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## **BOOSTING ENERGY EFFICIENCY: HOW CAN LOCAL COMMUNITIES CONTRIBUTE?**



**Public Dialogue**  
on the Sustainable Use of  
Energy in South-East Europe

**Skopje, November 2013**



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## **I M P R E S S U M**

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## List of Abbreviations

European Union – EU
European Commission – EC
European Parliament – EP
Energy Community – EnC
Republic of Macedonia – RM
National Action Plan on Energy Efficiency – NAPEE
Public Private Partnership – PPP
National Fund for Energy Efficiency – NFEE
Renewable Energy Sources - RES
Energy Efficiency - EE

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## **1 Energy Efficiency in the European Union**

### **1.1 Challenges and strategic approach**

Faced with huge challenges in the fields of energy supply and energy consumption especially in the last two decades, the European Union (hereinafter: EU) was forced to undertake various activities and implement measures in order to sustain its development. Namely, even in late nineties of twentieth century, different studies, statistical researches and other scientific surveys indicated unprecedented energy challenges emerged from import dependency and increasing energy demand. At that time, the European Union was able to satisfy only 50% of the energy needs from its own resources. Bearing in mind rapidly increasing final energy demand, statistical estimations showed that energy import (which amounted 6% of the overall trade balance of the European Union) will increase from 50% to 70% by 2030. Such energy dependency entails economic, social, environmental and geopolitical risks for EU, as well. Besides that, actual energy consumption causes a vast number of other side effects reflected in environmental pollution, global warming, increasing of Green House Gasses (GHG) emissions, insecurity of supply, weakening of competitiveness of the Union's economy, etc.

Keeping that in mind, the Union was forced to develop strategies, action plans, and various policy tools with the sake of putting under control rapidly increasing energy consumption. At the early stages of this fight against wasting of energy, potential of more than 20% savings by year of 2020 was identified. The Union's inability to use energy efficiently amounts to more than 100 billion € annually by 2020. Nevertheless, in order to reach this ambitious target, harmonized action provided through strategic planning together with adoption of policy tools at all different levels of government and society was indispensable.

In parallel to preparation of legislative framework European Union is also developing comprehensive strategic framework which reveals essential constraints and challenges for the Union. Both of these approaches – strategic and binding (legal) simultaneously serve to achieve assessed potentials and defined targets. While legal framework sets binding obligations and introduces rules, sets the borders, and codes of conduct, strategic framework identifies essential constraints which impede sustainable development and jeopardize economic growth. Then the

developed strategies try to find solutions, recommend directions and set up concrete targets recommending measures to be implemented toward achieving these targets. Strategic framework of the European Union was developed very intensely during the last decade, providing significant changes and ensuring policy steering in the intended direction. Several of these important strategic documents which shaped future EU development in the field of energy efficiency deserve to be mentioned and will be briefly presented in this policy paper.

One of the first important documents which paved the way for the development of energy efficiency policy in the European Union was "**The Green Paper towards a European strategy for the security of energy supply**" adopted by the European Commission on 29th November 2000 (COM (2000) 769).

This Green paper identified the main problems of energy supply of that time. At the beginning it recognized growing European energy dependence in the future and all the risks that it brings. It emphasized that present import of energy products of 50% may be increased up to 70% in the next 30 years. Having in mind that costs for energy carriers are at the mercy of erratic variations in international prices, and that prices of crude oil are tripled since March 1999, it was clearly recommended to launch an all-encompassing fight on the energy demand side. In this document special attention was given to environmental concerns with regards to the risks caused from the production, distribution and consumption of energy from fossil fuels. Unfavourable energy mix of 2000 (chart 1) and even worse predicted future ratio in share of energy produced from fossil fuels in 2030 (chart 2) put the topic of environmental protection at one of the most important places of the document.

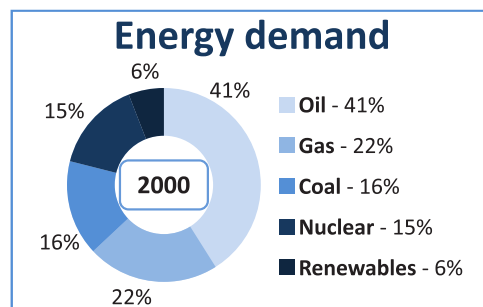


Chart 1: Energy mix in the European Union - 2020

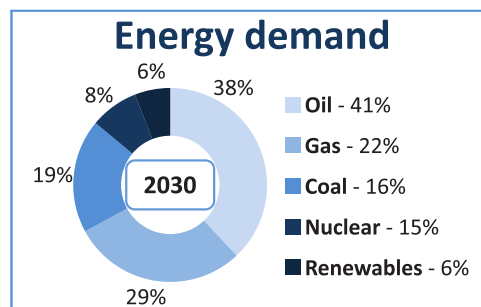


Chart 2: Forecasted energy mix for 2030 in the European Union

Having in mind all mentioned above, the Green Paper calls for intense actions in these three fields:

- Clear actions in favour of a demand policy; since activities on supply side are difficult to achieve, demand side appears more promising;
- Real and tremendous changes in consumers behaviour, as a tool to provide demand changes;
- Fight against global warming with regard to supply through fostering the development of new and renewable energy facilities.

In the previous decade European Commission adopted three Actions Plans which presented the basic barriers for further development of energy efficiency and recommended concrete actions and solutions for overcoming the problems.

The first "**Action Plan to Improve Energy Efficiency in the European Community**" (COM (2000) 247) was communicated on 26th April 2000. The Action Plan is a follow-up to the Commission communication adopted in April 1998 on the rational use of energy and the Council resolution on energy efficiency. Its aim was to make better use of energy, meaning reducing energy consumption without reducing use of equipment and living or working comfort. This document put focus on two main fields of interventions: promoting behavioural changes of energy consumers at all levels and improving working methods and manufacturing techniques to less energy-intensive ones.

It proposed a wide range of instruments and actions that should provide intended results in two focus area. All of them are divided in three categories:

- Measures to integrate energy efficiency into other Community policies;
- Initiatives to strengthen and extend existing policies;
- New policies and measures.

This Action Plan actually traced the way for future development of the most important European Union legislative acts. Namely it recognized importance of regulatory framework development in the fields of:

- Household appliances, commercial and other equipment (providing modern schemes for labelling systems and minimum standards for energy efficiency);
- Energy efficiency in buildings (the Action plan proposed amending one of the key directives in this area, Directive 93/76/EEC on the energy certification of buildings and established precondition for

development of the most recently adopted Directive 2010/31/EU on the Energy Performance of Buildings);

- Promotion of energy efficiency in public procurement;
- Energy audits in industry and in tertiary sector.

The second “**Action Plan for Energy Efficiency**” was communicated by the Commission on 19th October 2006 (COM (2006) 545). This document introduced a new contemporary view on problems and offered solutions for the European Union in the period that followed. One of the main aims of this act was achieving a 20% reduction in energy consumption by 2020. The Action Plan includes modern approach and measures to improve the energy performance of products, buildings and services, assuring effective production and distribution processes, to reduce the impact of transport on energy consumption, to facilitate financing and investments in the sector, to encourage and consolidate rational energy consumption behaviour and to step up international action on energy efficiency.

The Action Plan tried to mobilise all relevant stakeholders (the general public, policy makers and market actors) in order to transform the internal energy market. This Plan, as well as the previous one puts emphasise on energy efficiency techniques, consumption habits and products and services which should be less energy intensive, keeping the same quality of performance and life.

The second Action Plan identified sectors with the biggest energy saving potential: residential and commercial (tertiary) buildings (27% / 30%), industry sector (25%) and transport sector (26%). If achieved these savings may provide 100 billion € decrease in energy costs each year by 2020, or 390 Mtoe (Million tonnes of oil equivalent) per year. Impact on reduction of CO<sub>2</sub> emission with this scenario would be 780 Mt less CO<sub>2</sub> produced per year.

On 8th March 2011, the European Commission adopted the Communication “**Energy Efficiency Plan 2011**” (COM (2011) 109) which represents the third such document in a row. This act also identifies concrete measures aimed to provide substantial benefits in the fields of residential buildings, business and public energy consumption. This plan promises up to 1000 € savings per household each year and boost progress of the European Union's economy through strengthening of competitiveness. This plan also foresees increasing of employment and creation of up to 2 million jobs among the European Union.

This plan promoted Energy Efficiency as a key component of European energy policy, and it served as an additional support toward EU's 20/20/20 target.

The main aims of the Plan are:

- Economic development with respect to global energy resources;
- Decreasing carbon emission;
- Increasing of energy self-sustainability at EU level;
- Strengthening of energy supply security.

Particular attention of this Action plan is given to the following activities: Improving the Energy Performance of Building concept and encouraging the low energy consumption in construction (residential and tertiary) sector, developing market for Energy Service Companies (ESCO), strengthening competitiveness in European industry, introducing Energy audits schemes, developing financial instruments and penalizing polluters, prescribing energy characteristics (labelling and eco-design) of energy related products (appliances) and introducing obligatory planning and saving targets at the Member States level.

At last, but not least, on 10th November 2010 the European Commission has adopted the Communication “**Energy 2020 — A strategy for Competitive, Sustainable and Secure Energy**” (COM (2010) 639). The purpose of this strategy was to achieve long-term impact and changes to the way in which European Union produces and consumes energy. This Strategy recognised three key sectors in which intensive actions should be taken. These are building, transport and industry sectors where the biggest potential benefits are expected in relatively short span of time.

In this document special attention is given to 5 priority areas:

- Limiting the energy use in Europe;
- Developing pan-European integrated energy market;
- Improving the role of consumers and achieving the highest level of safety and security;
- Extending Europe's leadership in the development of energy technology and innovation;
- Strengthening the external dimension of the EU energy market.

All above-mentioned strategic and planning documents represent good basis for the development of legal framework and provide orientation and guidelines for the future activities. Yet, all of them without strong legislative framework and support reflected in the set of legal acts

(directives, regulations, technical standards etc.) would be only list of good wishes. Next chapter will list and discuss the basic principles and requirements of the most important legal acts in the field of energy efficiency in the European Union.

## 1.2 Legal framework in the European Union

Besides strong strategic framework described in the chapter 1.1, the European Union required a strong legal framework which will provide preconditions and ensure exploitation of huge energy saving potential. During previous decade, starting from 2003 up to now the European Commission intensified its own activities and prepared and adopted six directives (five of them are still in power) whose role is of crucial importance for implementation of energy efficiency strategies and achievement of goals.

As an instrument for legal harmonization at the Union's level (and broader), these directives are adopted by European Parliament and by the Council providing obligation to all Member States (MS) to transpose their provisions into national legislation. All the directives have their deadlines for transposition among MS and their implementation is already in progress.

The present legal framework of EU is consisted of the five mentioned main directives which are listed below according to their dates of adoption:

### 1. Directive 2006/32/EC of 5th April 2006 on energy end-use efficiency and energy services (Energy Service Directive – ESD)

Focus of this directive is directed to final energy consumption. This legal act was one of the pillars for further development of the whole energy efficiency policy framework. The Directive introduced few new concepts which caused huge changes in the Union, but also among other – non-EU member states (see chapter 1.3). First milestone that this Directive brought was introducing obligation for MS to set up indicative energy savings target. This target for all countries should be at least 9% for the ninth year of application, calculated based on average energy consumption in the most recent five-year period previous to the implementation. The Member States are free to set even more ambitious targets if they deem it achievable. In order to ensure proper monitoring of achieved savings

according to the methodology given in Annex I of the Directive, all Member States shall assign to one or more new or existing authorities or agencies the overall control and responsibility for overseeing process and level of realization of the saving targets.

Besides that, significant changes occurred in public procurement, where all national public authorities were obliged to procure goods and services, taking into consideration energy efficiency as one of the selection criteria. This directive also tried to promote and establish market for energy services, introduced concept of high-quality energy audit schemes, fostered promotion of energy efficiency measures, introduced obligation of measuring of energy consumption by suppliers, etc. One of the main changes that considerably influenced the EU was a provision in article 14 which calls all MS to prepare and submit National Energy Efficiency Action Plans (NEEAPs) to the European Commission every three years. Such Action Plans represent basic planning documents for each Member State, where they can explain their targets, recommend measures along with explanation of possible financial resources and expected savings, as well as monitoring methodology and results achieved in the period prior to NEEAP.

According to that, we can extract two main purposes of this legal act:

- To provide necessary indicative target, as well as mechanisms, incentives and institutional, financial, and legal framework to remove all market barriers which may impede efforts in the area of energy end use efficiency;
- To create preconditions for the development and promotion of a market for energy services and for the delivery of other energy efficiency improvement measures to final customers.

This directive tackled particularly public sector, since it is recognized as a sector with the biggest imperfections, and of course, with the biggest potential for achieving energy savings in short period of time, playing the exemplary role to all other actors at the same time. In order to ensure exemplary role, all implemented energy efficiency measures, actions, solutions, financial sources, incentives etc. shall be effectively and permanently communicated to citizens and/or companies as appropriate.

The new rules in the area of energy supply are also introduced by this document. Namely, the present rules for energy distributors and energy sales companies, widely implemented nowadays throughout the European Union, and even in the region, emerged from this directive.



Actually the Directive strives to establish preconditions for metering of real energy consumption of all end energy users. Directive also sets the rules for accurate billing based on actual energy consumption in defined period of time. Energy distributors are also obliged to provide set of necessary information (printed on the energy bills) including data on consumed energy in the same period of previous year, as well as average energy consumption information for specific category of buyer.

Energy Service Directive caused numerous positive changes in the area of energy end-use efficiency during eight years long period of its implementation.

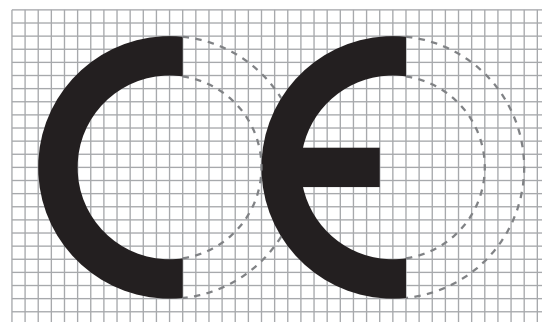
## **2. Directive 2009/125/EC of 21st October 2009 establishing a framework for the setting of eco-design requirements for energy-related products (Eco-design Directive)**

This directive establishes the framework for the setting of eco-design requirements for energy related products. The purpose of this directive is to ensure the free movement of such products (covered with this directive and other related regulation) within the internal market.

The term "eco-design" reflects the whole process of product design in such way to ensure that this product causes minimal energy consumption through its whole life cycle (design, production, usage and disposal). Other specific term "energy -related product" covers not only products that consume energy for its operation, but also goods that indirectly influence energy consumption (like windows for buildings, water taps, shower heads etc.).

The Directive sets framework for market rules and specific roles and obligations for member states, producers, distributors and dealers of products as well as for all other actors in the market chain. This directive influences only products that are covered by "implementing

measures" (additional regulation that sets out specific technical requirements for certain groups of products like household lamps, televisions, electric motors etc.). Prior to be placed on the market and/or to be put into service, energy related products



Picture 1: CE marking

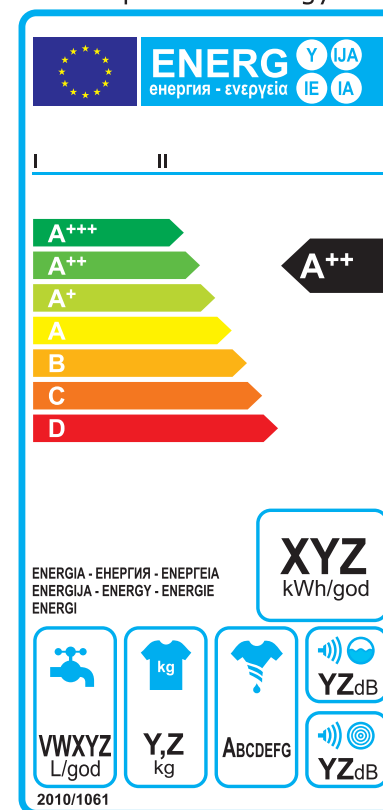
covered by implementing measures must fulfil certain requirements. If products covered by this regulation comply with those requirements they shall be properly marked and bear CE marking (picture 1) in accordance with this directive. Besides CE marking such products shall have issued EC declaration of conformity, whereby the manufacturer or its authorised representative ensures and declares compliance of the product with all relevant provisions.

## **3. Directive 2010/30/EU of 19th May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products (Energy Labelling Directive-ELD)**

This Directive establishes a framework for labelling of energy related products with the purpose of providing standard information on consumption of energy and other resources. Establishing a framework

means that it does not specify any limits or performance levels itself. This Directive just provides preconditions and legal basis into which other directives and regulations can be introduced and sets out performance levels for specific groups of appliances (washing machines, tumble-dryers, refrigerating devices, air-conditioners, televisions, dishwashing machines and other groups of appliances).

Mentioned labelling schemes shall allow consumers to compare products according to their energy needs during operation period. On that way consumers should be given a chance to choose and buy more efficient products which will save energy and costs during its operation period. This framework aims to somehow discriminate those products with unnecessarily higher energy consumption, resulting in eventually being withdrawn or decommissioned. These labelling schemes shall apply only for products which are covered by other related directives and



Picture 2: Example of energy label for washing machine

regulations which define certain requirements and methodologies for energy classification. Only products which have a significant direct or indirect impact (energy –related products) on energy consumption are covered by specific directives (so called delegated acts) and appropriate regulation.

This directive introduces obligation for all actors in the market chain, Member States, producers, suppliers and dealers ensuring free movement of product properly marked by energy label. Directive also calls public bodies to endeavour to procure only products which are properly marked (meaning that they are in compliance with the requirements) and possibly have the highest performance and belong to the best energy efficiency class.

#### **4. Directive 2010/31/EU of 19th May 2010 on the energy performance of buildings** (Energy Performance of Building Directive-EPBD)

This directive introduced obligation for all the Member States to apply minimum requirements as regards the energy performance of new and existing buildings. Energy performance of a building is expressed in absolute number representing annual energy needs or consumption of the building per square meter, expressed in (kWh/m<sup>2</sup>). Beside concept of minimal energy performance for new and existing buildings, this act introduced schemes for building certification as well as obligation to perform regular energy audits of heating and air-conditioning systems depending on their threshold effective rated outputs.

Special attention is given to this directive in the European Union taking into account that building sector is responsible for approximately 40% of the Union's total energy consumption. Thus, building sector is recognised as one of the most promising areas for achieving huge energy savings contributing at the large scale to reaching 20% of energy saving target defined in European Union's energy efficiency strategies explained in chapter 1.1.

The key aim of the Directive is to promote the improvement of the energy performance of buildings, taking into account outdoor climate and local conditions, indoor climate requirements, as well as cost effectiveness as one of the basic principles for setting out the minimum energy performance requirements.

The act is divided in several chapters covering the most important areas of possible intervention. The first part defines methodology for

calculation of minimum energy performance, which is further explained in Annex I of the Directive and covers the following aspects:

- Actual thermal characteristics of the building;
- Heating installation and hot water supply;
- Air-conditioning installations;
- Natural and mechanical ventilation;
- Built-in lighting installation;
- The design, positioning and orientation of the building;
- Passive solar systems and solar protection;
- Indoor climatic conditions;
- Internal loads.

The second and the third part cover application of minimum requirements to the energy performance of new and existing buildings (that are subject to major renovation), as well as their building elements and units.

The fourth part puts emphasis on the national plans for increasing the number of Nearly Zero Energy Buildings (NZEBs). The term nearly zero energy building represents building with high energy performance, where the most of energy needed is produced from renewable energy sources on site, and needs for rest quantities (small amounts – up to 15%) of energy are satisfied from outside.

Next part introduces and elaborates process of energy certification of buildings and building units.

This directive (unlike its previous version from 2002) extends obligation of performing regular energy inspections to whole heating and air-conditioning systems. The thresholds of effective rated output defined in previous EPB Directive remained the same, 20 kW for heating and 12 kW for air-conditioning systems, respectively.

Last part of this document establishes independent control system for energy performance certificates and inspection reports, providing their accuracy and objectiveness during carrying out energy audits.

Despite a lot of efforts, international support through various funds and institutions, in countries in the region these certification schemes did not yet implement in their full extent.

#### **5. Directive 2012/27/EU of 25th October 2012 on energy efficiency** (Energy Efficiency Directive-EED)

The Energy Efficiency Directive is the most recently adopted one from set of five main directives covering energy efficiency area. This act is

all-encompassing document which offers one broader view to energy efficiency issues. It tried to gather provisions from several legal acts repealing or amending some of them. The Energy Efficiency Directive repeals above-mentioned directive on energy services (2006/32/EC) and Directive 2004/8/EC on cogeneration. Both directives are repealed from 5th June 2014 but the EED already undertook or even improve their provisions.

Unlike the previous (Energy Service Directive) the new Energy Efficiency Directive covers not only final energy consumption, but energy efficiency at supply side, as well.

This Directive establishes a common framework of measures for the promotion of energy efficiency among the European Union. The act offers additional legal support to achieve 20% by 2020 energy saving targets, since surveys and researches showed that this ambitious target most likely will not be achieved by regular existing means and tools. This directive also attempts to remove barriers that impede further development of energy efficiency concepts, at the same time providing to pave the way for continuation of energy efficiency improvements beyond 2020.

Its several chapters are covering basic areas of possible intervention. The first part establishes new energy saving targets, overcoming the one set out by Energy Service Directive. Thus, directive sets the maximal (allowed) energy consumption as a target for the Union as a whole at a level of 1474 Mtoe of primary energy by 2020.

Building renovation is the second key part of this directive. This part calls the Member States to prepare national strategies for mobilizing investments for renovation of residential and commercial buildings.

In order to strengthen the exemplary role of public sector in comparison with requirements set out in the Energy Service Directive, this directive introduces obligation of renovation of at least 3% of useful floor area of buildings occupied by central government bodies. This requirement caused big discussion even at the European Union's level, and many constrains about possibility of its implementation have been mentioned during the process of preparation of directive.

Public bodies are tackled by this directive, also. Its provision obliges public institution to purchase only products, services and buildings with the highest energy efficiency performance.

This directive introduces energy efficiency obligation schemes, as

a pretty new requirement for energy suppliers and distributors. These schemes call energy companies to decrease the quantity of delivered energy to their final customers by 1.5% annually.

In this document particular attention is given to the energy audit schemes which shall be developed in all Member States and offered under reasonable and competitive prices to all final customers.

Metering of actual energy consumption and providing of certain (required) information on energy bills are also part of this directive. This requirement is undertaken and upgraded from the Energy Service Directive.

On the energy supply side this directive promotes possible application of high efficiency cogeneration, as well as efficient heating and cooling, as a solution for improvement of energy efficiency in energy production and supply.

In the last part of the document the Directive promotes market for energy services, availability of qualification, accreditation and certification schemes, as well as information, training and knowledge dissemination.

Besides these five main directives which create the basic energy efficiency legal framework in the European Union, the European Parliament and the Council adopted more than 30 other supplementing directives, implementing measures and regulations which all together represent this very complex and sophisticated system of legal acts. All these regulations set up technical and other requirements for certain groups of products (especially for eco-design and energy labelling). Regulation and implementing measures, as acts of legal unification (unlike directives which serve for legal harmonization) are directly implementable among MS. Once they are adopted by the European Parliament and by the Council and they enter into force, they are automatically applicable in all member states. But this principle of direct applicability is still not possible among non-EU member countries. It means that countries, like for example Macedonia, cannot directly apply EU (secondary) regulation, but same like with directives they should be transposed into national legal framework.

### 1.3 Implication on non EU countries

Five mentioned directives represent part of the European Union's legal framework. As such they produce no impact either for non EU member



states nor do they have any binding obligation for their municipalities, of course. The reason for their effects on other countries lies in three decisions of the Ministerial Council of the Energy Community, adopted in 2009, 2010 and 2011.

Pursuant to the Treaty, one of the main challenges for the Energy Community is extending the EU internal energy policy to South East Europe and Black Sea region on the ground of legally binding framework. In accordance to the overall objective of the Energy Community Treaty to create a stable regulatory and market framework among these regions the Ministerial Council adopted the three mentioned decisions. Through these acts, the Ministerial Council decided to extend validity of actual EU *acquis communautaire* in the field of energy efficiency, among all Contracting Parties of the Energy Community, as well. With the sake of proper transposing of the provisions among the Contracting Parties three decisions introduced necessary adaptations into the texts of the directives providing new deadlines for adjusted implementation in the Contracting Parties.

Decisions that extended validity of European legal framework among the Energy Community Contracting Parties are:

- Decision: D/2009/05/MC-EnC of 18th December 2009;
- Decision: D/2010/02/MC-EnC of 24th September 2010;
- Decision: D/2011/03/MC-EnC of 16th July 2011.

Due to these three decisions, the Contracting Parties of the Energy Community (Republic of Macedonia is one of them) are obliged to transpose into their legislation provisions of the following directives: Energy Service Directive, Energy Labelling Directive, and Energy Performance of Buildings Directive. As a result of that, several other important implementing measures, directives and regulations connected with labelling directive became obligatory, as well. As it is obvious the Eco-design directive is not recognized as an important one in order to be transposed into legal framework of the Contracting Parties. Likewise, the most recent one - Energy Efficiency Directive is still not adopted under the Energy Community, but preparation of the approach and adaptations that will be introduced for the Contracting Parties of the Energy Community is in process right now.

## 1.4 Provisions particularly influencing local level

Provisions of the EU directives do not directly influence local governments neither in EU countries, nor in other countries like in the Republic of Macedonia. As acts for legal harmonization Directives only determine legal framework for the single countries (MS). However the countries have sole responsibility and they are free to transpose provisions into national legislation protecting consistency with existing legal documents and adjusting it with current level of technical development and market circumstances. By transposing directives each country establishes its own legal framework consisted of laws and secondary legislation which imposes direct obligations for different stakeholders, as well as for local self governments. So far Republic of Macedonia developed comprehensive system of national legislative acts (in compliance with the European one) which transposes the main provisions of directives in force. This legal framework imposes a vast number of various obligations for public bodies (municipalities) to be implemented in the near future. The main aims of prescribed measures are to achieve national energy saving targets defined in the 1st and the 2nd (still available only as a draft version) National Energy Efficiency Action Plans (NEEAPs), as well as to achieve other energy efficiency improvement at local and national level.

The main provisions emerging from the above-mentioned directives, which are already (or will be) transposed in accordance to recent development are listed below:

### Obligations related to Energy Service Directive

Provisions of this directive give particular attention to public bodies and institutions, and various obligations are imposed in several articles.

- Public bodies (at all level) shall undertake all available measures and actions in order to contribute in achieving of the National energy saving target set out in the NEEAPs or other documents;

- Public sector must take leading position and play exemplary role in implementation of energy efficiency measures. With that aim, public bodies shall implement measures at the earliest stages and additionally make efforts to communicate them effectively. Public sector should be focused on cost-effective measures which generate the largest energy



savings in the shortest span of time. Through strong promotional and informative campaign implemented measures, obtained experience, knowledge, procurement schemes, technical solutions, best practice and so on, should be widely disseminated;

- All public bodies are obliged to choose (at national level) at least two out of six energy efficiency public procurement measures and to implement them. Six EE public procurement measures are listed in the Annex VI of the Directive in the context of the exemplary role of the public sector, and they call all public bodies to:

- 1) Use financial instruments for energy savings, including energy performance contracting;
- 2) Purchase equipment and vehicles based on lists of energy efficient product specifications, drawn up by responsible authorities and agencies;
- 3) Purchase equipment that has the lowest energy consumption in all modes, including stand-by mode;
- 4) Replace and/or retrofit existing equipment and vehicle with the new, energy efficient one;
- 5) Use energy audits and implement cost-effective recommendations;
- 6) Purchase or rent energy efficient buildings or their parts with the highest energy performances.

### **Obligations related to Eco-design Directive**

Even though this directive is not obligatory (as a part of EE acquis under the Energy Community), Republic of Macedonia made one step forward and adopted Decree on Eco-design which transposed provisions of this directive together with some of related implementing measures.

The Directive does not have particular requirements to public bodies at local level, but requirements it imposes influence local self governments, as well. That means that municipalities have to be aware of eco-design requirements (and products covered by the implementing measures i.e. by the Decree in Macedonia) and purchase only equipment which is properly marked with CE marking and possess EC declaration of conformity. In that way, municipalities can be sure that they use products that fully comply with eco-design requirements, and consume minimal amount of energy through their whole life cycle.

### **Obligations related to Energy Labelling Directive**

Similar to previous (eco-design) directive the Energy Labelling Directive does not introduce too many obligations for public bodies at local level. But the main and very important requirement given in Article 9 of the Directive obliges all public bodies (including municipalities) to procure only products (if they are covered by a delegated act) which properly bear energy label and possess all necessary technical documentation. In public procurement processes advantage should be always given to products with better energy class under the same other conditions.

According to this article, all public bodies shall endeavour and opt to procure only such products which comply with the criteria or have the highest energy efficiency performance.

### **Obligations related to Energy Performance of Buildings Directive**

EPB Directive is one of the most demanding ones for local public authorities. It introduces various obligations for all actors in Member States, with special emphasis on public bodies, which directly influences municipalities. In this respect, according to Directive's provisions municipalities have to:

- Ensure that all buildings or building elements and parts (that they build for their own purposes) meet the minimum energy performance requirements. Also, before construction starts, the technical, environmental and economic feasibility of high-efficiency alternative systems should be taken into account;
- Ensure that for all existing buildings, their parts and elements (owned and/or used by municipalities) which undergo major renovations, comply with the minimum energy performance requirements;
- Ensure that technical systems that are used in municipal buildings (in the case of construction of new buildings or replacement or upgrading of existing technical systems) also meet certain energy criteria in respect of the overall energy performance, the proper installation, appropriate dimensioning, adjustment and control of installed technical systems. Technical building systems in the context of this directive are:

1. Heating system;
2. Hot water system;

3. Air-conditioning system;
4. Building ventilation system.

- According to article 9 of the Directive all buildings occupied and owned by public bodies (hence, municipal buildings, as well) have to meet requirements related to Nearly Zero-Energy Buildings, by 31st December 2018 (by 30th June 2019 for Macedonia as the Energy Community Contracting Party);

- All municipal buildings with useful floor area over 500 m<sup>2</sup> have to possess the Energy performance certificate issued by authorized person according to defined methodology. This threshold of useful floor area will be decreased to 250 m<sup>2</sup>, by 9th July 2015 (by 30th September 2015 in Republic of Macedonia, respectively). This certificate has to be properly displayed at prominent place and clearly visible to the public;

- Provide regular technical inspection of existing heating and air-conditioning systems installed in buildings used and/or owned by municipal authorities. These inspections shall be carried out for all heating systems with boiler of an effective rated output of more than 20 kW, as well as for air-conditioning systems of an effective rated output of more than 12 kW. These inspections have to be organized regularly in defined time periods, but not longer than three years.

### Obligations related to Energy Efficiency Directive

The last but not least, the Directive is one the most recently adopted by the European Parliament. This legal act also has substantial influences on public and municipal authorities respectively. According to provisions of the Directive, the municipalities in the Member States are obliged:

- To provide its own contribution and endeavour to support achieving of National energy saving targets set pursuant to this directive. Timeframe for national targets for non EU Member States will be defined by the Energy Community Secretariat;
- To provide renovation of buildings which they use for their daily operations according to National long-term strategy;
- Similar to the provisions in the Energy Service Directive, municipalities have to take leading position and ensure playing of exemplary role by providing effective communication and dissemination of information about implemented energy efficiency measures, best practice,

experiences etc;

- Purchase only products, services and buildings with highest energy efficiency performance, insofar as that is consistent with cost-effectiveness and technically feasible;

Establish and maintain energy management systems within their organizations, in order to provide monitoring and control system of energy consumption and costs, with the sake of minimizing them.

## 2 Energy Efficiency in Macedonia

### 2.1 The Strategy in a Nutshell

The **Strategy for Improvement of the Energy Efficiency (EE) in the Republic of Macedonia until 2020** was adopted by the Government in September 2010. In response to the commitment for the improvement of the energy efficiency, which is one of the core strategic priorities in the energy sector, this Strategy develops a framework for adoption of EE through implementation of legislative and regulatory measures, institutional and capacity building, social and financial measures, as well as a number of technical programs and initiatives at energy demand sectors.

The Strategy envisages realization of over **9% energy savings till 2018, comparing to average consumption in the 5 year period 2002-2006 (147ktoe)**, with continued promotion of energy efficiency and monitoring and verification until 2020.

The **legislative and regulatory measures** include:

- Preparation and enforcement of primary and secondary legislation and regulatory framework (Updating of the Energy Law; Amendments to the Building Law; Completing the Rulebook on Building Energy Performance; Building Energy Code development; Energy Audit procedures and certification of energy auditors)
- Developing appropriate support mechanisms to boost the number of EE projects (Helping establishment of Energy Service Companies (ESCOs) and performance contracting; Development of the Energy Efficiency Fund; Public-private partnerships (PPP) which will allow

<sup>1</sup>Strategy for Energy Development in the Republic of Macedonia until 2030, Skopje, 2010. Official Gazette n. 61/10)

municipal energy utilities to get access to private capital, project implementation experience, more progressive management practices, cost-minimization skills, and better service and customer focus; Long-term agreement between industry and government on reducing energy consumption (Integrated Pollution Protection and Control (IPPC) working permission) to promote Best Available Technologies in Macedonian economy.

- Regional cooperation (Participation in international projects aimed at promotion of energy efficiency; Regional networking allowing exchange of experiences and knowledge between region's experts on lessons learned in the energy efficiency reform and market acceleration process.

Under **institutional and capacity building**, the Strategy defines the specific functions of the Ministry of Economy and the Energy Agency, as well as stipulates establishing a Watch Group (Committee) - an interagency group of experts from key stakeholders in the government, academia, public/non-governmental and private sectors, consumer groups, etc. Capacity building also includes education and awareness measures at all levels, as well as professional training and certifying energy auditors:

The **social measures** primarily deal with energy efficiency in social housing and block-tariff for electrical energy. Furthermore, as a key **financial measure**, the Strategy envisages creation of Energy Efficiency Fund.

Finally, the Strategy identifies and analyzes **technical initiatives (programs)** at energy demand side. The initiatives are grouped by sectors, as follows:

### Residential Buildings

- Skopje District Heating end-use heat metering and consumption-based billing
- Energy Efficiency in Social Housing
- Building codes and enforcement/certification
- Electrical appliance and equipment labelling, and energy performance standards
- Replacement of fire wood furnaces with high efficiency models
- Information centres; Information campaigns on energy efficiency

- Hot water boiler and air conditioner labelling and energy performance standards control
- Financial support to natural persons for EEI investments
- Solar systems and geothermal heat pumps in old houses
- EEI measures in existing multi-apartment residential buildings:
  - ✕ Window and door replacement
  - ✕ Attics insulation
  - ✕ Façade insulation
  - ✕ Introduction of efficient lighting in residential apartments and common space

### Commercial and Public Services Buildings

- Building codes enforcement and certification
- Inspections of boilers/air conditioning systems
- Education sector – schools renovation
- Information centres, campaigns, municipal EE network
- Energy management and auditing in the commercial and services sector
- Street lighting efficiency upgrades
- Electrical appliance and equipment labelling and energy performance standards
- Hospital Buildings Refurbishment
- Solar systems and geothermal heat pumps
- EE and Corporate social responsibility

### Industry

- Improvement of process performances
  - ✕ Cleaner production
  - ✕ IPPC – permitting
- Energy Auditing
- Co-generation
- Energy performance of non-residential buildings
- Improved Lighting
- Improved heating systems
- Fuel type change
- Clean Development Mechanism (CDM)

- Waste heat utilization (non CDM)
- Smart drives
- Compressed air supply
- Good house-keeping
- EE and Corporate social responsibility

### Transport

- Renewal of the national road vehicle fleet
- Promotion of sustainable urban transport systems
  - ✕ Introduction of tramway in Skopje
  - ✕ Renewal of public transport bus fleet
  - ✕ Parking policy
  - ✕ Promotion of greater use of bicycle
- Introduction of integrated traffic management centre
- Fuel quality and fuel economy standards
- Car free days
- Promotion of greater use of railway for intercity travel
- Tax reduction on eco friendly vehicles

The Strategy envisages energy savings following the dynamics presented in Table 1. Besides energy savings, additional benefits will be reflected on the financial, social and environmental levels.

Table 1. Energy savings by the sectors (ktoe)

Sector	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Residential buildings	2.33	4.71	7.63	11.4	15.74	20.42	26.52	33.49	40.51	48.32	57.14
Commercial and Public Buildings	1.45	2.98	4.96	7.53	10.83	14.85	18.43	21.62	24.19	26.54	28.60
Industry	17.7	36.8	40.96	45.32	63.53	72.49	80	84.06	90.45	90.76	90.09
Transport	3.31	7.79	12.55	17.86	22.99	28.21	33.20	38.70	44.63	51.94	60.48
<b>Total</b>	<b>24.79</b>	<b>52.29</b>	<b>66.10</b>	<b>82.15</b>	<b>113.09</b>	<b>135.97</b>	<b>158.16</b>	<b>177.87</b>	<b>199.78</b>	<b>217.56</b>	<b>237.31</b>

Source: Strategy for Improvement of the EE in the Republic of Macedonia until 2020, Skopje, 2010

The total costs (cumulative over the period 2010-2020) for implementation of the Strategy are estimated to 522 M€ with annual schedule presented in Table 2.

Table 2. Penetration of financial investments by the sectors (M€/year)

Sector	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Residential	11.1	11.6	12.4	17.2	18.9	19.6	26.2	31.8	34.5	43.9	52.4
Commercial and Public Buildings	6.8	7.8	8.9	10.1	12.3	15.5	14.8	14.8	14.0	14.9	15.0
Industry	23.7	3.7	5.8	20.0	7.0	3.0	2.0	3.2	5.5	0	0
Transport	7.0	18.00	24.0	4.5	1.0	0	0	0	0	0	0
<b>Total</b>	<b>48.59</b>	<b>41.14</b>	<b>51.06</b>	<b>51.83</b>	<b>39.22</b>	<b>37.09</b>	<b>40.99</b>	<b>46.83</b>	<b>50.06</b>	<b>53.87</b>	<b>61.43</b>

Source: Strategy for Improvement of the EE in the Republic of Macedonia until 2020, Skopje, 2010

The proposed measures require a substantial amount of financing, which besides from the Government should come from other sources too. Hence, to complement the Government efforts in the buildings sector, the municipalities, donors/International Financial Institutions (IFIs), private consumers should also invest. In the Industry sector all of the investments will be the responsibility of the enterprise owners, while the major EE measures in the transport sector shall be supported by the Government (Figure 1).

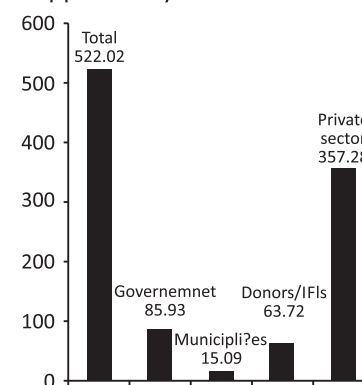


Figure 1. Investment responsibility for energy saving measures by sectors (M€)

Source: Authors, based on the Strategy for Improvement of the EE in the Republic of Macedonia until 2020

1st National Energy Efficiency Action Plans (NEEAP) until 2018 was adopted by the Government in April 2011. Findings from 1st NEEAP indicate that targets for the period have not been met. Also, the Energy Community Secretariat Review has reported substantial weaknesses in costing and identifying financing sources for activities outlined in the NEEAP.



## 2.2 Action beyond the Strategy

The **adopted legislation and regulation** in the area of EE includes:

- Decree for indicative energy savings targets in the Republic of Macedonia (Official Gazette of the Republic of Macedonia No. 112/2011)
- Decree for eco design of products (Official Gazette of the Republic of Macedonia No. 100/2011)
- Rulebook on indication by labelling of energy consumption and other resources of energy-related products (Official Gazette of the Republic of Macedonia No. 154/2011 and 146/2012)
- Rulebook on high efficient combined heat and power plants (Official Gazette of the Republic of Macedonia 128/2011)
- Rulebook on energy performance of buildings (Official Gazette of the Republic of Macedonia 94/2013)
- Rulebook on energy audit (Official Gazette of the Republic of Macedonia 94/2013)

Macedonia submitted a draft of its 2nd NEEAP to the Energy Community Secretariat in June 2013. The 2ndNEEAP adopts a more pragmatic approach where **final energy saving target is to be achieved within same schedule but with more progressive steps.**

Concerning the strengthening of the access to financial and institutional capacity, the Ministry of Economy, through a project supported by the World Bank, has prepared a national programme (in the process of adoption by the Government), which includes **the creation of a revolving fund to finance EE improvements in public building** as a core element.

Although with wide range of responsibilities, the institutions in charge of EE have not been provided with adequate capacities and funding to implement them, which hinder translation of policies into actions. The situation can be improved by utilizing the long-term experience from various operators in implementing local EE schemes and the agricultural development fund which had a similar set up as the one proposed for the EE fund.

Still, although EE has not yet been identified as a specific national budget line, **the EE investments occur as part of overall renovations or building programmes in different sectors such as education or health. Also, some municipalities have been successful in implementing small-scale EE projects** and some have benefited from

the recent World Bank financed grant programme. However, they face considerable financing and technical difficulties, particularly in rural municipalities.

Billing on the basis of individual metering has been initiated in part of the district heating, but has not been conducted in a systematic fashion. More efforts in this respect are needed to **provide energy saving incentives to apartment blocks dwellers.**

The establishment of **integrated monitoring and verification platform** has also been identified as a key factor for measuring progress made in 2nd NEEAP towards achievement of targets.

## 2.3 Available Financing Mechanisms

The set of financing instruments relevant for use in Macedonia, and generally in the Western Balkans, includes:

- Financial and fiscal instruments
  - ✗ Loans and grants from IFIs, European Commission(EC) and bilateral donors
  - ✗ Internal financing (budget capture)
  - ✗ Energy taxes
  - ✗ Price reform
- Delivery mechanisms
  - ✗ Creating a market for ESCOs
  - ✗ Legal obligations for suppliers
  - ✗ EE funds
  - ✗ EE agencies

Availability of financing is a key issue facing all actors responsible for EE and while the 2ndNEEAP indicates that some national budget will be available, it places a high degree of responsibility on the private sector.

In addition to the successful support from the World Bank under the EE in public building projects and in designing an ESCO model (revolving fund), the recent launch of European Bank for Reconstruction and Development (EBRD) Regional Energy Efficiency Programme can help address some of the country's main obstacles in the implementation of EE measures, such as the regulatory framework necessary to facilitate

<sup>2</sup>Presentation of the IFI Coordination Office, Workshop on Financing Options for National EE action Plans, Skopje, 8 October, 2013

municipal finance, the establishment of ESCOs and the financing of investment through lending.

Table 3 lists the banks that were identified as clearly advertising loans for dedicated EE facilities. In addition, the table includes details of banks that offer European Investment Bank (EIB) financed credit lines for Small and Medium-sized Enterprises (SME) investments as these include EE as an eligible activity.

Table 3. Banks advertising identified EE funds

Financial institutions	Fund	Structure	Fund size	Size of loan	Eligible end-borrower
Halkbank	Green for Growth Fund Southeast Europe	Loan with TA	5M€	Up to 100 k€	Private: households, SMEs, energy service companies, renewable energy companies
Halkbank	EIB	100% loan	Not identified	Investment loans Micro companies to 26.7 k€ Small companies to 266.7 k€ Medium companies to 2666.7 k€	Private: SMEs
Komercijalna Banka	Own funds	100% loan	Not identified	Up to approximately 5 k€	Private: households
Komercijalna Banka	EIB	100% loan	Not identified	Purchase of material assets, working capital Micro enterprises loan up to 45 k€ Small enterprises loan up to 450 k€ Medium enterprises loan up to 3.5 M€	Private: SMEs, Public: municipalities
Komercijalna Banka	Italian credit line	100% loan	Not identified	50 k€ to 400 k€	Private: SMEs
Unibanka ad Skopje	own funds	100% loan	Not identified	The maximum loan amount depends on the client's needs and business	Private: SMEs
NLB Tutunska Banka	EIB	100% loan	Not identified	Up to 2 M€	Private: SMEs, Public: municipalities
Halkbank	EBRD WeBSEFF	100% loan TA financed from separate Fund	3 M€	Up to 2 M€	Private: SMEs
Ohridska Banka	EBRD WeBSEFF	100% loan TA financed from separate Fund	5 M€	From 100 k€ up to 2 M€	Private: SMEs
Ohridska Banka	EIB	100% loan	50 M€	From 10 k€ to 3.5 M€	Private: SMEs, Public: municipalities
ProCredit Bank	EIB	100% loan	Not identified	From 5 k€ - 667 k€	Private: Households, SMEs, Public: municipalities
ProCredit Bank	Presumably own funds	100% loan	Not identified	Households; 10 k€ to 80 k€ SMEs: up to 750 k€	Private: households and SMEs
Direct EBRD	WeBSEFF	Loan 78% with Grant 17% and TA 5%	Not identified	From 2 M€ to € 6 M€	Private: SMEs Project developer

Technical Assistance (TA)

West Balkan Sustainable Energy Financing Facility (WeBSEFF)

Source: Presentation of the IFI Coordination Office, Workshop on Financing Options for National EE action Plans, Skopje, 8 October, 2013

### 3 Views and Perspectives of the Macedonian Municipal, Civil and Business Sectors

#### 3.1 Public Dialogue on Sustainable Use of Energy in SEE Project

The "Public Dialogue on Sustainable Use of Energy in SEE" project has been launched by the network of Schools for Political Studies in South East Europe (SEE) in collaboration with the Council of Europe and supported by the German International Cooperation and its Open Regional Fund for Energy Efficiency (GIZ-ORF-EE) and Konrad-Adenauer-Stiftung (KAS). The main objective of the project is to foster the dialogue among the officials at local and central level, as well as the civil and business sectors – the main actors in the energy efficiency domain and policy. In addition, the dialogue intended to identify the existing obstacles, challenges and problems in the implementation of energy efficiency policies and investments, in terms of legal frameworks, finances, institutional barriers, staff capacities and others.

The realization of "Public Dialogue on Sustainable Use of Energy in SEE" in Macedonia followed bottom-up approach. Namely, in order to acquire accurate and first-hand information and data about the energy efficiency policies, efforts, and challenges that municipalities, local NGO's and business sector face with, GIZ-ORF-EE and the Centre for Research and Policy Making (CRPM) performed a ground research in all eight planning regions in the country in order to detect the common problems and challenges, but also to identify the eventual problems and obstacles which are exclusive for some region. Hence, in a period of six months, GIZ-ORF-EE and CRPM teams organized eight public debates in Skopje (Skopje Planning Region), Veles (Vardar Planning Region), Bitola (Pelagonia Region), Strumica (South-eastern Planning Region), Stip (Eastern Planning Region), Ohrid (South-western Planning Region), Kumanovo (North-eastern Planning Region) and last one in Gostivar (Polog Planning Region). At the debates, all municipalities which belong to the respective planning region were invited, as well as the local NGOs and companies which work in the field of EE.

The public debates comprised a presentation section, as well as an open discussion session. In the first part, there were three presentations delivered to the attendants. Besides defining the energy efficiency and

explaining the benefits of it, (financial savings, lowering the environmental pollution, and increasing the comfort) the first presentation also demonstrated possibilities for public buildings to serve as a positive example with regards to sustainable and responsible use of energy. Changing the habits in the way how the energy is used, instating thermo isolation on the facades, changing the windows, installing new lightning system (both internal and street), as well as retrofitting new heating/cooling systems were the main tools mentioned. Several examples from Croatia were presented, such as the case of the Sisak city, in order to present tangible example about the benefits of energy efficiency actions.

Namely, in Sisak, several renovations and reconstructions have been implemented at the public buildings in the last few years, such as "23rd of June" Primary School and the local swimming pool. In the latter one, the waste water with additional warming now is used for the local heating system; as a result of this action, savings of 8500€ were achieved, whereas the return of the investment is expected for 2.5 years. In the case of the primary school, after the replacement of the old boiler with a new gas-fired one, savings of 55,000€ have been registered, whereas the investment return is expected for 2.5 years, as well. Also, it was advised that in order to reach the energy efficiency goals, huge campaigns, promotions and info-spots are necessary, highlighting that the support of the officials is paramount for boosting the EE awareness. Moreover, the support of officials is crucial for establishing central data base which must be updated on a regular basis in order to provide accurate information about the total consumption of the energy by public institutions - something which is already implemented in Croatia.

The second presentation was dedicated to the use of renewable energy sources (RES) at local level. It was stressed that for such action and policies, it is essential to have an adequate legal framework (laws, bylaws and rulebooks), as well as sustainable financing network (funds, credits). Also, in this "package", of huge importance is the existence of local strategies and action plans which will serve as roadmaps for further investments adjusted to the needs and capacities of each region. In this presentation it was emphasized that municipalities, NGOs, business sector and citizens play crucial role for implementation of energy efficiency measures. Also, it was said that local governments together with the companies can boost the energy efficiency investments via the public-private partnership (PPP) contracting, especially in the case of city

lightning, biomass and waste.

The need for cooperation and communication among municipalities and with the NGOs regarding utilization of the international funds as a good alternative source for investing and financing projects for fostering the sustainable use of energy, was also underlined. At the end, a highlight was made on the importance of citizens in this domain with personal investments and actions, such as installation of solar panels, geo-thermal and heating pumps, façade isolation and change of windows, investments which can cause lowering the costs for energy for even 80%.

With the third presentation, the main accent was given to the energy poverty. In the opening part of this presentation, the attendants were acquainted with the fact that the main reasons for energy poverty are the energy non-efficiency, the low households' income, as well as the price of energy. In addition, it was stressed that impossibility of satisfying the basic needs, such as heating, cooking and lightning is caused due to the culture and habits in using the energy, as well as the old infrastructure. Additionally, it was presented that Macedonian households have to spend 43% more electricity than now in order to fulfill the basic needs. But, presenters explained that this does not indicate that households save energy, but it is a sign that they cannot afford it. For over passing these problems, the presenters suggested fostering the energy efficiency investments both in public and private sector, with special accent to the citizens in worst -off socio-economic situation, by providing special funds and finance sources; the other recommendations included renovation of the distribution network, boosting the energy production by RES and increasing the public awareness about the energy efficiency benefits.

The presentations were delivered by Zoran Bogunović and Darko Hecer, international experts, and Igor Pančevski, Robert Šarlamanov, Prof. Konstantin Dimitrov and Jasminka Kapac Dimitrova, national experts, whereas the discussions were moderated by Ilija Sazdovski. The findings of the public debates are summarized in the next chapter. A matrix of problems and solutions is also developed in order to have the results presented in a structured and easy-to-follow manner.



## 3.2 Debates by Regions

### 3.2.1 Skopje Region

The need for intensifying the process of gasification of the Macedonian capital was one of the main topics during the debate in Skopje. It was highlighted that synchronized approach is necessary; the industrial sector has to be completely integrated to the gas network as well as the households, because only in this way the gasification is most profitable and attractive to investors. The municipalities face several obstacles which slow down the investment process in energy efficiency. Most notably, the lack of finances for such activities is one of the greatest stumbling blocks. Namely, even though the process of decentralization should provide sustainability of the local governments, including investments, reconstructions and renovations in respect to energy efficiency, there is still insufficient finances which could be allocated for this purpose. Another problem is the absence of National Fund for energy efficiency. Skopje municipalities see in this fund a source which can intensify the investment and reconstruction process. According to the municipalities' representatives, the establishment of such fund will secure stable source for partial financing of activities. This fund would be of a large importance, especially as a co-financing facility to international funds or funding programs.

The adoption of a Law on Energy Efficiency was mentioned as a possible solution in order to have precise and more detailed regulation of responsibilities and procedures regarding energy efficiency investments, for both the municipalities and the business sector. It was stressed that such law will facilitate the cooperation between the local governments and companies, especially in the field of Public/Private Partnership. Speaking about the PPP, the municipalities' and business representatives pointed out that the number of such contracts is still small. It was emphasized that the mutual cooperation in this direction has to be strengthened taking into consideration that it is beneficial for both sides. Furthermore, as an additional catalyzer for energy efficiency investments, marking the construction area for energy efficiency and RES investments during the Detailed Urban Planning Procedure was proposed; this was pointed out both from the municipalities and companies. Namely, it will facilitate the investment procedure and will provide appropriate visualization of the potential investment zones.

Furthermore, an important note was made in regards to the construction sector– the lack of capable construction workers engaged with energy efficiency activities. In Macedonia, there is a need for approximately 10.000 construction workers who would be solely engaged in energy efficiency activities, but the training providers can train just 100-150 workers annually.

The businessmen who deal with energy efficiency, called the state for active measures which will boost the energy efficiency especially among the citizens. A businessman provided an example how this can be done with the tax provisions:

*"Albania and Kosovo are step ahead compared to Macedonia. Albania adopted 200% customs tax for import of regular bulbs, whereas we do not have such measure in Macedonia. Kosovo also charges 20 Euro cents for import of regular bulbs",*

It was also stressed that there is space for enhancing the cooperation among the municipalities themselves and with the business sector. The participants also proposed organizing frequent roundtables, as a venue for exchange of experiences and ideas, fostering the regional cooperation, as well as regular participation at regional and international fairs (in order to get acquainted with latest developments regarding to energy efficiency).

### 3.2.2 South-western Region

During the debate in Ohrid, the stakeholders from the Southwestern region, including municipalities, NGOs and the companies delivered their views, suggestions and ideas how to intensify the energy efficiency in the city of Ohrid, as well as in the other smaller local governments which gravitate towards Ohrid. One of the most frequently mentioned issues by all of the participants was the urgent need for raising the awareness among the local citizens about the benefits of energy efficiency investments. As a possible "way out" of the current situation, frequent and visible public campaigns and promotions were suggested, especially in the primary and secondary education (alike the existing "Green Package" curricula, but to a much greater extent).

In this region also, the representatives of the municipalities stressed the need of establishing NFEE which will boost the investment



process, bearing in mind that the local governments of this region face limited sources and finances for such activities. Unfortunately, the existing expert and professional capacities which still are quite weak, also contribute to the slow investment pace. Furthermore, the business sector asked for a simplification of the investment procedure regarding to energy efficiency. In other words, they called the municipalities for shortening and simplifying the procedure in order to save time and money. In terms of cooperation between municipalities and local companies, both parties acknowledged the need for boosting the PPP, especially with ESCO companies. As most cost-effective area for both sides, PPP contracting for street (public) lightning was advised. Such contracting is also welcomed for constructing small hydro-power plants which will improve this region's RES portfolio. The businessmen involved in energy efficiency also recommended legal changes in order to include individual producers of energy in the distribution network, which is not the case with the current Law on Energy. According to them, this will motivate them for further energy efficiency investments and it will contribute for additional improvement of the share of "green energy" in the total energy produced.

However, the municipalities and companies were not the only ones which delivered proposals and ideas for fostering the energy efficiency. Local NGOs highlighted the need for greater openness of the municipalities and companies in terms of mutual cooperation. NGOs see a great potential for joint presentation and application with municipalities in front of the international donors. More cooperative relationship between NGOs and companies will result in better perception where such investments and activities are needed. The lack of expert assistance in drafting the projects in terms of energy efficiency imposes difficulties for NGOs. Other impediments regarding the application process are the requested bank guarantees, as well as the complexity of the procedures and required documentation. Interestingly, all of the participants emphasized the limited access to new information about new mechanisms, tools and techniques in the field of energy efficiency, something which would be beneficial for all of them when drafting the investments/project plans.

### 3.2.3 Eastern Region

The debate was opened by the mayor of the city of Stip, Ilco Zahariev. Zahariev applauded the initiative to organize such a debate and underlined its usefulness for the local governments' officials, pointing out that the final conclusions will serve as a roadmap in the process of drafting and implementing the energy efficiency local policies. Unquestionably, the opening speech demonstrated the determination of the Eastern Region mayors for the energy efficiency and their understanding of the importance of this process.

However, the region is facing problems and obstacles, similar as the other regions. For the municipalities, the problems with the finances and experts are among the most challenging ones. Consequently, the establishment of the NFEE was pointed out as a way to alleviate this issue. Also, they asked for a special fund which would be exclusively devoted to the private households with uncompleted facades – an issue which impacts the total consumption of electricity and heating.

The problem with finances does not affect just the investment / renovation / reconstruction process, but also the process of drafting feasibility studies. Namely, the lack of finances burdens municipality to beef up the local ecological and energy efficiency programs with feasibility studies – an essential thing in order to attract investors and financiers. Also, they required facilitated access to bank credits which can also boost energy efficiency activities. The representatives of the local business sector pointed out that the Eastern Region has huge potential for investing in the bio-mass, as well as for PPP contracting. On the other hand, municipal representatives emphasized that this process is burdened by several issues - difficulties in providing bank guarantees as a precondition for signing such contracts and lack of a law on energy efficiency to facilitate and firm up the investment procedure in terms of energy efficiency. In this situation, the municipalities' representatives claim that they are obliged to pass through a long legal labyrinth drafting the PPP contracts and attuning them with several other laws such as the Law on Procurement and the Law on Energy, which is complex and time-consuming task.

In regards to the cooperation, both municipalities and NGOs acknowledged that there is a huge potential for that, which primarily can be directed towards raising the public awareness about the energy efficiency benefits. Incorporating the energy efficiency in the education process to a

much greater extent, intensive public campaigns, and most importantly - demonstration of a strong, visible and constant determination and commitment by the policy-makers (local and central) for energy efficiency investments and activities were pointed out. According to the participants, the public sector's awareness in this area will be a signal for the private sector and citizens to engage in such activities per se.

Not less important was the conclusion that Eastern Region requires intensification of the process of gasification, which can contribute for more energy efficiency activities and it can boost the local economy too. For this purpose, municipalities expressed readiness and willingness to assist in the development and improvement of the distribution network, but to do so, legal changes and adjustments are necessary.

#### **3.2.4 South-eastern Region**

The establishing of NFEE was also one of the most frequently articulated needs at the debate in Strumica. The municipalities' representatives stressed out that this fund will foster the investment pace bearing in mind that this region also faces limited financial resources for such activities. But, the finances are not the single impediment; smaller municipalities confront with lack of qualified experts, which certainly affects the intensity of actions related to energy efficiency. As a solution to this problem, they suggested for dispersed regional offices of the Energy Agency of RM which can help in boosting the mutual cooperation and closely cooperate with teams to appease the lack of professional human resources.

The debate pushed out on the surface the administrative and institutional weaknesses, which were already noticed at the previous debates: complex and long procedures in developing Detailed Urban Plans (at least 6 months), which affects the investors' patience, as well as lack of complete planning documentation. According to some of the municipal representatives, some of the investors face difficulties with the electricity distribution company EVN to ensure connection to the distribution network. Namely, they claim that this procedure sometimes takes long time, making some of the investors to withdraw from their investing intentions.

Both the municipalities and business sector confirmed that there is a huge potential related to PPP contracting, especially in terms of the bio-

mass from the agriculture. The agricultural waste can be one of the most significant resources for boosting the energy efficiency, considering that Strumica and Southeastern region are the areas where the agricultural sector is most developed. On the other hand, local NGOs empathized that municipalities, especially the smaller ones, do not use the potential of the non-governmental sector, so progress in the mutual cooperation has to be achieved. Same as in the Eastern region, this collaboration can be oriented towards raising the public awareness on energy efficiency, which is still not at satisfactory level; one more reason for this to be done is the fact that these municipalities are not in a position to independently organize such campaigns due to the weak budget. Speaking about the need of raising the awareness, twofold approach was advised - public campaigns and activities within the educational process.

#### **3.2.5 Pelagonia Region**

Each debate was a chance to acquire new data and information. This was also the case with Pelagonia Region - the most interesting finding was the care (lessness) of the mayors for energy efficiency. Namely, several representatives of the local governments pointed out that for some of the mayors, energy efficiency investments and activities are of limited interest. This is due to the fact that most of the activities need longer period of time for realization, while the mayors would like to achieve something during their mandate and use it as an additional asset for the next local elections campaign. In other words, they rarely decide for such step avoiding in that way the completion of the activity to be eventually promoted by the next mayor.

Local governments of this region face the same problems: limited professional and expert capacities and weak financial potential for energy efficiency investments and activities. In order to improve this situation, urgent establishment of NFEE was suggested, as well as raising the awareness among the citizens for the avails of energy efficiency. Regarding the awareness, one participant advised adjusting the eventual public campaigns and promotions to the needs of the rural and urban areas bearing in mind the differences in the potentials and resources. Boosting the awareness about energy efficiency in the primary and secondary schools was also recommended, whereas the local NGOs expressed their

willingness and readiness to help in this regard offering their capacities and knowledge.

On the other hand, the business sector complained about the long administrative procedures regarding the building permits for renewable energy installations, illustrating that it takes twelve months to get building permit for wind turbine. It was also mentioned that this issue deters the potential foreign investors. For overcoming this impediment, the most effective measure was identified to be the marking of the construction area for energy efficiency investments in the Detailed Urban Planning Procedure. The businessmen also underlined the fact that they feel the purchasing power of the citizens is low, illustrating that most of them are not in a position to buy compact fluorescent lamps. As in the rest of the analyzed regions, here there is also a space for fostering the cooperation between companies and municipalities. Intensifying the PPP contracts certainly is the prime way to demonstrate a good example.

Another modus to foster the cooperation is including the energy efficiency component as one of the conditions in the public/municipal procurement. The benefit of this would be multilayered: improved savings in the energy consumption, boosting the business sector and better quality of services. However, municipalities need assistance in order to prepare good specification for procurement procedure to be effective and feasible. It was stressed out that overall communication and cooperation between the municipalities and companies has to be sustainable and permanent, whereas the same approach is suggested for the inter-municipal collaboration by intensifying the exchange of ideas, experiences and views regarding the energy efficiency. This applies especially for public lighting as a cost which burdens the most local governments' budgets.

### 3.2.6 Vardar Region

The lack of finances was one of the most frequently mentioned issues which affect municipalities of the Vardar Region. Some of the municipalities' representatives stated that there is no provision in their local budgets which is entirely devoted to energy efficiency. As in the previous debates, establishing NFEE is seen as a tool which will alleviate the existing difficulties in terms of finances. In addition, they emphasized that the financial block allocations from the central government should remain

the same, in case savings are made as a result of energy efficiency activities or measures. They argued that such actions would be disincentive for local authorities in terms of future EE reconstructions, renovations or adjustments.

However, the NFEE was not pointed out as a single source for boosting the activity related to energy efficiency; for this aim, heightening the number of PPP was also mentioned as an effective tool. Municipalities' representatives, as well the businessmen who deal with energy efficiency concluded that greater involvement both from the public and private sector is required in order to change the current image of the PPP; it was underlined that this is a good opportunity especially for the small and medium size enterprises as a way to boost their financial condition, whereas for the local governments, a chance to lower their expenditures for energy. Considering the companies, during the debate it was said that there is a huge potential for ESCO companies; however these companies must demonstrate multidisciplinary knowledge in regards to EE activities. Namely, for the respective investments/activities, a wide spectrum of experts in architecture, electrical engineering, construction and economy is of vital importance in order to secure good dynamic of the activity and more importantly, at the end that investment must guarantee appropriate savings. Also, the participants at this regional debate acknowledged that the level of awareness among the citizens about the benefits of energy efficiency is still not sufficient, as well as activities for their involvement and active role are not satisfactory. Also, it was highlighted that there is a room for improvement in terms of the cooperation between the Energy Agency of RM and the municipalities. These can be beneficial especially in attracting investors in the area of RES and facilities in this domain. However, it was said that for fostering the investment pace, administrative adjustments are indispensable, such as marking the construction area for building RES facilities. This movement will give a signal to domestic and foreign investors that local governments are fully devoted to energy efficiency and sustainable use of energy and wishful for such investments.

The participants also stressed the fact that NGO sector needs to demonstrate higher involvement in this area, whereas the IPA funds are excellent opportunity for that. Speaking of these funds, it was noted that bigger involvement is needed from the municipalities, as well.

Interestingly, the lack of human and expert capacities was not mentioned as an impediment or problem. But, one fact indicates that this



might be different (disproved). Namely, the Macedonian Center for Energy Efficiency assisted in the preparation of municipal plans for energy efficiency for all of the local governments of Vardar Region (except for Municipalities of Veles and Sveti Nikole). Taking into consideration all of the debates, this was underlined as one of the most serious challenges, so there are no strong and sustainable arguments to believe that this region is fully capable and adroit in this sense.

### 3.2.7 Polog Region

The Polog Region also faces obstacles regarding energy efficiency. Despite the lack of finances for EE activities, the lack of professional capacities was mentioned as a serious problem.

*"I am the only person who works on the development of the municipal energy program. I am aware about the fact that the deadline for submission has passed, but this is reality",* said one municipal representative.

Polog region struggles with the lack of finances too. This lack affects the intensity of investments, but also affects the implementation of the energy programs. As a solution for this problem, again as in the other regions, foundation of NFEE was advocated. Local NGOs proposed that fund to be set likewise the former one on environment in the frames of the Ministry of Ecology. Also, as a bridge for overcoming the problems with finances, an involvement of the Regulatory Commission in distribution of finances was proposed, as well as possible higher amount of central budget to be relocated to the local governments' budgets.

An interesting aspect was raised from the representatives of the municipality of Tetovo. Namely, in their opinion previous mayors have not been completely dedicated and interested in the energy efficiency, which is not the case with the current one. This testimony implies a lack of political will and commitment for energy efficiency - a pre-condition for sustainable and effective use of energy at local level.

Representatives of municipalities complained about the lack of coordination and cooperation between the governmental institutions in terms of issuing documentation - a problem, which according to them, affects the investors and their plans for constructing RES facilities. The representatives from the business sector and from the local governments acknowledged the fact that there is a potential for fostering the PPP

contracting, particularly in the domain of street lighting. However, as an impediment, the mistrust was raised in the ability for payment by the municipalities bearing in mind their debts and financial challenges. This situation makes companies skeptical for going into such business arrangement.

Further, joint cooperation was advised for all of the representatives including the Regional Center for Development, as well as fostering the involvement of Association of the units of local self-government (ZELS) energy efficiency network. According to the attendants, public awareness in terms of energy efficiency in the respective region exists, but further activities for its rising would not be in vain.

### 3.2.8 North-eastern Region

This debate was the last, but it brought some new perspectives. Of course, the lack of finances in local budgets was indicated as the biggest challenge. Municipal representatives stated that establishing NFEE would produce more intensive activity pace. They also said that it is preferably this fund to be set on grants, but knowing that this is less possible, they suggested NFEE to offer loans with very low interest rate and long grace period. Part of them, especially the smaller ones acknowledged the problems with shortage of professional experts which additionally affects the planning of energy efficiency activities. Formation of joint administrative body with representatives of each municipality of the North-east region alike the one in the Vardar Region is seen as a solution. They also said that such body will represent a catalyzer for more intense collaboration.

However, the representatives of the business sector delivered some important points. Namely, the presence of unfair competition (not certificated sale) affects the companies which work in accordance with the law. In regards to their cooperation with the local governments, some of the businessmen said that despite the long administrative procedures for procurements, a serious problem is the payment delay. According to them, this affects especially the smaller companies which cannot bear with that situation. Some of the municipal representatives replied that in the procurement process, the price parameter still plays crucial role; if there is a serious intention for including the energy efficiency in the procurement,

then law adjustments are necessary.

The representatives of municipality of Kumanovo agreed that PPP contracting is highly beneficial, but added that companies which deal with energy efficiency can present greater social responsibility by reconstructing public buildings on their own expense. They also added that this can be compensated by providing free street advertising by the municipal councils.

Regarding the cooperation, it was said that local governments must foster the collaboration with NGO sector, whereas they called for enhancement of the ZELS energy efficiency network especially in terms of the inter-municipal cooperation. Representatives of local governments were also self-critical. They acknowledged that additional efforts are needed for monitoring energy consumption in the public sector and minutely marking the energy consumption of each public building.

### 3.3 Summary Matrix of Problems and Solutions

Region	Legal and regulatory impediments	Institutional and administrative challenges	Financial capabilities	Expertise/ professional capacity	Cooperation	Awareness	Additional notifications
Skopje Region	<b>M:</b> Lack of exclusive Law on EE; <b>B:</b> need of establishing NFEE;	<b>M:</b> Marking the construction area for EE and RES investments during the Detailed Urban Planning procedure; <b>B:</b> Tax facilitation for the import of energy saving light appliances;	<b>M:</b> Lack of finances for investments and implementation of the programs and projects;	<b>B:</b> Limited number of construction workers capable for EE activities; <b>B:</b> no assessment about the required number of energy controllers;	<b>M/B:</b> Limited number of PPP contracting; Lack of regional cooperation;		<b>M:</b> Intensifying the process of gasification; <b>M/B:</b> Organization and participation at domestic and international fairs in regards to EE; Frequent roundtables;
Polog Region	<b>M/N:</b> Need of establishing NFEE accessible for NGO's too;	<b>M/B:</b> Municipalities and business sector experience the lack of coordination between governmental institutions in terms of issuing documentation for construction which is; need of intensifying the PPP especially in the domain of street lighting; <b>M:</b> Simplification of the administrative procedures for investing in RES;	<b>M:</b> Lack of finance for EE investments and activities; <b>M:</b> If possible additional transfers to local level from Regulatory Agency budget;	<b>M:</b> Weak professional capacity;	<b>M:</b> Bad financial health produces mistrust at local companies for PPP or other collaboration; bigger involvement of ZELS EE network in inter-municipal collaboration; fostering the Regional Center Office for Development in regards to EE; <b>M/B/N:</b> Fostering the mutual and regional cooperation;	<b>M:</b> Examples from the past where former mayor have not been fully devoted to EE;	

North-eastern Region	<b>M:</b> Need of establishing NFEE; lack of legal provision for incorporating the EE component as a condition during the procurement (price still plays most significant role);	<b>M:</b> Simplification of the administrative procedures for investing in RES; fitfully monitoring the energy consumption at public buildings; <b>M/B:</b> need of intensifying the PPP in the domain of waste and street lighting; <b>B:</b> Companies face unfair competition (uncertificated sale);	<b>M:</b> Lack of finance for EE investments and activities;	<b>M:</b> Weak professional capacity, especially at smaller municipalities;	<b>M:</b> Increasing the involvement of ZELS EE network in inter-municipal collaboration; fostering the Regional Center Office for Development in regards to EE; <b>M/N:</b> Insufficient cooperation;	Need of greater social responsibility of business sector in terms of EE (reconstructing public object on own expenses which would be compensated with free street advertising)
South- western Region	<b>M:</b> Establishing NFEE;	<b>B:</b> Complexity of the investing procedure in regards to EE; <b>N:</b> Difficulties in providing bank guaranties necessary for the application procedure; complex and long document procedure;	<b>M:</b> Lack of finance for EE investments; <b>N:</b> Limited funding sources;	<b>M:</b> Weak professional capacity; <b>N:</b> Lack of expertise assistance in the drafting project phases;	<b>M:</b> Demonstrating greater openness for cooperation with NGOs; using the ZELS EE network for exchange of ideas, proposals and views; <b>M/B:</b> Boosting the PPP contracting with ESCO companies especially in the domain of public lighting; <b>N:</b> Greater involvement of NGO is municipalities" work in regards to EE investments/projecting; <b>N/B:</b> Intensifying the partnership among NGO's and business sector ;	<b>M/N/B:</b> Limited access to information in regards to new mechanisms and tools for EE; <b>M/B:</b> Intensifying the construction of small hydro-power plants;

Pelagonia Region	<b>M:</b> Establishing NFEE;	<b>M:</b> Long administrative procedures in regards to building permits (exp. it takes 12 months for administrative procedures for building wind turbine); need of incorporating the EE specifications during the drafting of tenders procedures /calls; short-range interest of the mayors for EE investments and measures; marking the construction area for EE and RES investments during the Detailed Urban Planning procedure;	<b>M:</b> Modest financial strength for EE investments; <b>B:</b> Business sector feels the economic power of the citizens (exp. citizens do not have enough finances to buy CFL)	<b>M:</b> Moderate professional/expert capacity;	<b>M/B:</b> Need of intensifying the PPP contracting; <b>M:</b> Desiderate of exchange of experiences and ideas about public lighting ; need of forming common EE teams; <b>N:</b> Readiness to contribute in the EE domain;	Low public awareness about the EE benefits/ policies; low awareness about the EE gains; need of campaigns adjusted to rural and urban areas; boosting the EE in the formal and informal educational process;	Potential for utilization of international funds
Vardar Region	<b>M:</b> Establishing NFEE;	<b>M:</b> Incorporating/ including the EE and RES components as precondition for issuing building permit; marking the construction area for EE and RES investments during the Detailed Urban Planning procedure; challenges in regards to registration of public buildings;	<b>M:</b> Limited financial resources; finding financial stimulus for EE without curtailing the central budget transactions in case of savings; additional efforts for realizing the IPA fund in terms of EE; <b>N:</b> Bigger involvement of NGO sector in terms of providing funds for financing local projects, especially the IPA Fund for cross-border cooperation		<b>M/B:</b> Intensifying the cooperation among municipalities and companies in terms of EE, especially with ESCO companies; <b>M:</b> Increasing the communication and cooperation with Energy Agency of Republic of Macedonia in regards to finding potential investors (previously informing the Agency that the respective municipality has marked areas for RES, power plants); <b>B:</b> Bigger involvement and engagement of the business sector in regards to EE investments for small and medium enterprises via PPP contracting: bio-mass potential; <b>N:</b> Bigger involvement of NGO sector in regards to EE;	Animating local citizens in regards to EE benefits and boosting their personal involvement in EE;	

Eastern Region	<b>M:</b> Lack of exclusive law on EE which facilitate and firm up the EE investment procedure; need of establishing NFEE;	<b>M:</b> Problems and difficulties in providing bank guarantees necessary for PPP contracting; legal labyrinth during the procedure of drafting PPP contract (attuning the contract with several laws);	<b>M:</b> Financial lack and problems for EE investments and drafting feasibility studies; need of special fund exclusively devoted for uncompleted facades of the private buildings/houses; facilitating the access to credits; <b>M/N:</b> Limited funding sources;	<b>M:</b> Deficiency of experts in the EE domain;	<b>M/N:</b> Need of mutual openness and willingness for cooperation; <b>B:</b> potential for investments in the bio-mass and thermal waters;	Lack of awareness among the citizens in terms of EE; need of strengthening the awareness and responsibility for sustainable use of energy in the education process as well as broad public campaign; demonstrating accurate an firm determination for EE improvement of the political stakeholders as a prerequisite for this process;	<b>M:</b> intensifying the process of gasification and providing legal base for municipalities to take part in the development and improvement of the distribution network;
South-eastern Region	<b>M:</b> Need for establishing NFEE;	<b>M:</b> Long procedures in drafting the Detailed Urban Planning procedures in regards to RER and EE; lack of complete planning documentation; dispersed offices of Energy Agency of Republic of Macedonia within the municipalities in order to boost the mutual cooperation; <b>B:</b> Problems with EVN in regards to admittance for access to the network;	<b>M:</b> Lack of finances for investment in EE;	<b>M:</b> Deficiency of experts in the EE domain;	<b>M/B:</b> Intensifying the PPP contracting <b>B:</b> Additional engagement in investing in the bio-mass as a energy source for the rural areas; bigger involvement for PPP contracting; <b>N:</b> Intensifying the cooperation with municipalities in regards to applying for EE projecting;	Raising the awareness among the municipalities for cooperation with NGO sector; finding ways for inter-municipal cooperation; need of educational and general raising awareness campaigns;	Potential for utilization of international funds

**Table legend:** **M** – Municipalities; **B** – Business sector; **N** – NGO sector; **EE** – Energy efficiency; **RES** – Renewable energy sources; **PPP** – Public/private partnership; **NFEE** – National fund for EE; **CFL** – Compact fluorescent lamp

## 4 Concluding Recommendations

Taking into consideration all mentioned in previous three chapters and analyzing state of matter in Republic of Macedonia authors of this document prepared recommendations for the municipalities which should help solving actual problems, removing barriers and shortcomings and facilitate improving of energy efficiency at local level.

- Establishing fund for energy efficiency should be one of the first priorities since availability of financing is a key issue and a big stumbling block for all public institutions. Absence of such fund is mentioned at all public discussions sessions conducted in 8 regions of Republic of Macedonia. Such fund may be organized as a revolving fund which will be financed through government budget, international donors and financial organizations, charges for pollutants etc. Grants or low interest rates loans could be possible mechanisms for supporting energy efficiency improvements in public institutions;

- Lack of specific technical knowledge, weak and occasional exchange of information among municipalities, lack of information on financial instruments, low experience in ESCOs are some of the existing problems. Increasing the level of knowledge and boosting of information exchange as well as strengthening cooperation between municipal representatives can be achieved through various seminars, workshops, trainings etc;

- Another way for strengthening communication, cooperation, knowledge sharing and best practice examples could be introduction of electronic communication platform as a communications tool which allows cheap and quick sharing of information even in non-official and friendly manner;

- Fostering of international/regional cooperation between municipal representatives, and participating in activities of national/regional municipal associations. (Since English or other foreign languages could be rather barrier for public (municipal) servants, emphasis should be placed on cooperation between countries with similar languages);

- One of the important priorities for all municipalities is establishing of full Energy Management System (EMS) at municipal level (identifying qualified and trained members of energy teams headed by nominated energy manager in each municipality, creating hierarchical



structure, and division of roles and responsibilities). Such systems can play significant role in the initial phase (EMS causes low additional costs, but if properly implemented, can generate savings up to 15%). First hand savings usually generate investments for further energy efficiency measures in the phases that follow;

- The crucial part of well developed EMS is Municipal information system on energy consumption that allow monitoring of energy consumption, overview on energy bills, analyses of type, structure, trends and costs for consumed energy. (Information system of the Municipality of Bar (Montenegro) could serve as a good example <http://opstinabar.eu5.org/em/>);

- Lack of human resources and clear responsibilities for energy management as a primary (or the only) assignment is a problem that municipalities very often face with. Thus, capacity increase at municipal level (employment of qualified and devoted persons) responsible for energy management will allow harvesting of benefits through achieved savings;

- In order to motivate responsible municipal staff, national authorities (Ministry responsible for Energy) or national agencies (energy or energy efficiency) may organize the competition and the awarding system for the most advanced municipalities and managers. Necessary funds could be provided from National Budget or Energy Efficiency Fund;

- Developing information system for public lightning facilities and improving the functioning, maintenance and monitoring of such systems is also one relatively cheap and effective solution for harvesting energy savings in relatively short period of time;

- Monitoring water supply systems and sewage water systems in municipalities. (Analyses of operation, improvements of maintenance, monitoring of consumption and costs, possibilities for installation of variable speed drives and batteries for compensation of reactive energy);

- Preparation and implementation of municipal mid-term planning documents (three years programs, and annual EE plans) in compliance to National Energy Efficiency Action Plans. These documents help harmonization of energy efficiency policies at national and local levels, and provide planned actions towards more energy efficient municipalities;

- In accordance to provision of directives and national legislation (the energy law, the Law for Construction and related rulebooks), municipalities shall organize energy auditing of public buildings under their

jurisdiction. Also all heating and air-conditioning systems have to be inspected regularly. Buildings with useful floor area of more than 500m<sup>2</sup> shall be certified, and energy performance certificate properly displayed at prominent place. All these activities shall be integral part of established EMS;

- Renovation of public buildings (according to cost optimal methodology and pursuant minimal energy performance of buildings defined in the national legislation);

- Implementing energy management requirements and certification according to International Standard for energy management - ISO 50001;

- Establishing schemes and guidelines for energy efficient public procurement;

- Establishing market for ESCO companies, through market development activities, information campaigns;

- Participation in international initiatives aimed to support municipalities (Covenant of Mayors, European Mobility Week, Smart cities etc.);

Trainings and seminars for the increasing capacities for preparation of application for EU funded projects (or other). Disseminating of knowledge and information about open calls for applications.



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