



Development of concrete proposals for multilevel governance coordination



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List of abbreviations

AEA	Austrian Energy Agency
CM	Coordination Mechanism
CRESES	Center for Renewable Energy Sources and 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
IPE	Institute of Physical Energetics
LEI	Lithuanian Energy Institute
M&V	Monitoring and Verification
MACEF	Macedonian Center for Energy Efficiency
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	Strengths, Weaknesses, Opportunities and Threats
TD	Top Down
VC	Vertical Coordination

I Introduction

One of the key obligations in the MultEE project is to develop concrete proposals for multilevel governance coordination. These proposals will be based on the country-specific description of multilevel governance system from WP1, the identifying of improvements of coordination mechanisms in D.3.1, and the results from national workshops in the same theme, which are carried out based on the Guidebook D.3.3.

In the annex a template for the national workshops and a document with key conclusions of the discussions are included.

In the conclusion of this paper concrete proposals for developing multilevel governance coordination are specified for each of the partner countries.

II 3.1

The following description and conclusion is taken from D.3.1. The full paper can be seen [here](#).

D.3.1 is focusing on identifying areas of improvement of monitoring and verification schemes and coordination mechanism in the nine partner countries of the MultEE project. Supplementary an analysis has been carried out to conclude on these areas of improvements in respect of the different types of political governance in the partner countries.

The content is based on the country reports in D.1.2 and the Synthesis report on European best practices for M&V schemes and coordination mechanisms D.1.3, and Energy efficiency policies in the countries based on national and country reports from Odyssee-Mure, and Energy Community (FYR of Macedonia).

The partner countries are divided in the following 5 groups:

1. Lithuania
2. Slovakia, FYR of Macedonia, Croatia, Latvia and Slovakia
3. Greece
4. Austria and Germany
5. Denmark

II.I Areas of improvements – monitoring and verification schemes:

group 1

There is no formal M&V scheme. M&V schemes could be implemented with focus on verification, inspired by best case(s) from other countries.

Group 2

M&V schemes are already implemented/under implementation, but further development of the M&V schemes are needed.

IT tools could be important elements in respect of this development. The countries have verification procedures, which could be improved based on specific measurements.

Group 3

No M&V schemes. But bottom up methodologies are used to measure achieved energy savings. The M&V schemes could be improved. A unified system with focus on verification should be implemented. ESCO arrangements could be used.

Group 4

M&V schemes have been implemented, but in Germany systematic monitoring at local level could be improved. In the SEAP projects only individual methods are used. In Austria the funding could be better integrated and the provinces should have better access to data.

Group 5

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.

It is suggested that the existing M&V schemes should be transformed into a template for local/regional action plan – if possible integrated into the SEAP (CoM).

II.II Areas of improvements – coordination mechanisms:

Group 1

No CM. But CM could be established with a focus of involving the local administrative level as a part of vertical coordination. These countries have horizontal coordination but only with ministries responsible for the energy policy.

Group 2

CM are rather undeveloped both in respect of coordination bodies and in the actual vertical coordination and horizontal coordination.

Group 3

No specified legal obligations for local authorities, and they have only little vertical and horizontal coordination.

Group 4

Vertical coordination is performed as coordination between national level and the federal states. In Austria only informal vertical coordination is taking place. In both Germany and Austria horizontal coordination is only taking place between relevant ministries.

Group 5

In Denmark (Group 5) 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.

It is also concluded that all partner countries need capacity building in respect of education programs in EE at regional / local level, - national tailored local action plan template for energy efficiency and local horizontal integration through cross-organization (matrix organization on key issues).

Finally it is concluded that all countries need to include more relevant stakeholders both in the M&V schemes and in the CM schemes.

III Areas of improvements related to the different types of countries

III.I Division of the countries in 5 groups

Based on the political systems and features of M&V schemes in the countries, they are divided in five different groups. The idea is to direct the areas of improvement to the specific type of countries both in respect M&V schemes and the Coordination Mechanisms.

The former east european countries have centralized political systems. They are divided in two groups depending on whether they have M&V schemes or not.

Also Greece is a country with a centralized political system. Austria and Germany are federal political systems, and the scandinavian countries like Denmark are centralized countries with delegated tasks to the regional and local authorities.

1. Lithuania
2. Slovakia, FYR of Macedonia, Croatia and Latvia
3. Greece
4. Austria and Germany
5. Denmark

M&V	Lithuania	Slovakia	FYR of Macedonia	Croatia	Latvia	Greece	Germany	Austria	Denmark
Actual status	Group 1 Overall monitoring, which is not specific for different measures.	Group 2 A M&V scheme is implemented. Every measure is monitored via a monitoring system. A verification process is a part of the monitoring system.	Group 2 The M&V schemes are in line with the national Energy efficiently Action Plan. The verification of energy savings is implemented by results of measurements.	Group 2 A M&V scheme as an IT Tool, which is currently in its implementation phase. The measured energy savings are being verified through the IT tool in the M&V system.	Group 2 A M&V system based on evaluation of projects but only for national green investment scheme and EU Funds. Actually no sampling procedures are foreseen, but after the "Law on Energy Efficiency" such procedures will be created.	Group 3 No central M&V scheme. Bottom up methodologies are used to measure achieved energy savings. A verification procedure is foreseen.	Group 4 M&V schemes have been implemented.	Group 4 M&V schemes have been implemented. The energy savings reported are verified by means of plausibility checks. Selected projects are verified through on site visits.	Group 5 M&V schemes have been implemented.

M&V	Lithuania	Slovakia	FYR of Macedonia	Croatia	Latvia	Greece	Germany	Austria	Denmark
Improvements	<p>Group 1</p> <p>M&V could be implemented inspired by best cases from other countries. Use of data collection methods could simplify and improve M&V process. Random checks could be improved by better investigations of the actual energy savings implemented, annual targets and better statistics.</p>	<p>Group 2</p> <p>The monitoring system (MSEE) should include all energy efficiency measures organising both monitoring and verification.</p>	<p>Group 2</p> <p>A central reporting system for energy savings could be established to reduce double counting of the energy savings. Use an IT tool for data.</p>	<p>Group 2</p> <p>An IT system is implemented. It needs to be rooted in the national Acts. It needs to be obligatory, and political supported.</p>	<p>Group 2</p> <ol style="list-style-type: none"> Local Authorities should be involved. Other sectors than buildings should be integrated Sampling procedure should be used. IT tool should be used. 	<p>Group 3</p> <p>Improve ESCO market to improve M&V procedures.</p>	<p>Group 4</p> <p>Introduction of a systematic monitoring also on local and regional level. M&V must be secured in such a way that the costs are reduced as much as possible. Systematic verification at local level could be improved. SEAPs are only using individual methods.</p>	<p>Group 4</p> <ol style="list-style-type: none"> Funding should be integrated More provinces should have data access. 	<p>Group 5</p> <p>Costs should be reduced by change of rules. More knowledge. Increased priority factor for projects with high additionality. A central reporting system for energy savings could be established to reduce double counting of the energy savings.</p>

CM Criteria Actual status	Lithuania Group 1	Slovakia Group 2	FYR of Macedonia Group 2	Croatia Group 2	Latvia Group 2	Greece Group 3	Germany Group 4	Austria Group 4	Denmark Group 5
Administrative Procedures	Responsibility of energy efficiency policy lies on the national level.	A permanent inter-Institutional group includes ministries, regions and municipalities.	The administrative Authority is the Energy Agency. Not many formal or informal coordination bodies.	The legal responsibility of energy policy lies on the national level. Local authorities are involved but without obligations.	Besides the national level there are 119 local self-governments (municipalities), but no regional level. No national Energy agency, but there are several formal or informal coordination bodies.	Top down procedures are used. No specified obligations for regional and local authorities.	All levels of government are involved. It is performed as a coordination between federal level and the federal states for energy efficiency. Takes a long time - due to the type of country.	No formal coordination exist. But informal coordination takes place.	There is an agreement between the Ministry of Climate, Energy and Buildings and the large energy companies. No formal coordination exist.

CM Criteria Areas of improvements	Lithuania Group 1	Slovakia Group 2	FYR of Macedonia Group 2	Croatia Group 2	Latvia Group 2	Greece Group 3	Germany Group 4	Austria Group 4	Denmark Group 5
Vertical coordination	Could be improved in coordination with an increase of the interest at the local level.	The vertical coordination should be improved incl. the communication flow.	More formal and informal bodies should be established.	Local Authorities should have obligations.	Institutional frame-work should be improved.	SEAP plans could help involving lower local authorities	The efficiency of the vertical coordination should be improved.	Integrate local level in energy policy formulation	The lack of delegation reduces interest of stakeholders to carry out energy savings.

CM Criteria Areas of improvements	Lithuania Group 1	Slovakia Group 2	FYR of Macedonia Group 2	Croatia Group 2	Latvia Group 2	Greece Group 3	Germany Group 4	Austria Group 4	Denmark Group 5
Horizontal coordination	Further issues should be investigated.	The horizontal coordination should be improved incl. communication flow.	Very little coordination. Should be improved.	The collaboration between ministries is weak and takes time. Should be improved.	The strong coordination among two ministries, which are responsible respectively for energy efficiency and climate policy. Other ministries mostly provide information on energy efficiency measures within their supervised sectors. Coordination should be improved.	Very little coordination. Should be improved.	There is horizontal coordination between federal Ministries and federal state actors.	No formal coordination exists. But relevant Ministries are cooperating.	There is coordination between The Ministry and many national Institutions.

IV Conclusion

IV.I Monitoring and Verification: actual status:

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 ex-post evaluation of projects for EU-programmes and national green investment schemes..

IV.II Monitoring and Verification: areas of improvements:

In Lithuania (Group 1) 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 (Group 2) 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 (Group 3) 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 Germany and Austria (Group 4) M&V schemes have been implemented, but in Germany systematic verification at local level could be improved. In the SEAP projects only individual methods are used. In Austria the funding could be better integrated and the provinces should have better access to data.

In Denmark (group 5) 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.

IV.III Coordination Mechanisms: actual status and areas of improvements:

Lithuania (Group 1) 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. Lithuania has horizontal coordination but only with ministries responsible for the energy policy.

In FYR of Macedonia, (Group 2) the coordination mechanisms are rather undeveloped both in respect of coordination bodies and in the actual vertical and horizontal coordination. In Croatia the local authorities are involved, but they have no obligations. Latvia has no regional authorities and no state Energy Agency, but they have several formal or informal coordination bodies. 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, and in Latvia only two ministries are collaborating.

Greece (group 3) has no specified obligations for legal and local authorities, and there is only little vertical and horizontal coordination.

In Germany (group 4) is the vertical coordination performed as a coordination between federal level and the federal states. And the horizontal coordination is happening between two ministries, which are responsible of the energy policy. 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 (Group 5) 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.

Type of improvements	Country Group 1	Country Group 2	Country Group 3	Country Group 4	Country Group 5
Countries	Lithuania	Slovakia FYR of Macedonia Croatia Latvia	Greece	Germany	Denmark
M&V-schemes	No formal scheme. M&V schemes could be implemented with focus on verification, inspired by best case(s) from other countries.	M&V schemes are already implemented /under implementation. Further development of the M&V schemes are needed. IT tools like MVP could be important elements in respect of this development. These countries have verification procedures. These could be improved based on specific measurements	No M&V schemes in Greece. But bottom up methodologies is used to measure achieved energy savings. The M&V schemes could be improved. A unified system with focus on verification. ESCO arrangements could be used	M&V schemes have been implemented, but in Germany systematic monitoring at local level could be improved. In the SEAP projects only individual methods are used. In Austria the funding could be better integrated and the provinces should have better access to data.	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.
		The existing M&V schemes should be transformed into a template for local/regional action plan – if possible integrated into the SEAP (CoM).			

Type of improvements	Country Group 1	Country Group 2	Country Group 3	Country Group 4	Country Group 5
Countries	Lithuania	Slovakia FYR of Macedonia Croatia Latvia	Greece	Germany	Denmark
Policy (CM)	No CM. But CM could be established with a focus of involving the local administrative level as a part of vertical coordination. These countries have horizontal coordination but only with ministries responsible for the energy policy.	CM are rather undeveloped both in respect of coordination bodies and in the actual VC ¹ and HC coordination	No specified obligations for legal and local authorities, and they have only little vertical and horizontal coordination	VC is performed as a coordination between federal level and the federal states. In Austria only informal VC is taking place. In both countries HC is only taking place between relevant ministries.	No formal coordination exist. The lack of delegation reduces interest of stakeholders to carry out energy savings. HC exists between many relevant institutions.
Capacity	All countries need capacity building: <ul style="list-style-type: none"> • Education program in EE at regional /local level • National tailored local action plan template for energy efficiency Ensure local horizontal integration through cross-organization (matrix organization on key issues)				
Stakeholder	All countries need to include more relevant stakeholders both in the M&V schemes and in the CM schemes.				

¹ VC = Vertical Coordination

V Coordination mechanisms in the partner countries

The descriptions will include the following key elements:

- The energy policy
- The availability of data
- Coordination Mechanisms
- Vertical coordination
- Horizontal coordination
- Capacity

V.I Lithuania

V.I.I Energy Policy

The responsibility for energy efficiency policy making lies on the national level. The Ministries, which have the legal competence for energy efficiency policy formulation, consist of the Ministry of Energy, The Ministry of Environment and The Ministry of Economy.

The Ministry of Energy is responsible for residential and other buildings and for energy production, while the Ministry of Economy is responsible for energy efficiency measures in industry.

The strategic initiatives of the National Energy Independence Strategy are to increase in total energy consumption efficiency by 1,5% annually until 2020.

At present time the energy consumption per unit of GDP is 2.5 times higher than the EU average and can be reduced significantly if the overall energy savings are increased.

The total savings potential of final energy consumption in Lithuania by 2020 is approximately 17 % compared to the final energy consumption in 2009 (not including the increase in energy consumption caused by the growth of GDP). Realization of this potential would imply yearly savings of 740 kilotons of oil equivalent (ktoe) by 2020.

At 03 November 2016 the new Energy Efficiency Law by Parliament of Lithuania approved.

There is no regional energy legislation in Lithuania. The regions are preparing Regional Development Plans, but these plans are rather general documents without more significant emphasize on energy sectors in the regions.

V.I.II M&V - Data

Implementation and usage of IT systems, developed in multEE project, can be an essential part of the coordination mechanisms in Lithuania, facilitating the exchange of information, fostering the engagement of the national and local stakeholders and improving the monitoring of the energy efficiency measures both vertically and horizontally.

Upon completing the implementation of energy efficiency measures, persons receiving financial support from programmes register the entity's ambient and proper indicators during the same calendar year and for one calendar year afterwards and then transmit the data collected to the administrator of the respective programme.

The final national energy savings are establishing by applying the "bottom-up" approach taking into consideration energy savings of each measure.

Calculation Rules – "Rules for calculating national energy savings", approved by Order No 1-320 of the Minister for Energy of the Republic of Lithuania of 05 December 2016.

The "bottom-up" method is used to establish energy savings due to each individual measure implemented. Energy savings of individual measures can be evaluated using measurement-based data:

- directly metering the energy consumption at the entity where the measure is implemented (a specific technological installation, process, a building's heating system, lighting equipment, etc.);
- data of energy bills for a specific period submitted by energy companies before and after implementing the measure;
- energy sales data of energy companies collected before and after implementing the measure;
- equipment and devices sales data;
- data of applied research and surveys.

V.I.III Coordination Mechanisms

The distribution of responsibilities for energy efficiency policy making and implementation is clearly defined among the different governmental layers. Generally, there is a consensus about the distributed responsibilities incorporating various overlaying and jurisdiction issues.

Furthermore, agencies facilitate the implementation and coordination of energy efficiency policy between national and local levels. Nevertheless, the local authorities demonstrate limited interest in energy efficiency policy formulation.

Specific public consultations are organized, while relevant stakeholders are invited to participate in the drafting of regulations. The majority of the implemented energy efficiency measures have an inbuilt support mechanism (loans, subsidies, grants, etc.). Moreover, several agencies (depending on the type of measure and financing model) provide guidance for the effective implementation of energy efficient measures.

V.I.IV Vertical Coordination

New coordination mechanisms are under preparation. The best case(s) from other countries with focus of involving the local administrative level as a part of vertical coordination will be used.

Legal vertical coordination mechanism is not implemented in Lithuania yet. Agencies are helping with the implementation and coordination of energy efficiency policy between national and local levels.

The flow of communication between governmental levels with regard to EE policy making and implementation is not sufficient, but there are various mechanisms ensuring that communication and responsibilities between all involved parties are secured.

Improved vertical coordination mechanism could be established with a focus of involving the local administrative level as a part of vertical integration, thereby a better communication flow could be developed, when the limited interest on the local level has been increased.

V.I.V Horizontal Coordination

Lithuania has horizontal coordination but only with ministries responsible for the energy policy. Energy policy formulation between affected line ministries and other bodies is coordinated by legal acts and the energy policy is in line with EC policy.

Existing horizontal coordination mechanisms for local administrative levels requires updating, more involving of local actors, stakeholders from research, business or civil society into policy formulation and implementation. Existing legal obligations for financial support schemes (for example for ESCO's) must be updated.

V.I.VI Capacity

Existing educational programs for energy efficiency at local level must be developed.

V.II Slovakia

V.II.I Energy Policy

Energy efficiency policy is basically set by Energy Policy of the Slovak Republic, the latest from October 2014, covering the period until 2035. Energy Efficiency Strategy was adopted by the Government Resolution No. 576 of 04. 07. 2007, supported by the report in 2011, based on ESD, where three-years Energy Efficiency Action Plans have been used as implementing mechanisms for this strategy. Energy Efficiency Action Plans aim to propose energy efficiency measures to ensure the fulfilment of the policy and strategy objectives.

The Ministry of Economic Affairs has drawn up draft generally binding legal regulations to transpose the Directive 2012/27/EU into national law. One piece of legislation currently at the preparatory stage is a law aimed at supporting energy efficiency.

In the preparation of the law, the Slovak Republic has considered a number of alternatives such as introducing a mandatory energy efficiency scheme and implementing political measures aimed at achieving energy saving.

Responsible body for administration and coordination of the monitoring system of energy efficiency is Slovak Innovation and Energy Agency (SIEA).

V.II.II M&V - Data

The measures are monitored via monitoring system as asked by the EED. Specific requirements are set for monitoring the energy savings related to Art.7 of EED, as well as cumulative calculation of savings. Each measure is described by the basic factors asked for in Art.7 as for policy measure. Only bottom-up methods of energy savings calculation are used, and they are were evaluated at the same level as the implemented projects.

If the monitoring of energy savings was not required, the determination of savings was set as planned savings. Total investment costs were for the purpose

of 3AP determined on the basis of the investment intensity (€/MWh) of projects that were solely aimed at improving energy efficiency in the sector.

The verification process in Slovakia is a part of monitoring system. Data are verified after being entered into the system, but before being used in the database as core data.

V.II.III Coordination Mechanisms

It is the national level, which mostly is responsible for energy policy making. Some of the activities are established under the responsibility of regions (e. g. related schools) or at local level (e.g. concepts of community development in the field of heat energy).

V.II.IV Vertical Coordination

The Government has established a permanent interinstitutional group for preparation of NEEAPs. The group include all relevant ministries and representatives from regional administration and municipalities. Their role is to prepare, consult and coordinate the preparation of conceptual documents related to EE and NEEAPs. The group is therefore both relevant in respect of vertical and horizontal coordination.

V.II.V Horizontal Coordination

Relevant representatives of ministries are vital parts of working groups under the lead of MoE, those are mostly responsible for conceptual work in the responsibility area of each individual ministry. There is long term cooperation with the relevant ministries and organisations who are responsible for running of the financial mechanisms with effect on energy savings. But else there is only little cooperation among the ministries.

Strengthening of the vertical and horizontal coordination are needed. The quality of the vertical and horizontal communication flow with regard to EE policy making and implementation at the national, regional and local level can be characterised as good, but it could be improved at all levels.

V.III Germany

V.III.I Energy Policy

In September 2010 a new Energy Concept was decided, which changed the energy system. Also the use of renewable energies reducing energy consumption by increasing energy efficiency is a key pillar. The Energy Concept also includes ambitious energy efficiency targets for Germany.

A reduction of primary energy consumption by 20% until 2020 (and by 50% until 2050) must be realized to meet the primary energy target in 2020 was estimated to be around 10 to 13% based on current forecasts.

To fill this gap, the German Federal Ministry for Economic Affairs and Energy (BMWi) presented the "National Action Plan on Energy Efficiency" (NAPE) in early December 2014 (BMWi 2014). The NAPE includes new and further developed policy measures to increase energy efficiency in buildings, industry and the tertiary sector. The highest contributions to energy and CO₂ savings are expected from a newly introduced competitive tendering scheme for energy efficiently and the establishment of up to 500 energy efficiency networks in industry.

V.III.II M&V - Data

Authorities interact to safeguard access to data and information. This usually is done informally and on ad hoc basis. As local, federal state and federal statistics are interlinked the overall energy aggregates can be tracked at any point in time for an evaluation.

At local level, a systematic tracking of energy efficiency is not comprehensively implemented. Whereas all major local entities like bigger cities or agglomerations collect and monitor energy data, the review of energy saving programs is not systematically installed.

Energy efficiency monitoring is implemented mainly in the local entities participating in the European Energy Award and having taken up a dedicated reporting obligation in this framework.

In relation to evaluation of SEAP projects energy monitoring is performed systematically only in 22 cities. All of these actors rely on individual methods (bottom up or top down, depending on the case) for tracking energy efficiency progress.

In general terms, all major energy efficiency instruments are assessed in regular intervals usually through evaluation by independent research institutes in order to allow for redesigning them. The German authorities, both on federal as well as on state level, place high emphasis on the fact that their monitoring should be cost-effective. Implementing a continuous and comprehensive monitoring and verification of energy savings on all levels and for all measures including the introduction of a common IT tools is generally not considered of meeting the criterium of cost-efficiency. Hence, most important programmes are stringently monitored and evaluated, but less money is spent to trace the saving impact of an energy saving campaign or secondary energy audits.

Monitoring and verification of energy savings could be done in a more systematic and comprehensive manner especially at local level. The actors involved in SEAP projects rely mostly on individual methods (bottom up or top down, depending on the case) for monitoring of energy efficiency progress.

V.III.III Coordination Mechanisms

Unlike in centralized countries, the federal structures of Germany imply that all levels of government (federal government, regional federal states and local level) have competencies in the various fields of energy policy.

V.III.IV Vertical Coordination

Formal vertical coordination is performed largely in the legal context set up by the shared competences of the federal level and the federal states for energy efficiency.

In case local governments are impacted by this legislation, the federal state ministries will ensure coordination with the respective associations of local level representatives.

The German formal coordination mechanisms are designed to guarantee smooth law-making which is closely oriented at the subsidiarity principle. Whereas this general framework was sufficient for the last decades, the increasing need for a constant exchange on energy efficiency policy making as well as on monitoring and implementation has led to the emergence of supplementary informal coordination mechanisms at all levels of government. Owing to the informal and non-binding character of these mechanisms, the group of involved actors has in

many cases been enlarged to include researchers, industry associations, consumer associations and NGO representatives.

To underpin the formal law-making, the Federal Ministry of Economic Affairs and Energy hosts an annual working group of the responsible government officials of federal and federal state level (Bund-Länder-Arbeitskreis Energieeffizienz). Key aims of this working group are facilitating the policy process, informing about intended policy changes or amendments and exchanging best practices on a regular basis.

To guarantee a successful implementation and monitoring of the energy system transformation, the Federal Ministry for Economic Affairs and Energy has established a number of informal “coordination platforms” (Energiewende-Plattformen), among those the coordination platforms for energy efficiency and energy efficiency in buildings. Key tasks of these platforms are to develop and discuss joint solutions together with the relevant stakeholders from business, civil society, science, the affected government departments and the federal states.

With the implementation of the energy transition and climate change policies, new forms of informal coordination have appeared both on federal and federal state level. As these mechanisms include a broad range of stakeholders – in some cases even civil society at large – in the policy formulation and implementation process, they might be an interesting mechanism for testing in other countries as well.

V.III.V Horizontal Coordination

Adding to this formal vertical coordination, a horizontal coordination between the federal ministries and between the federal state actors on energy efficiency is taking place in formal and informal settings. This allows for the exchange of best practices and a concertation which supports the law-making and policy implementation process.

Especially with the energy transition, the additional informal coordination mechanisms both on vertical and horizontal levels can be seen as opportunities for enhancing and complementing the formal coordination. As these informal mechanisms define coordination in a very broad sense, including civil society at large, they might prove an interesting and effective instrument.

Acknowledging the fact that the success of energy efficiency policies eventually depends on the acceptance of energy consumers and energy users who are

actively participating in policy design and formulation through the informal coordination mechanisms, this element of German policy coordination might prove interesting for other countries as well.

V.IV Austria

V.IV.I Energy Policy

The federal government represented by the Federal Ministry of Science, Research and Economy and the Federal Ministry of Agriculture, Forestry, Environment and Water Management is currently preparing the Austrian climate and energy strategy for the timeframe up to 2030. It is expected to be finished in summer 2017.

At the regional level, the governments of the nine federal provinces have prepared their own energy strategies. The timeframe for those energy strategies varies between up to 2020 to 2050. The targets set are often more ambitious than the ones set in the national energy strategy.

On local level, 373 of Austria's 2,100 municipalities have voluntarily prepared their own strategy on energy efficiency within the framework of energy efficiency programs like "e5 – program for energy efficient municipalities", "Energy-saving Municipalities program" or the Covenant of Mayors.

Austria's federal provinces support the federal government in its obligation to report alternative measures. This agreement, however, is on a voluntary basis. The measures reported by the federal provinces mostly include the results of subsidy programs administrated by them like for example the Residential Building Support.

The target for energy savings in Austria is set by the Austrian Energy Efficiency Act. By 2020, the final energy consumption should be reduced to 1,050 PJ per year. This leads to a necessary reduction of final energy consumption of 310 PJ as compared to a business-as-usual scenario within the years 2014 to 2020. In order to reach this savings target, the federal government will implement energy savings measures at an amount of 151 PJ. The remaining 159 PJ will be covered by an energy obligation scheme. Obligated parties to implement energy savings are retail energy sales companies whose final energy sales exceed 25 GWh per year.

V.IV.II M&V – Data

The Austrian MVP system is designed as a tool for data collection and evaluation only. Results from the reports on the entered energy efficiency measures can be used for the drafting of new energy strategies or policies, the system itself does not offer technical assistance for the planning of future savings.

Reports on the entered measures can be generated by the Austrian monitoring agency. They contain the amount of energy savings per measure and can be used to determine to what amount the overall energy savings target has been reached after each reporting period as well as the contribution of each policy measure to the achievement of the overall target. The differentiation of the standardized calculation methods in consumption categories makes it possible to analyze in which category the individual savings have been achieved. Since the detailed information entered by the obligated parties is contained in the reports as well, the monitoring body is able to investigate possible misunderstandings regarding the correct use of the standardized calculation methods and can adapt them if necessary.

Municipalities have no obligation within the Energy Efficiency Act. They can sell implemented energy efficiency measures on the market like other parties within Austria's EEO.

Municipalities themselves have a high awareness of the importance of energy efficiency topics. Many of them implement measures to reduce their energy use, but since there is no legal obligation to report them, the resulting energy savings are not included in the calculation of the target achievement for Austria. The cause for this is mostly of financial nature. Municipalities argue that in order to report the implemented measures into the MVP system, the documentary requirements that have to be fulfilled are quite high. There is no possibility to get access to the Austrian MVP system for municipalities since the platform is only designed for the obligated parties under the Austrian energy efficiency act, the federal government and the federal provinces. Measures implemented by municipalities can be sold on the market to obligated parties to use for their individual target achievement. For companies without obligation in the energy efficiency obligation scheme, it is possible to report energy efficiency measures in the Austrian MVP as well to be sold to an obligated party later on. This process is called banking. Municipalities expressed the wish to be able to enter and bank their implemented energy efficiency measures in the Austrian MVP too in order to have more time to find a financially reasonable offer for them.

Another point mentioned were legal uncertainties regarding the ownership of energy efficiency measures. While measures that are financed by the municipality's budget are certainly in their possession, there are other cases more

unclear. For example, there is the case of the so-called “Bedarfszuweisung” which is financial support granted by the provincial government dedicated to a specific project in a municipality. Since this can be compared to a subsidy, legal matters about the possession of the energy efficiency measure are unclear. In order to prevent double counting, the regulation regarding those financial supports of federal provinces to their municipalities should be discussed and legally specified.

V.IV.III Coordination Mechanisms

In Austria there is no formal coordination mechanisms neither on vertical nor on horizontal level. Involvement of another governance level (e.g. the federal level involving the regional level or the regional level involving the local level) in energy policy formulation mostly happens on an informal basis, usually with no obligation of mutual coordination.

But the regional level is involved in national energy policy formulation and implementation, especially related to national energy strategies or similar, which is standard practice. Subsidy schemes for energy efficient construction and refurbishment exist in each province; energy savings achieved through these schemes contribute largely to the Austrian energy savings target. The local level only plays a minor role in regional and national energy policy formulation, but initiatives such as the European Energy Award®, targeting the local level, are well received in Austria with more than 160 local authorities participating and showing commitment to reduce CO₂ emissions by improving energy efficiency and boosting the use of renewable energy sources in their sphere of competence. At the local level there are no coordination bodies or fora are known that particularly deal with energy issues.

V.IV.IV Vertical coordination

There are no vertical coordination bodies or fora in Austria per se between national and regional level for energy policy. However, the provincial states are usually represented in task forces, strategic coordination groups and similar settings when important strategies such as the Austrian Energy Strategy are developed. In such cases, representatives from the provinces are involved in the development and/or adaption of energy efficiency measures through participation in different working groups, each working group being in charge of a different energy topic.

But regional energy strategies are usually formulated without involving representatives from the national level.

It is also worth mentioning, however, the so-called 15a agreement: it is an agreement between the federal government and the provincial governments about matters falling within their sphere of competence. A 15a agreement is binding for the federal government as well as for the provincial governments. An example is the 15a agreement to implement the ESD in Austria. The agreement between the federal government and the provincial governments stipulates common quality standards for the promotion of the construction and refurbishment of residential buildings in order to reduce greenhouse gas emissions. It would be advisable to reach such an agreement on the matter of the EED as well. Apart from the reporting of energy efficiency measures implemented by the federal provinces in general, the agreement should contain a guideline for the calculation of energy savings accomplished by the subsidy schemes which are in the federal provinces' responsibility and a clear definition of the reporting periods.

On regional level a nationwide cooperation forum on climate and energy between the provinces and the Austrian Energy Agency exists. The forum meets three times a year and aims at improving collaboration and communication between the institutions involved. This forum has no duties or a responsibility related to horizontal EE policy formulation and only meets informally. It cannot be classified as a horizontal coordination body by definition.

The local level, consisting of Austria's 2,100 municipalities, is not included in the formulation of energy policies. Their participation is of voluntary nature and mostly organized by programs like e5, the Energy-saving Municipalities program or the Covenant of Mayors. However, federal provinces can oblige their municipalities to implement energy savings measures in their regional energy efficiency acts or plans.

V.IV.V Horizontal coordination

The Federal Ministry of Science, Research and Economy, The Federal Ministry of Agriculture, Forestry, Environment and Water Management and The Federal Ministry of Transport, Innovation and Technology are the relevant ministries in respect of energy and environment. These ministries cooperate on a regular basis, for example when launching research and funding programmes or developing strategies covering their different thematic focuses altogether.

A nationwide forum exists on regional level on climate and energy between the provinces and the Austrian Energy Agency. The forum meets three times a year and aims at improving collaboration and communication between the institutions involved. However, it needs to be noted that this forum has no duties or responsibilities related to horizontal EE policy formulation and only meets

informally. It cannot be classified as a horizontal coordination body by definition, but still it is an important contribution to horizontal coordination.

The political culture in Austria is characterized highly cooperative. The term “Social Partnership”, the institutionalized co-operation between the representatives of employers and labour in Austria, is used to describe the cooperative political culture in Austria. The Austrian Social Partnership aims at solving diverging interests through achieving consensus via negotiations between the different parties and to minimize open conflicts.

150 stakeholders were involved in developing energy strategy/energy concepts, when the Austrian energy strategy was developed. And each of these stakeholders came with specific know-how and interests.

Regular evaluations of policies are determined by the budget available and the importance of the energy policy for the country, region or municipality. Evaluations may take place internally or through external institutions such as consultants or similar companies evaluating objectively to what extent the policy has been implemented.

The mechanisms of policy implementation are redesigned to increase their effectiveness, when updating policies after a certain time.

The process of creating energy policy in Austria is not regulated through an established and institutionalized coordination mechanism. However, when important energy and/or climate relevant strategies and policies are developed at national level, representatives from the federal governments usually participate in such processes.

Though energy is a matter which is not only the legal responsibility of the national administration but also of the federal provinces. They may pass their own energy-specific laws and decrees and develop energy policies independent from those at national level – theoretically, in practice their strategic approach and measures are similar to the national ones, and often even more ambitious. In addition, the 2,100 local authorities in Austria may also develop their own local energy policies and have to respect regional laws and decrees if they become relevant for the implementation of their policies.

The implementation of energy efficiency measures at regional and local level is incentivized through subsidies schemes targeting, among others, local authorities, and the energy efficiency obligation scheme obliging energy suppliers to implement energy efficiency measures in the end-use sector including local authorities.

A lot of energy policy related topics are under the legal competence of the federal provinces in order to be able to address the regional particularities. This includes for example the definition of minimum standards for the granting of subsidies or the building codes. However, this results in nine different approaches on energy strategies. In order to coordinate the savings of all provinces and to benefit the most from the regional particularities, horizontal coordination between the federal provinces should be improved by periodic coordination meetings.

Due to the federal structure of the country and the competence provincial states have in energy policy making on regional level, coherence in energy policy formulation between the national and regional (and local) level is not ensured (e.g. provincial states adhering to national targets)², (2) Also horizontally (regional and local level), there is no coherence with regard to energy policy formulation; (3) The local level is not involved in processes on national strategic energy policy making, nor in energy efficiency monitoring. (4) Legal energy matters (may) differ from one provincial state to another and may therefore complicate to harmonize nationally important proceedings.

The local level could be more involved in regional and national energy policy formulation and energy strategy development e.g. through bringing the issue of sustainable energy and the role of local authorities in contributing to energy and climate targets to the attention of existing associations such as the Austrian Association of Towns and the Austrian Association of Municipalities.

V.V FYR of Macedonia

V.V.I Energy Policy

The FYR of Macedonia (former Yugoslav Republic), has progressed in the implementation of the energy efficiency acquis in the reporting period, including the update of primary and secondary legislation. However, the recent decision to postpone the implementation of the certification scheme shows a lack of political will to implement in full the requirements of Directive 2010/31/EU, but also to enable investments in building renovation.

As the first priority for former Yugoslav Republic, the FYR of Macedonia remains in the following period to adopt the second EEAP and to implement its measures. The Ministry of Economy should take the initiative to promptly unblock the

² However, it needs to be noted that provincial states are often more ambitious in energy target setting as the federal state.

Government's approval of the second EEAP, as a key policy document enabling investments in energy efficiency, especially since the planned timeframe for the third national EEAP is closing.

The Directive 2010/31/EU remains a priority for further implementation, in particular, with the development of calculation software and the cost-optimal level of minimum requirements of energy performance of buildings and building components. Further transposition of the Labelling Delegated Regulations started in 2015, in accordance with the Ministerial Council Decision of September 2014.

Also strengthening the institutional capacity in both the Ministry of Economy (the Energy Efficiency department) and in the Energy Agency is extremely important, as the existing human resources proved to be insufficient during the realization of the first EEAP. The draft second EEAP proposed also the establishment of the Energy Efficiency Fund, which is expected to strongly support the implementation of energy efficiency measures.

V.V.II M&V – Data

The energy agency is the administrative authority for the M&V scheme in the Former Yugoslav Republic, the FYR of Macedonia.

Available are two voluntary (not defined in the legislation) software solution for M&V. ExCITE is a software solution that is used by the local authority for monitoring the energy consumption. The software also provides several types of reports that are helpful in mandatory reporting regulated in the legislation.

A Rulebook on energy audit prescribes MVE methodologies: top-down and bottom-up. Both are developed according to the EU methodologies.

The M&V schemes in the Former Yugoslav Republic, the FYR of Macedonia are in line with the National Energy Efficiency Action Plan.

The verification of energy savings is through officialization of results of measurements, through preparation of annual report for achieved energy savings by the Energy Agency of the Republic of the FYR of Macedonia. Also, as verification could be treated adoption of each Energy Efficiency Action Plan in which consisting part is information for achieved energy savings for the previous period of 3 years.

V.V.III Coordination mechanisms

The Ministry of Economy and the Energy Agency are included in the process of policy formulation.

The academia and the private sector, research organisations and educational organizations are helping the policy formulation process participating actively during preparation, or are included in the process of finalisation of the policy formulation during public discussions.

Steering structure for implementation of EE measures is the national Energy Agency. The Energy Agency controls the implementation of the EE measures by the local authorities.

Some EE measures and regulation are foreseen in Energy Efficiency Action Plans which are intended to motivate participation of different authorities and which have been implemented.

Local and regional governments have legal obligation for fulfilling and implementing EE measures. In some cases, technical and financial support for implementation of EE measures from international financing institutions and donors is available, relevant national authorities give possibilities to all local self-governments to use it, in the frame of the possibilities of this mechanism.

In accordance with Article 7, paragraph 1-8 of the Directive on energy efficiency: the obligatory scheme should ensure 1.5% annual energy savings in terms of annual sales of energy to all final customers of all energy distributors or energy sales company.

At the national workshop the following possibilities of implementation of the obligatory scheme was discussed:

- Obligation on energy distributors
- Obligation on retail energy sales companies
- Obligation on energy distributors and retail companies
- Alternative system to an energy efficiency obligation scheme

At the workshop 75% of the participants wanted an alternative system such as:

- Energy or CO² taxes that have the effect of reducing end-use energy consumption
- Financing schemes and instruments or fiscal incentives

- Regulatory or voluntary agreements
- Standards and norms improving the energy efficiency of products and services
- Energy labelling schemes
- Training and education, including advisory programmes

V.V.IV Vertical coordination

In the FYR of Macedonia there are not any formal or informational vertical coordination bodies or fora between national and regional level for energy policy.

The FYR of Macedonia follows the guidelines of the Energy Community. Also, the Energy Community is supervising body for the implementation of the EE measures and policies in the country.

The goals of the country are decided by the National Action Plan for Energy Efficiency, which is then transposed in the local strategic documents through Municipal Plan for Energy Efficiency. These two types of action plans are setting the foundation for vertical coordination, since the Energy Agency of the FYR of Macedonia Municipal Action Plans for Energy Efficiency must state their share towards the National Plan.

In the FYR of Macedonia the Energy Agency has the main role in the coordination mechanisms. This public body gathers information on planned and implemented measures on vertical and horizontal aspects.

The most important problems with the lack of vertical coordination are:

- Lack of awareness of institutions for their responsibilities
- Weak institutional capacity to fulfill the responsibilities,
- Lack of system for vertical coordination between institutions
- No official forms for data collection
- Better information of the requirements
- Inquiries from many parties
- Many institutions require a large volume of information

V.V.V Horizontal coordination

The horizontal coordination is not included in the energy policies. The situation is similar as the vertical coordination. The Energy Agency is responsible for gathering information from the Ministries (central government) about the planned and implemented measures, and to share this information with the Ministry of Economy.

The most important problems related to the horizontal coordination, are the following:

- Unwillingness and lack of capacity of the Ministry of Economy to establish a horizontal system of coordination
- Lack of communication
- Lack of coordination bodies
- Lack of capacity
- Lack of plans for improving the coordination between municipalities.
- Lack of/or unspecified responsibility between institutions and responsible persons

The biggest operational issue is the lack of capacity, both financial and human. Several measures are in place to address this problem in several national strategies, like the National Energy Efficiency Action Plan, inducing municipalities for using the web-based software tool for monitoring and management of the energy consumption (i.e. the information system). The Ministry of Economy in 2015 is implementing EE Campaign, which, in addition to other, includes such type of trainings. Also, in the Energy Efficiency Action Plan (first and draft second) trainings for relevant authorities are proposed for using the software tool for monitoring and verification of energy savings from implemented EE measures. At the workshop it was concluded that the vertical coordination (between institutions at different levels) and horizontal coordination (between institutions at the same level) in terms of implementation, measurement and verification of energy savings should be applied in Macedonia.

Suggested improvements at the national workshop:

Vertical coordination:

- Defining working groups, coordination should be governed by rules
- Introducing MVP system, change the bylaws (bottom up)
- Improving the legal framework
- Definition of obligations

- Helping tools
- Formation of questionnaires and statistics for more parties
- Coordinating body with more powers
- Development of guidelines
- Defining responsible ministry

Horizontal coordination:

- Working groups that will meet periodically
- Appointment of persons from each institution to work on energy and raising their capacity.
- Preparation of action plans for each institution.
- Changing the legal framework for budgeting and allocation of energy costs as a separate item.
- Establishment of an official body for coordination
- Greater involvement of regions
- Perform a regular training
- Regular information sessions
- System Interface / training for employees at all levels

The main conclusion from the workshop was that the coordination mechanisms, even though are existing, can and should be improved significantly, in order to function properly.

The main suggestions for improving the coordination mechanisms, both horizontal and vertical, were that:

- The coordination mechanisms should be more clearly defined in the law and bylaws
- The definition of the mechanisms is best implemented in one frame, and not in different laws and bylaws
- There should be a responsible institution or creation of new central institution for the purpose of coordination mechanisms
- The structure of the data that is required should be more precisely defined
- Regular training for responsible persons should be implemented because the capacity in the current situation is not sufficient to perform the requested obligation

V.VI Croatia

V.VI.I Energy Policy

The legal responsibility for energy policy making lies on the national and local level. Ministry of Economy is responsible for national EE targets, but all counties, as well as all cities larger than 30.000 citizens are obliged to make yearly EE plans. Although there is no decided goals for them to achieve in terms of savings, the EE Plan is obligatory and there are incentives in form of the ECO fund large subventions for various EE measures.

V.VI.II M&V – Data

Necessary information and data on energy savings are being sent on a regular basis, at the right time and in complete form.

In the SMiV application 10,000 energy savings measures have been inserted, 90% of which were inserted by the Croatian Fund for Environmental Protection. The regional administrative levels, such as the City of Zagreb, have inserted measures not co-financed by the Fund. There were 30 national action plans adopted in 2016 and more are expected in the future. The total energy savings monitored and verified by SMiV in 2016 were above 1 PJ.

It is expected that the upgrade of SMiV will be finalised very soon. The upgrade was made per suggestions by CEI. The upgrade is based on 30 ideas for improvement that help with the analysis and examination of measures. These changes are therefore not of “cosmetic” nature but achieve higher efficiency and practicability for a successful measurement and verification of future energy savings.

Further improvements on the local and regional level will be developed in order for the SMiV to have access to fully fledged and complete data for the evaluation, monitoring, measurement and verification of the EE measures developed and implemented within Croatia’s energy policy.

A key discussion on the workshop was about future developments which most of all was focusing on upgrade and improvements on the SMiV application.

V.VI.III Coordination mechanisms

The Croatian legislature has also defined the obligations of cities, towns, and counties to write and implement Sustainable Energy Action Plans (SEAPs), CEI has an ongoing and productive relationship with most of the counties and towns.

V.VI.IV Vertical coordination

In Croatia there are existing coordination bodies between national and regional levels for energy policy. There are many now successful regional energy and development agencies that help the local community implement EE measures. But the only official body for EE is the National EE Authority.

The local authorities are involved in national energy policy formulation, since they are obliged by law to make yearly and three-year EE plans. All EE plans need to be approved by the National EE Authority on yearly basis.

The priorities and needs of the different involved authorities have been taken into consideration during the design of the energy efficiency measures.

In Croatia vertical coordination is both formal and informal; formally, all local and regional authorities that plan EE measures, need to report those plans to the National EE Authority. In this, the main informal role is carried out by the regional energy agencies, and in great extent regional development agencies, which are most of the times the ones drafting and implementing EE measures on the local level. The local and regional governments have been incentivized by financial support schemes.

The discussion at the national workshop about vertical coordination was focusing on how energy saving measures can be improved on local, regional (the administrative name in Croatia for this level is "county") and national level.

In relation to the engagement on local level it was noted that per the Regulation on Energy Management System in the Public Sector (OG 18/15), all administrative levels have a person authorised for energy management in their respective public institution and this person is on a mailing list available to all stakeholders within the system. If there is a change made in the Energy Management System regulated by APN, the contact persons in each of the respective local institutions are notified and communication between established levels is therefore well-established. The vertical coordination from the local to the national level has therefore significantly improved in this area.

V.VI.V Horizontal coordination

The main weak link is the horizontal communication. Independent ministries decide on the specific issues they are responsible for, but the collaboration is not always well-timed and the more ministries are involved, the more time the official procedures take up.

EE policy is coordinated only nationally. There is no official regional coordination – all local and regional policy is sent to the national bodies and ministries.

in Croatia a coordination between the different bodies has been developed, although the only official body is nationally defined – the National Energy Efficiency Authority. Local authorities are involved by making three-year and annual energy efficiency plans which are legally required and evaluated by the National EE Authority, but they are not obligated to implement the EE measures as defined by NEEAP. There is also a significant problem with human resources on a local level. There is a large amount of EE measure co-funding available. The problem is alleviated by the regional development agencies subcontracted to do EE plans.

The main problem is lack of funding on national level, inability of local authorities to incur debt, and overall lack of official penalty for not implementing the planned EE measures.

On the national Croatian workshop in Zagreb it was discussed how the overall scheme of coordination mechanisms and how they can be applied in Croatia were shown and elaborated to the present stakeholders.

The discussion about horizontal coordination was focusing on improvements, suggestions and recommendations between the two main Ministries, the Ministry for Environmental Protection and Energy Sector and the Ministry for Construction and Physical Planning, responsible for energy savings measures, their implementation and their monitoring and verification, and their communication with the Centre for Monitoring Business Activities in the Energy Sector and Investments (CEI), which is the national coordination body for energy efficiency and the main responsible entity for the implementation of SMiV – the System for Measuring and Verifying Energy Savings, which is defined by the Croatian Act on Energy Efficiency (OG 127/14) and by the Regulation on Monitoring, Measurement and Verification of Energy Savings (OG 71/15) as the national M&V platform for energy efficiency measures in Croatia.

The cooperation between the aforementioned stakeholders on a horizontal coordination level, in particular with APN (national agency responsible for the management of ISGE, the Energy Management Information System which monitors and analyses energy and water consumption in public sector buildings), FZOEU and MGIPU was commended.

Since the Croatian legislature has also defined the obligations of cities, towns, and counties to write and implement Sustainable Energy Action Plans (SEAPs), CEI has an ongoing and productive relationship with most of the counties and towns. Necessary information and data on energy savings are being sent on a regular basis, at the right time and in complete form.

The merge of Ministry for Environmental Protection and Energy Sector has simplified to an extent the horizontal coordination, since there are now two ministries to be coordinated instead of three (the sector for environmental protection was previously at the Ministry of Economy).

It was concluded that the coordination mechanisms are improving and they can be considered better than average at the EU level. In addition to this, it was also emphasised that the coordination mechanisms are at a satisfactory level due to legal obligations, whereby CEI receives regular and accurate information on energy savings at all levels, from all relevant stakeholders, where CEI is the national coordination body that regulates this, creating an institutional synergy.

V.VI.VI Capacity

The advanced level of networking going on between local and national institutional levels regarding energy savings measures through education programmes and job specializations, after which the know-how is established at a local level, thus allowing the employees at the local level to be educationally qualified for the monitoring of energy savings.

V.VII Denmark

V.VII.I Energy Policy

There have been several phases of the EEO in Denmark, which dates back to the 1990s. The overall policy objective has not changed significantly, but how to secure the energy savings has changed radically. Through the years there has

been a long tradition of dialogue between the energy authorities and the energy sector.

Under the Energy Efficiency Directive (2012/27/EU), Member States are required to inform the Commission by not later than 5 December 2013 how they intend to implement Article 7 of the Directive.

Denmark consequently wishes to notify the following:

Denmark wishes to fulfil the obligations of Article 7 by means of energy efficiency obligations. Such obligations have existed in Denmark since 2006. They are contained in the energy-policy agreement of 22 March 2012 about energy savings by the energy companies in Denmark. The agreement will remain in force up to 2020. The agreement is concluded between the Ministry of Climate-, Energy and Buildings and the grid- and distribution companies with electricity natural gas, district heating and oil. The responsible monitoring body is the Danish Energy Agency.

The Danish EEO was originally focused on advice and not subsidies. There has been a shift toward solely subsidies that tend to have lower additionality than advice in combination with subsidies according to the evaluation in 2012.

Particularly for households subsidies is the main if not only measure used. The subsidies only provide a very small part of the total investment cost at the end user (approx. as little as 2% in some cases), why it can be questioned if the subsidy really is a determining factor in the investment decision and hence the additionality of the saving is questionable. On the other hand the experience in Denmark shows that subsidies in combination with advice are a very strong driver in industry.

Furthermore, the experience in Denmark is that the shift towards subsidies seems to dry out "the acknowledged potential". "The acknowledged potential" is the potential for saving that industry and consumers know of and acknowledge as feasible – not equal to the technical and economically viable potential. When subsidy is the only instrument, the projects that are implemented are the projects that are to a large extent already known by the end-user as potential projects. No new knowledge is added and the possibilities dry out. In the years to come the scheme needs to balance the incentives so that "the acknowledged potential" is maintained.

Advice, energy audits and energy management should once again play a major role in the EEO.

The easy answer to flaws in the scheme is to apply more rules for e.g. documentation. More complex and detailed rules on the other hand increase the margin of error without necessarily providing significantly more real energy savings. The Danish EEO has over the years developed more and more specific rules to overcome certain flaws. The first EEO from 2006 was based on a voluntary agreement of 12 pages. The agreement from 2012 counts 50 pages and has roughly 25 pages of explanatory documents and 36 pages of FAQ. When you want a scheme with many active parties like in the Danish EEO, you need to keep the rules simple and easy to understand.

A market based scheme implicates the market operators make profit. Unfortunately, this is not the full understanding of the politicians and the authorities in Denmark. They seem to expect no or very little profit being made in the executing/operating companies. In a true market based scheme you need to allow profit at the executing level, or no one will deliver the needed energy savings.

In view of the difficulties in reaching the target in 2013 and 2014, contracting parties behind the voluntary agreement are currently looking into the possibilities of realizing more savings in the transport sector and energy production, adjusting the framework to further facilitate energy savings in SME segment and facilitate an increase of the additionality of notified savings in the household and building sector. At the time of writing, ideas on how to do this is still very much on the drawing board, making it premature to suggest specifically how to meet these ends.

V.VII.II M&V Data

The aim of EEO is to promote cost-effective energy savings for the benefit of consumers, enterprises and society focused particularly on realising savings in end-use consumption; savings that would otherwise not have been realised without the companies' involvement.

The savings are weighted with a simple factor, which reflects the lifespan of the savings, impact on primary energy consumption associated with the implemented saving, as well as the expected CO₂ impact of the savings, including, especially, whether there is a saving inside or outside the ETS area.

The efforts are to be aimed at existing buildings and businesses (industries), but there is no specific, quantified target for this policy objective.

Further the EEO should promote Best Available Technologies wherever possible. This is done mainly through deemed savings that set requirements that goes beyond the building code, as it is the case for windows and insulation material.

Energy companies have a so called free choice of methods within the legal framework and the energy savings agreement. This means that energy companies can choose whatever measure they expect to be most cost-effective taking into account the provision that the companies' efforts are to be aimed at existing buildings and industries. In other words, no measures are excluded as long as the effect can be documented.

In practice the most common measures are advice and subsidies or a combination of both. "Market influence" or "market impact" such as campaigns and feedback on energy consumption can be included if the effect can be documented. If deemed savings for such measures exist they must be used.

The grid and distribution companies for electricity, natural gas, district heating and oil are the obligated parties. There are three gas companies, six oil companies, 74 electricity companies and 417 district heating companies.

V.VII.III Coordination mechanisms

The few responsible actors is giving an effective coordination mechanism, but the interest of the stakeholders to carry out energy savings is reduced due to the lack of delegation.

V.VII.IV Vertical coordination

In Denmark there are only little vertical coordination due to the fact that nearly all decisions of energy policy are taken at the national level. But there are fora and organizations at the regional level, which first of all is giving knowledge and subsidies to the local energy planning activities at the municipal level.

V.VII.V Horizontal coordination

The Ministry of Climate-, Energy and Buildings are working together with the Ministry of Environment and Food – especially in respect of waste handling and climate policy. Several formal bodies, research institutions, energy companies and NGO's at the national level are delivering input to the energy policy formulation.

Suggestions for improvements:

- The web information site: Energispareindsatsen.dk could be improved to give better information to the final energy consumers.
- Also the Danish Energy Agency could give better information.
- A market place for not reported energy savings could be established to secure that the companies better could reach their individual targets of energy saving.
- The priority factor could be increased for projects with higher additionality e.g. projects including consultancy.
- A central reporting system for energy savings could be established to reduce double counting of the energy savings.

V.VIII Latvia

V.VIII.I Energy Policy

On 29 March 2016 the national Energy Efficiency Law³ came into force. This Law is transposing the requirements of the Energy Efficiency Directive 2012/27/EU (hereinafter - EED).

On 02 February 2017 the Latvian national Plan of the Alternative Measures of Energy Efficiency Policy to Reach the Target of Energy End-Use Consumption Saving 2014-2020⁴ (hereinafter – the Alternative Measures Plan) has been announced in the State Secretaries Meeting. The Alternative Measures Plan has been agreed between the institutions, and has been approved by the Cabinet of Ministers on 24 May 2017.

The Latvia cumulative energy savings for the year 2020, calculated and notified according to the Article 7 of the EED, is 9896 GWh.

- The dominating part of these savings shall be reached by the alternative measures (hereinafter - AM).
- In its turn, in the first obligation period from 01.01.2018 to 31.12. 2020 the role of Energy Obligation Scheme (hereinafter -EOS) in reaching the cumulative savings target is rather small. According very recently

³ Energoefektivitātes likums, see website of Latvian legislative documents <https://likumi.lv/doc.php?id=280932>, English translation – see "Tulkojums"

⁴ Energoefektivitātes politikas alternatīvo pasākumu plāns enerģijas galapatēriņa ietaupījuma mērķa 2014-2020.gadam sasniegšanai, , <https://likumi.lv/ta/id/291026>

(25.04.2017) adopted Cabinet of Ministers Regulations on EOS, only electricity retail traders, having amount of annual sold electricity of 10 GWh and above are included in the EOS⁵.

- The Alternative Measures Plan contains the following important features:
- The already implemented and currently planned stated AM contains together in total only ~ 38% (3720 GWh), anticipated savings from excise tax measure not included here) of necessary cumulative savings.
- The currently planned stated AM (meaning those AM which are already stated and will be implemented 2017-2020) in total constitute ~ 2167 GWh cumulative savings in 2020.
- The rest shall be covered by both EOS, voluntary agreements with those energy sector parties, not included in EOS, and new, non-identified yet, AM
- Latvia envisages the majority of savings due to implementation of investment subsidy schemes as well as energy management systems. Latvia has widened the parties which shall mandatory implementation the EMS (namely, certain municipalities and large electricity consumers (national definition) are included in addition to EED).

V.VIII.II M&V Data

The deemed-savings method and the metered savings method are the most suitable for Latvia.

The metered savings method is already being used. Several financing programs have been implemented in Latvia in which energy savings have been assessed. However, the Buildings Energy Efficiency Calculation Method is the only methodology approved for the moment in Latvia.

The application of noted above Buildings Energy Efficiency Calculation Method is still limited due to this method is based on the heat balance process of the building, but the method cannot be applied to evaluate the energy savings arising from the replacement of out-of-dated technologies and installation of new energy efficient ones.

Ministry of Economics has published Latvia deemed energy savings catalogue. The starting example for the Latvia catalogue development has been the Danish

⁵ In 2015 9 retail traders corresponded to this threshold

Catalogue “Standardværdikatalog for energibesparelser” (version 3.1 of August 2014), the discussions involved branch associations, energy auditors and other partners. Finally, it was developed and approved (June 2017⁶) the catalogue which bases on the multEE methodological approach and evaluated default values. At the moment there are published measures relating to lighting, buildings, heating (hot water), heat pumps, technologies (industrial motors and circulating pumps), ventilation, transport, and information. It is planned that the catalogue will be added by other multEE measures as well.

No sampling procedures are foreseen, but after the adoption of the “Law on Energy Efficiency” such procedure will be foreseen.

Use of a TD method, the total energy savings are calculated based on statistical indicators and their variation over time.

V.VIII.III Coordination mechanisms

Around of 70% of currently planned AM is coordinated by the Ministry of Economics (ME), followed by the shares of the Ministry of Transport (MT, 13%), Ministry of Environmental Protection and Regional Development (MEPRD, 7%) and the Ministry of Agriculture (MA, ~7%). The role of other ministries are very minor. The role of other ministries are minor (less than 10%). Also for the municipalities the Alternative Measures Plan predicts very minor role (taking into account limited possibilities of municipal budgets), but there are also mandatory energy efficiency measures prescribed by the EMSs and introduced in certain municipalities.

It can be concluded that the problem issue mainly relates to the operation level of planning. Motivation for local municipalities to elaborate high quality energy efficiency plans is important, due to the elaboration of municipal disciplinary energy sector planning document is not stated as the mandatory function.

Besides the following activities can be proposed:

- Coordination mechanisms shall be improved for identification and inclusion of new AM within the Alternative Measures Plan

⁶ Ministry of economics order No 137 (20.06.2017), catalogue website https://em.gov.lv/lv/nozares_politika/energoefektivitate_un_siltumapgade/energoefektivitate/energijas_i_etaupijumu_katalogs/, in Latvian, see “*Enerģijas ietaupījumu katalogs*”.

- Horizontal cooperation between responsible authorities shall promote effective procedures for energy savings monitoring in investment support programmes (ISP), taking into account the share of ISP within the set of AM.
- The important issue is the effective internal cooperation between the structures of Ministry of Economics (namely, the Energy Efficiency Division and divisions responsible for EU Funds programmes),
- The important issue is the effective cooperation between the Ministry of Economics, and the ministries noted above – MEPRD, MA, MT
- As the national operational programme for EU Funds is prepared/approved as well as supervised by the Ministry of Finance, the involvement of this ministry and its subordinated institutions (the Central Finance and Contracting Agency) is crucial.
- It shall be further promoted the motivation of large companies/large electricity consumers, which are obliged to implement EMS, to elaborate high quality energy efficiency improvement plan. The wider set of instruments to be applied for such motivation should be developed. To develop such instruments, horizontal coordination between state authorities is relevant. The same relates to the motivation of municipalities, obliged to implement EMS (issue of both horizontal and vertical coordination).
- Limiting number of EOS participants (electricity sector only), on the other hand, might promote the development of voluntary agreement instrument. The legal framework for establishment of voluntary agreements is already in place and is re-casted after adoption of the Energy Efficiency Law. Important issue is development of voluntary agreements with the district heating utilities of large cities. Preliminary interest for it has been expressed from both agreeing parties (ME and some utilities), however the crucial issue is what “motivating carrots” could be applied.
- There is no currently national Energy Agency in Latvia, which could contribute /take responsibility in better providing of operative cooperation between Ministry of Economics and other state authorities. The establishment of such Agency would contribute to faster and more efficient implementation of adopted policies as well as make constant basis for policy impact check.
- The energy plans in respect of Covenant of Mayors (COM) in 20 Latvian municipalities (covering slightly more than half of the Latvia population) should be evaluated. Such evaluations could give both recommendations for better contextual developments of COM plans and their linkage with national both climate and energy planning interests.

V.IX Greece

V.IX.I Energy Policy

The Ministry of Environment and Energy is responsible for the implementation of the ESD and EED at national level for the design, facilitation and monitoring of the implemented energy efficiency measures and for the establishment, administration and coordination of the required M&V schemes.

The EED has been transposed into the national legislation through the adoption of the Law 4342/2015. The Law 4342/2015 foresees the introduction of energy efficiency obligation scheme in combination with the already adopted alternatives measures in order to fulfil the targets of Article 7 of the EED. The establishment of the energy efficiency obligation scheme is expected to enable the development of a central M&V scheme integrating of the implemented energy efficiency measures.

V.IX.II M&V - Data

The implementation of the M&V schemes for energy efficiency measures depends on the implemented programs. The monitoring of the energy efficiency measures is performed through the establishment of specialized bottom-up procedures. These procedures were developed from the Ministry of Environment and Energy. The foreseen approaches were improved according to the requirements of the Article 7 of the EED. An innovative point is the bottom-up approach for the case of "Energy Savings at Home" program, which is based on the analysis and the evaluation of the EPC data for these buildings financed by each Operational Program. Specifically, for each building it is estimated the savings in final energy consumption by the provided savings in primary energy consumption through a specialized calculation procedure utilizing specific reference values. The specific approach is intended to be utilized for all the energy efficiency measures that are related with interventions in buildings.

V.IX.III Coordination mechanisms

In Greece the Ministry of Environment and Energy has the legal competence for the energy efficiency policy formulation. Specifically, the Ministry is responsible for the transposition of the relevant directives and their implementation including the design, implementation, monitoring and verification of the foreseen energy efficiency measures. As a result the legal responsibility for energy policy making is concentrated on national level. Moreover, other Ministries are involved into the

formulation of energy efficiency policies in their corresponding fields in collaboration with the Ministry of Environment and Energy.

Various energy efficiency measures are performed at regional level through the financing from the regional Operational Programs, which have the flexibility and duties to implement their regional energy efficiency strategy according to their needs and priorities. The formulation of energy efficiency policies at local level is limited through the conduction of Sustainable Energy Actions Plans, while the financing of the proposed measures is implemented mainly by the National Strategic Framework and the corresponding regional Operational Programs.

In the National workshops the following elements were discussed:

- How the vertical coordination can be improved?
- How the horizontal coordination can be improved?
- How the identification of the stakeholders' interests, needs and priorities in respect of designing and implementing energy savings can be facilitated?
- How the utilization of a Monitoring and Verification Platform can spur the establishment of effective coordination mechanism?

The first conclusion that was derived by the initial discussion after the presentation is the absence of an integrated coordination mechanism in order to facilitate the design and implementation of energy efficiency measures within the framework of the EED.

Moreover, it was noted also the lack of a homogeneous measurement and monitoring framework according to the requirements of the EED for the achieved energy savings. Indisputably, the utilization of different indicators, data sources and methodological approaches for the estimation of the energy savings from the responsible ministries and the responsible units in the operational programs hamper the effective reporting and the efficient fulfilment of the established energy efficiency targets. Moreover, the implementation of diversified approaches from the different involved authorities highlight the lack of the vertical and horizontal coordination. Both of the different administrative levels and the different ministries that are involved into the formulation and monitoring of the realized energy efficiency targets have no official communication channels and coordination mechanisms regarding the required actions and the imposed obligations. The solution of specialized consultants in order to conduct ex-ante estimation of the achieved energy savings is not evaluated as the most effective option.

Even if the developed Action Plans within the framework of Covenant of Mayors can be considered as an effective tool so as to collect the required data for the estimation of the energy consumption's current status, they can be utilized as

tools for the assessment of the realized energy efficiency measures and the calculation of the achieved energy savings. Moreover, all the estimations are based on the quantification of the CO₂ reduction through assumptions that are not compatible with the technical requirements of the EED. Therefore, it is crucial to introduce unified measurement and monitoring protocols, which will be followed by all the responsible authorities, while the accurate identification of the required data sources for the mapping of the final energy consumption is considered also as a prerequisite.

Considering the coordination mechanisms, it was pinpointed that no coordination mechanisms have been established both vertically and horizontally. The lack of the coordination, the non-distinction of the different roles among the involved authorities, the absence of specific communication channels and coordination bodies and the lack of mutual understanding and trust among the involved parties were mentioned as indicative problems in the respective field.

The horizontal coordination can be improved through the constitution of formal working groups with the participation of representatives from all the involved ministries accompanied by the adoption of specific legislation regarding their obligations and roles.

The vertical coordination can be benefited by the adoption of effective regulations and the design of flexible financial schemes and mechanisms ensuring the active involvement of all the administrative parties.

The selection of the energy efficiency measures is essential to be performed taking into consideration other evaluation criteria, such as the cost-effectiveness ratio and the achieved economic benefits for the beneficiaries.

The most effective options so as to facilitate the establishment of coordination mechanisms comprise the development of a national central strategy for energy savings that should be prepared as an initiative induced by the regional authorities, the organization of specific consultation rounds for the efficient identification of the needs and priorities and the demonstration of best practices and pilot projects.

Due to the lack of the required personnel, it is important to design specific programs for the replication of the best practices. Toward this direction the constitution of a coordination body may be crucial for the most effective promotion and replication of the best practices and pilot projects.

Regarding the lack of technical resources, it is proposed to provide the required flexibility and the necessary budget to the regional and local authorities so as to hire external consultants obtaining indirectly the required technical expertise.

Last but not least, the confrontation of specific legislative problems, such as in the case of EPC projects in the public sector, will facilitate the fulfillment of the established energy efficiency measures increasing the mobilization of private funds.

Finally, the utilization of information systems can benefit the vertical and horizontal coordination. Nevertheless, the utilization of different information systems that pursue divergent goals and are developed according to different methodological approaches may be problematic constituting as a prerequisite the introduction of a homogeneous information system avoiding simultaneously potential overlaps and maximizing the synergies.

Besides the effectiveness of specific mechanisms were evaluated.

The examined mechanisms comprised:

- The establishment of official coordination bodies
- The establishment of unofficial bodies and networks
- The signature of memorandum of cooperation
- The adoption of regulatory measures
- The design of financial mechanisms
- The establishment of official working groups
- The organization of consultation procedures
- The obligatory development of regional and local plans
- The deployment of technical assistance schemes
- The development of monitoring & evaluation IT tools

The conclusions of the evaluations were the following:

The first conclusion, which was derived by the initial discussion after the presentation, is the absence of an integrated coordination mechanism in order to facilitate the design and implementation of energy efficiency measures within the framework of the EED.

The adoption of regulatory measures, the utilization of monitoring and evaluation IT tools and the conduction of technical assistance schemes are considered as the most effective mechanisms in Greece.

Moreover, the establishment of official coordination bodies and the obligatory compilation of regional and local energy plans constitute also effective options.

Finally, the establishment of unofficial bodies, the organization of consultation procedures and the signature of memorandum of cooperation seem to be less effective mechanisms for the development of a coordination mechanism.

Moreover, the specific aspects that are related to the coordination mechanisms were evaluated.

The examined aspects comprised:

- The access on data and information
- The level of skills
- The level of knowledge
- The availability of tools
- The availability of resources

All the examined aspects must be enhanced significantly, while the need to improve the access on data and information and the availability can be considered as more indispensable in comparison with the remaining aspects.

Finally, it was highlighted that the utilization of information systems can benefit the vertical and horizontal coordination. Nevertheless, the utilization of different information systems that pursue divergent goals and are developed according to different methodological approaches may be problematic constituting as a prerequisite the introduction of a homogeneous information system avoiding simultaneously potential overlaps and maximizing the synergies.

VI Concrete proposals for multilevel governance coordination

The development of a multilevel governance coordination system can only be done through a **process** involving a number of stakeholders from EU level to the national level and from the national level to those who are supposed to implement energy savings. It is about setting up new governance systems.

There is a need to develop a new energy Union's governance if the goal of 27% energy saving and 40% reduction of greenhouse gases is to be achieved by 2030. » ... These goals can only be achieved through a set of coherent and coordinated actions – legislative and non-legislative – at EU and national level. Designing and managing such a broad set of diverse actions requires the Energy Union to establish **robust** Governance«.⁷

The process for developing capacity at different levels - national - regional and local - is a central theme of the new EU regulation Governance of the Energy Union. Here is the focus on building »... necessary sufficient administrative

⁷ »New Energy Union Governance til deliver Common Goals«, European Commission, Bruxelles 30 October 2016, p.1. Also see:

capacity within Member States and to engage with various stakeholders such as non-state actors, civil society and business.«⁸

The two important assumptions: The energy saving governance has to be **robust** and **process** oriented. Process orientation is about patience. A new energy governance system must be built step by step. The development of robust energy saving requires the application of adaptation-oriented schemes. It requires that you can work with and choose among several different schemes.

The concrete proposals for saving energy governance take just a starting point in the formulation of a governance system that can support building capacity especially on the national level.

The main regulatory focus: Energy efficiency obligation schemes, where the basic option is: All energy distributors or all retailers in the 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 final customers (article 7 of EED).

This basic scheme is a very demanding scheme. It is therefore possible to choose alternatives. The directive mentions a number of alternative policy measures. »... 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«.⁹

The following seven schemes are used in the proposals for concrete energy saving schemes:

1. The energy efficiency obligation schemes – the basic scheme
2. The energy efficiency schemes of Covenant of Mayors
3. ECO-budget schemes – energy management for communities.
4. Taxation and subsidy
5. Technology support – ETAP, SET-Plan, etc.
6. ECO-labelling
7. IED /IPPC – Industrial energy efficiency.

(See the detailed review of the seven schemes in the report: »Guidebook for development of concrete proposals for multilevel governance coordination«, multEE, WP3, June 2017 or the appendix to this report).

⁸ »New Energy Union Governance to deliver Common Goals«, op.cit., p.1.

⁹ 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) final, p. 12.

It should be noted that, apart from the ECO budget schemes, all schemes have a direct or indirect origin in EU directives and therefore apply to all member states. The concrete proposals are furthermore also based on the following two issues:

1. Improvement of monitoring and verification schemes and improvement of coordination mechanisms; see chapter IV.
2. The coordination mechanisms in the partner countries, including energy policy, availability of data, vertical and horizontal coordination and capacity. See chapter V.

In the following sections, proposals have been made for how the partner countries can utilize the various schemes in the process of developing processes that help increase horizontal and vertical coordination and capacity building to increase energy savings.

Saving value, measurement and verification: Following the rules in the [Energy Efficiency Directive](#) 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. The multEE project has developed a system (MVP) that meets these requirements. It is assumed that this system is used in full or in a modified version in both the basic schemes as well as in the six other schemes.

The question then is: which energy savings schemes would be beneficial in each partner country? The figure 1 below shows possible options for the different countries. The countries are divided into 5 groups (see Chapter V, The conclusion), related to the status and improvement level of M&V (monitoring and verification), and the status and improvement of coordination mechanism.

Figure 1. Selected energy savings schemes that can be used to build a coherent national energy savings governance:

		Group 1		Group 2		Group 2		Group 2		Group 3		Group 4		Group 4		Group 5	
		Lithuania	Slovakia	FYR Macedonia	Croatia	Latvia	Greece	Germany	Austria	Denmark							
The basic Schemes	3	3	3	1	5	4	1	1	1	1	1	1	1	1	1	1	1
Covenant of Mayors	2	4	1	2	1	1	2	3	2	2	2	2	2	2	2	2	2
ECO-Budget	1	1	2		2	2		3	3	3	3	3	3	3	3	3	3
Taxation & subsidy		2	4	3	4												
Technology support																	
ECO- Labelling																	
IED/IPPC					3												4

The numbers indicate the different schemes that are considered useful to improve the multi level energy efficiency governance for each of the country.

The numbers indication the process: Start with 1, then 2, afterwards then 3 etc.

VI.I Concrete proposal for Lithuania

Status and improvement:

- **Saving value, measurement and verification:** Lithuania does not have a formal M&V scheme, but has only a general monitoring system without specifications for individual measures. There is a need for improvement of M&V schemes, possibly based on experiences from other countries.
- **Coordination:** Lithuania has a horizontal coordination but only with ministries responsible for the energy policy and doesn't have any vertical coordination mechanisms.

Proposal for alternative energy saving schemes:

The proposed schemes should contribute two things simultaneously: On the one hand, to energy savings, and on the other hand, to the development of the energy saving governance: Improvement of measurement & verification, coordination mechanisms and capacity building.

Lithuania is on a more introductory level in building energy saving governance. It is important to choose energy saving schemes that can help build the governance from scratch. This can be done with the following:

1. As process starter: ECO-budget schemes – energy management for communities.
2. Then: The energy efficiency schemes of Covenant of Mayors

Then perhaps later on:

3. The energy efficiency obligation schemes – the basic scheme.

The expected outcome:

It is relatively expensive to establish a detailed system that contains saving values, measurement and verification. And it may be difficult to establish the necessary coordination mechanisms. The alternative: ECO-budget schemes - could be a way to start the development of energy saving governance, which works from national targets, but local activities.

ECO-budget schemes could function as a starter, because the schemes deliver data and coordination through the way the system works. The ECO-budget schemes starts with budget preparation (mapping of energy consumption), setting target (target for energy saving), implementation (completion of savings), and in the end of the year accounting of the saving activities.

Through this process the ECO-budget system deliver saving values, measurement and verification through practical activities, but it also provides vertical coordination through cooperation between the multilevel governance levels.

In the first ECO-budget rounds, saving data will be limited, but through subsequent rounds and in cooperation with other urban communities, comprehensive data on saving standard values could be established.

The next step could consist of using the energy efficiency schemes of Covenant of Mayors, to finally implement the energy efficiency obligation schemes – the basic scheme.

VI.II Concrete proposal for Slovakia

Status and improvement:

- ***Saving values, measurement and verification:*** Slovakia has implemented a measurement and verification system and every measure is monitored through a system, but there is a need to further develop the system.
- ***Coordination:*** An interinstitutional group prepare, consult and coordinate documents related to EE and NEEAP, but it is needed to strengthen the vertical and horizontal coordination, especially the vertical communication flows.

Proposal for alternative energy saving schemes:

The proposed schemes should contribute two things simultaneously: On the one hand, to energy savings, and on the other hand, to development of the energy saving governance: Improvement of measurement & verification, coordination mechanisms and capacity building.

Slovakia has begun to implement the energy saving requirements according to Article 7, but clearly needs to increase vertical coordination – that is the communication - to be able to »... to engage with various stakeholders such as non-state actors, civil society and business«.

This process could be promoted by choosing the following alternative schemes for energy savings as a process development:

1. As process starter: ECO-budget schemes – energy management for communities.
2. Support for the ECO-budget schemes: Taxation and subsidy
3. Then: The energy efficiency obligation schemes – the basic scheme

4. Maybe later on: The energy efficiency schemes of Covenant of Mayors.

Slovakia is not in the same situation as Lithuania. Slovakia has developed an M&V scheme (measurement and verification scheme), although further development may be needed, according to the national workshops. Slovakia has also established an interinstitutional preparing group. The main problem is the vertical communication flow. How do you get data and tools communicated to two institutions who are supposed to implement the energy savings?

The ECO-budget system could act as an intermediary. The idea could be to develop a guideline for the use of ECO-budget schemes (or The Aalborg Commitment). The guideline should contain data from the already development measurement and verification system. Through this approach the ECO-budget scheme delivers vertical coordination by creating a channel between the national authorities and local authorities.

The implementation of the ECO-budget schemes could be supported financially: There is a well-developed cooperation between the ministries on financial mechanisms aimed at energy savings. Financial support for energy savings could be even made more targeted through the combination of M&V system, the guidelines on M&V and ECO-budget schemes.

The next steps in development of the energy multilevel governance in Slovakia could be the energy efficiency obligation schemes – the basic scheme or the energy efficiency schemes of Covenant of Mayors – or both.

VI.III Concrete proposal for FYR Macedonia

Status and improvement:

- ***Saving values, measurement and verification:*** Macedonia has implemented a measurement and verification system with two voluntary software solutions for M&V (measurement and verification). One of the tools is a software solution, used by the local authorities. M&V schemes are in line with the requirement of NEEAP.
- ***Coordination:*** The horizontal coordination is lacking, among others due to lack of responsibility, lack of institutional capacity, lack of vertical integration between institutions, and no official format for data collection. Horizontal coordination is also inadequate, mainly due to lack of capacity.

Proposal for alternative energy saving schemes:

Macedonia has completed to implement the energy saving requirements according to Article 7, but clearly needs to increase coordination mechanisms. At the national workshop 75% of participants wanted to use alternative systems rather than the energy efficiency obligation schemes (the basic scheme). The following alternatives were mentioned: Energy and CO2 taxes, financial subsidy schemes, voluntary agreements, standards/norms for energy efficiency, and energy labeling schemes. At the workshop there was agreement to try all the alternative schemes mentioned in the introduction (see appendix).

Taxation and subsidy raises the following problem: How can *taxation and subsidy* meet the method requirements for setting energy saving values on the one hand and the requirements for measurement and verification on the other hand. It has been shown in the review of the alternative (see appendix) that taxation cannot function as a full-fledged option; but the use of subsidies can.

At the workshop there were also wanted alternatives focusing on training and education, including advisory programs. If based on this wish, it will be obvious to choose energy saving schemes that contain a high level of training and education. Against this background, it could be an idea to choose the following alternatives:

1. The energy efficiency schemes of Covenant of Mayors
2. ECO-Budget schemes – energy management for communities.
3. The energy efficiency obligation schemes – the basic scheme
4. Taxation and subsidy.

The two schemes - Covenant of Mayors and ECO-Budget - have a high level of training and education. Training is a prerequisite for the functioning of the two systems. The office of The Covenant of Mayors has prepared a comprehensive document, training materials and guidelines designed to establish Covenant of Mayors step by step. The same applies to ECO-Budget and Aalborg Commitment Implementation Guide.

They are both voluntary systems, and they will be able to provide the training and education needed to develop vertical coordination in a direct and less resource-consuming way in comparison with the energy efficiency obligation schemes.

Covenant of Mayors and ECO-Budget will be able to create **a development process** that naturally can be expanded through the implementation of the more specific scheme as the energy efficiency obligation schemes and Taxation and subsidy.

VI.IV Concrete proposal for Croatia

Status and improvement:

- **Saving values, measurement and verification:** Croatia has fully implemented a measurement and verification system. A system with 10,000 energy saving measures have been inserted, and 30 national action plans were adopted in 2016. Further improvements on the local and regional level will be developed in order for the system (SMIV) to have access to fully fledged and complete data.
- **Coordination:** Croatia have a well developed vertical coordination mechanism in shape of coordination bodies between national and regional level, and many regional energy and development agencies help the local community to implement energy efficiency measures. The local authorities are thus involved, but without obligations. The horizontal coordination is weak and time consuming and need improvement.

Proposal for improvement of the energy saving schemes:

Croatia has to a large extent a full implementation of The energy efficiency obligation schemes – the basic scheme in accordance with Article 7 of the Energy Efficiency Directive. Horizontal coordination could be improved. This leads to the following considerations specifically addressing The energy efficiency schemes of Covenant of Mayors (CoM).

In the CoM system action plans have been prepared for more than 7,500 municipalities and urban communities in the EU, corresponding to 44% of the EU population. Croatia have 62 local action plans. The same goes for Latvia with 20 action plans; Greece has 118. In Germany there are 59 action plans, Austria has 12 and Denmark has 36 plans. CoM deals with both energy saving and conversion to renewable energy. CoM has proved to be a major asset, and it could be an advantage to work with horizontal coordination at both national, regional and local level. These considerations lead to the following concrete proposal for Croatia:

1. The energy efficiency obligation schemes – the basic scheme, which is largely fully implemented.
2. The energy efficiency schemes of Covenant of Mayors
3. Taxation and subsidy.

It is expected that the involvement of Covenant of Mayors planning scheme in the energy efficiency scheme may have two important effects that are linked to horizontal coordination. First, it can contribute to creating a higher level of local-level commitment through the CoM's planning and verification schemes. Secondly,

it can create a horizontal coordination on the local level which may provide a basis for more efficient horizontal coordination at national level.

Even the best plans, the best proposals for energy saving measures, require adequate financial incentives. This is why taxation and subsidy (especially subsidy) could be added to ensure the implementation of the many energy saving measures produced by the energy efficiency obligation schemes.

VI.V Concrete proposal for Latvia

Status and improvement:

- **Saving values, measurement and verification:** Latvia has a measurement and verification system, but it is mainly used for the national green investment scheme and EU Funds co-financed projects. There are several needed improvements: IT tools, involvement of local authorities and other sectors than buildings should be integrated. An energy saving catalog has been developed (see above in p. 41).
- **Coordination:** The horizontal coordination especially at the ministry level should be improved (including internal cooperation in Ministry of Economics). It is needed to create motivation for local municipalities to elaborate high quality energy efficiency plans. The expected savings towards 2020 should be based on alternative measures.

Proposal for alternative energy saving schemes:

The proposed schemes should contribute two things simultaneously: On the one hand, to energy savings, and on the other hand, to development of the energy saving governance: Improvement of measurement & verification, coordination mechanisms and capacity building.

Latvia has a broad perspective on energy saving activities and the need for development of the vertical and horizontal coordination. All of the energy savings already made are provided through alternative schemes. The development of energy saving governance that can cover the different needs and help to solve the outlined issues, could be based on the following alternative scheme:

1. The energy efficiency schemes of Covenant of Mayors
2. ECO-budget schemes – energy management for communities
3. IED /IPPC – Industrial energy efficiency
4. Taxation and subsidy

and partly:

5. The energy efficiency obligation schemes – the basic scheme.

Following the information at the National Workshop, there are very limited solutions for saving data, measurement and verification as well as horizontal and vertical integration.

The above suggestions should step by step help to build a comprehensive energy efficiency multilevel governance system. The ECO-Budget scheme can be used to build all three main elements. If ECO-Budget schemes were implemented in a number of major cities, it could contribute to: a) Standard saving values, measurement and verification; b) Vertical integration on all dimensions local-regional-national; and c) Horizontal verification, especially at regional and local level. The horizontal integration, especially at regional and local level, is a decisive thought in the ECO-Budget system and, in particular, in the Aalborg Commitment (see appendix).

It is also obvious to try to integrate the Covenant of Mayors into the stepwise process of building up energy efficiency governance in Latvia. Lessons learnt and activities from the 20 municipalities and communities who today have established Covenant of Mayors plans could especially contribute to the development of the vertical integration. The scheme on IED /IPPC – Industrial energy efficiency could have the same function, especially to motivate the major energy consumers and energy producers to develop energy efficiency improvement plans.

The new approaches related to taxation and subsidies could be found in addition to existing co-financing of the energy efficiency investment projects.

VI.VI Concrete proposal for Greece

Status and improvement:

- ***Saving values, measurement and verification:*** Greece has no national M&V system. However, bottom-up methodologies are used to implement energy savings, based on energy performance data (EPC) for the specific buildings. The estimated savings are based on specialized calculations using specific reference values. From the national workshop it is noted that a homogeneous measurement and monitoring framework is lacking.
- ***Coordination:*** The national workshop concluded that there is an absence of an integrated coordination mechanism to facilitate the design and implementation of energy efficiency measures within the framework of the Energy Efficiency Directive. The vertical coordination are mainly using top down procedures. There are no specified obligations for regional and local authorities. The horizontal coordination is very limited.

Proposal for alternative energy saving schemes:

Greece has focus on the framework of the Energy Efficiency Directive, but there is a need to develop: a) Saving values as a general system, measurement and

verification schemes, b) Vertical coordination, and c) Horizontal coordination. The development of the three elements could be supported by some of the following alternatives, especially the Covenant of Mayors. The proposal is here:

1. The energy efficiency schemes of Covenant of Mayors – the SEAP's
2. ECO-budget schemes – energy management for communities.
3. Taxation and subsidy, including innovative financing/saving schemes (ESCO).

and then the full implementation of:

4. The energy efficiency obligation schemes – the basic scheme.

Greece has 118 SEAP's in municipalities and larger cities. The SEAP's and the Covenant of Mayor (CoM) are expected to contribute to the establishment of vertical integration. SEAP and CoM can provide the basis for involvement of local and regional authorities in an energy efficiency multilevel governance system. The SEAP's are an important asset, but two improvements are needed: a) Standard values for energy saving; b) Building up the vertical integration of the national level.

Standard values for energy saving: The Covenant of Mayor does not use standard values for energy savings, but it works with a 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). This action plan – the SEAP, includes among others specific suggestions for saving energy. It would be beneficial for all Greek SEAP plans if a general methodology were developed based on specific reference values. SEAP allows innovative systems, such as development of ESCO as integrated energy saving and financing.

Building up the vertical integration of the national level: 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, networking between the municipalities, etc. to create a full fledged vertical coordination could be from the national level actions to link the local and regional actors to state level. The national level could take the initiative to link local and regional actors to state level to create a full-fledged vertical coordination.

In this way, the existing activities - the 118 SEAPs - could provide the basis for the development of standard values, measurement & verification and coordination. SEAP's are used to start **the governance development process** that can later on lead to a fully developed energy efficiency obligation scheme.

VI.VII Concrete proposal for Germany

Status and improvement:

- **Saving values, measurement and verification:** Germany is assessing all energy efficiency instruments in regular intervals in order to allow redesigning of the instruments. There is a great focus on cost-effective monitoring of energy efficiency, both on the federal and the state (countries) level. The ongoing monitoring and verification of energy savings includes the introduction of an IT tool, although IT tools are not generally perceived as cost-effective.
- **Coordination:** The vertical coordination is determined by a formal division of competence between the federal government and federal state level (Germany is divided into 16 federal states, each with its own government). The majority of energy policy is decided on the national level. If local authorities are affected, coordination with representatives of local authorities will be conducted. The German formal coordination mechanism works in general according to the principle of subsidiarity.¹⁰ The horizontal coordination takes place in formal and informal settings. Due to the »Energiewende« a number of informal coordination platforms has been established.

Proposal for alternative energy saving schemes:

Germany has not fully implemented the Energy Efficiency Obligation scheme but has met the energy savings requirement in the Energy Efficiency Directive through alternative measures in line with Article 7, especially through enhance of already established energy saving measures. A number of alternative energy saving schemes has been enhanced and implemented, including:¹¹

- **Regulatory measures:** Minimum requirement in new buildings and existing stock; energy savings through renewable heating energy.
- **Investment support:** Support for energy efficient renovation and construction; investment support for municipalities and social facilities; investment support in companies; support for combined heat and power; incentive program to promote use of renewable energy in the heating market; promotion of investment in energy efficiency in commercial

¹⁰ The general aim of the principle of subsidiarity is to guarantee a degree of independence for a lower authority in relation to a higher body or for a local authority in relation to federal state or the central government.

¹¹ See Communication from the German Federal Government to the European Commission pursuant to Article 7 of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency. German Federal Government. February 2016.

refrigeration systems, micro-CHP, etc.; financing measure to promote energy efficiency in agribusiness. In addition, there are a number of other investment supports for energy efficiency.

- **Measures affecting prices:** Energy and electricity tax; toll on heavy goods vehicle; air traffic tax; emission trading.
- **Measure through information and advice:** Federal advisory program; promotion of energy management for companies; promotion of municipal concept and network for energy efficiency.

Most of the measures can be characterized as top-down measures. Since 2014, federal states have been working to identify a number of measures, which result in energy conservation, which are related to Article 7. These measures are primarily aimed at end-users in accordance with Article 7 of the Energy Efficiency Directive. Indicators and measurement and verification system have been developed.

The German governance structure is complex. There are many levels in the multilevel energy governance structure. Based on the main features and the above review of alternative measures, it might be an idea to further support a bottom-up approach, including focusing on the following schemes:

1. The energy efficiency obligation schemes – the basic scheme
2. The energy efficiency schemes of Covenant of Mayors (Germany has 59 sustainable energy action plans (SEAP's)).
3. ECO-budget schemes – energy management for communities.

As mentioned earlier, the idea of a multilevel energy saving governance is to create sufficient administrative capacity »... to engage with various stakeholders such as non-state actors, civil society and business«. (op.cit.)

The activities in article 7 may necessarily be based on a bottom-up approach. A bottom approach shall promote energy savings at the local level through specific saving values, measurement and verification systems and energy saving schemes. Such development could be strengthened through a more widespread use of the Covenant of Mayors schemes and through the use of energy management at city or municipal level (ECO budget schemes). Both are expected to be able to act as intermediaries and provide a strengthened local effort.

The two schemes are expected to create the **process** leading to a full multilevel energy governance system.

VI.VIII Concrete proposal for Austria

Status and improvement:

- ***Saving values, measurement and verification:*** Austria has in 2014 introduced an energy efficiency obligation schemes to implement the Energy Efficiency Directive. The energy savings are verified by means of plausibility checks. Selected projects are verified through site visits. The Austrian MPV system is designed only as a tool for data collection and evaluation. Improvement: Better access to data for the provinces and for local level. The funding system and financial support for energy-saving should be integrated in the Austrian M&V system (see below).
- ***Coordination:*** No formal coordination exists neither on vertical nor on horizontal level, however informal coordination takes place. The horizontal coordination takes place at the national level through cooperation among ministries. There is no vertical coordination bodies or forums, however the provincial level is usually represented in task forces, strategy coordination groups, etc. On the other hand, regional (provincial) energy strategies are formulated without the involvement of representatives from the national level. *Improvement:* Development of the vertical coordination including all levels from the national level, provincial level and the local level.

Proposal for alternative energy saving schemes:

Austria is working on two fronts. On the one hand, the basic scheme: The energy efficiency obligation schemes are implemented. On the other hand, alternative measures are used, based partly on existing and partly expanded on completely new measures.

The following five energy saving measures are the most important alternative measures, and are used as a contribution to the requirements of article 7 in Energy Efficiency Directive:¹²

- Subsidy schemes for residential buildings
- Domestic environmental support scheme (UFI)
- Energy Taxes
- Federal highway toll
- Green electricity support.

¹² See »Energy Saving Policies and Energy Efficiency Obligation Scheme. Report on Alternative schemes to Energy Efficiency Obligations under Article 7 implementation. Austria; ENSPOL, March 2015, p. 2.

As noted, there is a lack of vertical integration between the different levels: The state level, the provincial level, the local level and the obligated parties (that is: all retail energy sales companies selling more than 25 GWh). It is expected that the development of this multilevel energy saving governance system could be further developed with focus on the following schemes and initiatives:

1. Further development of the The energy efficiency obligation schemes (the basic scheme) and integration with the alternative schemes.
2. Further development: Taxation and subsidy (the five measures), integrated and supportive for the basic schemes: The energy efficiency bond schemes.
3. Focus on voluntary energy efficiency schemes: a) The energy efficiency schemes of Covenant of Mayors, or ECO-budget schemes – energy management for communities or even better: The Austrian **e5 Programm** für energieeffiziente gemeinden.

This mix of programs is expected to contribute to stronger vertical coordination among the various government levels, better flow of information, and thereby contributing to a **governance development process** in which EU goals and national targets are transfor-med into action by all energy efficiency agents.

VI.IX Concrete proposal for Denmark

Status and improvement:

- **Saving values, measurement and verification:** Denmark has implemented standard values for energy-saving measures, and has established a measurement and verification system based on sampling checks by national authorities. This scheme is a full implementation of The Energy Efficiency obligation Scheme (EEOS), and has been under development since 2006. The scheme is not completely cost effective; there is a need to reduce the administration cost. There is also a need for the development of a national reporting system to avoid double reporting of energy savings.
- **Coordination:** There are no formal coordination mechanisms. The large energy companies make the rules together with the Danish Energy Agency on standard saving values and the M&V. Lack of vertical coordination between the national le-vel and various stakeholders, including the municipalities, is estimated to have a negative impact on the further development of this scheme. There are some vertical coordination among the Ministry of Finance and Ministry of Energy. Horizontal coordination at regional and local level is only available in very limited terms.

Proposal for alternative energy saving schemes:

Proposals for the development of the existing energy saving system are based on four different issues: (a) the effectiveness of the existing EEOS is estimated to decline in recent years. The 'low hanging fruits' are picked. (b) The EEOS should be developed through the establishment of both a vertical and a horizontal coordination with the different voluntary energy efficiency schemes. (c) There is a need to assess EEOS in relation to the additionality, including side effect on the energy transition to renewable energy. (e) The major requirements for energy efficiency up to 2030 will also require the development of new forms of financing and technologies.

Based on these considerations, the concrete proposal for the development of the energy efficiency could be based on the following of the seven schemes:

1. Further development of The energy efficiency obligation schemes (EEOS).
2. Integration of the EEOS in The energy efficiency schemes of Covenant of Mayors.
3. ECO-budget schemes. In Denmark there is a similar scheme called strategic energy planning containing both energy efficiency and transition to renewable energy.
4. Taxation and subsidy-especially subsidies to promote greater energy efficiency programs.
5. Technology support.

Nearly 40% of the municipalities have prepared SEAP under the covenant of mayors. There are thus great opportunities to further develop the bottom-up approach through a horizontal integration between SEAP and the energy companies committed through EEOS. The same goes for the strategic energy planning; the majority of the Danish municipalities have developed long-term strategical energy plans, based on principles like the ECO-Budget schemes.

The additionality issue requires that energy-saving measures should be assessed based on their overall impact, for example both macroeconomic development, industrial productivity, employment, impact on transition to renewable energy, security of supply, resource management, energy prices, greenhouse gas emission, etc. It is unconditional a challenge to incorporate these aspects into setting up the future energy saving measures.¹³

The development of a horizontal integration between for instance SEAP and EEOS - between the Covenant of Mayors and The energy efficiency obligation schemes - are also expected to provide the basis for the development of **vertical**

¹³ See Energy efficiency indicators. International Energy Agency, IEA 2016.

integration, involving all governance levels and all relevant stakeholders. Or in short: This could contribute to a new **multilevel energy efficiency governance** system.

VII Annex

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.

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 achieved¹⁴.

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.

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).

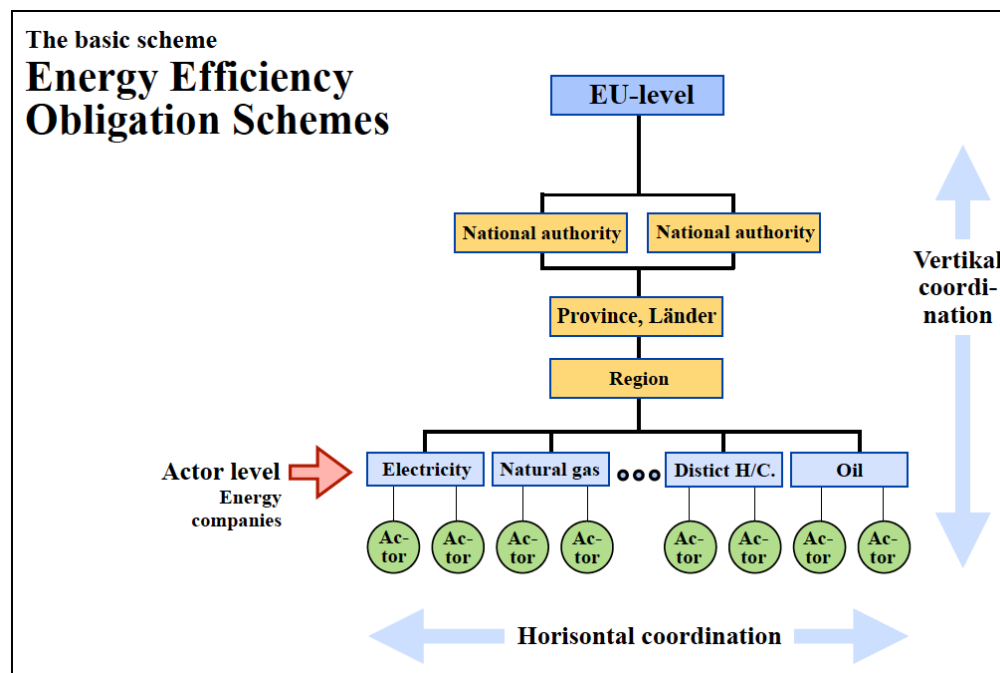
It is not always possible to set standard saving values, because the savings potential can be linked to specific conditions. However, specific values must be calculated according to the same principles and in such a way that the same measurement, control and verification methods can be used. It points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

¹⁴ 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.

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



The 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)

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.

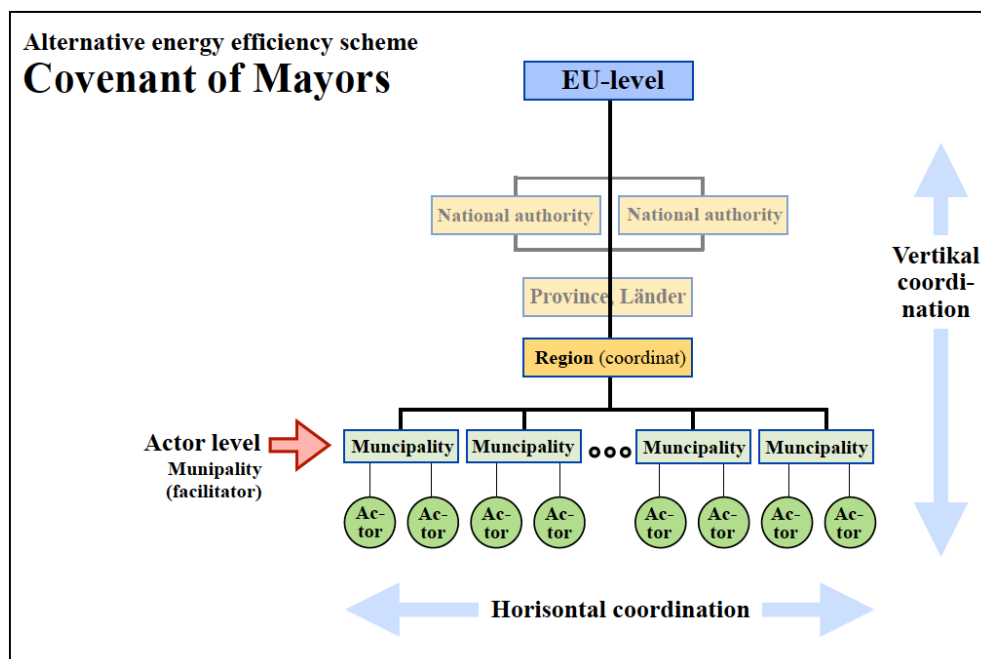
3. Saving values, measurement and verification: As mentioned earlier if an alternative to the basic system is used, member states must explain how to achieve a similar level in energy efficiency, and in monitoring and verification. In the following, it is therefore necessary to assess how *The Covenant 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



The 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).

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.

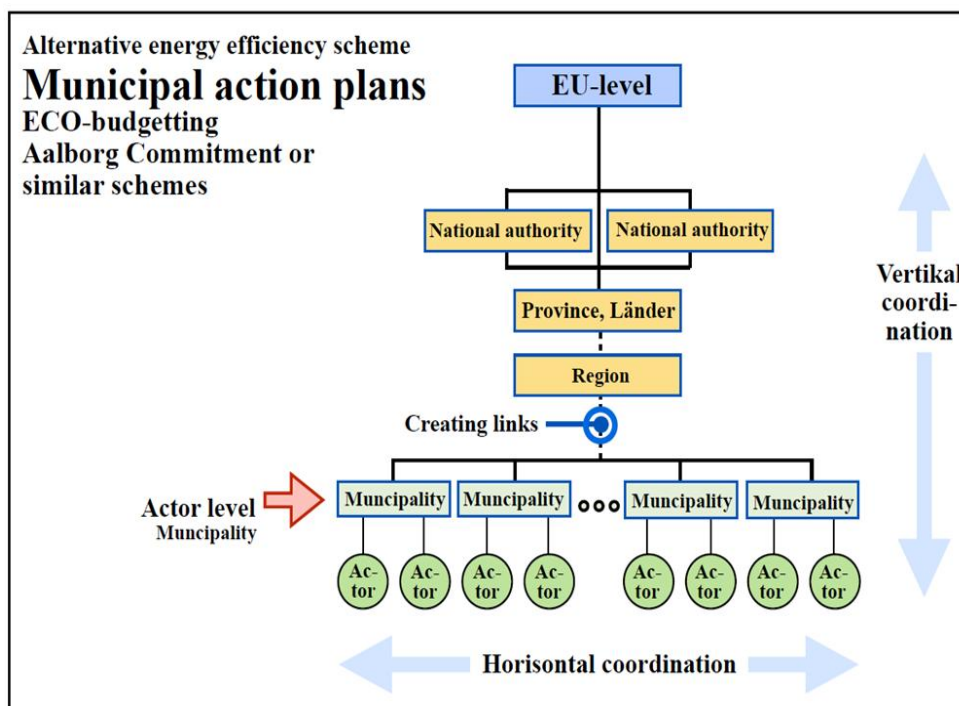
3. Saving values, measurement and verification: As mentioned earlier, if alternatives to the basic system should be used, member states must explain how to achieve a similar level in energy efficiency, and in monitoring and verification.

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



The 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, which 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.

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 CO₂ 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.¹⁵ 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

¹⁵See Quick Reference Guide. Financing Opportunities for Local Climate & Energy Actions (2014-2020). Covenant of Mayors.

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.

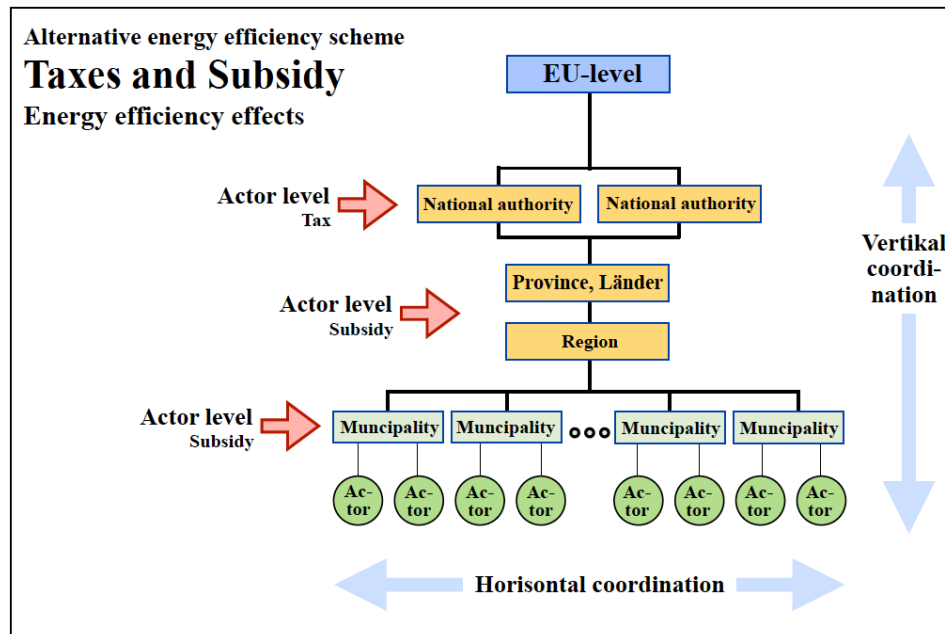
Subsidy: If the grants are linked directly to the above mentioned data set over energy savings (standard saving values), a subsidy scheme will be able to meet the requirements as an alternative to the Energy efficiency obligation schemes.

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.

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



The 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.

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 schemes, 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.

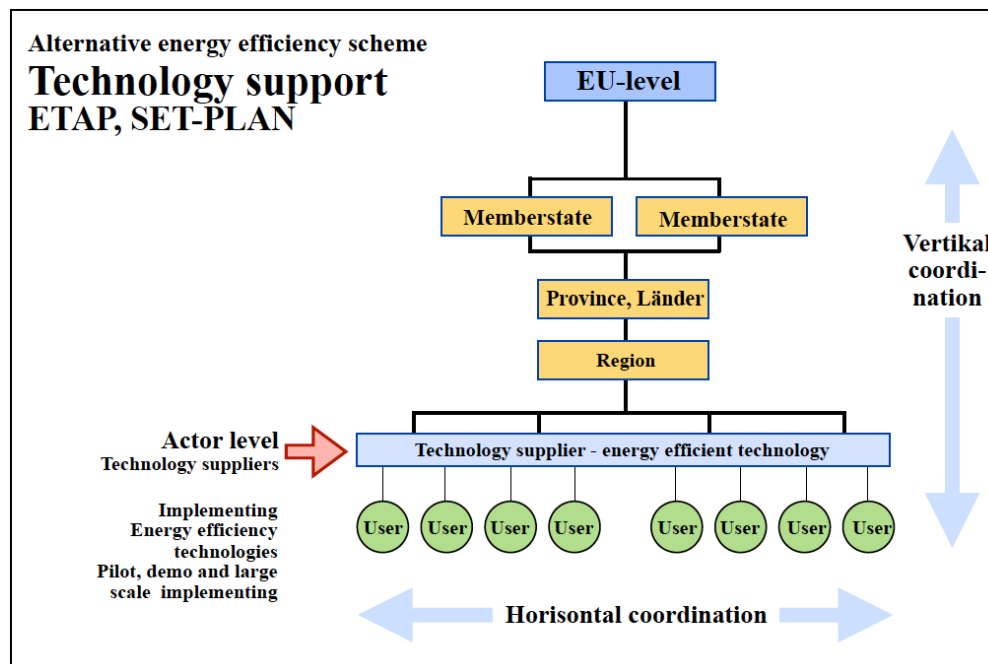
3. Saving values, measurement and verification: As mentioned earlier if an alternative to the basic system is used member states must explain how to achieve a similar level in energy efficiency, and in monitoring and verification. In the following, it is therefore necessary to assess how *the different 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)



The 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.

ECO-Labeling

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

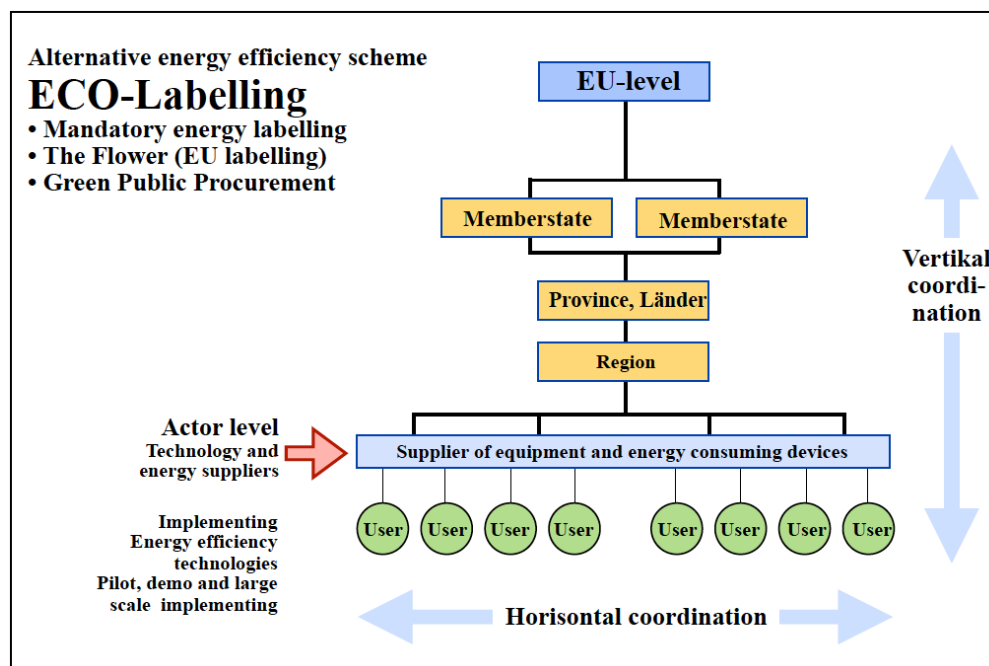


Figure 6 shows that the important actor level is the supplier of equipment and energy consuming devices. The scheme is relatively simplified because it consists of only three levels: the EU, equipment suppliers and end-users

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.

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.

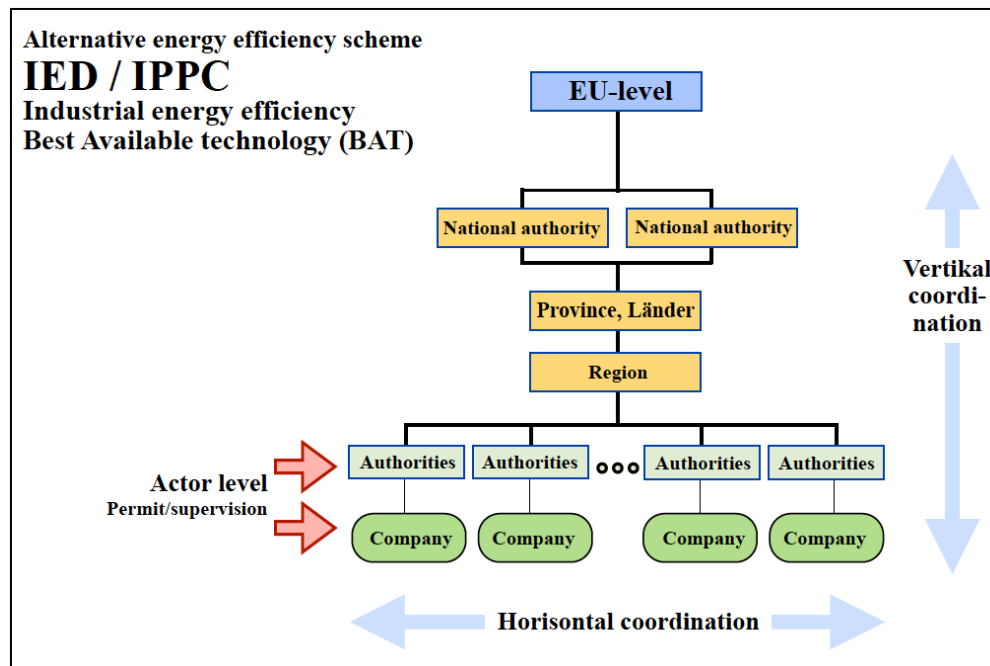
Saving values: The BREF document does not contain specific data or data sets on energy efficiency, but it points to the use of three types of data sets that could be used to determine potential efficiencies: (1) Specific data mainly from energy-intensive industries, for instance glass, chemicals, metallurgy. (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



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



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