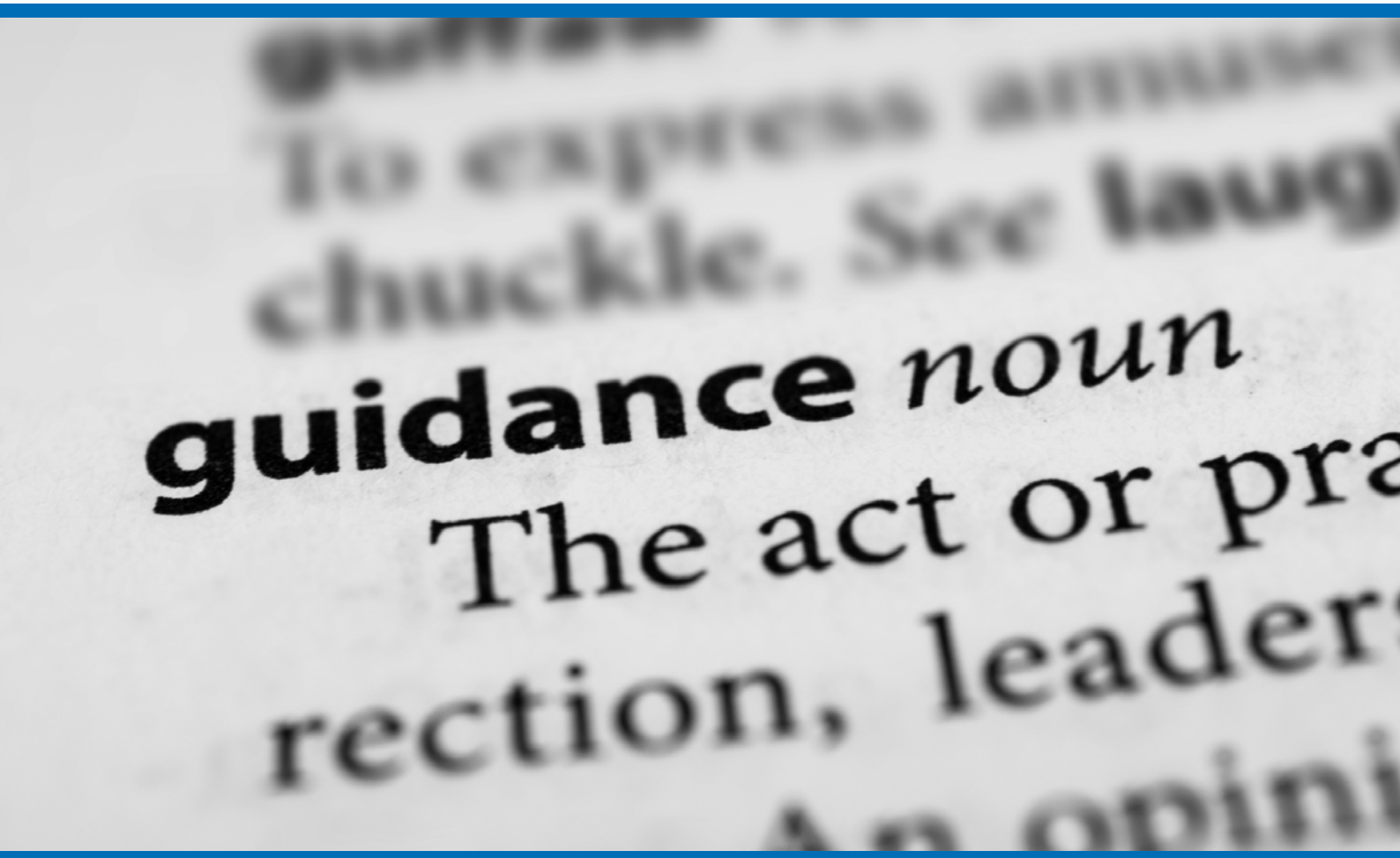
multEE
facilitating multi-level governance
for Energy Efficiency



Guidebook for development of concrete proposals for multilevel governance coordination

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List of abbreviations

AEA	Austrian Energy Agency
BAT	Best Available Technology
BREF	Bat Reference Document
CM	Coordination Mechanism
CRES	Center for Renewable Energy Sources ad Savings
EE	Energy Efficiency
EEAP	Energy Efficiency Action Plan
EED	Energy Efficiency Directive
EEOS	Energy Efficiency Obligation Scheme
EPC	Energy Performance Certificate
ESCO	Energy Service Company
ESD	Energy Service Directive
ETS	Energy Trading System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IED	Industrial Emission Directive
IPE	Institute of Physical Energetics
IPPC	Integrated Pollution Prevention and Control
LEI	Lithuanian Energy Institute
M&V	Monitoring and Verification
MACEF	Macedonian Center for Energy Efficiency
MVP	The web tool for evaluating, planning, measuring and verification, developed in this project
NEEAP	National Energy Efficiency Action Plan
NGO	Non Governmental Organisation
R&D	Research and Development
RES	Renewable Energy Systems
RUC	University of Roskilde
SEAP	Sustainable Energy Action Plan
SIEA	Slovak Innovation and Energy Agency
SME	Small and Medium Enterprises
SMIV	System for Monitoring, Measurement, Verification of Energy Savings
SWOT	Strenghts, Weaknesses, Opportunities and Threats
TD	Top Down
VC	Vertical Coordination

I Introduction

One of the key tasks in the MultEE project is to elaborate concrete suggestions on how to improve coordination mechanisms in the European partner countries.

The concrete suggestions will be based on a country-specific description of multilevel governance and its evaluation carried out earlier in the MultEE project. The aim of this guidebook is to give input to the development of concrete proposals on improving coordination mechanisms at national workshops in each of the partner countries.

This guidebook will include the activities, which will be carried out before and on the workshops in respect of defining the concrete proposals for multilevel governance coordination. Besides the guidebook should be supplemented by the content of specific information in the partner countries included in the following reports:

- The country reports
- The Synthesis report on European best practices for M&V schemes and coordination mechanisms
- The Identified areas of improvements of Monitoring and Verification schemes and Coordination Mechanisms
- A support Paper to identifying concrete proposals for Multilevel Governance Coordination

II Demands from the Energy Directive

Article 7 of Directive 2012/27/EU (Energy Efficiency Directive - EED) provides that the following measures may be taken in order to achieve the 1.5 % annual energy savings target:

1. Introduction of an **energy efficiency obligation scheme** (in accordance with paragraphs 1 to 8), - the basic system by means of:

a) an obligation on energy distributors, or
b) an obligation on retail energy sales companies, or
c) an obligation on energy distributors and retail energy sales companies

OR

2. Introduction of an alternative system to an energy efficiency obligation scheme (in accordance with paragraphs 9 to 12) by **taking alternative policy measures** to achieve energy savings at the same level (1.5 & annual energy savings) among final customers:

a) energy or CO_2 taxes that have the effect of reducing end-use energy
b) consumption;
c) financing schemes and instruments or fiscal incentives
d) regulations or voluntary agreements
e) standards and norms improving the energy efficiency of products
f) and services
g) energy labelling schemes
h) training and education, including energy advisory programmes

These policy measures can include an Energy Efficiency Fund, in accordance with Article 20, or a combination of an energy efficiency obligation scheme and policy measures.

There are already a number of energy-saving activities and systems in our countries. Some are based on EU regulations (e.g. Industrial energy saving, Public green procurement / energy labelling), others are based on EU initiatives (e.g. Covenant of Mayors), a number of systems are carried out as voluntary system through cooperation at local and regional level (e.g. ECO-budgeting); There also exist a number of national options to support the development of energy savings (taxes and subsidies).

II.I Energy Saving Systems

Seven energy-saving systems are identified: Based on the basic system, based on the alternative policy measures (see above) and based on existing energy-saving activities the following seven energy-saving systems are identified:

- The basic system: The energy efficiency schemes in EED (article 7)

Focus: Supply companies

- The saving schemes in CoM (Covenant of Mayors)

  Focus: Energy efficient enduse technology and/or behaviour

- Energy efficiency schemes through ECO-budgeting (ICLEI)

  Focus: Energy management schemes on cities, residential districts, buildings, etc.

- Energy efficiency schemes, based on taxes and subsidy (for instance CO2 tax)

  Focus: Energy tax

- Energy efficiency schemes, based on financial schemes directed towards promotion of energy efficient technologies

  Focus: Financing or financial technology support

- Energy efficiency schemes based on labelling (standards for energy efficient products or services – for instance Energy Star)

  Focus: Energy labelling of products or services

- Energy efficiency related to the environmental regulation, especially enterprise regulation (EU directives: IED/IPPC), cf. BREF on energy with requirement on energy saving

  Focus: Energy savings based on performance requirements

The basic system: It could of course be recommended immediately to establish an energy saving system in accordance with the energy efficiency directive (EED Article 7): Savings implemented by utilities (electricity, oil, natural gas, district heating, district cooling, etc.). This activity could be supported by the MVP tool from this project – the MVP tool can be used to evaluate, to plan, to measure and to verify the savings.

Alternatives: But it is also possible to start from existing activities, i.e. activities that have already been implemented in your country with the purpose to establish a coherent energy system in course of some years through a continuous development.

A few examples may illustrate the thinking:

- Example 1. The start could be a SEAP (Sustainable energy action plan) from the Covenant of Mayors. It is typically geographically limited. Lessons from a specific SEAP could be transferred to other urban communities.
These experiences could be systematized and transformed through the MVP Tool in this project. This kind of approach will ensure a bottom up approach and

create a strong local presence, and through its transparency successfully secure further deployment.

- Example 2. The authorities' specific requirements for energy efficiency can lead to an improved energy performance of the company. The requirements are set and will subsequently be documented in the measurement and verification of the company's energy behavior. The procedure for fulfilling the requirements can subsequently be transferred to other companies, etc.

- Example 3. The start could also be the Energy Star labelling system. The Energy Star has developed guidelines for Energy Management in seven steps: (1) make commitment (2) Assess performance, (3) set goals, (4) create action plan; (5) implement action plan, (6) evaluate progress, (7) recognize achievements. This system would typically be used at company level or local community level. If this Energy Star system is already used, it could be used for expansion in more companies or in more local communities. These expansions could be systematized and supported through the MVP Tool in this project.

The purpose of this guide book is as previously mentioned to inspire the establishment of a comprehensive energy saving system, either by setting up the basic system (EDD §7) or by building on existing activities and expand them successively from company to company, from citizens to citizens, or from local communities to local communities.

Awareness, education and training play a crucial role in this developing process. Therefore included in this guidebook you will find some examples of community-oriented education and training activities. Awareness and education can be addressed in several directions - from local authorities to companies to citizens or in combination.

II.I.I The Energy efficiency obligation schemes – the basic

1. Regulatory basis: Energy efficiency is an important part of the EU policy. In 2012 the *Energy Efficiency Directive* set up a number of binding measures to promote the EU in reaching its 20% energy efficiency target by 2020. Under the Directive, all EU countries are required to use energy more efficiently at all stages of the energy chain, from production to final consumption.

The Energy Efficiency Directive was updated on 30 November 2016. The Commission proposed a new 30% energy efficiency target for 2030, and measures to update the Directive to make sure the new target is met. Later, the Council of Ministers adopted a small reduction in the saving target. The target was set at 27% by 2030.

2. Main content: It is not the intention here to review the entire directive, but the following three elements should be emphasized:

- ***Public energy efficiency:*** Yearly renovation of public buildings (article 5); member states shall ensure that central governments purchase only products, services and buildings with high energy-efficiency performance (article 6).
- ***Energy efficiency obligation schemes.*** The basic option is: All energy distributors or all retailers in the energy retail sector must achieve an annual savings of 1.5%. As an alternative to setting up an energy efficiency obligation scheme, member states may use alternative policy measures to achieve energy savings by final customers (article 7).
- ***Energy audits and energy management system:*** Member states shall promote the availability of high quality energy audits to all final customers (article 8).

Here, the focus is on Article 7 (the basic schemes) and alternative energy efficiency, which by nature cannot normally include public savings (according to Articles 5 and 6), nor the energy management system (Article 8).

The directive mentions a number of alternative policy measures. The list of alternatives is not exhaustive and other policy measures may be applied. »… The list […] is not exhaustive and other policy measures may be applied. However, […] Member States must explain in their notification to the Commission how an equivalent level of savings, monitoring and verification is achieved«.[1]

3. Saving values, measurement and verification: The Energy Efficiency Directive requires that national savings requirements are formulated and that these savings requirements are transformed as savings requirements for the different groups of energy distributors and/or energy suppliers. Then two tasks follow:

- ***Standard value for energy efficiency***: The member state has to determine the standard value for a given saving. Typically, it will consist of the preparation of an energy savings catalog that establishes the link between a given activity and the energy saving that the activity represents.

[1] See: »Guidance note on Directive 2012/27/EU on energy efficiency.« Article 7: Energy Efficiency obligation schemes; European Commission, Brussels, 6.11.2013, SWD (2013) 451 final, p. 12.

The directive states that the method chosen to express the required amount of energy savings is also used to calculate the savings that the committed parties claim to have achieved (article 7, paragraph 5).

It is not always possible to set standard saving values, because the savings potential can be linked to specific conditions. However, specific values must be calculated according to the same principles and in such a way that the same measurement, control and verification methods can be used. It points at the second main task:

- ***Measurement and verification system:*** The member state has to set up a measurement, control and verification system to verify the savings put in place by the obligated parties. The measurement, control and verification shall be conducted independently of the obligated parties. As mentioned the measurement, control and verification system has to use the same methods as used in setting up the standard or the specific calculated saving values.

The main idea of the multiEE project is to propose how energy savings can be put into the overall governance system. This problem should be illustrated with the following figure:

Figure 1: Model for basic system: The Energy efficiency obligation schemes

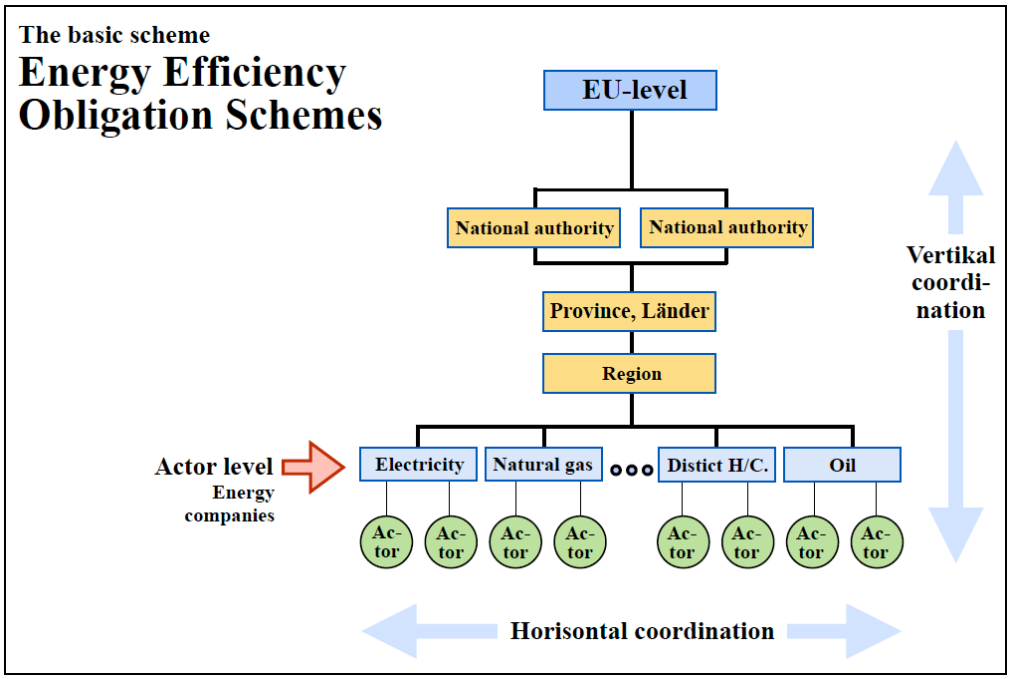


Figure above shows two coordination problems, namely vertical and horizontal coordination. They will be highlighted separately:

4. The vertical coordination: The vertical coordination is about how step by step objectives and content of the EU directive are brought down to the bottom in the governance system. The basic system – Energy efficiency obligation schemes - is a relatively simple system, consisting of only three parts: (1) EU, (2) national level and (3) energy distributors and/or energy suppliers.

The first step is that the EU sets rules for the preparation of rules for all member states (Directives and EU guidelines). The next step is that the Member State draws up rules that are directly addressed to the organizations to which the rules

are addressed, namely energy distributors and/or energy suppliers. For some countries, there are intermediate "stations" from the national level to the performing level in the form of länder or provinces.

5. The horizontal coordination: Horizontal coordination consists of two main elements, namely horizontal coordination at the national level, and possible coordination between the different stakeholders at the action level.

Discussions at the national workshops on multilevel coordination have shown that in some Member States it is necessary to pay attention to the need of horizontal coordination at the national level. The decisions are divided between several ministries (for instance ministry of energy, economics, planning, etc.).

Horizontal coordination at the stakeholder level – that is between the different energy suppliers - is not necessary for establishing an efficient energy savings scheme focusing at the energy distributors and energy suppliers, but it will undoubtedly be an advantage. (http://www.covenantofmayors.eu/index_en.html)

II.I.II The Energy efficiency schemes of Covenant of Mayors

1. Regulatory basis: CoM is a voluntary program, originally launched in the EU Commission in 2008 as a way to endorse and support the efforts deployed by local authorities in implementation of sustainable energy policies. Target year and target were originally formulated until 2020, but by 2015, the Commission extended the target to 2030.

2. Main content: CoM is about involving local and regional authorities, who are voluntarily committed to contributing to the EU target for reducing greenhouse gas emissions by increasing energy efficiency and use of renewable energy sources on their territories. CoM has three main targets:

- Mitigation of climate change: Accelerating the decarbonisation in the member state with at least 40% lower CO2 emission by 2030.
- Adaptation to climate change: Strengthening the capacity to adapt to unavoidable climate change impacts.
- Secure Sustainable and affordable energy: Increasing energy efficiency and the use of renewable energy sources in the member state.

General approach for CoM: A specific action plan, which sets out the intended actions, must be formulated. Every two years, a progress report must be prepared which evaluates the implementation of the plans. The CoM scheme thus includes both measurement and verification of the activities carried out. There are currently prepared plans for approx. 7,400 municipalities and urban communities in the EU, corresponding to 44% of the EU population. The action plans are prepared by four steps: (1) Baseline review; (2) Formulation of a specific action plan to year 2030, including energy efficiency measures, (3) Implementation, and (4) Progress report to assess implementation, and so forth.

The use of CoM: The use of the covenant of mayors as an alternative to the basic system leads to the following model and consideration of horizontal and vertical coordination as well as the establishment of the required capacity.

3. Saving values, measurement and verification: As mentioned earlier if an alternative to the basic system is used, member states must explain how to achieve a similar level in energy efficiency, and in monitoring and verification. In the following, it is therefore necessary to assess how *The Covenant of Mayors* can meet the method requirements for setting standard values on the one hand and the requirements for measurement and verification on the other hand.

Saving values: The Covenant of Mayor does not use standard values for energy savings, but it works with another type of bottom-up approach. The starting point is the emission of greenhouse gases (baseline access). An action plan is formulated based on the baseline and the given targets (20% reduction). The action plan called Sustainable energy action plan (SEAP), includes among others specific suggestions for saving energy, stating the timeframe and expected energy savings. There is hardly any doubt that the Covenant of Mayor method complies with the directive on the precise indication of energy savings for a given activity.

Measurement and verification: CoM requires a progress report every two years, and a detailed account of the development of greenhouse gas emissions, energy savings and conversion to renewable energy. The municipalities report their own measurements, while the CoM office in Brussels has a verification system. Thus, there is a type of measurement and verification, but not at the same level with an

independent unit. If CoM is to be fully replaced by the basic system, there will be a need for a development of CoM's measurement and verification system.

The governance system of the Covenant of Mayors is relative simple and very direct as it is shown in the figure below:

Figure 2: Model for alternative: the Covenant of Mayors

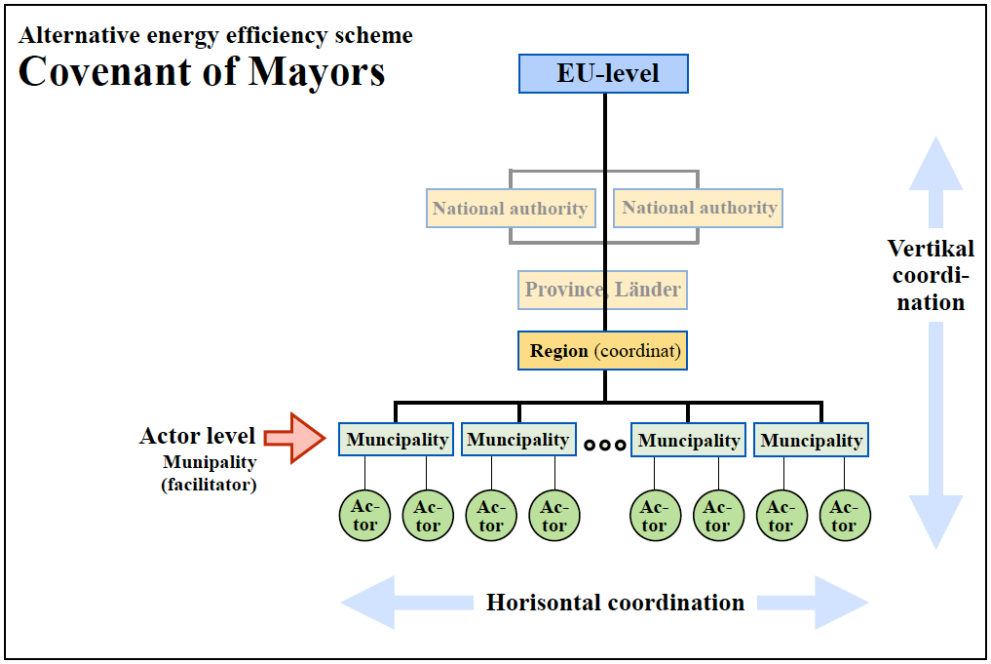


Figure 2 shows the typical set up at the Covenant of Mayors with the two main levels, namely the EU level, presented at the CoM office, and the municipalities as the primary actor level.

4. The vertical coordination: As mentioned before the vertical coordination is about how to step by step bringing down the objectives and content of the EU directive to the 'bottom' in the governance system. In principle, there are only two levels in the Covenant of Mayors, namely CoM-Office in Brussels and municipalities or cities in the EU. Others may participate and act as supportive organizations, for example the regional authorities through the establishment networking between the municipalities in their region.

CoM Office has prepared a very comprehensive document and guidelines designed to establish Covenant of Mayors step by step. There is a clear focus on the necessary steps to ensure a vertical integration. The vertical coordination requires also to »… strengthen your capacity for achieving your Covenant of Mayor's goals; your internal administrative structures should be adjusted and optimized.« (Homepage, CoM).

The local authority or municipality has a number of different roles: The role as authority, as facilitator and developer, as owner of energy facilities and as consumer. All roles fit into the CoM scheme, however, the most important role is as a facilitator, which naturally places demands on the municipality in terms of vertical coordination aimed at the municipality's many different inhabitants.

5. The horizontal coordination: Contains two questions, namely coordination at EU level and coordination at local level or at municipal level. The Covenant of Mayors has proved to be an unconditional success. Many participants and significant results have been achieved. Against this background, one could imagine that there will be great interest in creating a more direct relationship between the methodology of The Energy efficiency obligation schemes and the methodology of The Covenant of Mayors. It will imply a easier translation between the two systems.

The other coordination is the horizontal coordination at the local level. It is incorporated in a number of advice and guidance from CoM. It is for instance stated by the CoM-Office, that establishment of an action plan is »… challenging and time-consuming process that has to be planned and continuously managed. It requires collaboration and coordination between various departments in the local administration, such as environmental protection, land use and spatial planning, economics and social affairs, buildings and infrastructure management, mobility and transport, budget and finance, procurement, civil protection, etc.«. (Homepage, CoM).

II.I.III ECO-budget schemes

1. Regulatory basis: There are a number of different voluntary programs based on environmental management thinking, but not applied to a company, but on *an entire city* or part of the city. There are two systems to be mentioned, namely the Eco-Budget under the ICLEI (Local Government for Sustainability), and the Aalborg Commitment Implementation Guide.

The Eco-Budget system consists of three phases (see www.ecobudget.org):

- ***Budget preparation and approval:*** Based on the current environmental situation in the municipality, identify the natural resources they require for budget planning, identify budget priorities, set targets and prepare the environmental master Eco-Budget which is presented to the Council for approval.
- ***Budget implementation:*** Following the Council's approval, programs and measures are undertaken to meet the environmental targets. The

implementation measures and compliance with the targets are monitored and accounted for.

- ***Budget balancing***: At the end of the budget year, just as with financial budgeting, a statement of the environmental accounts is prepared - the (environmental) Budget Balance.

The Aalborg Commitment Implementation Guide has a number of similarities. It is based on the same idea, namely start with mapping, setting an action plan to secure continuous improvement.

The guideline contains five steps: (1) Baseline review. (2) Target setting. (3) Political Commitment. (4) Implementation and reporting. (5) Evaluation and Reporting, where after you return to the start, namely the baseline, but now a new baseline, setting new goals, obligations, new implementation, etc.

2. Main content: The above-mentioned schemes can be used as an alternative to the energy obligation schemes. These schemes in the Eco-Budget and Aalborg Guide are broadly aimed at environmental and resource issues. If these schemes should be used as an alternative, they must of course be *adapted to energy efficiency* options. The strength of the two schemes is that they have proven to be very suitable for creating a large and persistent local commitment.

3. Saving values, measurement and verification: As mentioned earlier, if alternatives to the basic system should be used, member states must explain how to achieve a similar level in energy efficiency, and in monitoring and verification. In the following, it is therefore necessary to assess how *the Eco-Budget* or *the Aalborg Guide* can meet the method requirements for setting energy saving values on the one hand and the requirements for measurement and verification on the other hand.

Saving values: In the preparation phase the focus should be on the energy consumption of the entire city, a city quarter, or a specific number of houses, etc., with the purpose of mapping the current energy consumption. As a next step, possible actions and their savings effects could be determined. The Eco-Budget and Aalborg guide thus allow easy use of existing data sets for energy savings (standard values) in the formulation of a specific action plan.

Measurement and verification: Both schemes have a recurring control of the accomplished efforts. However, like CoM, it is not an independent measurement and verification system. It is necessary to supplement the Eco-Budget and Aalborg Guide with a more detailed measurement and verification system according to the requirements of the Energy Efficiency Directive. The two schemes are not part of

the formal EU governance, but have to be an integrated part of the energy efficiency regime as illustrated with the figure below:

Figure 3: Model for alternative: The Eco-Budget

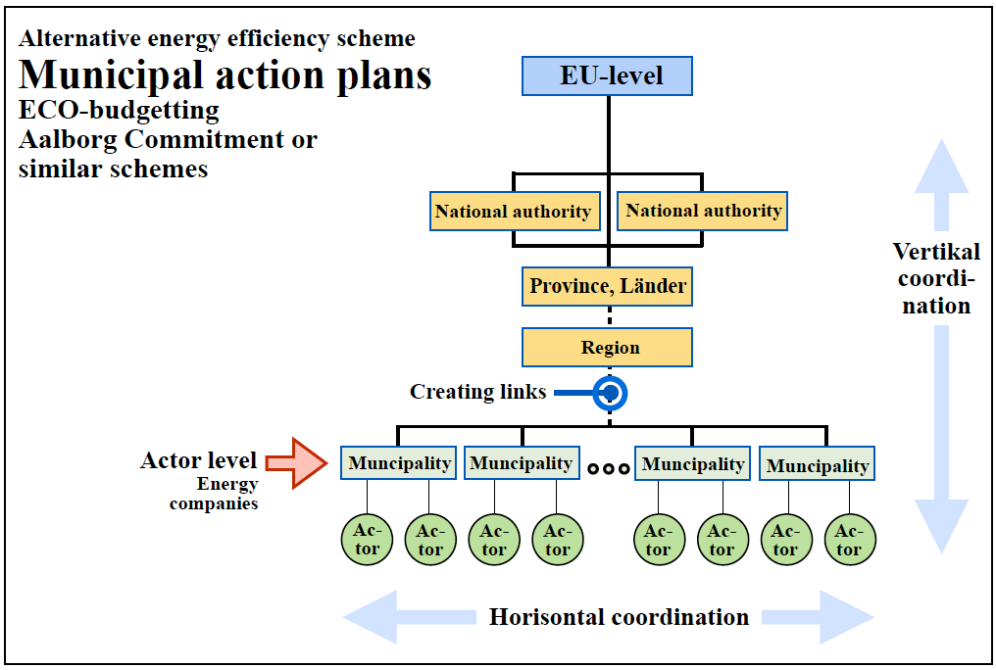


Figure 3 shows that actor level will typically be a municipality or similar local authority. The role of the local authority will predominantly be to facilitate, control and report energy efficient efforts. The figure also shows that there is no direct relation to the multilevel governance system because Eco-Budget and Aalborg Guide (or similar schemes) are generated by private organizations outside the EU system. A multilevel coordination must be established, if the Eco-Budget or Aalborg serves as an alternative to the basic system.

4. The vertical coordination: As mentioned before the vertical coordination is about how to step by step bringing down the objectives and content of the EU directive to the 'bottom' in the governance system. The establishment of vertical coordination means the establishment of a link to the entire multilevel governance system that is a link to the rules and tasks contained in the Energy Efficient Directive, which is targeted and formulated by the national state, province, countries and regions.

Said in another way: If a vertical integration is to be achieved, a specific supplementary guide to the Eco-Budget or Aalborg Guide should be prepared clarifying how this type of scheme may become an integrated part of the regulatory regime contained in the Directive and its guidelines.

It is of course a major task. The advantage is that the two mentioned schemes – Eco-Budget and Aalborg Guide have – demonstrated to be able to create a high degree of local commitment. For example, it could be a task for ICLEI to prepare a supplementary guide that shows how Eco-Budget could be a valuable alternative to ensure energy savings with a high level of local commitment.

5. The horizontal coordination: Horizontal coordination consists of two main elements, namely horizontal coordination at the national level, and possible horizontal coordination between the different stakeholders and inside the municipalities.

If decisions at the national level concerning the Energy efficient directive are divided into several ministries (for instance ministry of energy, economics, planning, etc.), it implies the need for the development of a horizontal coordination at this level.

This cross-cutting cooperation at the local level could be achieved solely by applying the guidelines prepared for the Eco-Budget and the Alborg Guide schemes. The need for horizontal coordination is highly recognized in these schemes.

II.I.IV Taxation and subsidy

1. Regulatory basis: Taxes are defined in principle at the national level, while subsidy can be defined at a variety of levels, both EU, national state and underlying levels in the overall multilevel governance level.

Tax instruments can play an important role in energy efficiency, alone or in complementing other market based instruments and regulatory measures implemented. The advantage of tax instruments compared to regulatory instruments is often their efficiency and the fact that they can raise revenues that can be used to reduce distorting taxes elsewhere in the economy. Taxation often proves to be superior to regulation when environmental damages are not location-specific and do not vary with the source of pollution. However, the tax instruments might sometimes be insufficient and need to be complemented by other fiscal instruments. Such complementarities are especially called for when there are information costs or market failures. A number of relationships have to be kept in mind, in particular, affordability constraints for consumers, myopia about the long-term savings, high search costs, and principal-agent relationships.

2. Main content: It is important to distinguish between the two instruments: Taxes and grants because they will have very different options to act as an alternative to the Energy efficiency obligation schemes:

- ***Taxation:*** There are several principle options. One option is direct tax on energy consumption. Another option is taxes on the effects of low energy efficiency, for instance CO_2 taxes. The tax can thus be reduced through energy savings.
- ***Subsidy:*** There are a number of support schemes that will promote energy efficiency. For instance, the wide range of support schemes to support local climate and energy actions, which in some cases support energy savings.[2] There are two main models: (a) A special energy efficiency support scheme, for instance developed at provincial level or regional level. (b) An existing support scheme is selected, focusing in particular on energy saving elements in the schemes.

3. Saving values, measurement and verification: As mentioned earlier if an alternative to the basic system is used, member states must explain how to achieve a similar level in energy efficiency, and in monitoring and verification. In the following, it is therefore necessary to assess how *taxation and subsidy* can meet the method requirements for setting energy saving values on the one hand and the requirements for measurement and verification on the other hand.

Saving values: The challenge is how to connect taxation or subsidy with specific energy savings. We assume an establishment of data sets for energy savings (standard values). Then the problem can be formulated as follows: How can tax or subsidy support the specific savings, as shown in the standard energy savings catalog. In this matter, there is a very big difference between taxation and subsidy.

Taxation: Taxation can hardly be related to specific saving activities, which means that taxation cannot function as a full-fledged option, although it may be assumed that taxation could greatly contribute to increased energy efficiency.

Subsidy: If the grants are linked directly to the above mentioned data set over energy savings (standard saving values), a subsidy scheme will be able to meet the requirements as an alternative to the Energy efficiency obligation schemes.

There are major challenges if a more general subsidy scheme or energy saving program is used. If that type of program is to be a full-fledged alternative, it is necessary to specify the energy saving at such a level that it is possible to perform subsequent measurement and verification.

[2] See Quick Reference Guide. Financing Opportunities for Local Climate & Energy Actions (2014-2020). Covenant of Mayors.

Measurement and verification: Measurement and verification will not cause major problems if the taxation and subsidy scheme uses specific saving values forming a data set on energy savings. If this is not the case, it is necessary to develop a specific documentation system for instance for a taxation scheme so it is possible to carry out a relevant measurement and verification.

The multilevel governance for the above-mentioned taxation and subsidy schemes is illustrated with the figure below:

Figure 4: Model for alternative: Taxation and subsidy

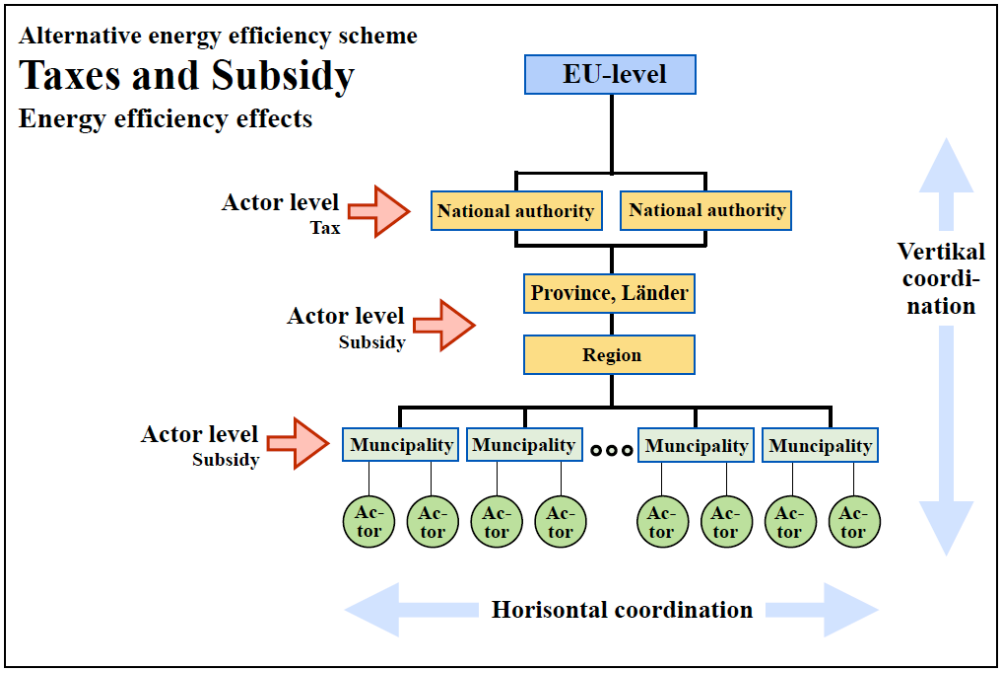


Figure 4 shows the various action or decision levels for taxation and subsidy schemes, respectively.

4. The vertical coordination: As mentioned before the vertical coordination is about how to step by step bringing down the objectives and content of the EU directive to the 'bottom' in the governance system. The vertical coordination is different for taxation and for subsidy schemes.

Taxation: In the preparation of a taxation system, it is the task of the national authority to establish a link between the EU Directive on the one hand, and the possible energy savings and their implementation at the actor level on the other hand. The vertical coordination must provide answers to both relationships with saving values and on measurement and verification.

Subsidy schemes: In this case, vertical coordination is about relating the support scheme to actor level. This implies that the governmental level initiating a subsidy scheme must carefully consider how the support scheme contributes to energy saving in accordance with established criteria and data sets for energy savings at the actor level.

5. The horizontal coordination: The horizontal coordination is different for taxation and subsidy schemes. *Taxation schemes:* In the development of taxation schemes, there is a need for extensive coordination at the state level between ministries for finance, energy, climate, etc.

Subsidy schemes: There is a need to develop horizontal coordination at all levels in which the different support schemes are drawn up. There is therefore a need for horizontal coordination at EU level between EE-Directive authorities and the authorities that draw up EU funding grants. The same applies to the member states for the different support schemes determined at the national level. The corresponding applies to support schemes developed at 'lower' decision levels.

II.I.V Technology support – ETAP, SET-PLAN, etc.

1. Regulatory basis: There are a large number of EU programs that support innovation in a number of specific areas. Examples may include the European Technology Platform (Smart Grids and Renewable Heating & Cooling), the SET-Plan (Transforming the European Energy System through innovation), ETAP (Eco-Innovation Action Plan), to mention just a few. (http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=etp)

The question is: Can you think an alternative to the Energy efficiency obligation sche-mes, where the focus is innovation, where this innovation will contribute to increased energy efficiency? Can you get innovation from energy savings? Or can you get energy savings from innovations?

The following is based on one or more innovation projects where the purpose is to promote research and innovation efforts across Europe by supporting the most impactful technologies in transformation of the energy system to a more efficient and low-carbon energy system.

2. Main content:

Establishing an innovation program that, for example, is aimed at developing increased energy efficiency, addressing the whole innovation chain, from research to market uptake:

- More energy efficient products - for instance industrial fans, power transformers, computers and servers, water pumps, vacuum cleaners, fridges and freezers, televisions, circulators, cooking appliances, ventilation units, electricity motors, lighting, space and water heaters, dishwashers, etc.
- More energy efficient buildings – for instance renovation of existing buildings, or development of new nearly zero-energy buildings.
- Cogeneration of heat and power (The Energy Efficiency Directive requires each EU country to carry out a comprehensive assessment of the national potential of cogeneration and district heating and cooling (a main user of cogeneration) by December 2015).
- Heating/cooling. In February 2016, the Commission introduced an EU heating and cooling strategy. Plans for this EU strategy were first launched in 2015 as part of the Energy Union strategy.

3. Saving values, measurement and verification: As mentioned earlier if an alternative to the basic system is used member states must explain how to achieve a similar level in energy efficiency, and in monitoring and verification. In the following, it is therefore necessary to assess how *the different innovation programs* can meet the method requirements for setting energy saving values on the one hand and the requirements for measurement and verification on the other hand.

Saving values: Much depends on how the innovation program is formulated and the extent to which innovations from the program are implemented. If criteria for specific energy performance goals are set for the various activities, it will be possible to convert the realized innovations into measurable sizes, which then could be included in the energy savings statement.

Measurement and verification: If the innovations are implemented and if measurable criteria have been applied for the innovations, it will also be possible to measure the efforts and verify the energy savings efforts, according to the rules of the Energy Efficiency Directive.

The different innovation schemes are not a direct part of the formal EU governance, but have to be an integrated part of the energy efficiency regime as illustrated with the figure below:

Figure 5: Model for alternative: ETAP (Eco-Innovation Action Plan)

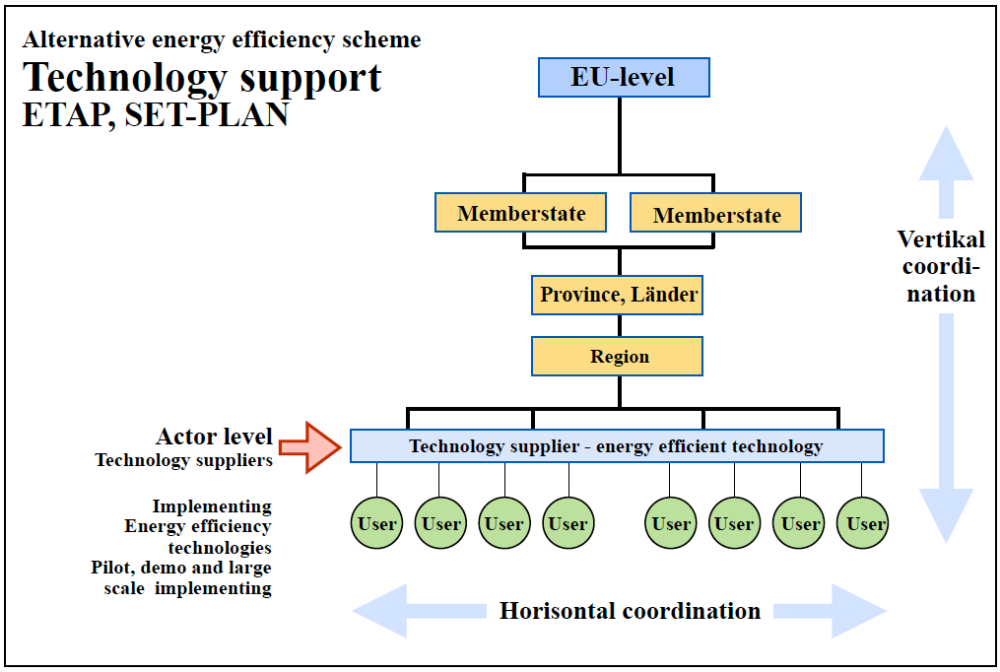


Figure 5 shows the actor level, namely technology developer and suppliers and their basic relations to the end-user.

4. The vertical coordination: As mentioned before the vertical coordination is about how to step by step bringing down the objectives and content of the EU directive to the 'bottom' in the governance system.

The vertical coordination is primarily about the relationship between the innovative actors and end-users – or short: The diffusion of energy saving innovations. Will the innovation program be able to develop products and services that result in end-user energy saving. And vice versa: Will end-users be able to or want to utilize the innovations.

5. The horizontal coordination: Horizontal coordination occurs especially at EU level. It would be advantageous to develop a further horizontal coordination between all the EU-innovation programs and Energy efficiency directional infomercials. This will help the energy efficiency schemes form the Industrial Emissions Directive to become a real alternative to The Energy efficiency Obligation schemes.

II.I.VI ECO-Labelling

1. Regulatory basis: Energy labeling schemes can play an important role in energy savings. According to the EE Directive, statutory energy labeling schemes cannot be included as an alternative, precisely because these schemes are mandatory. The statutory energy labeling schemes include Energy labeling of buildings and for electricity consuming appliances.

There are a large number of environmental labels that contain, to a greater or lesser extent, energy saving elements. In particular, the EU Flower and Nordic Swan should be mentioned. To illuminate energy labeling as an alternative, Energy Star program will be highlighted.

The EU ENERGY STAR® program follows an agreement between the European Community (EU) and the Government of the US to co-ordinate energy labeling of office equipment. It is managed by the European Commission. US partner is the Environmental Protection Agency (US-EPA), who started the scheme in the US in 1992 (Homepage www.eu-energystar.org).

2. Main content: In the early 1990s, an innovative idea took hold with the advent of the Energy Star program to overcome barriers to energy efficiency, and prevent pollution rather than remedy it.

Energy Star has traveled a carefully planned journey, considering each step with deliberate and thoughtful examination. US-EPA first introduced the ENERGY STAR label to recognize energy-efficient computers. Since then, the label has grown to

identify efficient products across more than 70 product categories. US-EPA expanded the label for use on efficient new homes in 1995, and efficient buildings became eligible for the label in 1999 when EPA unveiled a new standardized approach for measuring the energy performance of an entire building.

US-EPA also continues to offer many tools and materials to partner organizations to use in the efforts to promote energy efficiency. These include: The Energy Star marks, public service announcements, promotional and campaign materials, performance rating systems, sales training materials, educational brochures and awards in recognition of excellence.

3. Saving values, measurement and verification: As mentioned earlier if alternative to the basic system is used, member states must explain how to achieve a similar level in energy efficiency, and in monitoring and verification. In the following, it is therefore necessary to assess how *the Energy Star program* (or similar programs or schemes) can meet the method requirements for setting

energy saving values on the one hand and the requirements for measurement and verification on the other hand.

Saving values: It is estimated that the Energy Star Program will be a full-fledged alternative to The Energy efficiency obligation schemes because the Energy Star Program's method corresponds to the methods typically used by building a standard energy saving catalog. The Energy Star program will be able to deliver data to the existing data set or the Energy Star program can retrieve data input from existing standard energy saving catalogs. The same will apply to other eco-labeling schemes whose performance data are built according to the same methodology.

Measurement and verification: Measurement and verification does not cause major problems because the data format used will allow the post-control of implemented energy savings, which is an important part of the thinking of the EE Directive. The multilevel governance for the above mentioned Energy Star program schemes is illustrated with the figure below:

Figure 6: Model for alternative: ECO-labelling

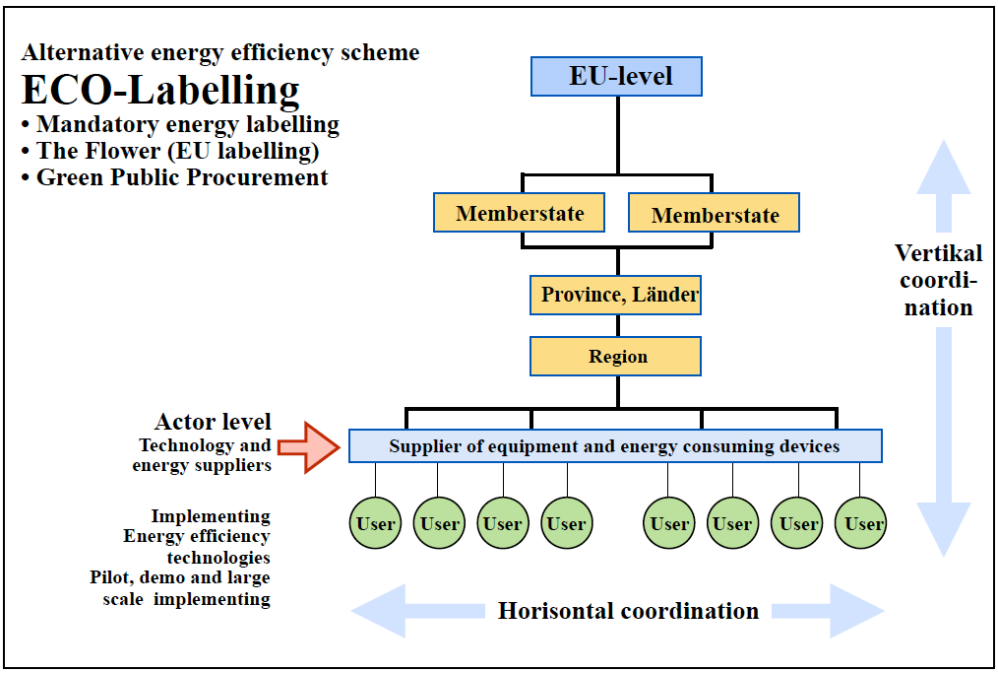


Figure 6 shows the important actor level is the supplier of equipment and energy consuming devices. The scheme is relatively simplified because it consists of only three levels: the EU, equipment suppliers and end-users.

4. The vertical coordination: As mentioned before the vertical coordination is about how to step by step bringing down the objectives and content of the EU

directive to the 'bottom' in the governance system. There are two vertical coordination problems: The one is between the EU and equipment suppliers. The second is between equipment suppliers and end consumers.

The Energy Star Program is - as mentioned - operated by the EU Commission. Vertical coordination from the EU to suppliers of energy-saving equipment and energy-consuming devices is considered to be quite uncomplicated.

The second vertical coordination problem is the relationship between equipment suppliers and consumers or end consumers. This coordination is incorporated into the Energy Star program itself, because the program focuses on public service announcements, promotional and campaign materials, educational brochures, etc.

5. The horizontal coordination: Horizontal coordination occurs especially at EU level. There is the opportunity to strengthen the Energy Efficiency Directive with enhanced coordination between, on the one hand, the Energy Star Program and, on the other hand, the Directive and the related EU-guidelines.

This horizontal coordination is both about equality of methods or approach and about extending the Energy Star program's focus areas to cover more and more of the energy-saving areas included in Energy Efficiency Directive.

II.I.VII IED / IPPC – Industrial energy efficiency

1. Regulatory basis: The regulatory basis is Directive 2010/75/EU on industrial emissions (Integrated Pollution Prevention and Control), or short: IED. The directive entered into force on 6 January 2011 and had to be transposed by Member States by 7 January 2013.

The IED is based on several pillars, in particular (1) an integrated approach, (2) use of best available techniques, (3) flexibility, (4) inspections and (5) public participation. The integrated approach means that the permits must take into account the whole environmental performance of the plant, covering e.g. emissions to air, water and land, generation of waste, use of raw materials, ***energy efficiency***, noise, prevention of accidents, and restoration of the site upon closure.

The permit conditions must be based on the Best Available Techniques (BAT), which is defined through a number of documents, namely the **BAT Reference Documents** (BREFs). The IED requires that the BREFs documents are used for setting permit conditions. Some of the BREF-documents are about specific industries and production, while others deal with cross-cutting topics. Relevant in this context are *Reference Document on Best Available Technique for Energy Efficiency;* European Commission; February 2009.

2. Main content: The directive requires that all installations are operated in such a way that energy is used efficiently. The BREF Document describes a number of topics that will ensure a continuous improvement in energy efficiency. The main topics are:

- Techniques considered to achieve energy efficiency in energy-using systems, processes or activities. This includes combustion, steam systems, heat recovery and cooling, cogeneration, electric motor driven sub-systems, compressed air systems, pumping systems, heating ventilation and air conditioning systems, lighting, drying processes, etc.
- Best available techniques, including among others: Energy efficiency management, energy efficient design, increased process integration, effective control of processes, maintenance, monitoring and measurement.
- Emerging techniques for energy efficiency. This focuses especially on new technologies that can contribute to a significant reduction in energy consumption in specific processes.

3. Saving values, measurement and verification: As mentioned earlier if an alternative to the basic system is used, the member state must explain how to achieve a similar level in energy efficiency, and in monitoring and verification. In the following, it is therefore necessary to assess how *the energy efficiency* BREF document can meet the method requirements for setting energy saving values on the one hand and the requirements for measurement and verification on the other hand.

Saving values: The BREF document does not contain specific data or data sets on energy efficiency, but it points to the use of three types of data sets that could be used to determine potential efficiencies: (1) Specific data mainly from energy-intensive industries, for instance glass, chemicals, metallurgy. (2) Data on cross-cutting technologies, for instance combustion, steam, motor drivers, pumps, compressed air. (3) General data produced on energy efficiency for all industries and business, for instance as bench marking data (energy use per produced unit).

Data sets and methods for providing specific data largely correspond to the requirements contained in Energy efficiency Obligation schemes. In line with the thinking of energy management, a company describes its actual energy performance level in various processes based on relevant indicators and sets targets for performance improvements. The indicators thus form the basis for monitoring and measurement.

Measurement and verification: The data sets typically used to determine current energy performance and possible improvements are suitable for a specific measurement and verification. It is also normal that measurement and verification is carried out by independent controllers, for example in connection with the ISO standard on energy management.

The multilevel governance for the BREF document on industrial energy efficiency is illustrated in the figure below:

Figure 7: Model for alternative: IED / IPPC – Industrial energy efficiency

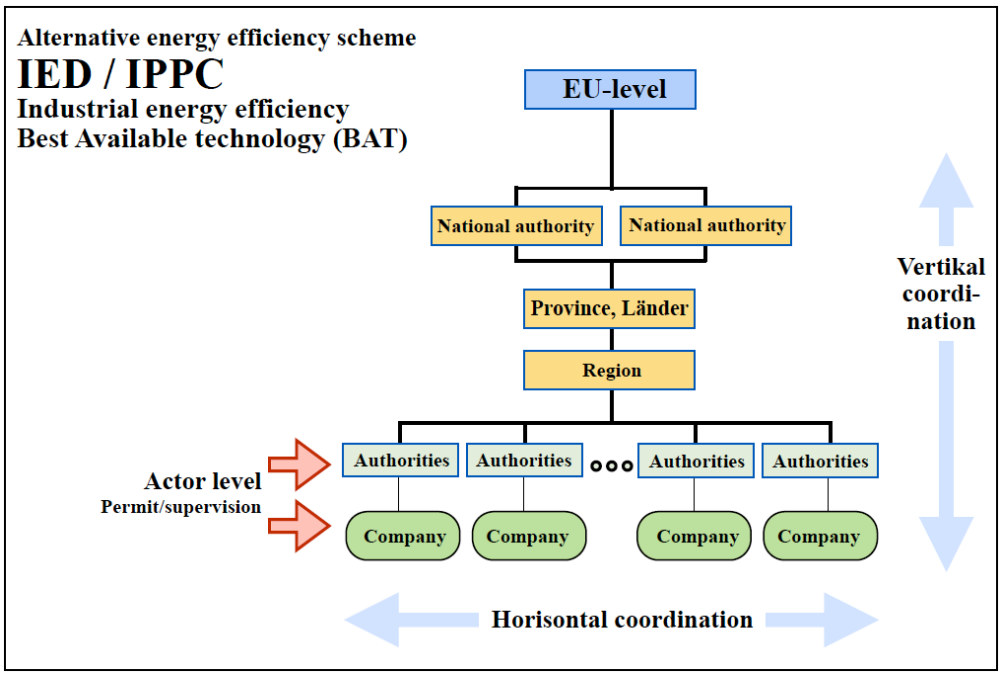


Figure 7 shows the important actor level consisting of two parties, namely the environmental authority and the company subject to the provisions of the EU Industrial Emissions Directive.

4. The vertical coordination: As mentioned before the vertical coordination is about how to step by step bringing down the objectives and content of the EU directive to the 'bottom' in the governance system.

The vertical coordination is primarily about the relationship between the authority and the companies. If the Industrial Emissions Directive serves as an alternative to Energy Efficiency Obligation schemes, it is necessary for the Authority to set a number of specific requirements for companies. The terms of approval must contain specific indications of current energy performance and possible improvements in such a way that it will subsequently provide the basis for measurement and verification.

5. The horizontal coordination: Horizontal coordination occurs especially at EU level. It would be advantageous to develop a further horizontal coordination between the two EU directives, namely the Industrial Emissions Directive and Energy efficiency directional infomercials. This will help the energy efficiency

schemes form the Industrial Emissions Directive to become a real alternative to The Energy efficiency Obligation schemes.

III Development of concrete proposals

This development should be based on the following four basic elements:

- M/V schemes
- Energy Policy
- Capacity
- Stakeholder interest

The process should be divided between countries, which already have M/V schemes and countries actually without M/V schemes.

III.I Countries that already have M/V schemes

III.I.I M/V schemes

a) Base the development of the already existing M/V schemes (1+6 = 7)

b) Transform the existing M/V scheme into a template for local/regional action plan - if possible integrated into the SEAP (CoM)

III.I.II Policy

a) Policy - horizontal integration at national level. Focus on integrated benefits. Multilateral benefits through integration (energy, environment, business development)

b) Policy - involving the local level in policy formulation and implementation - Use the concept of "better regulation" (see point c)

c) Policy - national target transformed to targets at regional/local level, using the M/V schemes as a tool (target —> realistic target — evaluated)

III.I.III Capacity

a) National tailored local action plan template for energy efficiency
b) Capacity building: Ensure local horizontal integration through cross-organization (matrix organization on key issues)
c) Capacity building: Education program in EE at regional/local level.
d) Education programs are a very important element for improving capacity. Therefore there will be a large focus on education programs in this guidebook.

III.I.IV Education programs

As a part of capacity building education programs should be developed and carried out. As MultEE is focusing on energy efficiency – this should be an import part of the education programs. The understanding of the different character of energy efficiency/savings should be included in the education programs.

The education programs should also be designed to give the relevant knowledge and information for specific stakeholders.

Stakeholders:

The programs could focus on the information needs of the following types of stakeholders:

- Public authorities
- Enthusiasts
- Decisionmakers at different levels

Type of education Programs:

The education programs could include the following types of education/training:

- Education/training focusing on building energy plans
- Education/training focusing on realization of the plans
- Education/training for enthusiasts
- Education/training for national/regional/local decision makers

In the Annex examples are attached to describe courses for energy planners at local authorities and local climate agents.

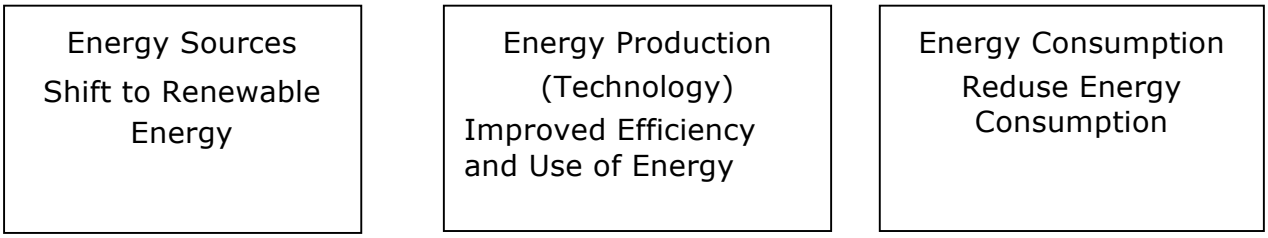
III.I.V Strategy for implementation of energy savings

There are different types of energy savings:

Savings based on implementation of **technical improvements** – better insulation or new windows, but they could also be related to use technical devices with higher efficiencies or reduction of use of fossil fuels replaced by renewable energy.

Savings could also be based on change of **human behavior** either directly by turning off the light or by the heat from the radiators or by human control of technical saving equipment.

Besides, savings should also be integrated with improvements of the elements in the energy chain to create overall improvements in the energy efficiency.



As it can be seen in the figure the three main efforts are:

- Change of the energy sources to renewable energy
- Improving of the energy efficiency
  - in the energy production
  - by using surplus heat
  - by producing combined heat and electricity
- make energy savings in the final energy consumption

To find strategies for such improvements and to define the specific and optimal solutions when comparing many initiatives in respect of amount of energy savings, environmental improvements, amount of investments and profitability, then **energy planning instruments** are important and relevant tools, which also could be included in the education programs.

The strategy could therefore include the following:

- Energy Chain
- Energy savings
- General plans
- Specific plans
- Projects

III.I.VI Stakeholder

a) Local integration: Using the multi stakeholder approach at the local level

b) Local resources: Use the stakeholder collaboration and stakeholder benefits to increase the available resources for the local authorities

c) Communication among stakeholders and potential stakeholders at all administrative levels

III.II Countries actually without M/V schemes

III.II.I M/V schemes

a) Set up of M/V scheme with two purposes:
   - M/V scheme as EE monitoring tool
   - M/V scheme as a template for monitoring local/regional action plans - if possible integrated into the SEAP (CoM)

III.II.II Policy

a) Policy - horizontal integration at national level. Focus on integrated benefits. Multilateral benefits through integration (energy, environment, business development)

b) Policy - involving the local level in policy formulation - Use the concept of »better regulation« (see point c)

c) Policy - national target transformed to targets at regional/local level, using the M/V schemes as a tool (target —> realistic target — evaluated)

III.II.III Capacity

a) Capacity building: Education program in EE at regional/local level
b) National tailored local action plan template for energy efficiency
c) Capacity building: Ensure local horizontal integration through cross-organization (matrix organization on key issues)

III.II.IV Education Programs

As a part of capacity building education programs should be developed and carried out. As MultEE is focusing on energy efficiency – this should be an import part of the education programs. The understanding of the different character of energy efficiency/savings should be included in the education programs.

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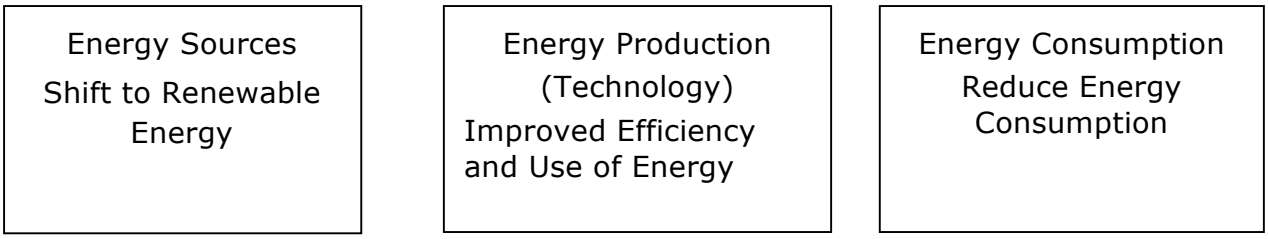

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To find strategies for such improvements and to define the specific and optimal solutions when comparing many initiatives in respect of amount of energy savings, environmental improvements, amount of investments and profitability, then **energy planning instruments** are important and relevant tools, which also could be included in the education programs.

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- Energy savings
- General plans
- Specific plans

III.II.VI Stakeholder

a) Local integration: Using the multi stakeholder approach at the local level

b) Local resources: Use the stakeholder collaboration and stakeholder benefits to increase the available resources for the local authorities

c) Communication among stakeholders and potential stakeholders

III.III Suggestions for improvement of the M&V Schemes and Coordination Mechanisms in the specific partner countries.

Deliverable D.3.1: "Identifying areas of improvements of Monitoring and Verification schemes and Coordination Mechanisms" included the following conclusions:

III.III.I Monitoring and Verification: actual status and areas of improvements:

Lithuania does not have any formal M&V scheme. The rest of the countries have implemented M&V schemes except Greece. But some countries like Latvia have a system based on the evaluation of projects for EU-programmes only.

In Lithuania M&V schemes could be implemented inspired by best case(s) from other countries. The use of data collection methods could simplify and improve the M&V process. Especially the verification process needs improvements to secure that the energy saving projects also are being implemented.

In Fyr of Macedonia, Croatia and Latvia M&V schemes are already implemented or are under implementation, which means that further development of the M&V schemes are needed. IT tools like MVP/SMIV could be important elements in respect of this development. These countries have verification procedures but these could be improved based on specific measurements.

Also Greece could improve its M&V scheme. Even if Greece doesn't have any M&V scheme or verification procedures, bottom up methodologies are used to measure achieved energy savings, and ESCO arrangements could be used to involve private companies in defining and implementing energy saving projects to secure the verification of the implementation.

In Austria M&V schemes have been implemented. In Austria the funding could be better integrated and the provinces should have better access to data.

In Denmark costs should be reduced by change of rules, and the priority factor should be used to define and implement projects with a higher additionality, and a central reporting system should be implemented to reduce double counting.

III.III.II Coordination Mechanisms - actual status and areas of improvements:

Lithuania doesn't have a coordination mechanisms, but it could be established with a focus of involving the local administrative level as a part of vertical coordination. Luthiania has horizontal coordination but only with ministries responsible for the energy policy.

In FYR of Macedonia, the coordination mechanisms are rather undeveloped both in respect of coordination bodies and in the actual vertical and horizontal coordination. FYR of Macedonia has very little horizontal coordination.

In Croatia the collaboration is taking place between ministries, but the collaboration is weak and takes time, but dome progress has been made. The Ministry of Environmental Protection is now combined with the Ministry of Energy, which makes it possible to have a better overview over energy efficiency measures, although the Ministry of Construction has an important role and the coordination between the two ministries will be essential in the development of energy efficiency measures in the future.

In Croatia the local authorities are involved, but they have no obligations, but there are currently no sanctions/repercussions if the goals aren´t
met.

Latvia has no regional authorities and no state Energy Agency, but hey have several formal or informal coordination bodies. In Latvia only two ministries are collaborating.

Greece has no specified obligations for legal and local authorities, and there is only little vertical and horizontal coordination.

In Austria no formal coordination is taking place, but a lot of informal coordination is going on, and horizontal coordination is taking place between relevant ministries.

In Denmark there is no formal coordination mechanism, and the lack of delegation reduces the interest of stakeholders to carry out energy savings. But the horizontal coordination takes place between the Ministry of Climate-, Energy and Buildings and many national institutions.

III.IV Organizing of the workshops

The workshops should be organized taking into account the specific national "workshop culture".

- National, regional and local stakeholders should be invited. The MultEE stakeholder database could be used.
- Presentations should be given on the results on M&V and Coordination Mechanisms from the MultEE reports for the actual country.
- Suggested improvements of M&V and Coordination Mechanisms should be discussed in groups with stakeholders from the same governmental level and in groups with stakeholders from different governmental levels.
- Elements in a plan for defining and implementation of energy savings should be discussed.
- Conclusions from the group discussions should be discussed in Plenum.
- A report of the discussions, process and results should be prepared and sent to the other partners in the MultEE project.

III.V Possible questions to be discussed at the national workshops

III.V.I How to improve the coordination mechanisms in your country? The following topics could be discussed.

- An improved plan for defining and implementation of energy savings
- Improvements of horizontal coordination to support the implementation of energy savings
- Improvements of coordination to support the implementation of the energy savings

III.V.II Possible questions

1. Define the specific demands and targets for energy savings in relation to the energy policy.

2. Which are the interests, needs and priorities of the most important stakeholders in respect of defining and implementing energy savings?

3. Discuss energy efficiency plans including future targets and key activities of energy savings – distributed on different periods; e.g. the short term and the long term.

4. Discuss how the Monitoring and Verification Platform could help in defining optimal energy saving activities to fulfill the target.

5. Discuss possible improvements of horizontal and vertical coordination, which could contribute to define and implement these optimal energy savings.

6. Discuss how an improvement of the horizontal coordination could sustain the regulation/support of energy saving activities at the national level.

7. How could responsibilities in respect of defining and implementing energy savings be directed to regions and municipalities, thus improving the vertical coordination?

IV Annex

In the annex examples of different types of courses already carried out in Denmark will be presented. These examples are included in the guidebook to improve the capacity within energy planning – especially focusing on energy efficiency.

The target group for participating in these courses are first of all relevant stakeholders at the local level, but the courses could also be relevant for stakeholders from other administrative levels. To improve vertical integration of the coordination mechanisms it is important to increase the capacity of the stakeholders at the local level.

The first course is explaining the needed strategy, methodology and energy planning methods for participating in the Covenant of Mayors. The other examples of energy courses are adapted to different types of local stakeholders.

Annex A: Covenant of Mayors

Committed to local sustainable energy

The Climate Pact and the Regional Climate Strategy

Course in climate – and energy planning

February – May 2010

Region Zealand

Roskilde University

The Climate Pact and the Regional Climate Strategy

Course in climate – and energy planning

The main objective of the course is to contribute to the development of specific climate and energy action plans in the municipalities in Region Zealand with the inclusion of knowledge and experience from the municipalities and the region and experience from a number of similar, Danish and foreign climate and energy plans. The course will also help set up the inventories and action plans for sustainable energy use, which is provided in Climate Pact (The Covenant of Mayors), and regular reports on goal achievement compared to plan.

The course is including the following elements:

- Presentation of methods to be used to produce climate and energy action plans including development of the methods to be adapted to the available data.
- Presentation and development of tools to be used for an ongoing assessment of action and results in key areas (electricity, heat and transport).
- Contribution to the development of common approaches and priorities that can support cooperation and joint initiatives in the area.
- Presentation of opportunities to integrate initiatives on climate and energy with other planning and management areas.

Theme 1: Climate Plan.

- What is a climate plan and how can a climate plan look like?
- Discussion of how a climate plan established when and how the key stakeholders involved in the formulation and implementation of plan.
- Course Activity: Discussion on the basis of examples of climate plans and experiences from the region.

Theme 2: Introduction to climate issues and energy-understanding. What are the key climate issues, the current international agreements, the Danish specific objectives?

- Adaptation and mitigation of climate change (Mitigation and adaptation). Energy system's role in climate change.
- How should we understand the energy systems (national, regional, local), development of local energy systems, the current trends in energy systems (intelligent energy systems, distributed energy systems).
- How could climate action best be handled?
- How could the objectives be formulated?

- Which time horizons should be expected
- Course Activity: Discussion of the issues and a presentation of experiences.

Theme 3: Methods and approaches - baseline and projections What is a baseline and how could it be established?

- Collation of a number of data that allows for the preparation of a local energy balance and the corresponding baseline.
- Methodological pitfalls.
- Projections of the expected development of greenhouse gas emissions in the municipality.
  Course Activity:
- Presentation on baseline and projections. Presentation of spreadsheet to use for data array. Lessons from municipalities and region.

Theme 4: Reduction of greenhouse gases – Energy savings - Use of baseline and projections in practice and analysis of mitigation options

Working with mapping and projections include in order to setting targets. Presentation and discussion of the material from selected municipalities.

- Possible reduction of greenhouse gases - the three areas in energy system: More renewable energy, better use of energy and energy conservation.
- Developing a systematic approach for the identification of possible areas. Analysis and mapping requirements for reduction analyzes: potentials for more renewable energy potentials for increased efficiency and potentials
  for electricity, heat and transport savings within the various sectors (energy, agriculture, transport, industry, households, etc.).
- Course Activity: Discussion of the three themes.
- Presentations from selected municipalities.
- Presentation of preliminary results and problems.

Theme 5: Reduction of greenhouse gases in the short and long term – assessments opportunities

- Potentials for greenhouse gas reduction.
- Assessment methods Evaluation of each action in relation to greenhouse gases, materials and energy.
- Furthermore wider environmental assessments and assessment of local economic effects, etc. (especially employment, knowledge, business development)
  Course Activity: Talk about the assessment methods and introduction to

feasibility study for the compilation and evaluation of projects and project applications. Examples from the municipalities.

Theme 6: Integration of climate and energy initiatives with other planning and management areas (horizontal integration)

How can we achieve more benefits and positive development effects by integration of energy and climate plan with other planning and management areas.
Course Activity: Discussion of integration. Presentations of different experiences, including from the municipalities and the region.

Theme 7: Elements in the energy saving action plan

- Developing a climate and energy action plan.
- How can such a plan is built and anchored?
- The projects of the Climate and Action Plan. Transfer of the plan elements to specific projects.
- Which support possibilities are available? How to ensure ongoing evaluation of project results, and the ongoing evaluation of formulated goals and fulfillment.
  Course Activity: Discussion of the three themes. Presentation of preliminary results and issues from the municipalities and the region.

Final course evaluation

Annex B

Climate- and Energy Plans

From Plan to Project

Course in realising climate and energy action plans to be used in coordination with the regional climate network in Region Zealand.

Course for Local Climate Agents

Region Zealand. June-September 2013

Module 1: Overview of the energy situation

- Region Zealand the climate actions of the municipalities
- How to create a future sustainable energy system?
- What happens locally around the region?
- The different energy players in the region
- The campaign and the local climate agents' role

Module 2: Heating Savings

- Thermal insulation: exterior walls, roof, basement, foundation, pipes
- Energy-efficient windows and doors, seal
- How to identify heat loss?
- Management of heat consumption
- Heat saving behaviour
- Low-energy buildings

Module 3: Electricity saving

- Lighting, pumps, ventilation
- IT equipment, TV, other communication
- Appliances, households-, garden- and hobby equipment
- Stand by consumption and measurement of electricity consumption
- Management of electricity consumption
- Electricity saving behaviour

Module 4: Individual heating – Increasing efficiency

- Conversion from electric heating, oil or natural gas heating
- Biomass boilers - wood pellets, wood chips, other
- Solar heating - hot water, space heating
- Heat pumps - geothermal, air to air, other types
- Heat distribution systems, thermostats and regulation

Module 5: Common heating solutions – giving heat savings

- District heating from straw, wood chips or biogas
- Lessons from the neighboring district initiatives
- Joint purchasing of individual installations, insulation, etc.
- Other joint initiatives
- Challenges by creating common heating solutions

Module 6: Individual and joint electricity supply – giving electricity savings

- Individual solar PV
- Larger common solar PV
- household Wind turbines
- Common Wind turbines - wind turbine cooperatives
- Challenges by creating common power supply solutions

Course for Local Climate Agents

Process elements, which also will give energy savings

Knowledge …

- The energy situation, buildings, technologies, materials
- The economy - what it costs; when it pays off? When is it relevant with district heating / when not?

Practical on ...

- How do you do when something needs to be built, installed, replaced, repaired?
- How to find out what should be done / changed?

Exercises …

- The illustration of principles, phenomena, practical solutions
- Creation of understanding and remembrance by seeing it, experience it, try it

Experiences ...

- The participants' experiences involved - different backgrounds, very experienced and new in the field
- What happens in my community - differences and similarities?

Dialog ...

- Learning through the exchange of knowledge, experience and views
- Common clarification of campaign activities and mutual support in the group

"Do it yourself" - / Supervisor-suitcase

- Each selected community get a suitcase.

Climate Campaign in Region Zealand

Energy transition at the local level

Four key elements in the creation of readiness for local energy transition:

Empowerment: Local campaign

- Help to self-help
- Knowledge about energy solutions and their realization
- Ability to act / participate in practical energy transition

Anchoring in the community: Local Climate agent

- Roles - supervisor, facilitator, contact
- Competencies - developed through mini courses and meetings
- Course participation is documented by issuing a participant diploma

Interaction between local communities and municipalities: Municipal Climate Coordinator

- The mobilization of local resources
- Knowledge sharing
- Preparation of investment in energy transition

Facilitation: Regional campaign secretariat

- Campaign Coordination - campaign activities and products
- Professional expertise, advice and back up for climate agents
- Regular information to the climate agents
- Regional network - venue, dissemination of knowledge and experience

Local Energy- and Climate Agents

The Municipality of Solrød. August – December 2014

Program for the four courses:

- Overview of the energy situation
- Energy savings
- Common heat solutions
- Potential local heat projects

First Course

Overview of the energy situation

The energy situation in Denmark today, in 2020 and in 2050

- EU perspective
- The Danish perspective
- The regional perspective
- The local perspective

The Regional Energy today and tomorrow

- The new energy system built on wind, biomass, solar and everything else
- The new energy - more wind in the system
- Development potentials - renewable energy resources

Local Government action on climate and energy

- Plans
- The realization
- prospects

Second Course

Energy Savings

Heat savings:

- Thermal Insulation: External walls, roof, basement, foundation, pipes
- Energy-efficient windows and doors, seal
- How to identify heat loss?
- Heating saving behavior
- Low-energy buildings

Electricity savings:

- Lighting, pumps, ventilation
- IT equipment, TV, other communications
- Appliances, households, garden- and hobby equipment
- Stand by consumption and measurement of electricity consumption
- Behaviour of electricity savings

Practical introductions to identify heat loss

- Measuring equipment
- Equipment for the identification of the insulating state, etc.

Third Course

Common Heat Solutions

Collective heat

- Introduction
- The Danish perspective
- Example 1
- Example 2

Collective solar thermal

- Principles and structure
- Examples of integration in construction
- Data on collective solar thermal systems - Introduction to Data System

Biogas Based Heat

- Current situation
- Types of biogas plants
- Biogas in Region Zealand and heat markets

Fourth Course

Possible local heating projects

Introduction to a district heating system

- Principles and structure of boiler plants
- Operation of district heating system
- Economy
- Guided tour of the district heating station

Renewable energy in Kirke Skensved

- Conversion to renewable energy and the energy consumption
- Possible solutions
- Prices
- Oil Villages - An Introduction
- Support and fees

Roskilde University January-May 2014

Climate- and Energy Plans

From Plan to Project

Course in realising climate and energy action plans to be used in coordination with the regional climate network in Region Zealand.

The main objective of the course is to contribute to the implementation of climate and energy plans. All municipalities in Region Zealand has a climate or an energy action plan. The most common way to implement the plans is through projects where the projects will be realized by companies, organizations, etc., or by the municipality, or on the initiative of municipalities in a private / public cooperation.

The course will contribute to the implementation of the Covenant Sustainable Energy Action Plans (SEAP'en), as a number of municipalities have committed. As you know 14 municipalities are members of the Covenant, where 11 have elaborated more specific plans.

Covenant plans are not the only type of plans included in the course. All the types of energy/ climate plans, where the municipalities are involved will be included, as well as strategic energy planning, sustainable energy action plans etc., all with the aim of contributing to their achievement.
Perhaps there will be a need to provide an overview of the different types of plans, and how to work with them. The proposal is therefore that the course starts with giving an overview, before the focus will be on projects. The main objectives are therefore:

To provide an overview of the different types of plans and methods behind them. Examples are baseline greenhouse gas inventories, action plans and action plans.

To formulate and develop projects that can contribute to an increased use of renewable energy and reduction of greenhouse gases. How to formulate it? What requirements must made projects from participants, from government, from politicians, etc.?

To ensure the implementation of the formulated projects. How to establish backing to a project? What role should the local authority play and what good experience can be experienced from the good examples?

Module 1: Climate plans of the municipalities

Overview of plans.

How to establish a climate plan or a strategic energy plan? Use of selected examples from the municipalities in the region.

Introduction or brush up to the methods.

Course Activity: Presentation of planning systems and discussion based on examples of climate plans and experiences and lessons learned from the region. Introduction to the tools that are typically used in the formulation of a climate or energy plan.

Module 2: The local energy system

Overview of a local energy system and the energy services provided.

What trends can we expect in the short and longer term? What are the potentials for the conversion of the energy system?

What projects are possible and realistic in respect of economy and backing?

How can the projects be identified.

Coursework: Discussion of the issues and a presentation of different cases, including an introduction to the necessary economic and environmental assessment tools, as well as renewable energy potential tools.

Module 3: Conversion Projects in the local energy system (to increase the energy efficiency and/or energy savings)

The good project is a project where all stakeholders can see an advantage in the climate and environmentally benefits.

Besides the financing of the project must be appropriate.

How can this be assessed?

What can we learn from good examples?

Coursework: Presentation and discussion of different types of projects,
partly projects (biogas, biomass, renewable energy district heating, etc.) and partly projects in the form of programs, e.g. energy savings. Introduction of various project management tools.

Module 4: Processes and interactions focusing on energy savings

How to create a good process from project start to the establishment of an energy plant or implementation of a program.

Interactions between project participants, government and institutions.

Which role have the various participants and contributors to the success?

Coursework: Presentation on the listed themes. Invitation to selected municipalities for the presentation of their experience from past cases.

Module 5: Processes and interactions with practical examples

The purpose is to go in depth with one or two projects to illustrate all aspects of the processes and interactions that lead to the desired result. The projects are not actual cases, but potential projects, where the purpose is to discuss and evaluate the ideal project course or the ideal 'project flow' from the first project ideas for the final project.

Projects are selected on module 3 and different material is presented for the detailed discussion on the course. The aim is to highlight progress, pitfalls, streamlining of process cycles, etc.

Coursework: Analysis of the selected projects, with a subsequent discussion of how processes and progress can be organized for implementing the best projects in the shortest possible time.

Module 6: Interaction with the companies

Businesses play an important role in achieving of climate and energy plans. Focus should be on the energy companies. Other companies can also play an important role, both production companies, agriculture, horticulture as well as forestry especially in relation to delivering of surplus heat.

Which companies can contribute, and how can a local interaction be developed?

Coursework: Discussion of the topic partly with course teachers and partly with invited representatives from companies.

Module 7: Interaction with citizens

In the climate and energy conversion everyone have a role to play. This module will specifically address how citizens, citizen groups etc. can be active players in the achievement of climate and energy plans.

What makes tailwind and what creates headwind?

Course Activity: Discussion of different forms of interaction, and presentations on the creation of headwind and especially tailwind. Presentations by invited local climate and energy agents.

Module 8: Financing of the projects

There are a number of finance options from both Danish and EU programs. There is a need for very different financial support, depending on where you are in the project "flow". The module will provide an overview of possible fundings from project initiation, project development and maturation until the "ready made" project.

Course Activity: Discussion of funding opportunities during the different phases of the project development. Workshop on specific financial needs with the participation of representatives from the various funds, subsidy arrangements etc.

Module 9: Project - process - interaction - financing

How far can we get with better projects, with better processes, and with an ideal interaction with favorable financing?

Summary of course with the involvement of international experience on the achievement of climate and energy plans.

Where are the barriers and where are the opportunities?

Course Activity: Course participants are invited to present selected projects to illustrate the problem: Project - process - interaction - financing.

Presentations and discussion on barriers and opportunities.

Final evaluation of the course: Evaluation of the course and the course participants.

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