

Implementing Energy Efficiency and Renewable Energy Measures - are Southeast European Countries on track?

Barriers, Positive examples, proposed measures and policies



INTRODUCTION

*“The cheapest watt of energy is one that isn’t consumed at all”
– Colorado Governor Bill Ritter*

Energy efficiency (EE) is a vital part of every country’s energy policy. All countries strive to establish an energy system that will enable balanced development of environmental protection, the competitiveness of the market and the security of energy supply. But the uncertain global energy market and the poor use of indigenous energy resources make it difficult to build a sustainable energy system in Macedonia. Remaining highly dependent on energy, without proper implementation of energy efficiency, the overall success of energy development is at stake. Macedonia as a country member of the Energy Community and a candidate for EU membership needs to keep up the pace with the other countries of South Eastern Europe when it comes to reforms of the energy sector.

However, implementation of reforms is one of the main problems in Macedonia. According to a study conducted by Analytica in February, Macedonia is seriously lagging behind in the implementation of reforms in the energy sector, including the implementation of energy efficiency measures at the national and local levels.

“...Macedonia’s progress in the energy sector has been slow, positive in some areas, but with overall unsatisfactory assessment. The same problems have prevailed throughout the years, such as the capacity of the Energy Regulatory Commission; the proper functioning and professionalism of the Energy Agency and the departments in the Ministry of Economy in charge of the energy sector; the improper implementation of the legislation; changing of the legislation without following EC’s or ECSEE’s rules; lack of proper strategies; etc...”
(<http://www.analyticamk.org/files/ReportNo37.pdf>).

Nevertheless, the country is currently working on improving the state of the energy sector with vigorous determination, although a lot of work still remains to be done. As there are many studies of what should be done at the state level¹ this research focuses on the local level and the opportunities for ground-breaking development when it comes to energy efficiency. The main targets for energy efficiency measures are the sectors with the highest energy intensity: the housing sector, the service sector (hotels, business centres, banks, etc.), and the public sector (municipalities’ buildings and offices, ambulances, sports objects, kindergartens and primary schools, cultural objects, etc.). The goal of increasing energy efficiency in these areas is to gradually decrease the consumption of energy, which will not only save money for the private and public sector but will also reduce the country’s carbon foot print.

The research was conducted in several phases. After screening the municipalities in Macedonia (84 plus the city of Skopje within which there are 10 other municipalities) regarding their activities on

¹The preparations of the Strategy for development of the energy sector, the Energy Efficiency Strategy, the Strategy on Renewable Energy Sources, the National Energy Efficiency Action Plan, etc. attracted lot of media attention in the past year.

implementing energy efficiency two municipalities were selected as case studies: Karposh and Strumica. Using comparative methods, these municipalities were selected on the grounds of the following indicators:

- size of the municipality, level of local development, decentralization progress;
- local legislation dealing with Energy Efficiency (both municipalities have developed strategies, programmes for EE, LEAP, etc.);
- human resources in the municipalities that deal with these issues (special departments or teams that work specifically with these issues);
- past and future projects (several successfully implemented projects in both municipalities as many others planned for the following period);
- municipal budget funding (25% from Strumica's budget goes to EE related projects and most of the funds for the projects in Karposh come from the municipal budget);
- grant absorption capacity (both have several accepted project proposals by IPA, USAID and other foreign donors);
- and availability of information and data (the civil servants working in this area were open for cooperation and without a problem fulfilled the given questionnaire as well as gave interviews on the related topic).

On grounds of the criteria indicated above, the research focuses on in-depth analysis of two case-studies (one municipality from the capital and one from inland). The selected municipalities answered the questionnaires in a short time and showed the biggest interest in promoting their work, as well as sharing difficulties and challenges. Therefore, drawing on their work and experience, the aim of the research is to

-first, show the extent of progress and the clear concrete benefits that the implementation of EE policies has on the local communities in Macedonia,

- and second, to advocate these best practices to the rest of the municipalities in the country that could benefit from the transfer of know-how.

In the paper we also present the best practices of the more developed EU and regional municipalities as a comparison with the measures taken locally. This could also serve as guidance for the municipalities in Macedonia, as to which measures work best and where the emphasis should be put.

1. THE LEGAL FRAMEWORK FOR EE

1.1 National legislation on energy efficiency

The legal framework that regulates the energy sector in Macedonia has been significantly expanded in the last couple of years, encompassing all areas of the energy sector, which has been identified as a state and government policy priority. Among the last areas that entered the energy agenda of the country is energy efficiency (EE). Being an energy intensive economy², for many years the issue of EE has been neglected by the state authorities managing the energy sector. However, the last

² Reference from the IEA study about the Energy Outlook of the Western Balkans

several years have seen increased interest for energy efficiency, which has been conveyed into newly enacted strategies and primary legislation, as well as into many secondary legal acts (Rulebooks and Methodologies), which regulate specific, narrow parts of the area of energy efficiency.

In the following part a brief overview will be given of the legal documents that regulate the energy efficiency policy area.

- Strategy for development of the energy sector until 2030

The new country Strategy for development of the energy sector until 2030 does not address the issue of EE in an explicit manner.³ In the strategy, EE is considered only as a second scenario to the baseline scenario. It includes estimations for the energy consumption after implementation of energy efficiency measures, in comparison to the baseline scenario, which in turn excludes any EE measures in the energy sector, both on the production and on the consumption side.

- Energy Efficiency Strategy 2010-2018

An Energy Efficiency Strategy has been in place since 2004 as an overall umbrella document for operation of the sector of EE, offering institutional, legal and financial options for its development, but it did not allow for a sustainable and well founded development of EE in the country.⁴ In September 2010 the government published a new and updated Energy Efficiency Strategy that should take into consideration the low implementation progress of the previous strategy, as well as the altered priorities and conditions in the energy sector in the country.⁵ The aim of the new strategy is

“to develop a framework for accelerated adoption of the EE practices in a sustainable way, through implementation of programmes and initiatives focusing on: decreasing energy import dependence and energy intensity of the economy, nonproductive use of electricity, development of conditions for maximizing of the inclusion of the private sector in this area, through complementary activities and training”.⁶

The strategy proposes multiple legal, financial and technical measures to be implemented: legislative changes, drafting new secondary legislation complying with EU standards, new legal and regulatory measures, establishing an Inter-ministerial group of experts as a platform for public discussion and lobbying, a capacity building private-public partnership, as well as the establishment of a Fund for Energy Efficiency as a financial mechanism for the implementation of the Strategy, and the development of a market component by encouraging the involvement of the private sector and different ESCO arrangements. The national priorities that are embraced in the new Energy Efficiency Strategy are: security energy supply, sustainable economic development and competitive

³Strategija za razvoj na energetikata vo Republika Makedonija do 2030 godina. Official Gazette 61/2010.

⁴Strategija za energetska efikasnost na Republika Makedonija, USAID, December, 2003.

⁵ Ministerstvo za Ekonomija, *Strategija za unapreduvanje na energetska efikasnost vo Republika Makedonija do 2020*, septemvri 2010, Skopje, available at:

http://economy.gov.mk/WBStorage/Files/Strategija_za_EE_Konecna_MKD_verzija.pdf

⁶ Draft Energy Efficiency Strategy, pg.51. accessible at:

http://economy.gov.mk/WBStorage/Files/MEES_MK_Nacrt_verzija_za_javna_debata.pdf

economy, and for the first time one legal document sets national EE targets – 9% savings compared to the 2002-2006 average energy consumption and 20% savings by 2020.

- The Energy Law⁷

The Energy Law from 2006 is the foundation of the development of the energy sector in Macedonia. It is the legal basis for creating the country's energy policy, including the energy efficiency policy: strategy and secondary legislation.⁸ Parallel to the Energy Strategy that sets the wider framework for the EE, the Energy Law contains provisions that closely regulate different segments of EE in energy production and energy consumption - generation capacities, industry, commercial and service sector, households – at the national and local levels. The Energy Law also allows the Macedonian Government to enact a Programme for realization of the Energy Efficiency Strategy, which will contain measures for EE, financial sources, implementation conditions, evaluation indicators, technical and national standards, and a detailed implementation timeline.⁹

- First National Energy Efficiency Action Plan (NEEEAP)

Another incentive for the development of a comprehensive legislation are the obligations undertaken within the Energy Community Treaty (ECT). The ECT encourages adoption of measures that foster the development of energy efficiency.¹⁰ Therefore, energy efficiency has been one of the working areas of the ECT, receiving its momentum in 2008 with the organization of the first Energy Efficiency Task Force meeting.¹¹ The first Macedonian National Energy Efficiency Action Plan (MNEEAP)¹² for the period 2009-2016 for the first time sets EE targets in the country; outlines the criteria and priority areas for EE; proposes cross-sectoral and specific, directive based measures for the implementation of EE projects and the mobilization of financial resources.

1.2 Responsibilities of the municipalities in the area of EE.

Since the decentralization of local government in Macedonia from 2004, a number of responsibilities have been progressively transferred from the central to the local level. The process of developing the municipalities and consequently moving to the second phase of decentralization, meaning fiscal decentralization, has given local governments the right to independently create and implement policies in accordance with national legislation. This has also been the case with the energy efficiency.

⁷ The Energy Law is from 2006, however a new updated Energy Law is in preparation and in parliamentary procedure.

⁸ The Government of Republic of Macedonia is responsible for creation of the policy for development of the energy efficiency and sustainable use of renewable energy sources. The policy for energy efficiency is defined in a Strategy for development of the energy efficiency. *Zakon za energetika*, Official Gazette 63/2006, Article 121. Available at: <http://www.erc.org.mk/Uploads/Zakon%20za%20energetika%20-%2063-2006%5B1%5D.pdf>.

⁹Ibid, Article 125.

¹⁰ The EU Directive 2006/32/EC defines energy efficiency as "a ratio between an output of performance, service, goods or energy, and an input of energy". Official Journal of the European Union L 114/64, Article 3(b). Accessible at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:114:0064:0064:en:pdf>

¹¹ The 1st Energy Efficiency Task Force meeting was organised in Vienna, at the Energy Community Secretariat on 21 February 2008. Available at:

http://www.energy-community.org/portal/page/portal/ENC_HOME/CALENDAR/Other_Meetings/Meetings_2008/Feb_2008

¹²First National Energy Efficiency Action Plan 2009-2016, in draft version, prepared by the Ministry of Economy, with support of USAID and MACEF. Available at: http://economy.gov.mk/WBStorage/Files/MNEEAP_nacrt_MK.pdf

The legal framework that allows municipalities to engage in EE projects includes:

- The Energy Law

The responsibility of the municipalities regarding EE is enacted in the Energy Law, and has to comply with the respective law and the Energy Efficiency Strategy. According to Article 128 the municipality has the responsibility to prepare an Energy Efficiency Programme for a period of 5 years.¹³

- MNEEAP

The National Energy Efficiency Action Plan gives a specific role to the municipalities in reaching the energy savings target, through the organization of informational campaigns and by establishing a municipal network of EE. The aims are multiple, like awareness raising and influencing the behaviour of end-users, increasing the energy efficiency of municipal and county facilities and offices, the efficiency of state facilities and offices, etc.¹⁴

- Law on Financing the Units of Local Government¹⁵

Financing EE projects is a crucial issue that deserves special attention and needs to be addressed at both the national and the local levels. Therefore the legislation on the sources and ways of financing the municipality budget indirectly is connected to and influences the area of EE. As for the implementation of each policy, a stable and predictable financing scheme is very important for the viability of EE projects and the sustainability of an EE programme. The Law on Financing the Units of Local Self-Government is the basic legal act that prescribes the 'rules of the game' for municipalities to achieve fiscal independence –managing their budget revenues and expenses, and reaching the level of creditworthiness. Given the above, from a financial perspective this law plays an indirect role in the process of creating municipal Energy Efficiency Programmes and developing EE projects – both in financial terms and regarding the implementation timeline.

After presenting the legal frame in a nutshell, the following part of the report will give a detailed analysis of the current stage of EE at the municipal level, taking into consideration the experience of implementation of EE projects in some of the Macedonian municipalities.

1.3 KARPOSH MUNICIPALITY

1.1 Basic data and strategic plan for Karposh Municipality

- Karposh Info

¹³Zakon za energetika, Official Gazette 63/2006, Article 128. Available at:

<http://www.erc.org.mk/Uploads/Zakon%20za%20energetika%20-%2063-2006%5B1%5D.pdf>

¹⁴First National Energy Efficiency Action Plan 2009-2016. Table 1.2.1: Overview table of all existing EEI programs and measures in Commercial and Services.

¹⁵Zakon za finansiranje na edinicite na lokalnata samouprava, Official Gazette 61/2004.

The municipality of Karposh is one of the ten municipalities located in the City of Skopje. It consists of 14 local communities, 12 urban and 2 rural. It covers an area of 35 km², 363 meters above the sea level, located in the centre-west of the city. It has 59.666 inhabitants and 19.680 households. With these characteristics - urban, central location, mild climate, not over populated - Karposh has potential to grow into a real modern community. Having visionary leadership has also helped this municipality to use its capacities as much as possible which made it a pioneer in implementing energy efficiency policies at the local level in the country.

With the local decentralization process that started in 2004, the municipalities gained many rights but also lot of responsibilities in managing their communities. Municipalities are now responsible for their own environmental plans, and with the new legislation it is projected that each of them should adopt an LEAP (Local Environmental Action Plan). Some are more successful in fulfilling the new duties, some less, as financing is still a major issue for most of Macedonia's municipalities. As a fairly successful municipality Karposh has developed a clear vision and has formed a team to work thoroughly on creating an energy efficient municipality. There is a newly formed Energy Efficiency Unit which will be responsible for all activities and projects related to energy efficiency. Staffing of this unit is still on-going. Up until 2010 these activities were handled by a team of young professionals working in the Local Development Unit with the primary obligation to prepare programs and measures for the support of SMEs and entrepreneurship at the local level and craftsmanship. It also cooperates with the NGOs, promotes tourism in the municipality, etc. Apart from these two bodies, Karposh municipality also has a Commission for the environment and nature protection.

- Strategic Plan

Before analyzing the activities of Karposh municipality in the area of energy efficiency, a recap of their Strategic Plan for Local Development for the period of 2009-2013 will be presented. It is important to note that in the absence of an LEAP, this document is the second-best indicator of the current situation and the future plans in the areas of energy and the environment. One of the main goals in the Strategy of Karposh is to become a clean and 'green' municipality. Therefore there is a separate chapter under which six strategic goals of Environmental protection and Energy Efficiency are elaborated.¹⁶ Those are:

- Adopting a strategy for the protection and promotion of the environment;
- Implementation and updating of the Energy Efficiency Program of the municipality;
- Improving the air quality;
- Monitoring pollution from economic subjects;
- Schooling different categories of the population on environmental protection;
- Horticultural landscaping and maintaining public green areas.

2.2 Challenges.

¹⁶More about the Strategic Plan for Local Development of the Municipality of Karposh can be found on the following web page:

http://www.karpos.gov.mk/index.php?option=com_content&view=article&id=369&Itemid=126

In implementing the energy efficiency programme municipalities face a lot of issues. Karposh is not an exception to this rule. Usually the problems municipalities face are:

Technical	Funding	Others
Outdated transformer stations	Inefficient allocation of funds for these activities	Insufficient education of citizens about energy consumption, energy efficiency and overall environmental protection
Huge number of defects in street lighting	Lack of coordination between the different donors	Lack of knowledge and subsequent training of the civil servants that work in the municipality when it comes to EE awareness and the ability to work on project implementation
High consumption of electricity		Lingering issues with the decentralization process (not being able to sell construction ground in their municipality, not having all the schools under their jurisdiction, having parts of their budget still controlled by the central authorities, etc.)
Huge expenditures for excessive electricity consumption		
Use of short-lasting old type of light bulbs and the defects that occur on the passive elements (dampers)		
Permanent increase of the need for thermal and electric power with the development of the municipality		

2.3 Human resources, capacity and cooperation of the Municipality of Karposh

As previously mentioned, the municipality formed a Unit for Energy Efficiency which is officially part of the Sector for environmental protection. Currently it employs two civil servants, an electrical engineer and electrical technician. The unit cooperates closely with the Sector for development which also employs one mechanical engineer and one economist (they both work on the projects related to EE). The municipality also has a team for EE, consisting of four members. Two people of the Sector for Local Development are involved: Petar Teov (team coordinator) and Aleksandra Todorovska, and from the Energy Efficiency Unit, Ljubco Dimov and Dejan Jozunovski.

As can be seen, only four people work on areas as wide as environment and energy. This represents a major challenge for the municipality and will continue to do so in the near future. Field research showed that consolidation of personnel is highly important if the municipality wants to increase its competence in the area of energy efficiency. The needs are identified as the need for capacity building through the training of civil servants in EE project development, as well as the need for optimizing the levels of adopted programmes with implemented projects in this area.

The low administrative capacity is an even bigger issue for the other municipalities in the country, and reflects negatively on any attempt of inter-municipal cooperation. Transfer of know-how happens more at a personal, individual level rather than at the institutional level, as there is still no institutional framework for municipal cooperation in a vital area such as energy efficiency. Due to understaffing and limited budgetary means, Karposh municipality also has limited cooperation in energy matters with municipalities in other countries (regional and European). It has established however a communication with the Austrian Chamber of Commerce and some other similar organizations in Austria and Germany, which are highly interested in working and financing projects for energy efficiency in the whole Balkan area. However the important communication between municipalities from different countries is missing.

2.4 History of implementation of energy efficiency measures

The municipality of Karposh has been successful in implementing energy efficiency projects. To date, it has finished two projects, one aimed at implementing a double regime for sidewalk lighting on the river Vardar bank and the other concerning the installation of a solar system for charging stop lights at crossroads. Furthermore it has several on-going projects such as:

- **Integrated systems for managing and monitoring street lighting in the municipality (128 separate commands for the street lighting outside the transformer stations);**
- **Reconstruction of the street lighting with economical light bulbs (3600 in total);**
- **New object for the municipal building built by the highest energy efficiency standards.**

Apart from these projects, the municipality is also working intensively on several project proposals, including:

- Lighting on the municipal road from Sredno to Gorno Nerezi with autonomous solar bulbs;
- Changing the current 400 W reflectors (244 in total) from the sports playgrounds in the municipality with 140 W reflectors;
- Reconstruction of the lamp posts in the front yards of schools and kindergartens and replacing them with economical ones;
- Project for the Italian Ministry of Environment to : replace the current heating with geo-thermal pumps, replace doors and windows for achieving thermo-isolation; electricity for every primary school and kindergarten and replacing the light bulbs in the schools' and kindergartens' buildings with economical ones;
- Construction of a technological park which will consist of educational and innovative centers and will be completely energy independent, built according to the highest standards in that area;
- Creating measurements for technological water that can be used as a means for the geothermal pumps, which would be an alternative to the current heating system in Skopje.

These projects are defined with the Programme for EE of the municipality adopted for the period of 2008-2012, then with the Strategic Plan of the municipality and the development strategies deriving from the Programme for the regulation of construction land. Most of the projects are being developed by experts working in the municipality. Furthermore, the financing of these projects

usually comes from the municipal budget but the municipality also has a tendency to apply for grants or funds from the EU or other international or regional institutions. Still, the implementation dynamic of these projects mostly depends on the funds the municipality has. Unlike most municipalities in the country, Karposh has prepared energy related projects but cannot raise enough funds to get the project activities started. Nevertheless they are trying to compensate that by regularly following project calls from the EU and other donor organizations. What they are actively asking for is a change in the legislation that will allow for the categorization of objects according to their energy use and the adoption of measures for issuing an 'energy identity card' to each object.

The benefits of actively working on these kinds of projects at the local level are immense and they allow for a substantial amount of energy savings to be achieved at the municipal level:

- The amount spent annually on electricity for street lighting was decreased from 16.000.000 to 11.342.000 denars, even though the price of electricity increased by 10% over this period;
- Progressive decrease of the maintenance costs from 10.000.000 denars to 6.000.000 denars;
- Lower emission of CO₂.

2.5 Summary for Karposh Municipality

Karposh municipality is a vibrant urban community located in Skopje. It has a developed energy efficiency programme with many on-going and planned projects. The development of EE is elaborated in its Strategic Plan for Local Development 2009-2013. Karposh also formed a separate Energy Efficiency Unit, which is responsible for all activities and projects related to energy efficiency. This team consists of several civil servants with extensive experience in dealing with EE and other energy issues. Karposh has several successfully implemented projects of EE and a quite a few project proposals that are in the procedure of getting funds. The financing of these projects usually comes from the municipal budget but Karposh also applies regularly for grants or funds from the EU and other international or regional institutions. The implementation dynamic of these projects mostly depends on the funds the municipality has. However, it still faces major issues in its work even though the EE programme is running successfully. Most problems are of a technical or administrative nature such as: huge expenditures for excessive electricity consumption or lack of knowledge and subsequent training of the civil servants that work in the municipality when it comes to EE awareness. Poor coordination of the available funds at the national level, a low number of regional activities concerning EE projects and poor transfer of know-how at the national and regional levels add up to inhibit the efficient implementation of the EE programme and do not allow the municipality's full capacity in this field to be fulfilled.

3.3 BASIC DATA FOR STRUMICA MUNICIPALITY

Strumica is another municipality with an extensive successfully running Energy Efficiency Programme. The implementation pace of this programme is described further below. The

municipality of Strumica is located in the southeast region of Macedonia, close to the Bulgarian border. The town covers an area of 485.59 km² 256 meters above sea level. Strumica is a medium-sized town of 54.676 inhabitants.

Strumica bases its work on developing energy efficiency on the Programme for Energy Efficiency 2009-2013. The realization of the programme will contribute to a lower loss of energy and a decrease of expenses for electricity and heating in the municipality, as well as an improvement of comfort in schools, modernizing street lighting, etc.¹⁷ Apart from this, the goals set with this strategy are:

1. Renewed energy systems and facilities.
2. Improved sanitary conditions and increased productivity in the municipality.
3. Increased awareness for energy savings of the responsible civil servants, the executives and the end consumers.

3.1 Human resources, capacity and cooperation of the Municipality of Strumica¹⁸

As part of the EE Strategy, Strumica municipality formed a team for energy efficiency. The team consists of experts that work in different units in the municipality. They also have the possibility to work closely with external consultants for the proper implementation of their tasks. The team's responsibilities connected to EE are the following:

- coordination and implementation of EE projects in the municipality and reporting on the results at the end of the projects;
- participation in the creation of the municipal budget concerning the electricity costs and the maintenance of municipal buildings and street lighting;
- administering the database for the municipal buildings and monitoring of all energy related issues in the municipality;
- initiating and coordinating activities with governmental and non-governmental organizations for the implementation of EE projects as well as with donor organizations offering funds for supporting local development.

The municipality believes that its capacities are satisfying not only the needs of the citizens but also the demands arising from the extensive projects on energy. According to the officials, for each project there is a responsible team consisting of people whose competency is in line with the projected activities, civil servants from the municipality and external experts.

The municipality of Strumica is also part of a regional network, established through an IPA project for development of the local infrastructure. Like Karposh , the municipality does not have

¹⁷ More on the Energy Efficiency Programme 2009-2013 can be found on the following web-page: http://www.strumica.gov.mk/downloads/ler/FINAL_Strumica_MEEP_Draft_2009-2013.pdf

¹⁸ The data for Strumica was given in the form of questionnaire, by Sofce Janeva, councillor at the sector for Local Economic Development in the municipality of Strumica

substantial cooperation with other municipalities in Macedonia for transfer of know-how or sharing experiences.

3.2 History of implementation of energy efficiency measures

3.2.1 Past projects

The beginning of the activities regarding EE projects, as in the case with the Karposh municipality, arose from the necessity to modernize the infrastructure in the municipality and change the old ways of lighting, heating, and isolating. In the past several years the municipality of Strumica has implemented several projects of EE and has 15 projects in the pipeline to be implemented in the period 2009-2013, all of them part of their Programme for Energy Efficiency. The implemented projects are:

- **Municipal building – replacement of the roof, external doors and windows and renovation of the façade;**
- **Primary School Vidoe Podgorec – replacement of the windows and doors;**
- **Primary School Sando Masev – renovation of the façade, replacement of the external windows and doors;**
- **Primary School Kiril and Metodij village Dabile – replacement of the external windows and doors;**
- **Primary School Geras Cunev village Prosenikovo – replacement of the internal and external doors and windows.**

Funding for the projects is provided by the municipality, e.g. from its own municipal budget, and from international donors such as the USAID (financed the project for Green Schools), IPA funds, credits, etc. Depending on the funding available, the municipality decides how and which projects to implement. For the next 15 projects the funding will be provided by Strumica's own budget (25%) and external funding sources (75%) through domestic and international borrowing, international donors, IPA, etc.

3.2.2 Future plans

The municipality of Strumica is in the phase of realizing the Programme for installing a gas network in the municipality. The project envisages the implementation of a so-called virtual gas system, i.e. a system for the compression of natural gas in transport modules, transport of those modules (loading and unloading) and decompression of the gas and its use in the distribution network. For that purpose the municipality will form a public enterprise for the transmission and distribution of natural gas. The total cost of the investment is 4.567.939 Euros, of which 3.600.000 Euros are

planned funds i.e. credit from the World Bank and the rest are the municipality's funds. With the realization of this project, the municipality will contribute significantly to the protection of the environment, while using this energy source will have economic benefits for the citizens, companies and public bodies.

The other projects that are planned for the next period outlined in the EE Programme 2009-2013 are:

Activity

1. Replacing the old street lights with new EE lights
 2. Warm-water system, replacement of windows and roof isolation at "Nicola Karev" school
 3. Double-glazing windows and thermo-isolation of the roof at "Jane Sandanski" school
 4. Roof reconstruction, thermo-isolation and new windows at "Dimitar Vlahov" school
 5. Replacement of windows and thermo- isolation at "Nicola Vapcarov" school
 6. Replacement of windows, heaters at the sports gym, roof reconstruction with isolation at "Marsal Tito" school
 7. Roof isolation at the school building and the sports gym and replacement of windows and inside doors at "Sando Masev" school
 8. Roof reconstruction with thermo-isolation at "Vidoe Podgorec" school; installing hot-water system and replacing the entrance door at the gym
 9. Hot-water system, replacing the inside doors and roof's thermo-isolation at "Kiril i Metodij" school village Dabile
 10. Hot-water system, installing roof-isolation at "Marsal Tito" school village Murtino; etc.
 11. Roof thermo-isolation, replacement of inside doors at "Dame Gruev" school village Kuklish
 12. Hot-water system, replacement of inside doors at "Geras Cunev" school village Prosenikovo and replacement of the windows in the gym
 13. Hot-water system, replacement of old wooden windows with PVC, reconstruction and thermo-isolation of the roof at "Goce Delcev" school village Veljusa
 14. Replacement of windows and roof isolation at the Army Club in Strumica town
 15. Installation of sun collectors for hot sanitary water, replacing the windows and roof thermo-isolation at the five building of "Detska Radost" kindergarten in Strumica
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3.3 Challenges

The municipality of Strumica, like that of Karposh, is not immune to the various issues that arise when implementing energy efficient measures on its territory. These barriers can be divided into two categories: institutional and legal/financial.

Institutional	Legal/ Financial
<ul style="list-style-type: none"> The municipal administration as such is a relatively new institutional setting (after the decentralization process) and has an insufficient number of employees not matching the increased number of obligations. 	<ul style="list-style-type: none"> Difficulties in locating external funds for EE projects.
<ul style="list-style-type: none"> The civil servants do not have enough time/funds to engage thoroughly in dealing with energy efficiency and implementing EE measures in their work place. 	<ul style="list-style-type: none"> High interest rates (10% - 15%) are an obstacle for investments for reconstruction and the implementation of EE measures in case the municipality applies for credits.
<ul style="list-style-type: none"> There is insufficient knowledge regarding the development and implementation of EE projects. 	<ul style="list-style-type: none"> Unclear property rights (state/municipal property) hamper the approval of the credit.
<ul style="list-style-type: none"> The focus is more on short-term, daily activities rather than on long-term municipal planning for energy efficiency. 	

3.4 Summary for Strumica Municipality

The municipality of Strumica is one of the most developed energy aware municipalities in the country. It has a developed sector for EE, a Programme for Energy Efficiency for the period of 2009-2013 and a team of civil servants and experts that work on implementing EE projects. The goal is to reduce energy losses and to decrease expenses for electricity and heating in the municipality. The beginning of the EE projects was the necessity to modernize the infrastructure in the municipality and change the outdated lighting, heating, and isolation systems. As mentioned, the municipality has already completed several projects and has around 15 projects that should be implemented in the period of 2009-2013 which are part of the Programme for Energy Efficiency. One of its major projects is the forthcoming installation of a gas network in the municipality with a so-called virtual gas system. Strumica funds 25% of these projects, while outside donors provide up to 75% of the funding. Like Karposh, Strumica faces problems such as a lack of funding for all the planned projects and poor regional networking. Other issues include the lack of knowledge about EE projects (writing and implementation), insufficient human capacities within the municipality, problems with property rights that hinder the successful realization of the projects, etc.

4. PROMOTIONAL ACTIVITIES OF EE AT THE LOCAL LEVEL IN THE EUROPEAN UNION

The member states of the EU are working vigorously on improving the application of energy efficiency, as estimations show that it could reduce greenhouse gas emissions within the Union by around 20% by 2020. Bearing in mind that energy efficiency just started getting into the spotlight in the Balkans, the countries have the possibility to transfer good practices from the member states into their own communities. Energy efficiency is by far the quickest, cheapest and easiest way to tackle the problems of constantly growing electricity and heating expenditures as well as the problems arising from energy poverty and unsecure energy supply.

4.1 Municipalities as a role model

Municipalities have to serve as role models to their citizens when it comes to energy savings and being energy efficient. There are many ways in which municipalities can promote this, from adopting mandatory 'green' public procurement programmes to less mandatory measures such as setting up criteria or action plans for considering energy efficiency in investments in public buildings, municipal equipment and vehicles. For instance, in Finland voluntary agreements and mandatory information measures for municipal buildings are currently in place. Training civil servants about energy efficiency before campaigns is also of vital importance. Usually, citizens are the focus of the education and promotion campaigns, while forgetting that large numbers of civil servants at the local and central levels also lack proper information and training about EE. Having educated and informed civil servants who can be a role model for the citizens is an important priority for the local government.

4.2 Campaigns

The lack of understanding of EE and inadequate education on this subject form a major obstacle for the proper implementation of EE measures at the national and local levels. Therefore it is important that the initiative for EE projects comes from the local community, which can easily get through to the citizens, and with the support of international donors, the central government as well as the NGO sector raise this issue higher on the list of priorities. The measures a municipality can undertake are many and they mostly depend on the human capacity, the municipal budget and the type of community - rural or urban. Whatever the situation, organizing public awareness raising campaigns is a highly important tool and one that must be used in each case for promotion of EE.

Irish Example	Croatian Example
<p>Created a campaign called Power One the main focus of which is education and communication. The campaign focuses on:</p> <ul style="list-style-type: none"> -awareness of types and sources of energy, costs and environmental impacts -consumer information about the impact inefficient energy use has on costs and the 	<p>The UNDP Project in Croatia under the name Promoting Energy Efficiency (Poticanje Energetske Efikasnosti) created a unique campaign called EE Counseling which is mostly intended for households. Citizens can call a phone number free of charge and get all kinds of advice for improving EE in their homes. If</p>

<p>environment -individual responsibility and small changes in daily behavior. An innovative approach is the presentation of examples: for instance, the energy efficiency of eight families from different geographical and social backgrounds is tracked. Every month, the participants were set a challenge to improve their energy efficiency. The savings measured were announced to the media¹⁹.</p>	<p>necessary, the service can also send an expert to their home. Furthermore they conduct a preliminary energy audit which is mostly intended for the public and service sector. This includes an inspection by an expert who after seeing the building will determine where most of the energy is lost or spent and will give suggestions for improving the EE of the building.²⁰</p>
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4.3 Networking

Networks are highly important and represent the cheapest way to transfer know-how within the country and the region. The municipalities in Macedonia still work mostly on their own, thereby missing the benefits of network membership. Even Karposh, a successful example of an urban, energy aware community, is not a part of any regional or European network where they can exchange experiences with other similar and more successful municipalities. Apart from improving the communication within the Association of the units of local self-government of the Republic of Macedonia (ZELS), the municipalities need to work on improving their presence at the regional and European levels. The Network of Associations of Local Authorities of South-East Europe is another, positive example. However, even though the HQ of the organisation is in Skopje, Macedonian municipalities still lag behind in using the advantages of such regional cooperation and transfer of knowledge.²¹

4.4 Funding Energy efficiency projects

In addition to campaigning and networking, funding is the third main tool for enhancing promotion of energy efficiency projects. Municipalities still have a hard time applying for commercial credits to finance their projects due to the high interest rates in the country and the strict conditions each municipality has to fulfill in order to be creditworthy – i.e., proceeding to the second stage of the fiscal decentralization process²². Therefore most municipalities try to either provide the funds from

¹⁹*Promoting Energy Efficiency in Europe*, Insights, Experiences and Lessons learnt from the National Energy Efficiency Action Plans, Energy Efficiency Watch, page 6.

²⁰ UNDP Hrvatska, Poticanje Energetske Efikasnosti, http://www.energetska-efikasnost.undp.hr/index.php?option=com_content&view=article&id=149&Itemid=112

²¹ The Network brings together 15 Associations which represent roughly 4000 local authorities, directly elected by more than 80 million citizens of this region. The NALAS Secretariat, based in Skopje, is responsible for the overall coordination and the implementation of the activities...NALAS focuses primarily on local finances, urban planning, waste management, institutional development and energy efficiency. Network of Associations of Local Authorities of South-East Europe <http://www.nalas.eu/about.aspx>

²² The Law on local self-government adopted in 2005 established two phased fiscal decentralization, which aims at creating a mechanism for financing the municipalities based on transparent work and objective criteria and norms. The phase approach of the fiscal decentralization is based on the following principles: gradually transferring the authority in accordance to the capacity of the municipalities to take over their obligations; justified and appropriate procurement of the funds for effective and incessant implementation of the transferred obligations; decreasing of the national budget funds and the funds for the functions i.e. obligations that will be transferred at local level.

their own budgets or through international donors. EU member states deal with the lack of funds differently. The range of financial incentives for the industry and tertiary sector is quite big ranging from soft loans and grants to direct subsidy schemes and tax reductions. Prominent examples include:

- Rebate in taxation for investments in energy efficiency (Belgium, France);
- Implementing a scheme of direct subsidies for apartment buildings and (semi) detached houses (Finland)
- Establishment of Energy Savings Trusts in Denmark²³ and the UK.²⁴
- In order to reduce electricity use in the residential sector, the non-residential sector and the tertiary sector, Italy plans the replacement of incandescent lamps by compact fluorescent lamps (CFL) through, inter alia, white certificate schemes, information programmes, and monetary incentives, resulting in savings of 4,800 GWh/year until 2016²⁵.

RECOMMENDATIONS

Drawing upon our study, some recommendations arise as a necessity that should be taken into consideration when shaping the energy policy in the area of energy efficiency at the local level in Macedonia. Preparation of municipal energy action plans and sustainability of implementation of EE projects will in great part depend on the consideration of the following recommendations.

- Energy efficiency should be recognized at the national and local levels as a high-priority energy resource;
- Each municipality should follow the examples of Karposh and Strumica and adopt Strategic Plans for Local Development with subsequent Programmes for Energy Efficiency. These strategic documents are the starting point of a long-term EE strategy;
- Each municipality should also have energy efficiency teams or departments. Having specific group of professionals within the municipality who work on implementing EE measures and projects proved very successful for Karposh and Strumica;
- The capacity of the municipal administration should be strengthened by EU municipally tailored training programmes, Technical Assistance (TA), and financial support for establishing regional networks and the implementation of joint projects of EE;
- Municipalities should increase their cooperation with other municipalities, such as Karposh and Strumica, as they can offer assistance in the process of implementing EE measures and applying for funds;
- The municipalities together with the central authority should work on modifying policies to align utility incentives with the delivery of cost-effective energy efficiency;

²³ See <http://www.elsparefonden.dk>)

²⁴ See <http://www.energysavingtrust.org.uk>)

²⁵ *Promoting Energy Efficiency in Europe*, Insights, Experiences and Lessons learnt from the National Energy Efficiency Action Plans, Energy Efficiency Watch, page 8.

- Municipalities should work on establishing networks in the country and the region with the aim of sharing knowledge and experience in funding and implementing EE projects as this proved to be neglected even in the cases of Karposh and Strumica;
- In addition to promoting energy efficiency, municipalities should try to diversify their energy mix and promote alternative and clean energy sources, like wind, solar energy, but also projects relating to the installation of gas networks and the wider use of geothermal energy, as these also seem to be neglected;
- As the case studies showed that lack of funds is a prevailing problem, the municipalities should pressure the central government to adopt some of the global practices of innovative financing, such as soft loans and grants, direct subsidy schemes and tax reductions, as well as incentives for the best energy-efficient practices.

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