility

4.2.1 General

Top management shall demonstrate its commitment and support to the EnMS and to continually improve its effectiveness by:

- a) establishing, implementing, and maintaining the energy policy;
- b) appointing a management representative and approving the formation of an energy management team;
- c) providing the resources needed to establish, implement, maintain and improve the energy management system and the resulting energy performances;
- d) identifying the scope and boundaries to be addressed by the energy management system;
- e) communicating the importance of energy management to those in the organization;
- f) ensuring that energy performance objectives and targets are established;
- g) ensuring EnPIs are appropriate to the organization;
- h) considering energy performances in long-term planning;
- i) ensuring that results are measured and reported at determined intervals;
- j) conducting management reviews.

ISO 50001 applied in Public Authorities requires a strong commitment of top level politicians and of top managers

The responsibilities appointed by ISO 50001 to the Top Management clearly identify the Top Management in a Public Authority with the highest political level, with the local government.

SEAP implementation within the Covenant of Majors is clearly oriented towards reducing GHG emissions and achieving the 20-20-20 target.

The commitment supporting the implementation of SEAP actions shall run until 2020, when final achievements of the SEAP itself will be verified.

To prevent the risk of discontinuity, Top Management of the Local Authority shall support the SEAP and ensure that the organization for energy management of the Local Body shall continue to support SEAP implementation at all times.

The consistency between the energy policy and the improvement objectives (i.e. SEAP actions) shall be achieved both in accordance with ISO 50001 and Covenant requirements, under the responsibility of the same Top Management and the same Energy Policy. The following diagrams aims to represent this concept.

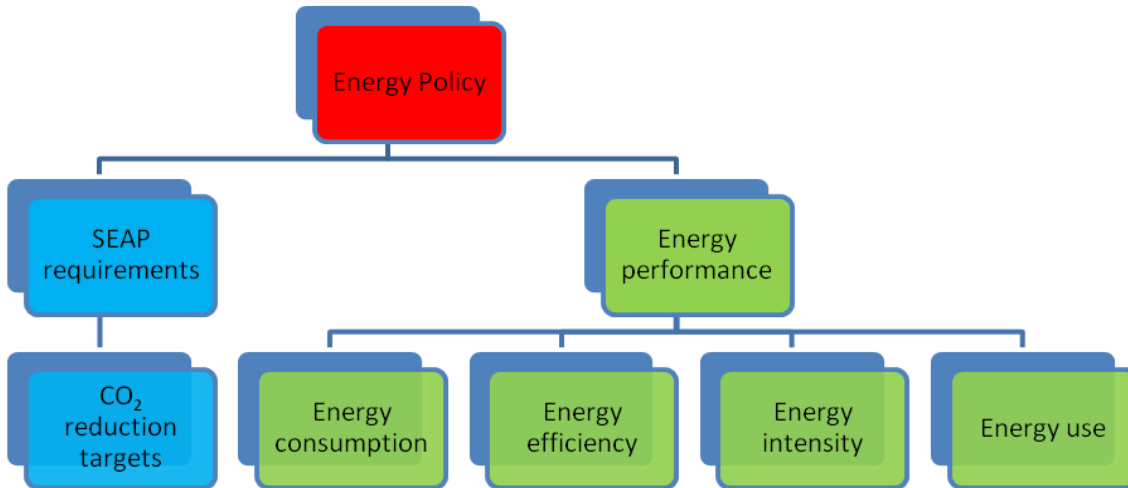


Figure 1. Energy performance targets and SEAP requirements can be managed within the same ENERGY POLICY

3.2 Planning

3.2.1 Introduction

The figure below represents the general concept of energy planning based on the ISO 50001 standard approach.

Proposed examples of inputs are suitable for single organizations, preferably industries rather than Public Authorities, and they are not likely to be fully and easily collected within a community context or in a territory where a large number of different public and private subjects are using energy.

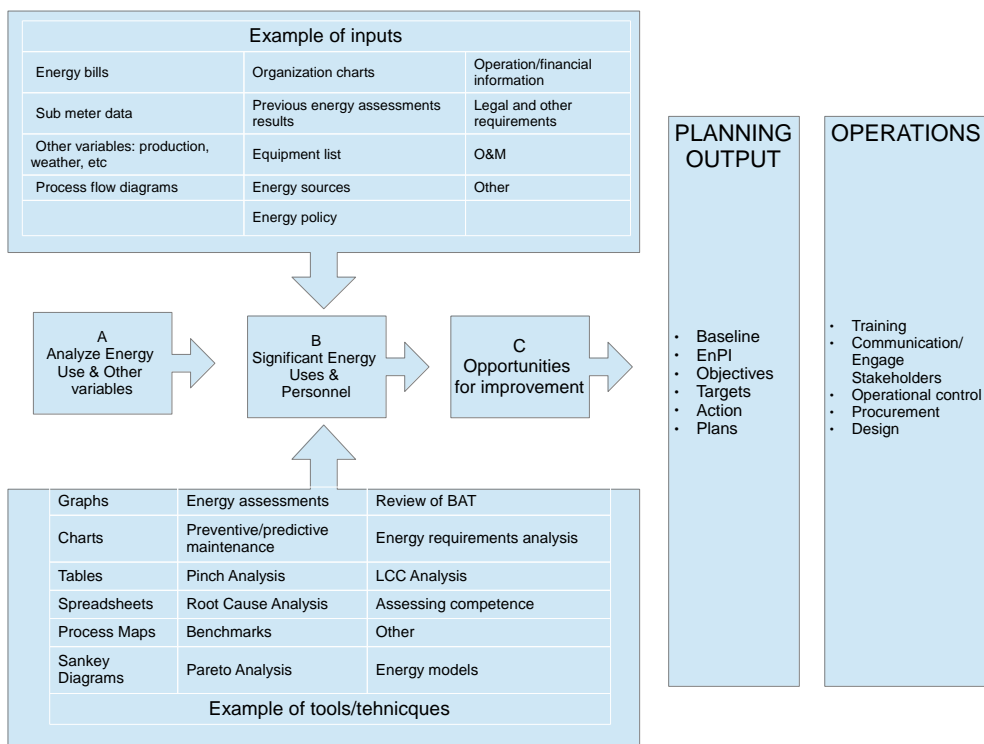


Figure 2. Planning scheme for a single organization. Examples of inputs show that very detailed information must be obtained from all the areas involved in energy uses

On the other hand, planning outputs are also the same if the concept of Planning in the urban context is to be extended. In any case, they need to be adapted to a new (and more complex) environment. The following chapters outline ideas of how to achieve this.

The next diagram shows how the concept of energy planning may drive a Public Administration in extending the EnMS standard to the whole urban context.

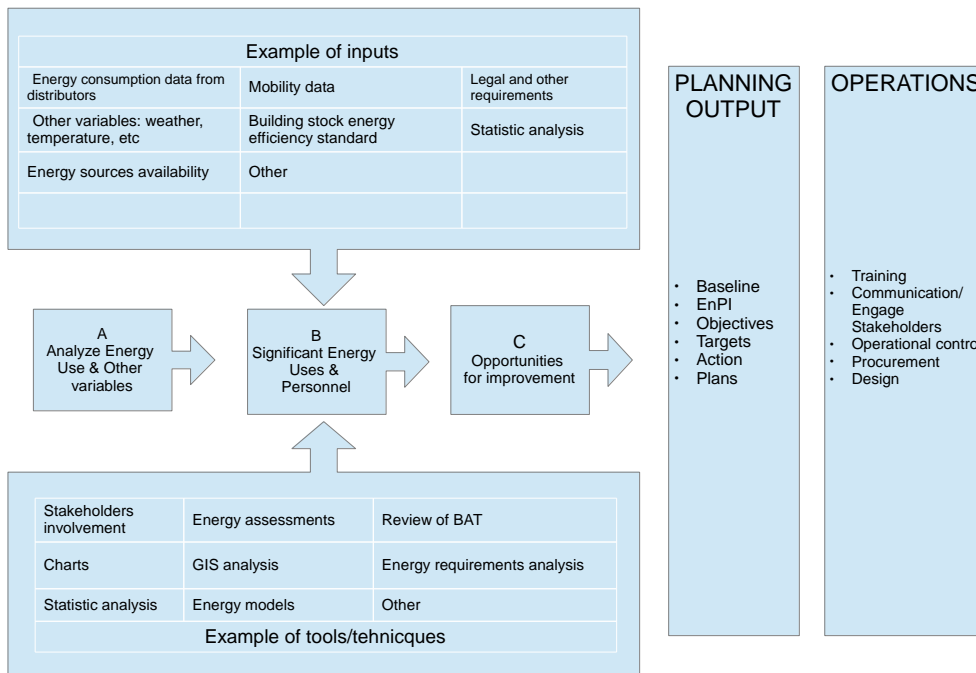


Figure 1. Planning scheme for an urban context, i.e. for an EnMS extended to manage a SEAP. Examples of inputs show that, in this case a lower level of reliability must be accepted.

3.2.2 Legal obligations and other requirements

When planning a SEAP in “tandem” with an EnMS according to ISO 50001, a Public Authority should be able to document the legal requirements – and any voluntary agreements – that apply both to its energy aspects and to the SEAP measures.

This will be useful for supporting the Public Authority to tackle all applicable requirements appropriately. Knowledge of how all legal requirements apply to the SEAP actions and/or to the EnMS will guide the organization’s policy and priorities with regard to energy issues and objectives.

When managing a SEAP, the parties involved should be asked to check legal obligations applicable to each action / project and to plan measures so that they comply with legal obligations.

WHY IS ISO 50001 FROM THIS STANDPOINT?

From ISO 50001 standard:

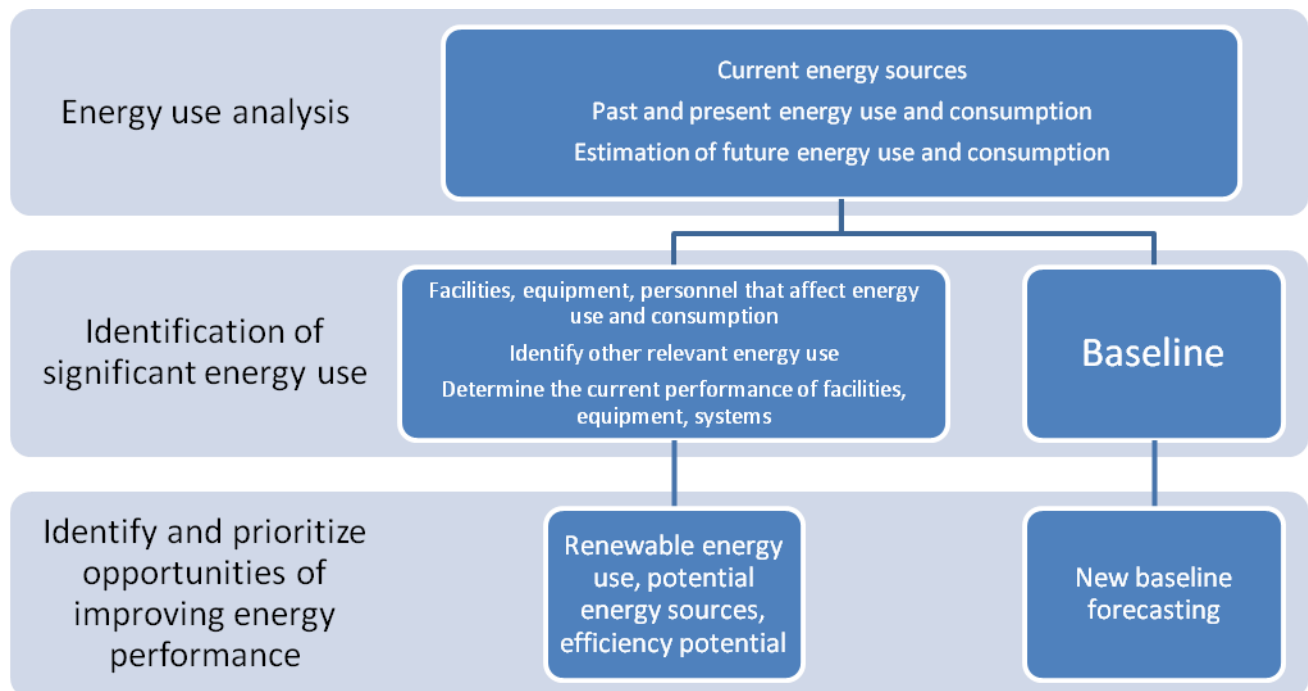
4.4.2 Legal and other requirements

“ ...
 The organization shall identify and have access to the applicable legal and other requirements to which the organization subscribes related to its energy uses
 ... ”

ISO 50001 helps the organization to be continuously aware of legal requirements. This is an important aspect as regards financial benefit, new efficiency standards, etc

3.2.3 Energy review and Energy baseline

Energy review and energy baseline provide the basis of the energy planning, as they make it possible to create an energy assessment inside the boundaries of the EnMS. In other words energy review is the process for obtaining an *energy baseline* and, using this “energy shot” as a starting point, for planning energy performance improvements (ISO 50001) and CO₂ emission reduction (SEAP objectives).



WHY IS ISO 50001 FROM THIS STANDPOINT?

From ISO 50001 standard:

4.4.3 Energy review

“ ...

The energy review shall be updated at defined intervals, as well as in response to major change in facilities, equipment, systems, or processes.

...”

4.4.4 Energy baseline

“ ...

The energy baseline shall be maintained and recorded.”

ISO 50001 makes it obligatory to establish at which intervals the energy review shall be updated. This will support work to assess to what extent the SEAP targets are achieved

3.2.4 Energy performance indicators

Energy performance indicators are designed:

- to describe energy performance improvement
- to document to which extent other performance criteria are fulfilled

There is a variety of EnPIs which range from a simple metric ratio to the complex model. The organization should choose EnPIs that provide information about energy performance. This means that if you want to follow the ISO 50001 Standard in SEAP management, you are obliged to develop appropriate EnPIs.

With regard to SEAP activities, this aspect is very important as it is necessary to define EnPIs for all the actions implemented in the SEAP. Moreover, they shall be useful for “providing information about energy performance” variations during SEAP implementation. This will help define useful indicators for each type of action, regardless of their targets (inside or outside the organization). A few examples can help clarify this concept:

Internal Action: school building refurbishment		
EnPI	Appropriate?	Why?
Annual consumption of natural gas [m ³]	NO	It doesn't take into account relevant variables affecting energy use, like external temperature
Annual consumption of natural gas linked to Heating degree days [m ³ /HDD]	YES	It takes into account external temperature and it recognizes energy consumption drops due to higher external temperature due to energy efficiency improvement

External Action: sustainable mobility plan		
EnPI	Appropriate?	Why?
Annual fuel consumption obtained from gas station sales volume	NO	It doesn't take into account relevant variables affecting energy use, like fuel price variation, vehicle stock variation
Monitoring number of vehicle and bicycle transits in certain strategic transition points	YES	It gives a direct measurement of variation in transit flows, and possible evaluation of shift from car to bike use

3.2.5 Energy objectives, targets and action plan

ISO 50001 and SEAP objectives are detected on different time scales. In fact, while ISO 50001 generally focuses its action on continuous improvement of energy performance of an organization, and constantly monitors the results with the process (Plan - Do - Check - Act), SEAP actions are made up of a long-term target that can be achieved (20% reduction in CO₂ emissions compared to a year and a baseline reference) through intermediate stages and their associated monitoring action.

Accordingly, it is interesting to note that the two processes can complement one another. The SEAP provides long-term horizons and determines the macro areas to work on (extended beyond the boundaries of direct influence of the organization), while EnMS becomes a powerful tool for implementation and monitoring of results achieved in the short term because it is expected to support the definition of:

- The type of organizational structure and relationships between actors involved in EnMS activities
- The identification of the area of intervention in the organization (policy).
- The objectives to be reached and the time needed
- The methods adopted for monitoring

In determining the energy objectives to be reached there is a considerable split between those directly influenced by the organization (in this case the public authority) for which ISO 50001 has been designed in the main, and those that can only be achieved through a concerted action with the same stakeholders directly involved in their attainment.

The first type of objectives will be called “**internal objectives**”, because their achievement depends only on the organization’s activity. The second type will be called “**external objectives**” and are the typical purposes of SEAP implementation. Since the “external” energy consumption accounts for the largest amount of the territory’s energy demand overall, its management is fundamental for reaching the SEAP’s targets. Two examples can help understand what is stipulated. These examples will be used to illustrate each sub-section: objectives, targets and programmes.

3.2.5.1 Objectives

As stated before, two kinds of objectives will be described:

- Internal objective: public building stock energy refurbishment
- External objectives: energy efficiency improvement of private building sector

Broadly speaking, the objectives according to the ISO 50001 standard must be:

- **Ambitious**, to commit the organization to Continual Improvement:
 - The SEAP sets an ambitious goal of achieving 20% reduction in CO₂ emissions by 2020. Energy efficiency in buildings is one of the most powerful tools for achieving this target. For public building stock it is relatively simple to fix an ambitious target because it can be reached across a wide range of activities such as changes in staff behaviour, lighting efficiency, third party financing, energy performance contracting and refurbishment of old buildings. Moreover, the public sector must set a good example for citizens also involved in SEAP target attainment.
 - Regarding the target for the private building stock efficiency level, it can increase within a reasonable average of 15 to 20%. But this value is affected by uncertainty due to many external factors which are difficult to evaluate. So the ambition of the target must be evaluated and modified in the light of the results of monitoring activities.
- **Realistic**, so that they can be achieved within the specified time limits. From this side, while ISO 50001 allows for evaluation of measures in the short term, the SEAP provides the long-term targets. The mix between these two approaches helps the authority to manage all the activities and resources for achieving EnMS and SEAP goals to suitable effect.
- **Specific and measurable**. Regarding measurement of energy consumption in public building stock the measure can easily be brought to completion with an appropriate monitoring policy. The most difficult activity, however, is measuring the increase in efficiency of private housing stock, since it should be based on assessments of statistical data and other measures, discussed in more depth in the “monitoring” chapter.

3.2.5.2 Targets

Setting energy targets ensures that the organization has defined success criteria so that **progress towards improved energy efficiency can be measured**.

This general consideration regarding the energy targets is set out in different ways depending on whether they are a goal within the organization (e.g. efficiency of public buildings) or an external one (efficiency of the private building sector). Whilst the performance indicator might be the same (e.g.: kWh / m² year) obtaining data and then tracking the target during the subsequent period can be very different.

	Internal objectives	External objectives
First assessment	Energy bill collection from checked buildings and / or energy labelling,	Statistical analysis derived from a comparative evaluation of data obtained from multiple sources, such as: <ul style="list-style-type: none"> • Sales data for natural gas: difficult to obtain, generally aggregated (not separating residential from industrial consumption) and not easily distinguishable, it must be further processed to determine the amount attributable to the residential consumption. • Statistical survey of the period of construction of the housing stock and private efficiency calculation based on statistical data.
Following monitoring phases	Energy bills and energy meters which can be applied for natural gas and electricity consumption	<ul style="list-style-type: none"> • Implementation of a questionnaire system which allows assessment of how the private sector has modified its energy consumption. • Statistical analysis of building trade practices which involve energy issues in building stock

It seems clear that fixing a target for an “internal objective” is simpler than fixing a target for an “external objective”, and the risk of not reaching the target will be higher in the latter.

3.2.5.3 Action Plan

Action plans shall establish the patterns that drive all the partners participating in the SEAP towards their objective and targets. They shall define:

- Single phases and tasks
- Responsibilities for each partner
- Timing milestones
- Check – points
- Criteria for controlling and monitoring
- Reporting rules for each partner

	Internal objectives	External objectives
Designation of responsibility	The Authority's budget needs to allocate adequate resources to achieve the objectives in both economic and personnel respects. Regarding the last aspect, the responsibilities for the implementation and achievement of objectives will be given based on the original functions.	In this case distribution of the roles is more difficult, since it will involve stakeholders which are not obliged to follow the authority's instructions. Only internal personnel will be involved in the EMS, but the feedback of the external stakeholders might not be adequate. In any case, actions for which roles and responsibilities for implementation must be assigned shall also be implemented to achieve external objectives.
The means and the timeframe by which individual targets are to be achieved	<p>The organization, through its representative, shall ensure that all personnel involved in activities are adequately informed of energy efficiency policy in buildings owned by the administration. In addition, information and activities carried out by the administration to monitor and control energy consumption shall be duly published. It is important for all staff to be appropriately involved and informed, so that everyone fully understands:</p> <ol style="list-style-type: none"> i. the actual or potential impact of their behaviour and their actions: <p>Example: the janitor of a municipality must be well aware about the running time of the heating or lighting systems. He/she must know that an impact of 1°C increased temperature of an heated room leads to an increase of 5% in energy consumption.</p> <ol style="list-style-type: none"> ii. The role and responsibilities within the organization in achieving the targets does not have punitive purposes but boosts and encourages the responsible contribution of all. iii. The timeframe and means available in order to achieve the foreseen objective 	<p>The municipality shall not only ensure that all personnel involved in activities are adequately informed of energy efficiency policy, but it shall should make a similar effort in order to involve the majority of stakeholders. A good timeframe and budget allocation allow the personnel involved to plan work properly.</p> <p>Example: if you want to achieve 10% of efficiency improvement in building stock by 2020 you need to programme several intermediate steps:</p> <ol style="list-style-type: none"> i. Continuous improvement of boiler efficiency through replacement ii. An increasing adoption of envelope building refurbishment iii. An increasing adoption of renewable energy integration <p>Obviously, the public authority cannot drive this transformation directly, but it can support it with information, purchasing groups and regulation. For each of these levers an adequate budget has to be assigned.</p>
Statement of the method by which an improvement in energy performance shall be verified	<p>Example: Energy performance improvement of school building stock.</p> <ol style="list-style-type: none"> 1. Baseline calculation 2. Energy refurbishment 3. New energy baseline calculation taking into account: <ul style="list-style-type: none"> • External temperature • Possible building management variation • Other external variables 4. Evaluation of energy performance improvement 	<p>Example: if you want to achieve a 10% of efficiency improvement in building stock by 2020:</p> <ol style="list-style-type: none"> 1. Baseline calculation 2. Activate action of <ul style="list-style-type: none"> • Citizens' information and awareness • Financial support of energy refurbishment • Building regulation 3. Periodic evaluation of the goals attained, for example by monitoring gas/electricity consumption 4. Evaluation of energy performance improvement due to each action

3.3 Implementation of EnMS and SEAP

3.3.1 Introducing new roles, responsibilities and competencies for the EnMS and/or SEAP

Resources include human resources, specialized skills, technology and financial resources.

Both for the ISO 50001 EnMS and for the SEAP, roles, responsibilities and authorities shall be defined, documented and communicated in order to facilitate effective energy management.

The Public Authority has a complex organizational chart including “political” authorities and administrative authorities: the Council, the President or Mayor, General Manager, Departments managers, etc. All people and employees involved have a clear idea of their own role within the Administration.

The adoption of an EnMS and an SEAP entails the creation of new activities and tasks.

It will accordingly be very important that those people with a clear commitment to the existing activities and tasks are clearly appointed to the new activities and tasks in such a way that sharing and awareness of roles and responsibilities are granted and that requirements of both EnMS and SEAP are fulfilled.

To do so, several recommendations can be considered:

- Nomination of persons for any new task or responsibility in a Public Authority shall be a formal act of the competent internal authority.
- To ensure a coherent approach and proper coordination, a “Committee” or “Working group” can be nominated to deal with EnMS and SEAP tasks; this Committee or Working Group may be the group of EnMS “Management Representatives” and may include the EnMS “Management Representatives”.
- It is strongly advised to include within the “Management Representatives” the Managers whose activities are linked with the priority energy users
- It may be useful – mostly in large organizations – to designate an additional technical working group to support managers and Management Representatives to carry out their tasks.

Examples of new tasks or responsibilities for the EnMS or for the SEAP are:
<ul style="list-style-type: none">• To analyse direct energy consumptions data for heating and illumination.• To analyse electric energy consumption data of third parties in the territory of competence provided by the energy suppliers.• To carry out a project to install a new photovoltaic plant on the roof of the public school.• To carry out a project to cooperate with private industries, banks and breeders to prepare projects and applications for renewable energies plants.• To edit, update, file, distribute, etc. all EnMS and SEAP related documents.• To coordinate and support the internal Management Representative Committee.• To coordinate and support the “forum” for the SEAP implementation and monitoring.

Considering the varied nature of all the possible tasks, allocation of roles and responsibilities is always a fundamental aspect for the success of any operation, such as an EnMS or a SEAP implementation project.

Covering energy aspects, objectives, targets and programmes beyond the organization’s boundaries, involving third parties, is a feature peculiar to the SEAP.

The “internal working group” and the single designated persons shall be able to manage relationships with external parties and should have the ability to coordinate actions involving several interests, people, etc.

Other aspects may be considered to properly allocate responsibilities for managing an EnMS together with a SEAP.

The discussion can focus on two alternative and opposite approaches:

1. to concentrate all the new tasks and responsibilities for the EnMS and/or SEAP in one or several persons.
2. to appoint each person involved in the EnMS activities and/or in the SEAP actions with managing tasks and responsibilities to involve the organization of the relevant Public Authority.

The first approach is a “short term” approach: it allows rapid implementation of the management system and/or of the SEAP actions because one or just a few people can be better focus their activities on the specific goal. On the other hand, this approach will create a separation among those managing the EnMS / SEAP and the other people responsible.

The second approach is a “long term” approach since it will take a long period of time to define, appoint and coordinate a group of people working on a complex project; on the other hand, all those involved will share a common objective and will take care each of their own work, providing the best add value.

Between these two opposite approaches, many intermediate solutions may be outlined.

Each organization has the possibility to choose the most suitable solution according to its needs and characteristics.

Total centralization of responsibilities		Responsibilities shared among all interested parties	
<ul style="list-style-type: none"> • One person responsible for EnMS / SEAP is appointed • He/she identifies the energy aspects and priorities for actions and projects • No tasks or responsibilities are allocated to others for specific EnMS / SEAP requirements • He/she collects and analyzes all data coming from processes, monitoring of performances, etc. • He/she controls and manages EnMS / SEAP documents • He/she proposes and plans activities and projects and asks for cooperation from interested colleagues and external parties • He/she has the overall control of the EnMS / SEAP 		<ul style="list-style-type: none"> • Several persons responsible for EnMS / SEAP are appointed; each of them has specific duties according to their skills and jobs • Specific responsibilities are allocated to identify energy aspects, to define priorities for actions and projects, to manage legal obligations • Each office collects data and information of competence and provides it for assessment • Each action or project included in the EnMS objectives or in the SEAP has one coordinator and single work packages are charged to different offices/persons according to their competence • The overall control of the EnMS / SEAP has to be maintained by a group whose activities should be addressed by the management commitment and policy 	
Advantages	Critical points	Advantages	Critical points
<ul style="list-style-type: none"> • Easy coordination • Easier to grant technical competence • Easier to manage formal aspects (coherence of documents, etc.) • Easier to communicate to external parties the reference persons 	<ul style="list-style-type: none"> • Low participation, less awareness of personnel • Lack of authority and/or competence for specific actions required • A difficult job for one/few person(s) • Probability that the EnMS / SEAP is rejected by the personnel as a useless additional job 	<ul style="list-style-type: none"> • Each person is involved for the task of competence • Sharing of commitment • Spreading of duties • Possibility to involve persons with most suitable authority and competence 	<ul style="list-style-type: none"> • Difficult to clearly define and appoint detailed tasks and responsibilities without overlapping or failure • Complicated coordination and taking decisions

Personnel awareness normally increases in time. It is possible that a centralising approach represents a good solution when starting the EnMS / SEAP, whilst sharing responsibilities is normally the best solution when the EnMS / SEAP are fully implemented and at a mature stage.

It is recommended to gradually involve all the personnel involved, as a means of increasing awareness and participation for a better result.

In the case where an EnMS is implemented together with a SEAP, it is very important to ensure that the “organizational chart” created for the EnMS is applied coherently in the context of the Covenant of Mayors.

WHY IS ISO 50001 USEFUL FROM THIS STANDPOINT?

From ISO 50001 standard:

4.4.2 Roles, responsibility and authority

“ ...

Top management shall appoint a management representative with the appropriate skills and competence, who, irrespective of other responsibilities, has the responsibility and authority to:

- a) ensure the energy management system is established, implemented, maintained, and continually improved in accordance with this International Standard;
- b) identify person, authorized by an appropriate level of management, to work with the management representative in support of energy management activities
- c) report to top management on energy performance;
- d) report to top management on the performance of the EnMS;
- e) ensure that the planning of energy management activities is designed to support the organization's energy policy
- f) f) define and communicate responsibilities and authorities in order to facilitate effective energy management;
- g) determine criteria and methods needed to ensure that both the operation and control of the energy management system are effective.
- h) Promote awareness of the energy policy and objectives at all levels of the organization

...”

ISO 50001 involves considerable commitment from top management (politicians) in that they must appoint their representative which will link management directly to the work group assigned to EnMS and SEAP implementation

A proper allocation of tasks and responsibilities should be agreed upon by the SEAP participating organization. This principle should be applied to each task required for SEAP preparation, implementation and monitoring e.g.:

- Collecting data
- Carry out single phases of complex objectives
- Verifying values of EnPIs and achieved results of each partner

3.3.2 Communication

When implementing a SEAP, different external and internal parties - stakeholders - are involved.

The SEAP guidebook identifies stakeholders as 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.

Some potentially important stakeholders are:

- local administrations: relevant municipal departments and companies (municipal energy utilities, transport companies, etc.);
- local and regional energy agencies;
- financial partners such as banks, private funds, ESCOs (Energy Services Companies);
- institutional stakeholders like 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;
- business and industries;
- supporting Structures and energy agencies;
- NGOs and other civil society representatives;
- research organizations;
- knowledgeable persons (consultants, ...);
- where relevant, representatives of national/regional administrations and/or neighbour municipalities, to ensure coordination and consistency with plans and actions that take place at other levels of decision;
- tourists, where the tourist industry represents a large share of the emissions.

Internal stakeholders may include all energy users, Departments dealing with energy supply contracts, Departments dealing with any kind of incentives for industries, trade or services companies for energy saving, etc.

Stakeholder participation is important for several reasons:

- participatory policy-making is more transparent, 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 least it is necessary to make sure that stakeholders do not oppose some of the projects);
- 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.

Communication is a very important issue to support EnMS and/or SEAP implementation. When implementing a SEAP together with an ISO 50001 EnMS, communication is necessary:

- To communicate to any internal and external stakeholder exhaustive information regarding energy performance to ensure that all persons working for and on behalf of the organization can take an active part in the energy management and the improvement of the energy performance.
- To improve collaboration between the internal Departments involved within the Local Authority
- To exchange points of view, to develop discussions and to verify results.
- To share decisions for EnMS or SEAP implementation.
- To inform the public and stakeholders that are not involved into EnMS or SEAP actions about achievements.
- To support motivation and awareness of all involved parties.

The “communication strategy and campaign” suggested for supporting the SEAP may be coupled with an external communication method potentially chosen according to § 4.5.3 of the EnMS standard.

3.3.3 Documents management

When managing a SEAP, the documents to be shared to grant a proper SEAP planning and control should be clearly defined. It is necessary to define who has to produce, review and approve all the relevant documents. Rules for document distribution shall be defined among members of the SEAP “forum”.

The most significant aspects for document control in a SEAP are:

- The identification of the documents, including the identification of the revision and of the date of issue.
- The list of persons to whom each single document is distributed; this list may be defined on request, but the traceability of the distribution should be granted.

The Public Authority adopting an EnMS may use the same rules for document control both for the EnMS and for the SEAP and may propose to all partners to adopt the same rules.

Documents control rules to be adopted within a SEAP should be easy to be understood by all participants to the programme and should be easy to use.

3.4 Monitoring

Monitoring is very important for both ISO 50001 and SEAP.

Particularly in SEAP, monitoring is critical because it is very difficult to obtain a bottom up approach in relation with energy consumption in the private sector. In all likelihood, the only way to get data will be using indirect methods. In fact, SEAP guidelines suggest a lot of “indirect” energy indicators, as the following table extracted from the SEAP guidebook shows:

INDICATORS	DATA COLLECTION DIFFICULTY	DATA COLLECTION
SECTOR		TRANSPORT
Number of public transport passengers per year.	1	Agreement with a public transport company. Select representative lines to monitor.
Kms of cycle paths.	1	City Council.
Number of vehicles passing fixed point peryear/month (set a representative street/point).	2	Install a car counter in representative roads/streets
SECTOR		BUILDINGS
% of households with energy labels A/B/C.	2	City Council, national/regional energy agency, etc.
Total energy consumption of public buildings.	2	See part II, chapter 4, energy data collection City Council.
Total surface of solar collectors.	3	See part II, chapter 4, energy data collection City Council, Regional/National Public Administrations (from grants) and selected areas door-to-door surveys.
Total electricity consumption of households.	2	See part II, chapter 4, energy data collection Selected areas door-to-door surveys.
Total gas consumption of households.	2	See part II, chapter 4, energy data collection Selected areas door-to-door surveys.

Table 1. List of indicators for SEAP monitoring. Data collection difficulty: 1-EASY, 2-MEDIUM, 3-DIFFICULT.

The level of difficulty of data collection is given by the SEAP guidebook. For the building sector (which is the most important and profitable sector for energy efficiency improvement) all the indicators are described as difficult to manage.

ISO 50001 standard enforces a direct measurement policy since the organization needs to use the most accurate practicable method of calculating 'expected' consumption. Comparison between actual and expected consumption will highlight unexpected deviations and may allow hidden waste of energy to be detected.

The Public Authority shall define a plan for monitoring and measuring the energy consumption in order to determine whether the energy policy objectives are reached or not, and then take the corrective actions if necessary.

In terms of performance indicators, ISO 50001 leaves a wide range of choice but, with regard to building energy efficiency, the indicator could be [kWh/m² year], as several mandatory national and European rules request.

It is important to note that EnPIs shall be not influenced by external variables that can affect variations, such as production level, weather, etc. Regardless of whether one is monitoring an external or internal objective this aspect must be taken in account. In relation to internal objectives, this aspect can be managed easily, but in the case of external objectives some difficulties can arise.

Examples

Whereas in public buildings, thanks to the complete control of their energy consumption, the above indicator can be calculated from measured values, in the private sector the same indicator will be obtained from a more complex evaluation. The following examples (which are the same discussed in cap. 3.2.5.3) will clarify what is stated.

Internal objective

The following is a common issue for public authorities: building energy refurbishment. It is quite simple to monitor this aspect, and an appropriate indicator could be the specific annual energy demand [kWh/m² * year * degree days].

In the case of improving the efficiency of public buildings such monitoring planning can take the following characteristics:

- Measurement frequency: the frequency of data collection (e.g. meter readings) will be monthly. Shorter periods complicate the task without giving further advantages in terms of information, whereas longer periods may not be sufficient to identify the factors that influence energy consumption, such as outside temperature, the seasonal pattern of the rooms, etc..
- Monitoring will collect data in a standard format which will allow the comparison between different periods. An example of this concept can be realised with the following table
- A collection of external variables must be taken in account. For example monthly average external temperature, which could influence EnPI

Building Name								
Heating surface								
Use classification								
Daily hours occupation								
	Month							
	Gen	Feb	March	April	May	June	July
Space Heating – nat gas [m3]								
Water consumption [m3]								
Space cooling electricity[kWh]								
Lighting Electricity [kWh]								
Average monthly external temp [°C]								

- The monitoring activity will analyse the energy consumption in the light of the energy factors, so the real increases in energy efficiency by changes in boundary conditions can be distinguished.
- Energy meters should be applied in all the shunts of electric panels in order to monitor energy efficiency of different electric appliances. (e.g. Lighting, space cooling, pumps). Obviously, this choice can only be taken into account in big size buildings, where the complexity of plants and lighting systems can be appreciated.

External Objective

A suitable indicator for average size buildings could be the specific annual energy consumption of the building stock, which can be expressed in [kWh/m² year].

With an end to improving this indicator, a public authority should implement a series of measures which encourage citizens to improve energy efficiency in buildings. They could be similar to the following smart actions:

- Purchasing groups for solar heating plants, condensing boilers, efficient windows
- Provide incentives for building envelope refurbishment. This work could be carried out applying tax discounts, feed in tariffs, or with a mandatory requirements in case of restoration works.

These activities must be monitored with different approaches, but the common problem is to cover all the aspects than can influence the chosen indicator of energy efficiency.

Such planning for monitoring can have the following characteristics:

- Measurement frequency and data collection: the frequency of data collection could be on a monthly basis.

- Data can be obtained through enquiries to energy consumers, addressing some questions to a representative sample of the overall population. The questionnaire should be simple to understand and easy to fill in, but people who are responsible for this questionnaire must be rewarded properly, to ensure their work is carried out to best effect; an error in their actions would be amplified to all the covered representative sample.
- Another way to monitor the energy efficiency trend is to register all the building refurbishments and/or interventions requiring the authority's permit in an appropriate manner. With a simple modification of registration procedures in public offices, it would be possible to monitor how SEAP energy policies (e.g. building code, public support to energy refurbishment) impacts on the territory in terms of energy savings and/or RES penetration.
- While the first method of data collection helps authorities monitor behaviour changes due to dissemination activities, the second one is more useful in terms of energy efficiency evaluation of building stock.
- With the matching of these two data sources, it will be possible to "present a view of the real situation".
- An ideal choice for monitoring this kind of activities would be obtaining data from energy suppliers.

As already stated, external variables must be taken into account. The next figure shows an example.

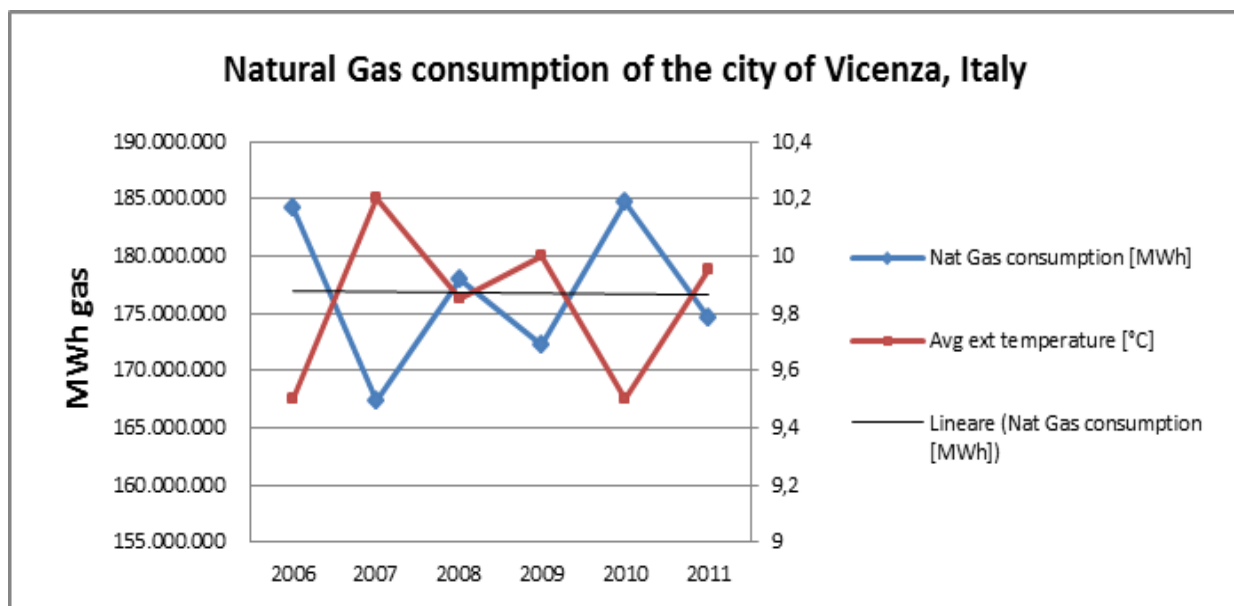


Figure 2. Gas demand of the city of Vicenza and correlation with external temperature. As can be seen, the relationship between average external temperature and gas consumption is very strong, and a variation of nearly 15 % (very close to SEAP targets!!!) can be achieved without any energy policy.

3.5 Audit, non-conformities, corrective and preventive measures

3.5.1 Auditing and reviewing EnMS and SEAP

According to the SEAP guidebook, the effectiveness of a SEAP is kept under control thanks to monitoring activities. ISO 50001 suggests further effective approaches to keep the SEAP under control and to improve its implementation.

An audit programme shall be proposed to keep the EnMS under control and can be proposed for monitoring an ongoing SEAP. The approach should be the same; auditing is a controlled and documented process based on the Plan – Do - Check – Act approach.

Plan:	the audit programme
Do:	single audit plans; carry out audits; prepare the audit report
Check:	review the audit programme
Act:	prepare a modified audit programme

In the case of SEAP, the audit scope may be all SEAP action (or some of them on a sample basis) and SEAP coordination.

The audit programme time extension may be annual or based on the SEAP duration. Details of the activities of the audit programme may be defined on the basis of the steps and milestones of the single actions of the SEAP.

It is strongly recommended for the audit team to be independent from the audited activities.

External auditors can be appointed to grant the best competence and independence; otherwise persons with responsibilities within the SEAP actions or coordination could be asked to audit different activities.

Results of such an audit programme may include:

- Early identification of any non-compliance.
- Identifying risk of non-compliance.
- Identifying and sharing corrective measures.
- Identifying improvement for the SEAP planning.
- Identifying improvements – both technical and otherwise – for single actions of the SEAP to consider new technologies or new opportunities for energy saving.
- Demonstrating effective implementation of SEAP to third parties.

When planning audits on an ongoing SEAP, it should be considered that all the parties and organizations with responsibilities within the SEAP should be included in the audit scope for aspects affecting the SEAP progress and implementation.

It is necessary to bear in mind that the audit programme is mandatory in the case of a management system, but is established on a voluntary base in the case of a SEAP. The audit programme requirements can be applied case by case, without obligations, taking into account general auditing principles, as described above.

Following a SEAP audit programme, an overall review of the SEAP may be planned and carried out, in order to take appropriate decisions for ensuring that the planning is still adequate for providing the SEAP's expected results. It might be an option to:

- Plan periodical reviews in advance.
- Define documents and information to be prepared in advance (reports, indicators, etc.) for the review.

- Check action results against expected targets; identify and tackle any problem; share conclusions and follow-up actions; define responsibilities for follow-up actions.
- Document and distribute the review report.

Non-conformities (findings or recommendations) are normally the outcome of audit processes.

3.5.2 Non-conformities, corrective measures and preventive measures

All management systems standards underline the importance of non-conformities, and corrective and preventive measure management.

A “non-conformity” occurs when an established requirement is not fulfilled. Requirements may be relevant to ISO 50001, laws and regulations, procedures or voluntary agreements such as the Covenant of Mayors, etc.

The corrective measure is an action to remove the causes of the non-conformity.

The “preventive measure” aims to “prevent” a non-conformity and to eliminate the causes of the expected non-compliance.

A non-conformity may also be called “finding” or “recommendation”. What is important is to identify occurring and expected problems and change them in opportunities.

All management system standards point out the importance of analyzing and identifying the causes of the non-conformity, of planning activities to prevent the problem from repeating (the corrective measure) and of checking the effectiveness of the corrective measure.

In the case of a SEAP, a non-conformity may be:

- A delay of an action or of a step of an action.
- An energy saving target not achieved.
- A money saving target not achieved.
- A partner giving up.

The most crucial “lessons learnt” for SEAP management may be described in terms of the importance of: Sharing the analysis of the causes of the problem among all involved parties.

Planning the corrective measure and identifying how to verify the effectiveness of the action all together, involving all the affected parties.

The action plan for the corrective measure should be documented and formally shared among all parties involved; each involved party should accept or approve the plan.

It is recommended that the corrective measure includes timing, resources and responsibilities.

All those taking part in the SEAP should be informed of the corrective measure and results.

The SEAP should be modified according to the results of the corrective action.

It is expected that corrective measures will help all the SEAP partners to cooperate in the best way and to ensure the SEAP is more effective.

Auditing and non-conformities and corrective measure management may require new and different competences which differ from those of the organizations involved in the SEAP. The possibility of seeking external expertise or planning appropriate training should be taken into consideration.

4 Integration of the ISO 50001 EnMS and the SEAP with existing management systems

There are several Public Authorities with an ISO 9001 Quality Management System, an ISO 14001 or an EMAS (Regulation 1221/09/EC) environmental management system, or with other management systems, whether certified or not.

In all these cases, the Public Authority should approach the ISO 50.001 and/or SEAP implementation keeping in mind the opportunity for integrating existing management systems.

Good criteria for planning effective integration should be geared towards the organization’s effectiveness.

Examples
<ul style="list-style-type: none"> • Avoid planning the same process or activity with two or more rules or procedures (written or not). • Define the scope clearly (what it has to be applied to) and the objectives of each document, procedure, etc. • Do not appoint the same task (or overlapping tasks) to different persons or offices. • Try to use the same forms and records for similar activities relevant to different management systems.

Proper integration of management systems is also recommended to minimize changes in the organization rules and habits. Otherwise, a longer period would be required to involve people in understanding and accepting the changes.

Examples
<ul style="list-style-type: none"> • Choose small modifications or integrations to existing rules and procedures rather than new rules and procedures • Opt for integrating existing responsibilities rather than defining new ones • Opt for integrating existing documents such as plans, actions, etc. rather than producing new ones.

As per the examples, some general recommendations can be provided to address choices for integration of different clauses of the ISO 50001 standard.

Document control	<p>It is highly recommended to define the same document control rules for all management systems.</p> <p>If quality management system documents are filed in the intranet area in a shared server folder, the same approach should be used for EnMS documents.</p> <p>If document distribution is planned using internal e-mail or by hand, the same system should be used.</p> <p>Responsibilities for saving, filing, distributing documents might be the same for all management systems.</p> <p>The same might be done for SEAP document management. In any case, with regard to SEAP, the organization should consider that many SEAP-related documents are to be shared with external parties and this is not true for the majority of the management system documents. For this reason, different rules might be established for saving and filing documents.</p>
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<p>Monitoring</p>	<p>Procedures and activities to conduct monitoring are strongly linked to the data, parameters and indicators that have to be collected. Different data probably mean different data owners, and different responsibilities for collecting and evaluating them.</p> <p>As a result, it can be expected that monitoring instruments, procedures and responsibilities should be different for energy management systems and/or SEAP, and for other management systems. Energy performance monitoring focuses on quantitative data to quantify energy related performance, and normally they differ from data and information collected to assess the effectiveness of a quality management system.</p> <p>Different conclusions may be addressed as regards monitoring the energy-related aspects of an ISO 14001 environmental management system. In this case monitoring should involve the same data required for ISO 50001. In any case, ISO 50001 and SEAP monitoring plans are expected to be more detailed to check trends and performance of all single energy-related processes or activities.</p> <p>SEAP monitoring plans shall be addressed to keep trends and performances of all SEAP related actions and activities under control, and shall not only include organization-related data.</p>
<p>Auditing</p>	<p>The EnMS audit process should be properly integrated with other existing management system audits.</p> <p>It is preferable to integrate requirements for audit programmes of different management systems into one overall audit programme and a single “audit programme manager” should be appointed.</p> <p>This can also include auditing of the SEAP plans.</p> <p>To include SEAP auditing in the overall auditing programme, the audit scope should be properly defined and it should be considered that external parties – those involved into the SEAP actions – might be subjected to auditing. External party representatives might also be involved in the auditing activities as auditors, observers, or within the audit results assessment.</p>
<p>Managing non conformities</p>	<p>Managing non-conformities is also a well defined process:</p> <ul style="list-style-type: none"> • Identify non-conformity. • Understand causes. • Decide immediate reaction. • Decide corrective actions and plan. • Carry out corrective actions. • Verify effectiveness of corrective actions. <p>This process would be extended with the same rules and responsibilities to all management systems.</p>

The same approach and procedures might be used to deal with any inconvenience occurring within the SEAP progress.

Integration between environmental and energy management system procedures can be carried out in a successful way taking into consideration:

- Any non-conformity should be approached as an opportunity to improve the EnMS/SEAP management and to help each party involved to work better.
- Corrective actions should be planned establishing responsibilities, sharing and communicating them; written documents are strongly recommended.
- The effectiveness of the action must be checked.

5 Examples

5.1 Energy Policy

Municipality of X

Energy Policy

We are committed to achieving a high standard of energy efficiency, and we aim to integrate saving principles and “Best Available Technologies” in all our processes and installations. We consider energy efficiency one of the key criteria for taking us towards “sustainable development” and saving public funds.

All staff members of our Municipality will be involved in the energy programmes and activities, and we will communicate the importance of the activities carried out by each individual working on our behalf to reduce energy consumption.

We are committed to implementing all applicable legal requirements, and to making ongoing improvements in energy efficiency in our territory.

Our Municipality has addressed implementation of this policy by adopting an Energy Management System compliant with the ISO 50001, by adhering to the “Covenant of Mayors”, and by promoting and coordinating an Energy Action Plan (SEAP).

Our SEAP will be based on a Baseline review for 1990 of the significant energy aspects in our territory, and on the participation and commitment of all involved parties. We believe that the active participation of stakeholders is a basic requirement for a successful SEAP.

Energy saving actions will, amongst others, be geared towards improving energy performance of buildings, developing production of renewable energy sources, promoting efficient industrial processes and increasing local public transport.

Our objective is to achieve a 30% reduction in overall carbon dioxide emissions caused by all activities on our territory by 2020.

We are committed to monitoring our energy consumption rates and efficiency, and to promoting proper energy consumption and efficiency monitoring in the local area, cooperating with energy suppliers and the parties involved in the process.

This Energy Policy will be communicated to all persons working on our behalf, to all parties cooperating with us for energy efficiency and to the general public.

Place, Date
Ms./Mr. XY
Mayor of X

5.2 Appointing the “Management Representative” according to §4.4.1 of ISO 50001 and integrating responsibilities for the SEAP

Place, Date

To: Ms./Mr. XY

Subject: Municipality of X - Energy Management System- Management Representative Appointment

Dear Ms./Mr. XY,

Our Municipality has signed the “Covenant of Majors” and an Energy Action Plan (SEAP) has to be prepared and approved according to Covenant requirements and in line with the decision to implement an Energy Management System (in compliance with ISO 50001 standard).

Bearing these points in mind and your role and skills, I am pleased to be able to appoint you to the role of Management Representative (MR) for the Energy Management System (EnMS), and Coordinator of preparation and implementation of the SEAP.

In order to establish and implement the SEAP and the EnMS in the most effective way, during the EnMS implementation period and after the ISO 50001 certification, you are assigned, irrespective of other responsibilities, the authority and responsibility for (see the clause 4.4.1 of the EN standard):

- a) ensuring that an energy management system is established, implemented and maintained in accordance with the requirements of the ISO 14001 International Standard;
- b) ensuring that all parties involved in SEAP planning and implementation are aware of their role and responsibilities and officially acknowledge their commitments for the planned actions;
- c) reporting to top management on the performance of the energy management system and of the SEAP implementation and monitoring the EnMS and SEAP for reviewing, including recommendations for improvement.

To achieve the above listed objectives, you shall carry out the following tasks:

- Coordinate and address activities of all Departments and branches involved in energy aspects, energy efficiency improvement and SEAP actions
- Ensure efficient control of documents and records, correct management of non-conformities, corrective and preventive measures, complete collection of data and information regarding energy performance and energy factors for EnMS and SEAP monitoring
- Stimulate exchange of information between all Departments and parties involved in the energy efficiency improvement actions and SEAP actions
- Identify any competence or training required to ensure the effectiveness of the EnMS and of the SEAP.

Thank you in advance for your support and cooperation.

,
Signature
Name and position

5.3 Establishing SEAP responsibilities

Action: Promoting installation of new private photovoltaic plants

Standard planning

Timing	2011 - 2012
Costs to be allocated on the Municipality budget	0
Financing for the Municipality	-
Expected energy savings	40 MWh/year
Expected reduction of CO ₂ emissions	27.5 t/year
Responsible	Department of Environment (DoE)
Indicator	Installed MWp

Detailed planning

Action: Promoting installation of new private photovoltaic plants			
Starting date:	January, 1st, 2011		
Deadline	December 31 st , 2012		
Partners:	<ul style="list-style-type: none"> - Municipality of X - Bank - Plant suppliers - Private citizens and companies 		
Estimated costs for private citizens and companies	XX Euros / kW		
Detailed planning			
Detailed planning	Party responsible	Start	End
Issue and award tender for plants suppliers; define good economical conditions for citizens	DoE	01.01.2011	31.05.2011
Issue and award tender for financial services; define good financial conditions for citizens	DoE (consultant)	01.01.2011	31.05.2011
Public presentation; collecting interest of citizens and companies	DoE	01.04.2011	30.06.2011
Preparing the action agreement	DoE (legal Department)	01.01.2011	31.05.2011
Signing the action agreement	DoE (citizens and companies)	30.06.2011	31.12.2011
On-site visits	DoE (plant suppliers)	31.07.2011	30.6.2012
Technical offers – verify required authorizations	Plant suppliers	31.07.2011	30.6.2012
Signing the best offer	Citizens and companies	31.07.2011	30.6.2012
Grant financing	Bank	31.07.2011	30.6.2012
Connection to the network; start with production; grant data communication to DoE	Citizens and companies	31.07.2011	30.6.2012
Installation of plants	Plant suppliers	13.08.2011	30.11.2012
Collection of energy production data and preparation of monthly reports	DoE	13.08.2011	30.12.2012
Auditing plant installations	DoE	13.08.2011	30.11.2012

Date:.....

Signatures

DoE: _____

Plant suppliers: 1) _____ 2) _____ 3) _____

Bank of _____

5.4 Managing a SEAP “non-conformity”

Date:	November 22, 2011
NC description:	The installation of the new 40 kW plant on the roof of the Art Museum has been halted by the Historical Heritage Department
Relevant SEAP action:	Promoting installation of new private photovoltaic plants
Cause:	The problem of the authorization required from the Historical Heritage Department for all installations to be placed on historical buildings was not addressed when planning the action.
Immediate action:	Prepare the application for the Historical Heritage Department authorization Person responsible: Plant supplier
Corrective actions:	Modify the detailed planning of the action including a specific responsibility for plant suppliers in order to grant all required authorizations. Sign the new planning. Responsible: DoE Deadline: 31 December 2011 Training session on all authorization that may be required for new photovoltaic plants installation for technical responsible of the plant suppliers Responsible: DoE (consultant) Deadline: 31 December 2011
Verify effectiveness	While auditing plant installations, DoE shall check that the technical responsible of the plant suppliers check for the requirements of any authorization

Date:

Signatures

DoE: _____

Plant suppliers: 1) _____ 2) _____ 3) _____

5.5 The experience of planning and implementing a SEAP in the Leivi Municipality

Leivi is a small town situated in the province of Genova. It has around 2,500 inhabitants, but during the summer the number of people increases due to its attractive position and view out over the southern Ligurian coast. It is important to note that there is not a sizeable presence of industry, and the main economic activities involve tourism and a small but very important production of olive oil.

The main sectors in which it would be possible to take measures to reduce GHG emissions by 20% include private building stock, where it will be possible to improve energy efficiency by refurbishment and Renewable energy sources –RES- implementation. It is important to note that Leivi did not apply both SEAP and 50001 as well. In any case, however, the main step involved in applying UNI ISO 50001 are also involved in SEAP implementation.

Plan

- 1) The introduction focuses on the following aspects in particular detail:
 - a. An overview of the legal obligation and legislation at European, National and local level which the local authority must take into account in applying its energy policy. For example, it is clear that an energy regulation which has the aim of supporting energy refurbishment in buildings must match national legislation in terms, for instance, of threshold limit values for insulation, minimal requirement of specific energy consumption,
 - b. An overview of the social, economical and geographical context of Leivi, with the aim of describing the activities and targets which can be reached with SEAP implementation.
- 2) The second part of the SEAP describes the overall strategy of its implementation. In particular the following aspects are focused on in Leivi's SEAP:
 - a. A vision of the future of Leivi which covers social, economical and environmental development.
 - b. An assessment of stakeholders and target persons in the local context for attaining the SEAP's activities
 - c. An assessment of the budget, in terms of financial and economic balance, which is needed in the future years.
 - d. Coordination and organization of the structures created within the public authority to manage implementation of the SEAP: in this case the existing technical structure, given that the small dimension of the town doesn't request a dedicated operative structure, is a good answer to *"Adapting city structures, including allocation of sufficient human resources"*. The steering committee is represented by the environmental assessor alone. The latter is the so-called "Management Representative" for ISO 50001 who will report *"on the performance of the energy management system to top management for their review, with recommendations for improvement"*.
- 3) The third part of the SEAP covers all the technical aspects which are required to implement SEAP in the local context.

- a. Baseline inventory: this is a milestone of the SEAP. In this assessment a realistic vision of the GHG emissions will be created, along with the consequent actions to reduce them. Baseline emission inventory has the same purpose of the energy review of ISO 50001, where it is described as follow:
- a) *Analyze energy use based on measurement and other data*
 - *identify current energy sources*
 - *evaluate past and present energy use and consumption*
 - *estimate future energy use and consumption*
 - b) *Based on energy use analysis, identify the areas of significant energy use and consumption*
 - *identify the facilities, equipment, systems, processes and personnel working for or on behalf of the organization that significantly affect energy use and consumption;*
 - *identify other relevant variables affecting significant energy use and consumption;*
 - *determine the current performance of facilities, equipment, systems, and processes related to identified significant energy uses*
 - c) *Identify, prioritize, and record opportunities for improving energy performance, including, where applicable, potential energy sources, use of renewables, or alternative energy sources,*
- b. The approach to the collection of data can be driven in a wide range of options. In this case, the availability of a top-down approach database from the province of Genova has provided the first reliable set of energy consumption data. During the next phases of monitoring and reporting this data will be validated with bottom-up data taken from the “monitoring families”.

DO

The last two bullet points of the above list are similar to the SEAP “Action plan”.

- i. identification of all persons working for and on behalf of the organization whose actions may lead to significant changes in energy consumption;*
- ii. identification and prioritisation of opportunities for improving energy efficiency.*

In Leivi’s SEAP these activities were carried out as follow:

- a. Activate involvement of stakeholders and citizens: this is an important task of the SEAP strategy, because a sizeable amount of energy saving is foreseen with energy efficient consumer behaviour . From this point of view, a sample of families are already involved in a project which has the aim of monitoring energy consumption during a long period and sharing the best practices identified with each other, in order to improve behaviour. This project is called “Famiglie salva energia” (Energy Saving Families).
- b. Set of activities: based on the Baseline inventory, the proposed activities must be carried out to reach the SEAP targets and are developed in order to cover all the sectors with a potential energy efficiency improvement.

Check

- a. Planned measures for monitoring and follow-up: the points stated above will provide the basis for the monitoring planning as well. In fact, a source of data for the monitoring and reporting activities will be implemented in this project. But in order to achieve the best

vision of the real situation, the technical department is developing a database where all the “energy related” activities carried out over the following years in the private sector will be registered. For example, a building energy refurbishment, a solar heating installation or a boiler replacement will be recorded in a dedicated section of this database. This data will contribute to the overall vision of energy efficiency improvement during the time horizon of SEAP activities.

Act

At present there is no feedback from SEAP implementation, but it will certainly be necessary to work on monitoring methods adopted, and on the effects of the SEAP’s activities, in order to best adjust targets and implementation to the local context.

The experience of the Municipality of Moneglia: the Sustainable Energy Action Plan (SEAP) and the certification of an Energy Management System (ISO50001:2011)

During 2011, the Municipality of Moneglia prepared and developed a SEAP and implemented an Energy Management System (EnMS) in line with ISO 50001:2011 within its organization. It integrated it with the existing Environmental Management System, in accordance with ISO 14001:2004, which has been applied since 2005.

The main GENERAL elements that overlap between SEAP and EnMS systems are the following:

1. The objectives of the SEAP and EnMS are similar, but they have different action ranges: the SEAP is a plan which develops and applies to the whole municipal territory, involving all the stakeholders in it: institutions, citizens, tourists, economical operators, associations... Part of the actions of the SEAP deal directly with activities of the public administration and its goals to improve management and use of energy. The implementation of these actions is planned by the Municipality of Moneglia through a management system, the main steps of which are defined in norm ISO50001:2011;
2. The actions of the SEAP which directly involve the Public Administration fall within the objectives of the EnMS and they are thus planned, implemented and monitored. This makes for more effective action by the Municipality towards reducing consumption and attaining improvements in energy efficiency;
3. The territory's involvement in the SEAP and implementation of specific actions affecting energy usage and consumption enable an increase in the range and influence of the Energy Policy and EnMS of the Municipality. Through the SEAP itself, this not only improves energy performance but also achieves higher scale and more significant objectives throughout the whole territory;
4. Thanks to the Municipality's EnMS, a systematic monitoring process is implemented on the performance indicators defined in the SEAP, so that the Action Plan can be implemented and respect the deadlines.

BENEFITS GENERATED BY HAVING AN EnMS integrated with a SEAP

According to the experience of the Municipality of Moneglia, the implementation of an EnMS supporting the SEAP allowed better internalization of the objectives and higher awareness of energy uses and management, not to mention possibilities for improvement. Furthermore, interaction with the local population got underway with the drafting of the SEAP, allowing the Administration to improve its perception of collective energy needs and to implement attentive communication on environment and energy efficiency.

One of the main benefits resulting from having an EnMS to support the SEAP is the development of proceedings that monitor SEAP long-term targets. As a result, the Municipality can control each progress and revise planned measures.

BENEFITS GENERATED BY HAVING AN EnMS integrated with an Environmental Management System

The integration between the existing Environmental Management System and the new Energy Management System, furthermore, has also improved and increased the capability of management and surveillance of elements of environmental data inside the Public Administration, through which specific and precise energy performance indicators have been implemented. These are fundamental for verifying the objectives foreseen in the Energy Policy of the Municipality.

PRACTICAL STEP OF IMPLEMENTATION OF THE EnMS INCLUDING PRACTICAL STEPS developed by the Municipality TO INTERLINK EnMS and SEAP

In particular, the implementation of the EnMS was developed with the following operative phases:

1. Identification and evaluation of the main energetic issues of the Municipality, usually related to:
 - Use of electric energy and fuel
 - Public lighting
 - Heating
 - Energy efficiency
 - Maintenance
2. Development of the Energetic Analysis of the Municipality, which gives the opportunity to:
 - Analyse the use and consumption of the Municipality in the management and use of real estate, and from carrying out of competence services. This analysis is based on data gathered and processed within the Energy Management System, identifying sources and evaluating trends over the course of time;
 - Identify the activities involving significant energy consumption, based on the equipment and processes used, personnel involved and other variables that could influence energy performance;
 - Estimate energy consumption and short-term results;
 - During the analysis, performance indicators can also be defined and can prove useful for monitoring the process.

In this phase, we encountered some difficulties, mainly linked to gathering data and analysing it.

3. Integration of the environmental objectives of the Environmental Management System, certified in compliance with ISO 14001:04 standard, with the energy efficiency objectives, and integration of the monitoring indicator "CO₂ emissions avoided" when applicable, which can also be useful for the SEAP monitoring process.

Within the objectives of the System, the actions of the SEAP are also included, when they are relevant for the time scale:

- PV panels on school roof
- Extension of methane gas distribution in suburban areas
- Development of high efficiency lighting in the tunnels connecting Moneglia with the neighbouring villages
- Development of best practices within the touristic sector involving hospitality and beach resorts

The existence of a mature and well-established Environmental Management System made this step easy and allowed the administration to improve the environmental objectives and their monitoring a great deal (this is one of the advantages of an integrated system).

4. Insertion of the monitoring process of the SEAP actions in the environmental performance monitoring surveillance.

In so doing, the Municipal administration has the possibility to monitor all the actions of the SEAP with certainty and accuracy, and it can intervene efficiently in case of delay, analysing and solving any problems or preventing them from arising.

Within the System, the Administration developed procedures for registering progress and critical aspects of each action.

5. Development of specific operating instructions for monitoring detailed energy consumption, per source and per use, correlated to properties of the Municipality and activities/services carried out, with indications on the maintenance scheduling needed to achieve energy efficiency.

The Environmental Management System has been combined with specific procedures so that each party involved in implementing the system can act in compliance with the objectives of the system itself.

In addition, the existence of an Environmental Management System which was already known and applied in all its aspects by all the those working in the Administration on this field (including suppliers and service managers) has proven fundamental.

MORE TESTIMONIALS AND DIRECT EXPERIENCES FROM MUNICIPALITIES CAN BE FOUND IN THE ENERGY FOR MAYORS "WHY INTEGRATE a Sustainable Energy Action Plan with an ENERGY MANAGEMENT SYSTEM?" BROCHURE AVAILABLE AT:

www.energyformayors.eu

6 Glossary

BEI	Baseline Emission Inventory
CO ₂	Carbon Dioxide
EC	European Commission
EMAS	Environmental Management and Audit Scheme (reg. (CE)/1221/2009)
EnMS	Energy Management System
EN	European Standard
GHG	Green House Gas
ISO	International Standard Organization
SEAP	Sustainable Energy Action Plan
SEAP guidebook	European Commission. How to develop a Sustainable Energy Action Plan (SEAP) – Guidebook. Luxembourg: Publications Office of the European Union. 2010 – 120 pp.

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