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KOSOVO ENERGY EFFICIENCY ACTION PLAN (KEEP)
(2010-2018)

FIRST KOSOVO MID-TERM ENERGY EFFICIENCY ACTION PLAN
(2010-2012)

Pristine, September 2011

Dr. Besim Beqaj, Minister
Ministry of Economic Development

KOSOVO ENERGY EFFICIENCY ACTION PLAN (KEEAP)

PREAMBLE

The Kosovo Energy Efficiency Plan (KEEP) represents Kosovo's first long-term energy efficiency plan. It covers the period from 2010 till 2018. The Interim Plan 2010-2012 is also included. Many of the measures undertaken before 2012 shall be continued and those measures are indicated.

The initiative to draft the KEEP was taken in November 2008, based on the request received from the Energy Efficiency Task Force of the Energy Community Treaty for Southeast Europe.

On 23 December 2008, the Ministry of Energy and Mining Permanent Secretary adopted a special decision establishing a Working Group for the preparation of a draft KEEP. The Working Group of Kosovo (MED-ex MEM) did have a realistic possibility to prepare such a plan and for the document to be finalized during a three-month period. The WG submitted the document by 1st March 2009. In the explanatory note send to the EE Task Force, the Working Group presented its perspective on the issue, emphasizing that Kosovo is actually implementing its Energy Efficiency and Renewable Energy Resources Program (KEERERP) for the period 2007 - 2009.

On 12th January 2009, as the response from ECT Secretariat, the WG received a letter related to the National Energy Efficiency Action Plan. In the letter was recognized that the KEERERP did represent a serious endeavor; however there was a clear suggestion made of the importance to draft the NEEAP by 1st March 2009.

Upon drafting a working version of the document, between 10th and 13th February 2009, the Working Group received assistance in terms of advisory services commissioned through TAIX, regarding the content and methodology used for drafting the KFFP.

Consequently, the Working Group commenced with the drafting of KEEP, and the document was finalized on 23rd February 2009.

KEEP is an authentic document, drafted by the Working Group, which consisted of professional staff from the Energy Efficiency, Renewable Energy Resources and Environment Division and the Statistics and Energy Balance Division, and it was based on a number of sample NAPEEs. An inter-institutional group was established to support the work in drafting KEEP, consisting of representatives from the following institutions:

1. Ministry of Economic Development (ex MEM)	Chair
2. Assembly of Republic of Kosovo	MEMBER
3. Office of Prime Minister of Republic of Kosovo	MEMBER
4. Energy Regulator Office	MEMBER
5. Ministry of Finance(ex.Ministry of Economy and Finance)	MEMBER
6. Ministry of Environment and Spatial Planning	MEMBER
7. Ministry of Public Administration	MEMBER
8. Ministry of Trade and Industry	MEMBER
9. Ministry of Infrastructure	MEMBER
10. Ministry of Agriculture, Forestry and Rural Development	MEMBER
11. Association of Kosovo Municipalities	MEMBER

Also it should be mentioned that based on the Decision of the Ministerial Council No. D/2009/05/MC-EnC of 18 December 2009 on the implementation of certain Directives on end use energy efficiency, EETF MEMBER s agreed to extend the period covered by NEEAPs and to calculate the 9 year national indicative energy savings target for the period 2010 to 2018 and include 2012 as an intermediate target. A Technical Group has been working up to now assisted by EU Consultants and has finalized all calculations relating to this task and the actual report now presents the updated figures regarding energy demand and energy savings for the whole period 2010-2018. Also, during the period July-November 2010, the Technical Group supported by EU Consultants responded to and complied with all suggestions and corrections received from the Energy Secretariat.

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ABBREVIATIONS

KEEP	Kosovo Energy Efficiency Plan
EE	Energy Efficiency
LCE	Law on Energy Efficiency
EEA	Energy Efficiency Agency
RES	Renewable Energy Resources
KEERERP	Kosovo Energy Efficiency and Renewable Energy Resources Program
ECT	Energy Community Treaty
TF	Task Force
EEI	Energy Efficiency Improvement
HEA	Home Electric Appliances
EC	European Commission
EEIM	Energy Efficiency Improvement Measures
WSW	Warm Sanitary Water
EAR	European Agency for Reconstruction
KEK	Kosovo Energy Corporation
ERO	Energy Regulator's Office
EL	European Union
AI	Administrative Instruction
DESB	Division on Energy Statistics and Balance
KCUC	Kosovo Clinical and University Center
DEERERE	Division on Energy Efficiency, Renewable Energy Resources and Environment
ToR	Terms of Reference
K	Kosovo
KH	Kosovo Households
KS	Kosovo, Services
KI	Kosovo, Industry
KT	Kosovo, Transport
KA	Kosovo, Agriculture

KR	Kosovo Budget
SME	Small and Medium Enterprises
ESCO	Energy Services Company
LPG	Liquefied Petroleum Gas
USAID	United States Agency for International Development
GTZ	German Technical Cooperation
AK	Assembly of Republic of Kosovo
OPM	Office of Prime Minister of Republic of Kosovo
MEU	Ministry of Economic Development
MESP	Ministry of Environment and Spatial Planning
MAFRD	Ministry of Agriculture, Forestry and Rural Development
MEST	Ministry of Education, Science and Technology
MoH	Ministry of Health
MPA	Ministry of Public Administration
MTI	Ministry of Trade and Industry
MF	Ministry of Finance
MI	Ministry of Infrastructure
ktoe	Kiloton oil equivalent
GWh	Gigawatt /hour
MW	Megawatt
CHP	Combined Heat and Power (electricity and Heat Generation Plant)
IED	Industrial Emission Directive
IPPC	Integrated Pollution Prevention and Control
MEM	Ministry of Energy and Mining

Chapter I. Introduction

The Ministry of Economic development of Kosovo (ex MEM) was established in December 2004, as the institution responsible for the energy sector. In the responsible ministry for energy MED (ex MEM), since 2005, EE issues were carried with RES issues as a common sub-sector by the Department of Energy. From the beginning the best practices on EE from other countries have been considered for undertaking efforts to strengthen the institutional framework for EE and RES, through the establishment of the Kosovo Energy Efficiency Agency.

The legal basis for EE is addressed by the three primary legislation regulations for the energy sector: the Law on Energy, the Law on Electricity and the Law on the Energy Regulator.

The legal base for the EE sphere is in the final stage of establishment, after first reading in Parliament of the Draft EE Law and it is expected that by first semester of 2011 will be approved. After receiving approval, this law will be complemented by a set of secondary legislation, especially with the establishment of Kosovo Energy Efficiency Agency, in the form of administrative instructions.

In addition, EE institutional capacity building is an element of the Kosovo Strategy on Energy (2005-2015). Similarly, the updated Kosovo Strategy on Energy 2008-2018 identifies EE as one of the strategic objectives for the period 2008-2018 and envisages the development of a comprehensive institutional and legal framework, in compliance with European EE Directives.

From the policy planning perspective, EE activities in the the Kosovo Energy Efficiency and Renewable Energy Resources Program (KEERERP) for the period 2007-2009 were connected with the first three-year Kosovo National Plan on EE (2007-2009), drafted by the Ministry of Energy and Mining(now MED), with advisory support from the EAR project implemented between 2007-2009. The measures foreseen in this document are overarching (legal, institutional, technical, financial, educational etc.) and cover all sectors of final energy consumption. The implementation of these measures was based on financial support pledged from external donors. Although concrete measures and programs foreseen by the document for this period are not implemented to the assumed level, some of the achieved results could be summarized as follows:

- Increase of overall EE related knowledge and culture
- Increase of EE professional capacities of central and local institutions, universities, etc.
- Initial licensing of some 50 experts on energy auditing process implementation;
- Monitoring of study and assessment projects regarding the application of EE measures in certain public sector facilities, etc.

The Republic of Kosovo became a party to the Energy Community Treaty (ECT), subsequent to UNMIK signing of the Treaty. An Energy Efficiency Task Force was established in February 2008 and the Kosovo Ministry of Energy(now MED) is a MEMBER of the Task Force.

In an effort to approximate local legislation with EU legislation on energy efficiency and in conformity with the requirements set forth by Directive 2006/32/EC, the Government of Kosovo adopted Administrative Instruction No.2008/15 on Promotion of Utilization of Efficient Energy by Final Consumers and Energy Services. In applying the objectives set forth by ECT, MED (ex MEM)is obliged to draft a National Action Plan on Energy Efficiency, entitled Kosovo Energy Efficiency Plan (KEEP). KEPP is a long-term document drafted and implemented at the national level, covering the period between 2010 and 2018. Drafting of the Kosovo Energy Efficiency Plan was based on a sample National Action Plan on Energy Efficiency provided by the ECT in July 2008. It has been customised to take into account specific conditions in Kosovo, as well taking into account the main requirements set out in 2006/32/EC Directive.

In particular, KEEP contains indicative targets for energy saving in the long-term, medium-term and intermediate-term (2010 – 2012) perspectives.

Chapter II. Executive Summary

Since the 1998 – 1999 war Kosovo has been facing unsustainable electricity supply. Further, it still does not have a trustworthy system of energy consumption data. Only the available data on supply is considered to be credible (excluding log wood, qualified as biomass). The data on electricity consumption is reported regularly by the public supplier, however, due to constant non-technical losses (around 30%), it is impossible to credibly determine where these losses are prevalent (in the household sector or in the services sector, the two sectors with the most distinguished energy consumption). Around 35% of Kosovo electricity is used for heating residential facilities and facilities belonging to service providers (public and private).

The leading sector in electricity consumption is the household sector (approx. 63%). Besides its high level of electricity consumption, the household sector also consumes a lot of biomass (wood) and oil products. The contribution of district heating is very limited and it exists only in Prishtina, Gjakova and Mitrovica. The proportion of energy otherwise produced for this purpose is not significant. The capacities of these heating facilities are insufficient to cover any significant amount of energy utilized for heating purposes. There are no combined heat and power plants installed in Kosovo up to now, but it should be mentioned that a feasibility study has been carried out for using part of Kosovo B as a cogeneration plant and expanding the district heating network of Prishtina. The development of cogeneration is promoted by the 2004/8/EC Directive because it significantly increases overall efficiency.

It is very important to analyse the new proposal contained in the European Industrial Emission Directive (IPPC/ED), whose text was politically agreed by the Council of EU MEMBER – State Ministers of the Environment in June 2009. The Directive proposes now, strong requirements to limit pollutants emission from large combustion plants (LCPs). The proposal raises the possibility of indigenous fuel use in the LCPs, as well adoption of the new requirements in medium-size installations (<200 MW) fulfilling district heating demand in the longer-term (till 2023).

Taking into account the IED proposal and experiences of lignite use in some EU MEMBER – States, it is possible to use indigenous lignite resources in highly efficient power plants (>40% for electricity or >75 % for CHP) which have adequate emission standards.

Further, Kosovo cannot facilitate the development of a natural gas system in the near future because it does not have indigenous natural gas production and neither is it connected with European Gas Networks. Also, the geographic location of Kosovo does not allow for the possibility of constructing a coastal LNG terminal. Therefore, as a consequence of the circumstances elaborated above, almost all energy services (space heating, cooking, hot water) for the residential and service sectors are covered either by electricity, biomass (currently fuel wood), oil products (including LPG) and lignite.

On the other hand, a considerable number of electricity consumers (over 40%) don't pay for the energy they use, so it is very important to change this behavior among the various categories of consumer. Reducing non-technical losses (non-paid bills) would improve both the security of electricity supply and the financial situation of KEK – the utility responsible for electricity supply – and it would make possible power sector investments which could be clearly linked to the implementation of energy efficiency measures.

In such circumstances, and taking into account the inconsistent supply and inefficient electricity utilization, the Government of Kosovo has undertaken legal and institutional steps towards improving EE compliance. Since 2005, the Division of Energy Efficiency has been operating within the MED's(ex MEM) Department of Energy. Different EEI related projects and measures were implemented under the framework of the Kosovo Energy Efficiency and Renewable Energy Resources Program (KEERERP) 2007 – 2009. The first Kosovo EE Plan (2010 – 2018) was drafted by an expert group from MED(ex MEM), comprising professional staff of the Division of Energy Efficiency, Renewable Energy Resources and Environment and Division on Energy Statistics and Balance and the current version presented here was updated based on the technical assistance of EU Consultants.

Chapter III. Overview of Energy Consumption by Type of Fuel and Sector

The following tables and figures represent an overview of energy consumption in Kosovo for the period 2003 – 2008, in figures disaggregated by energy source and energy consumption sector. Table 1 and Figure 1 below show energy supply based on primary energy sources for the period 2003 – 2008 (in ktoe).

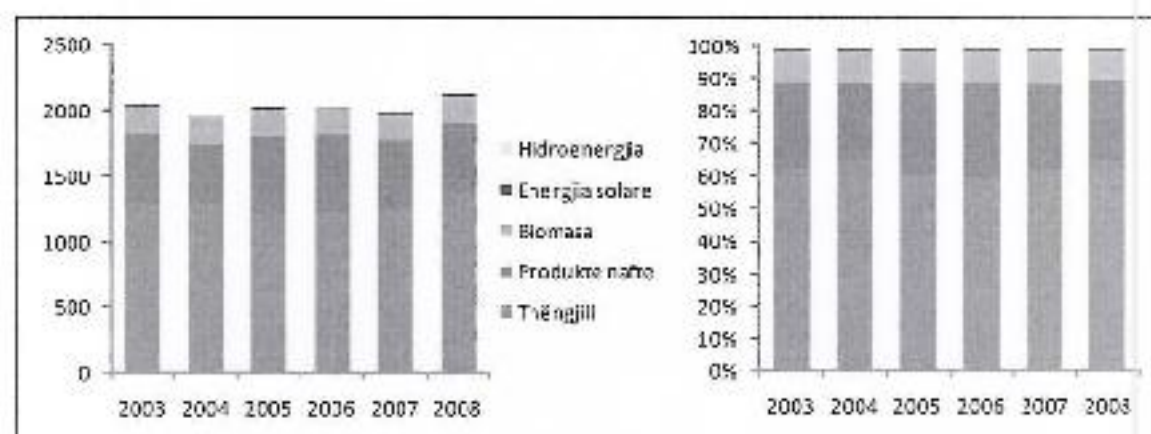
Table 1: Primary energy supply for the period 2003-2008 (ktoe)

Type of energy resource	2003	2004	2005	2006	2007	2008
Coal (lignite)	1293	1289	1231	1226.1	1251.3	1335
Oil by-products	540.3	455	576	595.26	518.93	524.1
Biomass (fuel wood)	216.3	216.3	216.3	216.32	216.32	216.19
Hydro-energy	5.58	12.14	11.99	10.902	10.135	10.05
Solar energy	0.16	0.18	0.19	0.263	0.289	0.321
Total	2055	1972	2036	2048.8	1997	2137.7

Energy supply in Kosovo during the period 2003-2008 has increased by an average of 3.2%. By type and quantity, energy supply for this period has been as follows:

- Coal production has changed with an average annual increase of 1.79%.
- Import of oil by-products has increased with an average annual increase of 11.08%.
- There exist no fully reliable data regarding the scale of fuel wood use, but it is believed that the annual amount of wood used as fuel is approximately 216-220 ktoe.
- The contribution of solar energy, although not significant for Kosovo, has shown an increase

Figure 1: Primary energy supply for the period 2003-2008 (ktoe)



Electricity production is dominated by TPP Kosova A and TPP Kosova B. Their electricity generation has increased from 341 ktoe in 2004 to 384 ktoe in 2007, with an average annual increase of 3.81%. Other significant points are as follows:

- Electricity production from Kosovo's Hydropower plants has experienced a decrease from 9.71 ktoe in 2004 to 5.40 ktoe in 2007, with an average annual decrease of 23.7%.

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- To meet peak demand, a considerable amount of electricity has been imported. Imported electricity amounted to 55.95 ktoe in 2004, whereas it amounted to 56.80 ktoe in 2007, with an average annual increase of 1.5%.
- Surplus electricity has been exported (excess energy is produced at night). Exports have increased from 16.7 ktoe in 2004 to 31.7 ktoe in 2007.
- Load shedding for different categories of consumers (especially for households), is estimated to be equivalent to about 8-10% of total supply.

Table 2 and Figure 2 show gross electricity supply data for the period 2003 – 2008, in ktoe.

District heating systems exist only in Prishtina, Gjakova and Mitrovica. These systems meet only 3% of heating demand for the entire household sector of Kosovo. Existing heating technologies are based on residual fuel oil and diesel. This sector is further challenged by old technology, negative environmental impacts and a low level of billing and collection of the energy supplied. Technical and commercial losses are very high and the existing tariffs do not completely cover the costs of supply. Table 2 shows gross district heating supply for the period 2003 – 2008 in ktoe.

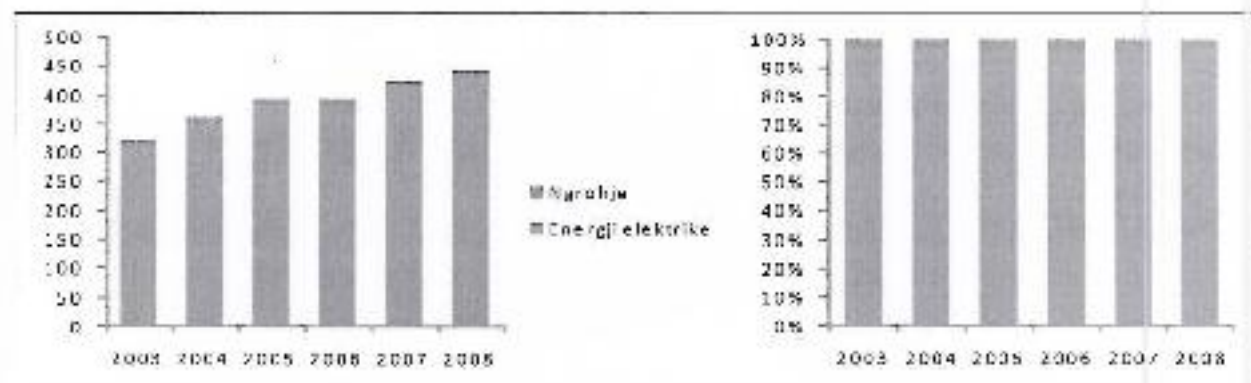
Electricity consumption data is reported by the public electricity supplier. The data on district heating is reported by the public supplier companies in Prishtina, Mitrovica and Gjakova. The data on fuel wood consumption as biomass is based on studies and surveys conducted, as well as on the statistics provided, by Kosovo Forestry Agency. The data on fuel consumption is assessed on the basis of comparisons with other countries of the region that enjoy a similar level of development with Kosovo. It should be emphasized that the data on energy consumption is not the outcome of any survey.

In 2010, a significant improvement of data quality is expected, as it will derive from comprehensive surveys planned to be undertaken in all consumption sectors. The MED(ex MEM) is implementing a very good project in this area for covering data gaps in energy statistics, especially for the consumption side. This survey will result in sustainable, credible and more complete data on energy efficiency improvements in all energy sectors.

Table 2: Gross electricity supply, 2003 – 2008 (ktoe)

Energy type by year	2003	2004	2005	2006	2007	2008
Electricity	312.1	350.98	383.27	381.27	415.79	429.25
District heating	9.99	11.31	14.05	14.489	10.34	14.563

Figure 2: Gross electricity supply, 2003 – 2008 (ktoe)



As seen in Table 2 and Figure 2, the amount of available electricity supply (generation and import) has increased from 312.1 ktoe in 2003 to 429.79 ktoe in 2008.

III.1 Final and primary energy consumption for the period 2003-2008

Energy sources are consumed in different economic sectors such as households, services in public and private buildings, industry, transport and agriculture. The relationship between the economic development of a country and its energy demand is considered a key issue and may be represented by a closed cycle. This cycle involves many economic, social and technological analyses. To define clearly their relationships, many studies are required on different economic and social development sectors. These will provide the basis for an understanding of the challenges facing the energy sector in Kosovo and the of commitment that is needed to ensure supply of energy sources at the lowest cost, to guarantee sufficient energy supply to meet consumer demand, and to create the conditions required for sustainable economic development. Currently, energy intensity in Kosovo is at a relatively high level. Kosovo's total primary energy supply per unit of GDP, in 2008 is estimated at 420 toe per million USD (PPP), compared to the EU 15 country average of 177.4 toe/million USD in 2005. That means macroeconomic production, generally represented by the Gross Domestic Product (GDP), has been extremely low. Reasons for this are related to the low level of industrial development of Kosovo, the use of old technologies compared to other Central and Eastern European countries and big share of energy consumption being accounted for by the household sector. In the following section the consumption by energy of each sector will be discussed.

The experience of European Countries shows the following trends in total energy intensity for the period 1995-2005:

- EU-27 annual average change -1,3 %;
- EU-15 annual average change -1,0 %.

Only a very small number of the 30 European countries covered by European Environment Agency research did not achieve annual decreases (4 increases were recorded, in Italy, Austria, Portugal and Norway and one country, Iceland, was unchanged). However, none of those countries has experience of a war within their territories for more than 50 years.

III.2 Final energy consumption for household sector, 2003-2008

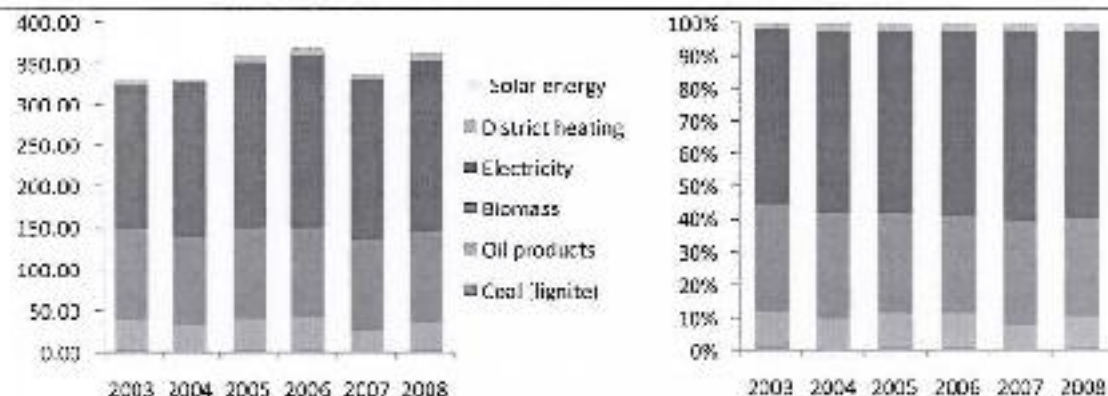
Energy consumption in the household sector is divided into five distinct parts, each with different characteristics: space heating, air conditioning, hot water and cooking, lighting and other electric appliances. The residential sector occupies first place in the consumption of energy resources in Kosovo, accounting for 32.85%. As a consequence, it is important to know about the potential for energy savings in electricity, biomass, oil products (including LPG) and coal for each service. Since 2000, the energy supply and demand for space heating, cooking and hot water (using mostly fuel woods) have remained more or less in balance. After 2000, there was a massive decline in the supply of fuel woods from forest areas to residential zones. This resulted in a massive (and mostly illegal) cutting-down of fuel woods and overloading of electricity equipment (sub-stations, transmission and distribution lines). Table 3 and Figure 3 show the household energy consumption for the period 2003-2008.

Table 3: Energy consumption in household sector (in ktoe)

Energy sources	2003	2004	2005	2006	2007	2008
Coal (lignite)	4.5	2.2	3.9	3.6	2.2	8.3
Oil by products	35.4	30.1	38.4	39.7	25.0	34.8
Biomass	108.2	108.2	108.2	108.2	108.2	108.2
Electricity	178.5	188.2	203.3	211.1	198.9	210.4
Solar energy	0.05	0.05	0.06	0.08	0.09	0.09
District heating	4.1	4.7	6.0	6.3	5.1	6.2
Total	330.8	333.4	359.8	368.9	339.4	368.0

Figure 3: Energy consumption in household sector (in ktoe and %)

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Electricity has been the biggest contributor to the household sector and this one of the main reasons why Kosovo is suffering from the security of supply point of view.

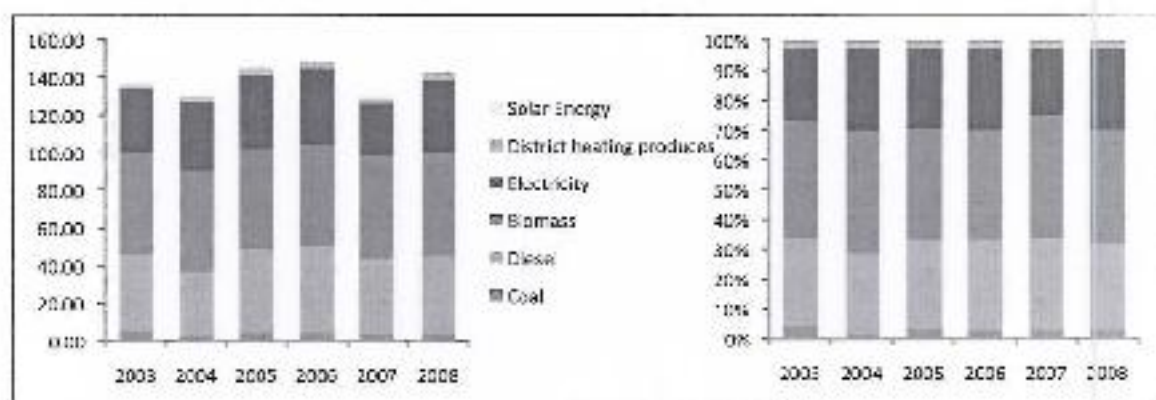
III.3 Final energy consumption for public and private services sector 2003-2008

The Service Sector is divided in two branches: Public Service and Private Service. The Public Service Sector has a traditional experience of heat demand, based mainly on old technology, installations and organization, but in some cases new schemes have been introduced. The data on the quantity of energy demanded for each service and the contribution of each energy commodity is based on different surveys carried out by Ministry responsible for energy MED(ex MEM). It should be underlined that space heating, hot water and lighting for all sub-sectors are generally provided at a low quality, due to old energy infrastructure in the public service institutions and the lack of an adequate budget for maintenance of energy systems. Table 4 and Figure 4 show the public and private services energy consumption data for the period 2003-2008.

Table 4: Energy consumption in public and private services sector (in ktoe)

Energy sources	2003	2004	2005	2006	2007	2008
Coal	6.2	2.9	5.2	4.8	4.3	4.5
Oil by-products	40.5	34.4	43.9	45.4	39.9	41.2
Biomass	54.1	54.1	54.1	54.1	54.1	54.8
Electricity	34.2	36.1	39.0	40.5	28.3	30.0
Solar energy	0.02	0.03	0.03	0.04	0.04	0.05
Heating produced	2.7	3.1	4.0	4.2	3.4	3.8
Total	137.7	130.7	146.1	148.9	130.1	134.3

Figure 4: Energy consumption in public and private services sector (in ktoe and %)



Biomass and oil by-products are the biggest contributors to public and private services energy consumption.

III.4 Final energy consumption for industry sector the period 2003-2008

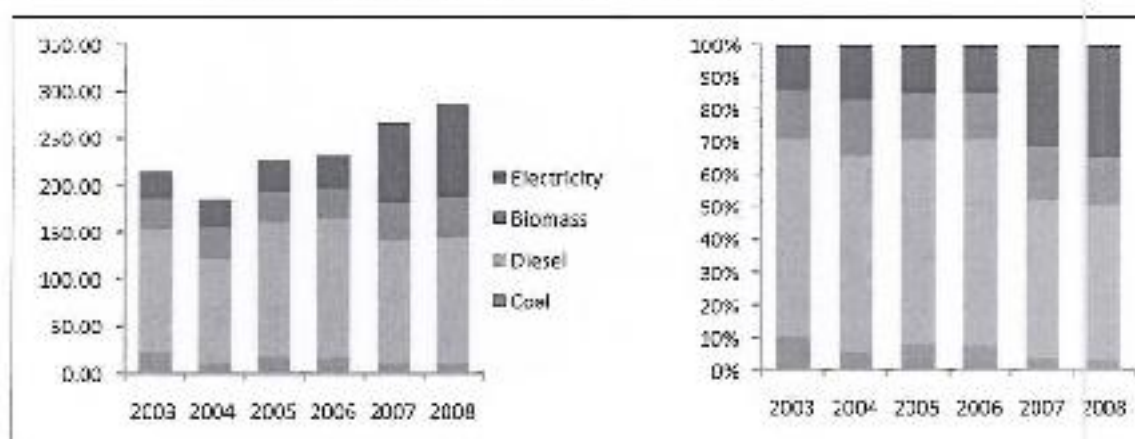
In the analysis of the updated document on Energy Strategy, the Industry Sector is divided into the following sub-sectors: Metallurgy, Chemical, Building Materials, Mining, Food/Beverage/Tobacco, Textile/Leather/Shows, Wood/Paper/Printing, Mechanical and others. The analysis of economic development during the period 2003-2008 shows small improvements in the contribution of the Industry Sector to national development. In other words, general industrial production in terms of absolute value of GDP, contributes less now than it did before 1998. Energy sources in industrial sectors are consumed for motive power, process heating at low and higher temperatures, as well as for different technologies (e.g. the electrolysis process). Table 5 and Figure 5 show the public and private services energy consumption for the period 2003-2008.

Table 5: Energy consumption in industrial sector (in ktoe)

Energy sources	2003	2004	2005	2006	2007	2008
Coal (lignite)	23.1	10.9	19.3	17.8	10.8	10.9
Diesel	131.6	111.9	142.6	147.6	129.8	133.7
Biomass	32.5	32.5	32.5	32.5	43.3	44.0
Electricity	29.3	30.9	33.4	34.7	85.0	100.4
Total	216.5	186.2	227.9	232.5	268.9	289.0

As shown in the above table, the main energy sources which contribute to covering energy demand in the industry sector are oil by-products, followed by electricity.

Figure 5: Energy consumption in industrial sector (in ktoe and %)



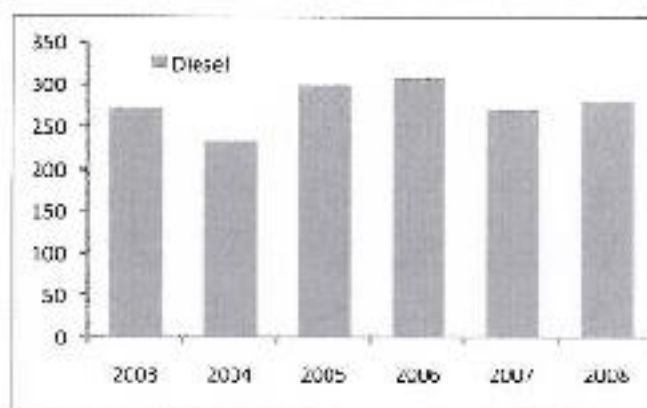
III.5 Final energy consumption for transport sector 2003-2008

The transport sector in Kosovo started to develop with fast growth rate after the 1960s, when, in addition to the quantitative increase of road transport means, the infrastructure and transporting capacities of the road and railway systems were developed, establishing a regional transport structure. The Transport Sector has an important role in the consumption of energy resources. The evident increase in the number of transport modes after 2000, especially in road transport, was accompanied by an increase of transport activity and an evident increase in fuel consumption, mainly diesel and gasoline. The sector is divided in two sub-sectors: transport of freight and transport of passengers. Table 6 and Figure 6 show the transport sector energy consumption for the period 2003-2008.

Table 6: Energy consumption in transport sector (in ktoe)

Transport sector	2003	2004	2005	2006	2007	2008
Oil products	273.3	232.4	296.3	306.5	269.5	278.2
Total	273.3	232.4	296.3	306.5	269.5	278.2

Figure 6: Energy consumption in transport sector (in ktoe and %)



As stated above, the main energy contributors in this sector are diesel and gasoline.

III.6 Final energy consumption in agriculture sector 2003-2008

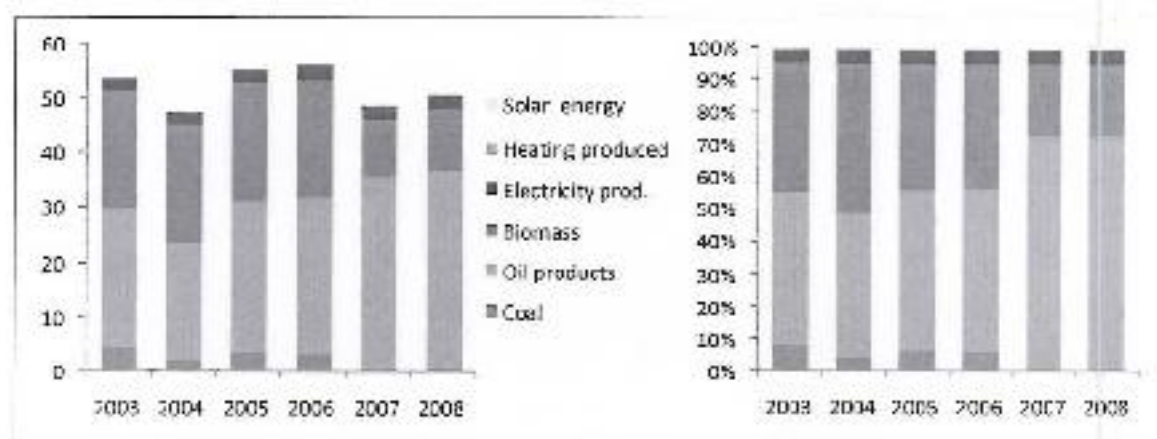
Kosovo has been for many years a country where agriculture has dominated - it still remains at about 40% of total GDP. Energy in this sector is consumed on the cultivation of plants, livestock and forestry and, particularly in rural areas, agriculture continues to provide the main option for economic and social development. In Figure 7 and Table 7 the energy consumption for the agriculture sector is shown. The development of the agriculture sector is conditioned by many factors, where the most important include:

- Farms are of minimal sizes and fragmented,
- Problems exist concerning the ownership of arable land,
- Very high prices of inputs and a disorganised and ineffective production and distribution system for agricultural products,
- Lack or insufficiency of agriculture credit,
- Lack or insufficiency of agriculture mechanics.

Table 7: Energy consumption in agriculture sector (in ktoe and %)

Agriculture sector	2003	2004	2005	2006	2007	2008
Ccal (lignite)	4.6	2.2	3.9	3.6	0.7	0.7
Oil products	25.3	21.5	27.4	28.4	34.9	36.3
Biomass	21.6	21.3	21.6	21.6	10.8	11.2
Electricity	2.4	2.3	2.8	2.9	2.6	2.7
Solar energy	0.01	0.01	0.01	0.01	0.01	0.01
Total	54.0	47.8	55.72	56.5	49.1	50.9

Figure 7: Energy consumption in agriculture sector (in ktoe and %)



As described above, the main energy source in this sector are oil products.

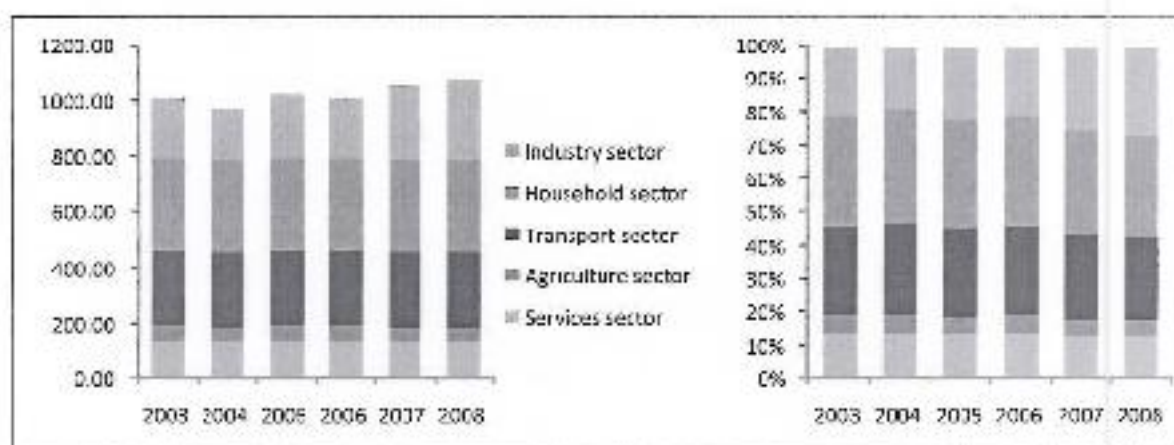
III.7 Final energy consumption from all sector 2003-2008

An analysis of Figure 8 and Table 8 shows that the energy demand for each sector has increased: from 1012.3 ktoe in 2003 to 1120.0 ktoe in 2008. As the figures show, the main consumer is the household sector, followed by the industry and transport sector. The analysis of the supply of energy sources shows that the main contributions come from electricity, oil products, biomass (fuel woods) and LPG.

Table 8: Energy consumption in all sectors (ktoe) in the period 2003-2008

Sector's energy consumption	2003	2004	2005	2006	2007	2008
Household sector	330.8	333.4	359.8	368.9	339.4	368.0
Services sector	137.7	130.7	146.1	148.9	130.1	134.3
Industry sector	216.5	186.2	227.9	232.5	268.9	289
Transport sector	273.3	232.4	296.3	306.5	269.5	278.2
Agriculture sector	54.0	47.9	55.7	56.5	49.1	50.9
Total	1012.3	930.6	1085.8	1113.2	1057.0	1120.0

Figure 8: Energy consumption in all sectors (in ktoe and %)



Chapter IV. Indicative Targets for Energy Saving for the Long-Term (2010-18) and Mid-Term (2010-12) Periods

IV.1. GENERAL ENERGY SAVING TARGET IN KOSOVO

IV.2 Determination of general indicative EE target

The most important issues for the future economic development of Kosovo and its energy sector are to increase energy security whilst at the same time maintaining a relatively low level of energy intensity which would induce an efficient and competitive economy in an increasingly open international market. The rapid development of energy efficiency shall be the key element for achieving long-term, sustainable development of the state.

Analysis shows that Kosovo's energy intensity is one of the highest in the region, after Bulgaria. As a consequence, the domestic energy sector is facing two important challenges: (i) maintaining current demand at average levels, and (ii) increasing the energy consumption per capita. One possible 'average' scenario of the Gross Domestic Production (GDP) growth rate for the period 2009-2018 (average annual growth at 3.1%) has been taken as providing a realistic basis for planning Kosovo's economic development and forecasting the energy demand. Table 9 presents a long-term forecast of energy demand in all sectors, based on the document: Update of the Strategy of Energy (final draft March 2009)

Table 9: Forecast of energy demand for all sectors (ktoe) (2005-2018)

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Household	330	369	333	368	377	381	387	396	405	414	421	430	441	454
Services	146	149	130	134	138	138	140	141	143	145	147	149	151	153
Industry	228	233	260	286	295	320	354	353	401	421	433	446	471	511
Transport	296	307	270	278	287	295	306	315	326	336	347	358	373	410
Agriculture	56	57	49	51	53	55	58	60	62	64	67	69	73	78
Total	1096	1113	1057	1120	1150	1191	1254	1296	1337	1380	1414	1455	1517	1610

Based on calculations conducted in accordance with EC Directive 2006/32/EC Annex 1, referring to the period 2003 – 2007, final consumption average is 1039.78 ktoe. Average consumption of air transport is 18.7 ktoe¹.

Referring average for the determination of energy saving targets, as per Article 4(1) of the Directive is: $1039.78 - 18.7 = 1021.08$ ktoe²

Based on the experience of many developed countries, Figures 9 and 10 present total energy demand (a) without energy savings and (b) with energy savings based on the above mentioned targets. Analysis of the figures shows that energy savings in the first years are lower (since this will serve as a preparatory phase but the target of 3% is reached in the period 2010-2012) and in the upcoming years energy savings shall be increased reaching the objective of 9%.

¹ Annex 2 represents the database, according to the EUROSTAT format for energy balance for all years in review.

² In Kosovo there is no Emission Trading Directive related consumption

Figure 9: Short and Long Term Target of EE in %

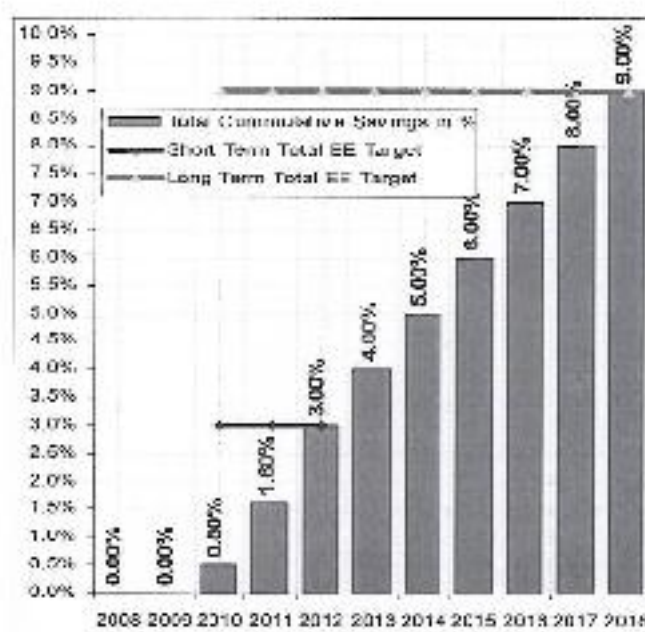
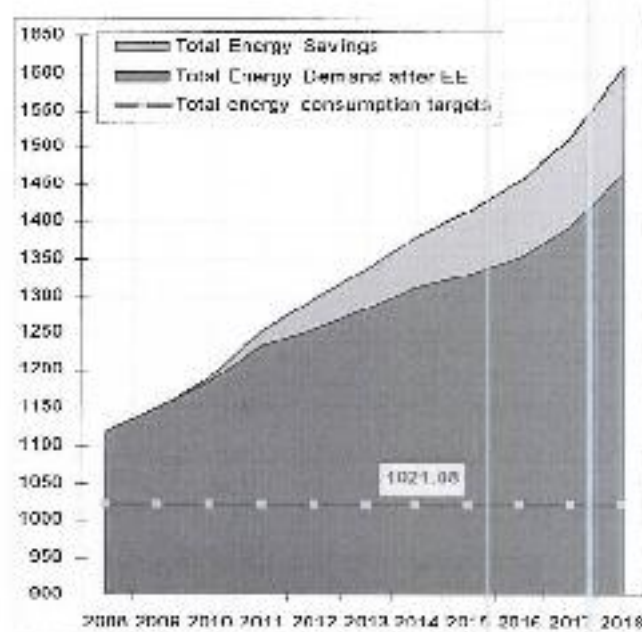


Figure 10: Total Energy Demand, Energy Savings and Short and Long Term Target in %



Kosovo has approved the indicative target of 9% of 1021.08 ktce to be achieved at the end of the period (2010 – 2018), amounting to 91.89 ktce energy saved, or else a quantity of 92 ktce acquired. Therefore, the amount of energy that Kosovo aims to save by the end of 2018 is 91.89 ktce

The following table represents the contribution (%) of different sectors to the overall energy consumption between 2010-2018, in accordance with the document: Forecast of Energy Demand for the period 2009 – 2018.

Table 10: Forecast of energy shares contribution for all sectors (%) (2009-2018)

Sectors	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Household	32.8%	32.0%	30.9%	30.6%	30.3%	30.0%	29.8%	29.6%	29.4%	29.2%
Services	12.0%	11.7%	11.2%	10.9%	10.7%	10.5%	10.4%	10.2%	10.0%	9.8%
Industry	25.6%	26.9%	29.0%	29.6%	30.0%	30.6%	30.6%	30.9%	31.2%	31.5%
Transport	25.0%	24.6%	24.4%	24.3%	24.4%	24.4%	24.5%	24.6%	24.7%	24.8%
Agriculture	4.6%	4.7%	4.6%	4.6%	4.6%	4.6%	4.7%	4.7%	4.7%	4.7%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 10 presents the participation of each sector in overall energy consumption, expressed in percentages. Based on analyses conducted during the drafting of the Forecast of Energy Demand 2009-2018, it is clear that we will proceed further towards the consolidation of the system. During this period, it is foreseen that consumption in the industry sector will gradually increase, leading to higher energy consumption at the end of 2018. This situation will be a result of the reconstruction and development of industry that will occur during the preceding years. On the other hand, the percentage participation of all other sectors in energy consumption will be reduced in relative terms. This includes the household sector, whose share will decrease from 33.34% in 2009 to 29.2% in 2018.

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The share of of different sectors in the overall (average for the period 2003-2007) energy consumption of Kosovo, in comparison with the shares of different sectors in the overall energy consumption of the European Union, is presented in the following Table 11:

Table 11: Shares contribution of all sectors (%)

Country	Kosovo	Average of EU States
Sectors	Shares in %	Shares in %
Households	33.34	26.28
Services	13.34	12.47
Industry	22.35	27.77
Transport	26.52	30.91
Agriculture	5.06	2.54

Based on the requirements of Article 4 (2) of Directive 2006/32/EC the Intermediate Indicative Target for Energy Saving for the period 2010-2012 was determined, based on the General Indicative Target for Energy Saving at the end of 2018.

The Intermediate Indicative Target for Energy Saving adopted is 3% of the average consumption during the five-year period referred to, without taking into consideration air transport consumption. The intermediate Energy Saving Target was determined based on an analysis conducted by the Working Group on Drafting the Kosovo Energy Efficiency Plan, lead by the Energy Efficiency and Renewable Energy Resources and Environment Division. To support this group, an inter-institutional group was established, encompassing representation from different institutions, energy entities, municipalities and donors, with the aim of determining realistic indicative targets and providing support for their monitoring and implementation.

In determining the national EE related targets for the intermediate period 2010 – 2012, the following facts were taken into consideration:

1. Lack of a Law on Energy Efficiency
2. Lack of a National Agency on Energy Efficiency and Regional Energy Offices
3. Lack of a Fund for Energy Efficiency
4. Lack of a labeling system for Energy in Buildings
5. Lack of suitable legal procedures for EE procurement
6. Lack of companies that provide EE related energy services
7. Delayed introduction of Labeling of Household Electric Appliances (to be adopted in near future)
8. Lack of complete data for accurate survey on the state of sectors, in regard to EE
9. Lack of a decision that would force public sector consumers to undertake EEI measures.

Further, the following facts were taken into consideration, to facilitate the process of KEEP implementation:

1. Raising the level of general professional knowledge and capacities on EE within MEI (ex MEM), with the support of European Commission, through EU, and other donors, such as USAID, EBRD, etc.
2. The ongoing process for promoting solar energy utilization in four hospital clinics in KCUC, and at the students' center, as a result of a project funded by the Kosovo Budget (2009 and 2010);
3. The European Commission has allocated a budget of 1.2 million euro for the project to implement EEI measures in 5 public consumer facilities (4 schools and one hospital). The project implementation will be finalised in the second half of 2011;
4. From the EE policy perspective, the Government of the Republic of Kosovo has increased its sensitivity to the importance of EE, a fact witnessed by the budget of 350 thousand euro that has been allocated for a public awareness campaign with the aim of promoting EE, with KASH, for the period between 2010 – 2012;
5. In 2010, the institutional framework for the implementation of adopted legislation will be completed to a great extent.

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6. Launching of an EE development program by KfW through two of the most important Banks (ProCredit and RBKO), reaching the value of 10 million euro, from which many EE projects in the household and SME sector are in the process of benefiting.
7. During 2010, a comprehensive survey has been conducted, to assess energy consumption by sectors. The survey for the first time also entailed an EE segment and the questionnaires are in the final stage of processing.
8. During 2010, the first 50 energy auditors are in the final stages of receiving certification, based on the EU Programme (and furthermore, GIZ has promised to fund capacity raising for MED and the private sector in energy auditing).
9. There is ongoing interest in the energy auditing business.

For the reasons mentioned above, Kosovo has adopted a tentative approach to establishing an intermediate indicative target for energy saving in its first National Action Plan on Energy Efficiency (2010 – 2012), amounting to 3% of 1021.08 ktoe. The target quantity of 3% of the overall amount for the period (2010-2012) is 30.63 Ktoe.

Approved Intermediate Indicative Target: 31 Ktoe

The national indicative target must be allocated between the sectors of final energy demand, so that the effectiveness of the proposed measures can be monitored at a more disaggregated level. Furthermore, different authorities and organisations have jurisdiction to implement energy efficiency improvements in different sectors.

The sector allocation of the national target is primarily based on the following:

- the proportion of individual sectors within the final energy consumption,
- the potential for efficiency improvements,
- economic efficiency concept of different energy efficiency measures for different sectors (so it is much better to promote the most effective measures) and
- the necessary level of policy and legal interventions in the sectors.

As demonstrated, the households and transport sectors have the largest share of final energy consumption. However, the allocation is not made solely on the basis of these percentages, but also based on estimates of impact of the proposed EE measures. The summarised target levels within each sector are provided in the table below. The distribution of this intermediate energy saving target, by sector was determined as it is presented in Table 12.

Table 12: Intermediate energy saving target by sector

Indicative Energy Saving Target: 31 ktoe			
Period	(2010-2012)		
Sector	%	ktoe	GWh
Household	40	12.8	144
Services	30	9.6	108
Industry	25	8	90
Transport	4.5	1.4	52
Agriculture	0.5	0.15	5.8

As may be seen in Table 12, during the mid-term period, the household sector shall be the sector that delivers the largest energy savings. That is why this sector is characterized with numerous EEI measures and those measures, which are going to be described below in more detail, are the lowest cost options compared with all other measures. The determination of an intermediate target set at 40% of the overall target for the household sector derives also from the fact that to date a range of actions were undertaken by

MED and external donors in this regard. Also the household sector in Kosovo represents its most studied sector, where energy saving possibilities have been most clearly identified.

The services sector includes a wide spectrum of consumers of all forms, energy forms and types. This sector includes: health, education, public services, cultural activities, sports, etc. The public sector also includes private service providers in different spheres (tourism, hotelier services, private sports undertakings, health care, education and cultural activities, etc). Albeit the realistic participation of this sector amounts to 13.34% of general energy consumption, the adopted intermediate saving target for the three year period is 30% of the overall target, because of the foreseen obligatory administrative EEI measures, such as application of Directive 2002/91/EC on the energy performance of buildings. Similarly, obligatory measures for energy auditing and energy saving in governmental buildings are foreseen. To date, initial works have been performed in promoting further utilization of solar energy in certain hospitals and student dormitories.

Industry, transport and agriculture as separate energy consumption sectors will tentatively manage to achieve an energy saving of 30% of the overall intermediate target. Although an overall overview of the energy consumption situation in these sectors shows that there is a lot of space for improved energy saving, the first three-year period does not envisage measures that could be deemed too ambitious, since the three sectors have not yet been treated from the energy efficiency aspect. These three sectors are considered to be more open to public promotional campaigns of awareness raising characters rather than to concrete obligatory measures. Considerable time is needed for these sectors to establish the necessary instruments and mechanisms, in order for them to directly have an impact on EEI. Figures 11 and 12 summarise the relative and absolute energy savings required for each economic sector in order to reach the objectives defined in the above mentioned sections.

Figure 11: Relative Cumulative EE Savings In % for each sector

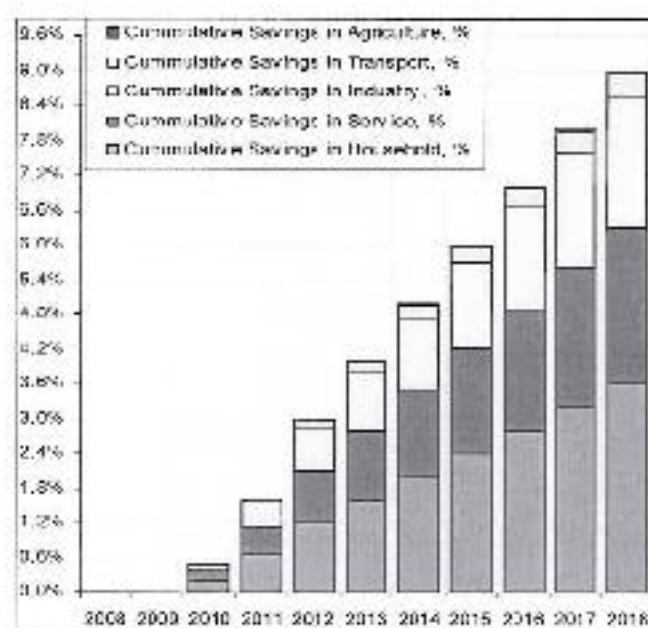
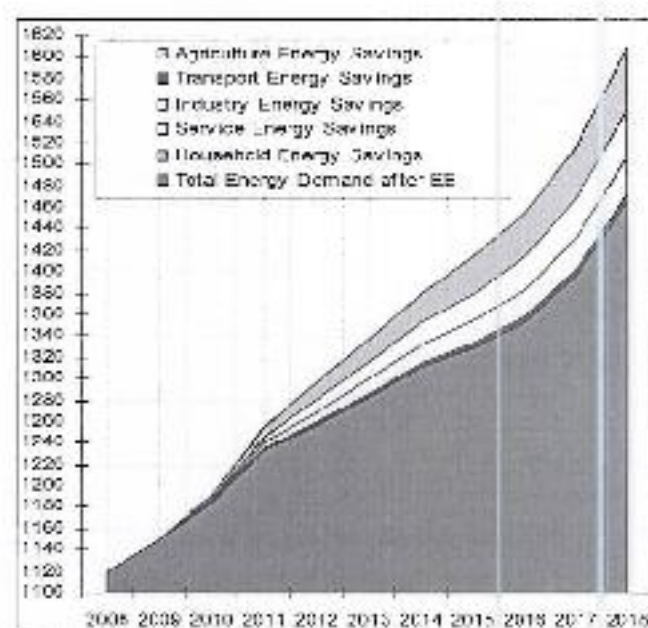


Figure 12: Total Energy Demand after EE measures are implemented in each sector and absolute EE savings for each sector (ktoe)



Chapter V. Energy Efficiency Improvement (EEI) Measures

V.1. Household Sector

As may be noted in Figure 3, between 2003-2008 the household sector accounted for a significantly high percentage of overall energy consumption. With the objective of reducing the energy consumption according to targets defined above, the following quantitative and qualitative measures needed to be taken into consideration for the following years:

- Complex thermo-renovation including: use of automatic control of heating systems and thermal insulation of buildings that shall contribute to reductions in the energy demand for space heating.
- Penetration of LPG that shall contribute to reducing the quantity of electricity used for cooking and space heating, and substitution of fuel wood consumption.
- Promotion of efficient cogeneration of heat and power (including heating-cooling systems) especially by finalization of the CHP concept for Prishtina supplied with heat from Kosovo B Plant;
- Promotion of central and district heating schemes that will contribute to the provision of space heating and hot water, especially in new blocks of multi-store dwellings.
- Promotion of new, efficient boilers.
- Penetration of solar panels for hot water preparation that will reduce the quantity as well peak demand of electricity used for this purpose.
- Use of efficient household equipment (washing machines, ovens, air-conditioners, bulbs etc.) that shall reduce the quantity of electricity used by electric appliances in households.

These efficiency measures and their results are discussed in detail below.

Figures 13 and 14 show the relative and absolute household sector energy savings required in order to reach the objectives defined in the above mentioned sections.

Figure 13: Short- and Long-Term Target of EE for household sector in %

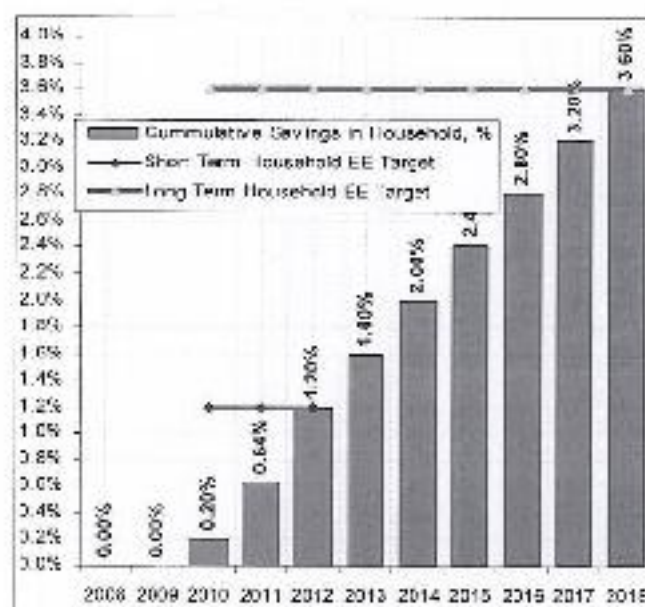
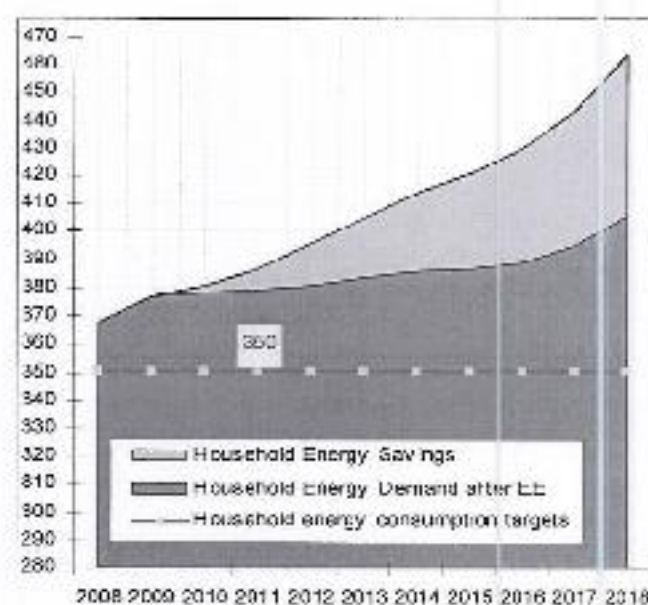


Figure 14: Total Energy Demand after EE measures are implemented in household sector and absolute EE savings in (ktoe)



Measures foreseen to be undertaken between 2010-2012 are considered to provide an immediate effect, especially as regards heating energy saving, being that heating is currently mostly conducted through electrically powered appliances - although these measures will have an effect in saving in fuel as well, mainly biomass and lignite. However, taking into account the necessary scale of investments, and considering experience in this field of other countries, it will not be possible to realise all of them over so short a time frame.

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Table 14: Measures for energy efficiency improvement in the household sector

CODE	TITLE	STATUS	TYPE	Start YEAR	Final YEAR	RESULT	Energy Savings (tona)	Cost of Savings (Euro)	Monitoring Indicator	APPLIED BY
KA1	AI on HEA labelling	Approved but implementation yet to start	Regulative/ normative	2008	2018	Implementation of this instruction results in individual sector specific annual electricity saving	1571	70000 Not committed	AI prepared	MELLEX MEM), MII, traders, consumer associations, MEFIGURATIONS, donors
KA2	AI on energy auditing	Approved	Regulative/ normative/ informative	2010		Implementation of voluntary energy auditing recommendations is expected to result in energy saving of 60 unascertained scale. EU is finalizing the project and first 50 EA are in the final stage of certification by the end of December 2010.	4714	300000 Committed as part of EU project which will start on second half of 2009	AI prepared	MEDJEX MEM), EU, EU, UNIVERSITY, ESLO, ASSOCIATIONS
KA3	AI on Energy Efficiency promotion with final consumers	Approved	Regulative/ normative/ informative	2010	2011	Refers to all other EEI measures	2619	60000 Not committed	AI prepared	INSTITUTIONS, ENERGY OPERATIONS
KA4	Capacity raising on project management and energy auditing in municipalities (first phase)	Finalized	Educative/ training	2010	2010	EU is finalizing the project and first 50 EA are in the final stage of certification by the end of December 2010.	1048	100000 Committed as part of EU project which will be finalised on the end of December 2010	Number of License Energy Auditors	MEDJEX MEM), RI INVEST
KA5	Beginner energy auditors training course (first phase)	Finalized	Educative/ training	2008	2008	Unascertained	1048	30000 Loans as part of EU project 2008	60 Energy Auditors trained	MEDJEX MEM), EAR, various experts
KA6	EE and collection rate increase	Finalized	Educative/ training	2007	2018	Unascertained	6286	300000 Committed by KEK and is in the process	% of collection payment rate increase	MDA

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KA.7	Promotion of LPG for space heating and kitchen consumption	Application under way	Education	2009	2012	It is established that there will be electricity saving for space heating and cooking purposes, which comprises 25% of currently consumed electricity.	4714	45000 Committed by MED and has been carried out on May - October 2008	In a case of LPG consumption	(ToR)
KA.8	Technical regulation on building energy performance	Draft	Regulative/ normative	2007	Adoption in 2009, implementation through-out the covered period (until 2013)	Implementation of this regulation is expected to result in saving of a considerable proportion of energy consumed for collective residential heating. MED in collaboration with MESP together with 11 municipalities of Kosovo have start a project for identification of main barriers for implementation of "technical Regulation related with Energy Saving in New and Existing Building Stock.	6286	50000 Already committed from MED and it is good to be mentioned that by the end of December 2010	MED is preparing a project for facilitating the implementation of this Administrative Instruction. Number of buildings constructed/renovated according to new technical regulation	MESP, MED (ex MEM)
KA.9	EE Law	Draft	Regulative/ normative	2009	Adoption in 2011, implementation through-out the covered period (until 2013)	Results are inter-related with all general EE measures	2619	10000 Final Draft has been prepared by MED	EE Law to be finalized and approved	MED, Government
KA.10	Promotion of household EE	Planned	Financial/soft loans	2009	2014	Evaluated by KfW and RFB using project benefit criteria. The campaign component of this project alone will effect a certain level of energy saved annually, as a result of awareness raising and undertaking of individual initiatives for thermal insulation of residential areas, and installation of solar systems for sanitary water heating. The projects will focus more on the installation of solar water heating systems, as this activity currently comprises 25% of the overall household electricity consumption.	7857	5500000 Loan package has been secured by KfW and RFB KfW is also in the process of starting the second phase with "Technical Bank of Kosovo" for issuing 10 MF Euro soft loan for EE in household and SME.	Amount Loan Disbursement from KfW and RFB for increasing EE in household	MED(ex MEM), Governmental institutions (central and local), KfW, other donors

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KA-11	Development of an energy auditor certification system	Planned	Financial	2008	2009	Will support from EC certification of an energy auditors will be performed up to the end of December 2010.	2005	100000 Committed as part of EU project which will start on second half of 2010	Number of License Energy Auditors	MEC, EC, GTZ, Energy associations, energy specialists
KA-12	Public campaign on energy saving and EE improvement	Planning	Financial/ educational	2008	2018	A demonstrative project is foreseen to be implemented to stimulate regular electricity payers. The project will be focused in a certain municipality and will have as a main goal promotion of energy efficiency measures in general and efficient lighting in particular, through replacement of incandescent bulbs with fluorescent ones.	3143	300000 Committed as part of EU project which will be finalized on December 2010	kWh saved from different households under the sample of MEDIRINVEST Study	MEC, KEK, GTZ, household sector consumers
KA-13	AI on Heating of New Collective Residential Buildings	Planning	Regulative/ normative	2010	2011	Addition of an AI on Heating of New Collective Residential Buildings will entail provisions to apply a limitation on usage of electricity for heating purposes in new collective residential buildings	4190	70000 Not committed	All to be prepared.	NEDex MEM, MESP
KA-14	Stop using the use of solar power systems for sanitary water heating	Planning	Regulative/ Financial/ educational	2010	2018	This measure is combined with other EE measures, but it is expected that its effect will be significant for energy saving, as 20% of the overall electricity costs imputed in this sector is spent for sanitary water heating	7857	34000000 Loan package has been secured by KfW and RFB as well as a second phase will be between KfW-Fin Credit Kosovo	Number square meters of solar water heaters systems in household sector	NEDex MEM, household sector consumers
Total All Measures							52,380	10,385,000		

KOSOVO ENERGY EFFICIENCY PLAN

V.2. INDIVIDUAL ENERGY EFFICIENCY IMPROVEMENT MEASURES IN THE HOUSEHOLD SECTOR

V.2.1: ADMINISTRATIVE INSTRUCTION ON LABELING OF HOUSEHOLD ELECTRIC APPLIANCES (CODE: KA1)

TITLE	AL ON LABELING OF HOUSEHOLD ELECTRIC APPLIANCES
CATEGORY	LEGISLATIVE/NORMATIVE
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	Household consumers, appliance suppliers and producers
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Development of labeling schemes and institutionalization of a product control system foreseen by the implementation of this Administrative Instruction. During 2010, the design and form of HEA labels has been prepared by Ministry of Energy and Mining supported by EU assistance. With the proper functioning of the label control system, the consumers will gain better trust in the HEA market, and give them the opportunity to save energy by using these appliances, which will replace the appliances with a lower level of energy efficiency.
EFFECTIVENESS	Labeling schemes include a rigorous control of the HEA from the labeling perspective. Control will have an impact on avoiding usage of inefficient appliances or abuse with labels. We will gain from highly efficient home appliances, which will be distinguished by their specific labels. Producers and traders aware of the consequences deriving from nonconformity of their appliances will be obliged to develop rigorous control over quality of goods used for production (producers) or appliances supplied (traders). This opens the path for safer and more efficient appliances to penetrate the market.
EXPECTED SAVING IN 2011 AND 2016	Indirect saving resulting from the application of the Al on HEA labeling is expected to be 1% of the average annual consumption of the household sector, or 3.48 ktoe. Expected saving for the period 2010-2012 are 6.92 ktoe, while by the end of 2018 this amount will be 24.22 ktoe.
IMPLEMENTATION STATUS AND TIMEFRAME	IA is signed. Full implementation will commence in 2011, when measure specific results are expected.

KOSOVO ENERGY EFFICIENCY PLAN

V.2.2.: ADMINISTRATIVE INSTRUCTION ON ENERGY AUDITING (CODE: KA2)

TITLE	ADMINISTRATIVE INSTRUCTION ON ENERGY AUDITING
CATEGORY	LEGISLATIVE/INFORMATIVE
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	Certain categories of final consumers and energy auditors
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	• Stimulation of energy auditors • Stimulation of auditing for buildings with surfaces that exceed 1000 m² and application of energy performance certificates of buildings • Establishment of a monitoring system for the AI on energy auditing
EFFECTIVENESS	• Developing an EA curriculum through EU Programme • Development of an energy auditor certification scheme • Establishment and maintenance of a register of certified energy auditors • After the establishment of the market of certified energy auditors, prerequisites for voluntary energy auditing from a category of household sector consumers will be met • Energy auditing certification establishes prerequisites for better evaluation of EE projects that are subject to foreign loans and borrowings • (Establishment of conditions for professional support for drafters of public sector tendering documents, as regards the energy efficiency improvement requirements, especially projects pertaining to school, ambulance, hospital, cultural objects construction and renovation, in the first phase of AI implementation (2011 – 2012))
EXPECTED ENERGY SAVING IN 2011 AND 2016	This measure will help the implementation of measures dealing with the energy performance of buildings, through the application of energy performance certificates of buildings.
IMPLEMENTATION STATUS AND TIMEFRAME	AI on energy auditing was signed in 2008. Energy auditor certification activities are foreseen. It is also foreseen to issue the energy performance certificates for public buildings.

KOSOVO ENERGY EFFICIENCY PLAN

V.2.3.: ADMINISTRATIVE INSTRUCTION ON ENERGY EFFICIENCY PROMOTION FOR FINAL CONSUMERS AND ENERGY SERVICES (CODE: KA3)

TITLE	ADMINISTRATIVE INSTRUCTION ON ENERGY EFFICIENCY PROMOTION FOR FINAL CONSUMERS AND ENERGY SERVICES
CATEGORY	LEGISLATIVE/INFORMATIVE
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	• EEI measure providers • Energy suppliers • Distribution operators and wholesale and retail companies • Energy service providers.
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Administrative Instruction is in force. This AI is in compliance with EC Directive 2006/32/EC. Kosovo Energy Efficiency Plan was drafted based on the requirements set forth by the AI on Energy Efficiency Promotion for Final Consumers and Energy Services, respectively on EC Directive 2006/32/EC. KEEP determines numerous measures that provide for the AI implementation. KEEP foresees to achieve by 2012 energy saving of 3% in the household sector, from the average energy consumption for the period 2003-2007. This plan is mainly based on the concrete measures foreseen to have direct effect in energy saving, including: loans for household sector projects related to EEI (this needs to be deleted, since as a measure does not entail saving. Saving are established by other energy saving measures implemented by the state and set forth by the requirements of this Instruction).
EFFECTIVENESS	• Increase of number of state organs and bodies engaged in monitoring and overseeing the implementation of EEI measures, as well as other documents and acts from the energy efficiency field. • Increase of quality of supplier companies, the distribution system and the grid, retail sale companies. • Increase of quality of the databases and communication between energy efficiency companies-consumers-monitoring bodies. • Improved energy saving in all sectors and saving of all energy resources.
EXPECTED ENERGY SAVING IN 2011 AND 2016	Energy saving during the implementation of this AI will be calculated through other measures that result from its implementation.
IMPLEMENTATION STATUS AND TIMEFRAME	AI is in force since 2008, however, its implementation will commence with the adoption of Kosovo Energy Efficiency Plan

KOSOVO ENERGY EFFICIENCY PLAN

V.2.4.: CAPACITY BUILDING ON PROJECT MANAGEMENT AND ENERGY AUDITING IN MUNICIPALITIES (CODE: KA4)

TITLE	CAPACITY RAISING ON PROJECT MANAGEMENT AND ENERGY AUDITING IN MUNICIPALITIES
CATEGORY	EDUCATION/TRAINING
LEVEL OF APPLICATION	MUNICIPAL
TARGET GROUP	Municipal staff, energy associations and companies, energy specialists
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Training was provided to municipal officials in data collection for energy statistics, energy efficiency project management, etc. Also based on the technical assistance secured from EU four training course has been done with the future staff of Local Energy Offices regarding energy planning, EE Action Plan for the Municipality Level.
EFFECTIVENESS	• Establishment of active and functional communication lines between municipalities and the Ministry of Energy and Mines Energy Department • Awareness raising in municipalities on KEEP requirements, which are to be taken into consideration during project planning or drafting of municipal development programs. • Awareness raising in municipalities and the needed for preparation of Regional EE Planning and its monitoring process from the Local Energy Office (which will be established during the 2011 according to the Draft EE Law) • Establishment of a common action fundement for drafting of documents and acts related to EEP.
EXPECTED SAVING IN 2011 AND 2013	This measure does not have a direct impact on EEP, however, it establishes organizational preconditions for energy efficiency monitoring scheme which will have high importance in the coming years.
IMPLEMENTATION STATUS AND TIMEFRAME	The training course was organized by the Ministry of Energy and Mines. The project is implemented by the Institute for Developmental Research Reinvest. Attendance of the course was at a high level. In total, 60 municipal officials were trained. The course was implemented within a 4.5 day timeframe, organized in five-hour lectures per day between November and December 2008. Lecturers included experts from different energy related fields, economy, statistics, project management, connoisseurs of energy assumption programs, etc. A second training was carried out from EU Programme in four workshops for 30 experts of 11 municipalities. This training was focus on energy planning, EE Action Plan for the Municipality Level. A model of EE Planning for Glakovo Health Sector has been prepared based on the on-job training and it will serve very well as good model for other municipalities.

KOSOVO ENERGY EFFICIENCY PLAN

V.2.5.: BEGINNING ENERGY AUDITOR TRAINING COURSE (FIRST PHASE) (CODE: KA5)

TITLE CATEGORY LEVEL OF APPLICATION	BEGINNING ENERGY AUDITOR TRAINING COURSE (FIRST PHASE)	
	EDUCATION/TRAINING	
	NATIONAL	
TARGET GROUP	Experts of the EE sphere from MEDex Mem, MESP; experts of different fields from the private sector interested in energy auditing training.	
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	This measure tends to establish an initial nucleus of future energy auditors. 60 participants were trained. The training is implemented in three working groups of 20 MEMBERS each. The project represents a donation of the European Commission. Initial preparatory work in selecting 20 experts, which underwent training, to be certified has commenced.	
EFFECTIVENESS	The establishment of a certified energy auditor market creates preconditions for energy auditing to be conducted initially on obligatory basis to public consumers, and at later stages in collective residential buildings, which will have to undergo energy efficiency auditing. This measure will impact the awareness raising among household consumers to conduct energy auditing and apply EEPs.	
EXPECTED SAVING IN 2011 AND 2016	The results of this measure are not quantifiable. The result of auditor's work will impact other measures that entail involvement of compulsory auditing and measures that require specialized evaluations of project proposals competing for EEP related loans, or projects from institutions and public agencies that require a specialized evaluation of energy efficiency extent, in terms of public tendering. The effect of application of voluntary energy auditing on the household sector was not ascertained.	
IMPLEMENTATION STATUS AND TIMEFRAME	The project is realized between 2007 and 2008, whereas the project has continued with practical certification of 50 energy auditors to be conducted in 2010 supported by EU technical assistance. EU Program will be finalized in the end of December 2010 and first 50 EAs will be certified from an EU certified institutions. This measure is inter-related with certain other measures that pertain to energy auditing stimulation, both on compulsory and voluntary basis.	

KOSOVO ENERGY EFFICIENCY PLAN

V.2.6.: INCREASE OF RATE OF COLLECTION AND ELECTRICITY EFFICIENCY IMPROVEMENT (CODE: KA6)

TITLE		INCREASE RATE OF COLLECTION AND ELECTRICITY EFFICIENCY IMPROVEMENT
CATEGORY		AWARENESS RAISING
LEVEL OF APPLICATION		MUNICIPAL
TARGET GROUP ²		CONSUMERS, KEK, Distribution Operator
FINAL CONSUMPTION ACTIONS TARGETED BY EEI		In the post-war period (after the war 1998 – 1999), Kosovo is facing with the phenomenon of irregular payments for electricity consumed, from a part of household sector consumers and very few service and industrial consumers. Over 30% of electricity is not billed at all. Over 30% of billed electricity is not paid by consumers. The energy company KEK continues to face great difficulties in its undertakings especially under very strong financial constraints. It managed to cover its non-technical losses mainly owing to the help received by the Budget of Kosovo and various donors. An increase in electricity payment will bring about change in attitude of that portion of consumers. This will affect more rational use of electricity. Household electricity consumption comprises around 60% of the overall consumption. To decrease this level, it is necessary to eliminate the phenomenon of not paying for consumed electricity, a phenomenon that hinders normal development and functioning of electricity market. For as long as this phenomenon remains an ongoing occurrence, it will be impossible to measure the concrete effects of energy efficiency improvement measures, since improvements in payment rate will have an effect in energy saving while payment itself is not subject to EE measures. The project is financially supported by EU/EAR and realized by MDA.
EFFECTIVENESS		The effect of the measure is foreseen to be reflected in the household sector consumer awareness to service their obligations towards the public electricity supplier, with the aim of stabilizing energy supply activities.
EXPECTED SAVING IN 2011 AND 2013		This measure was concluded, while the effects were impossible to measure. There were no surveys prior and after the measure was implemented, to show whether it had an impact in rising the collection rates, which represents one of the expected outcomes.
IMPLEMENTATION STATUS AND TIMEFRAME		The measure was implemented in 2007. But is very important that KEK supported from MEDex (MEM) and group of Donors to support continually this programme in order to reach a level of non technical losses of 5% in 2015 and 5% of non payment.

KOSOVO ENERGY EFFICIENCY PLAN

V.2.7.: LPG PROMOTION FOR KITCHEN USE (CODE: KA7)

TITLE	LPG PROMOTION FOR KITCHEN USE
CATEGORY	EVALUATION STUDY AND AWARENESS CAMPAIGN
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	HOUSEHOLD SECTOR AND SERVICES SECTOR CONSUMERS (HOTELIER, HEALTH, ETC.) WHO ARE THE MAIN ELECTRICITY CONSUMERS FOR COOKING NEEDS
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Study of current situation and possibilities of replacement of electricity with LPG. This is done with the purpose of identifying policies and measures to enable this replacement. This study is expected to result in electricity saving in general and primary energy source (savings of coal which is used to generate the equivalent part of electricity) in particular.
EFFECTIVENESS	The household sector utilizes a significant quantity of electricity for cuisine purposes, with around 25% of the overall electricity used by the sector. LPG does not enjoy massive usage, although its usage to service the aforementioned needs has commenced. Replacement of electricity with LPG energy will impact the decrease of electricity consumption, and the cost of energy supplies. Further, massive LPG utilization for cooking services will also decrease the level of pollutants emissions (especially SO_2 dust - particulate matter and CO_2). When knowing that electricity in Kosovo is mainly generated through lignite combustion, and that power-plant efficiency is relatively low, with Kosovo A operating at 29% and Kosovo B at 34%, this issue becomes increasingly important.
EXPECTED SAVING IN 2011 AND 2016	After the implementation of recommendations deriving from the study, it is expected to achieve a significant annual electricity and primary energy source saving from energy used for cooking, while knowing the accompanying factors that characterize utilization of LPG as a combustion fuel. Annual Energy saving is expected to be 0.5ktoe. By end 2011, expected saving will reach 1 ktoe, whereas at the end of 2016 it will amount to 7 ktoe.
IMPLEMENTATION STATUS AND TIMEFRAME	The project has been implemented during 2009. But is very important to be stressed that this process to continue during 2011-2012 in order to reach the proper awareness among all households.

KOSOVO ENERGY EFFICIENCY PLAN

V.2.8.: TECHNICAL REGULATION ON THE ENERGY PERFORMANCE OF BUILDINGS (CODE: KAB)

TITLE		TECHNICAL REGULATION ON THE ENERGY PERFORMANCE OF BUILDINGS
CATEGORY		REGULATIVE/NORMATIVE
LEVEL OF APPLICATION		NATIONAL
TARGET GROUP		Building owners, projecting experts, energy auditors, architect and constructor associations, construction material producers
FINAL CONSUMPTION ACTIONS TARGETED BY EEI		Kosovo have prepared the Administrative Instructions related with the legal act that covers the issue of the energy performance for new and rehabilitated buildings. Minister of Environment and Spatial Planning, Pursuant to article 12, of the Law on Construction no.2004/15 dated 27 May 2004, and article 1, paragraph 1.3, point (c) of the Executive Branch Regulation of Provisional Self Government Institutions in Kosovo no. 2001/19, dated 13 September 2001 for the purpose of thermal energy saving and thermal protection in buildings promulgates the following issue: TECHNICAL REGULATION ON THERMAL ENERGY SAVING AND THERMAL PROTECTION for Kosovo New Building Stock. This Technical Regulation, regulates technical requirements for thermal energy saving and thermal protection. Requirements relate to: 1.1. new building projects, and 1.2. existing buildings adoption and reconstruction projects with internal heating temperatures of more than 12°C. This Regulation regulates technical specifications and other specifications of construction products used for building construction for the purpose of thermal energy saving and thermal protection.
EFFECTIVENESS		This measure will further regulate EE compliance in buildings for all energy consumption services inside a building like space heating, space cooling, hot water, lighting, cooking and electrical appliances. It will enable controlled energy consumption in buildings and their energy performance improvement. Also, it will provide means for energy compliance building certification, as a result of their energy performance. As to the household sector, energy auditing and building certification will represent a desirable voluntary process, starting firstly with multi-store buildings with an total living area higher than 1000 m².
EXPECTED SAVING IN 2011 AND 2016		Upon entry into force of this Regulation, and with its full implementation, it is ascertained that it will yield significant results. These results are expected in 2011. Quantity of energy saved in annual basis can be ascertained after the EEI measures have been implemented in the household sector as well as in service buildings (please read more on respective chapter).
IMPLEMENTATION STATUS AND TIMEFRAME		The Regulation is expected to enter into force in 2010, whereas its implementation will commence in 2011.

KOSOVO ENERGY EFFICIENCY PLAN
V.2.9.: ENERGY EFFICIENCY LEGAL AND INSTITUTIONAL FRAMEWORK (EEL) (CODE: KA9)

Title	ENERGY EFFICIENCY LEGAL AND INSTITUTIONAL FRAMEWORK (EEL)
CATEGORY	LEGISLATION/REGULATIVE/ORGANIZATIONAL
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	Institutions, organizations and agencies, energy enterprises, energy services, distribution system operators, energy auditors, procurement services.
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	All activities developed and planned for the future pertaining to energy efficiency, until entry into force of the Energy Efficiency Law, are based on the Law on Energy, which treats and regulates energy efficiency. The lack of an EE Law, has resulted in numerous obstacles related to the development of the institutional framework. This law will aim to regulate EE, in a greater detail. This law will also determine the authority of different state bodies, organizations and agencies dealing with EE, including the EE Fund.
EFFECTIVENESS	Approval of EE Law will result further strengthening of the EE field from the legal, institutional and organizational perspective. It will encompass all energy consumption sectors. Also, the law will determine the mechanisms for application, monitoring and evaluation of EEI measures.
EXPECTED SAVING IN 2011 AND 2018	Results are related with concrete measures undertaken during the implementation of this law.
IMPLEMENTATION STATUS AND TIMEFRAME	The law is planned to enter into force during 2011. The Agency for Energy Efficiency will also be established in both the functional and organizational sense during 2011.

KOSOVO ENERGY EFFICIENCY PLAN

V.2.10.: PROMOTION OF HOUSEHOLD ENERGY EFFICIENCY (CODE: KA10)

TITLE	ENERGY EFFICIENCY PROMOTION IN HOUSEHOLDS
CATEGORY	FINANCIAL LOANS WITH FACILITATING CONDITIONS (SOFT LOANS)
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	Household consumers and small and medium service provision enterprises and industrial consumers.
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Aiming to promote Energy Efficiency in the Household Sector and in the Sector of Small and Medium Enterprises, the German Development Bank has provided a 10 million euro loan for crediting projects that relate to energy efficiency. Loans have started in April 2009 with RBKO and the second one will start next year with Pro Credit Bank of Kosovo with the main goal facilitating loan conditions (soft loans). Loans are foreseen to be serviced through Raiffeisen and Pro Credit Banks, during a five-year period (2009-2014). The household and SME sectors will be the main beneficiaries from EE measures for house walls and roof isolation, as well as isolation of doors and windows, installation of solar energy systems for sanitary water heating and other energy efficiency improvement measures. A list of EE measures supported from this soft loans to be included in SME will be discussed in Service and Industrial sectors.
EFFECTIVENESS	Energy efficiency improvement in residential buildings, as well as awareness raising on distinguished energy saving effects from utilization of isolation equipment and material
RESULTS EXPECTED IN 2011 AND 2016	Project application is expected between 2009-2014, whereas the energy saving effects has started to become effective during 2010. Up to now RBKO has disburse about 4.2 MEuro and ProCredit has reached 3.5 MEuro in all three sectors: households, private service as well as industrial sectors.
IMPLEMENTATION STATUS AND TIMEFRAME	This measure is assumed to be applied based on suitable, EEI compatible criteria.

KOSOVO ENERGY EFFICIENCY PLAN

V.2.11.: DEVELOPMENT OF AN ENERGY AUDITOR CERTIFICATION SYSTEM (CODE: KA 11)

TITLE		DEVELOPMENT OF AN ENERGY AUDITOR CERTIFICATION SYSTEM
CATEGORY		REGULATIVE/NORMATIVE
LEVEL OF APPLICATION		NATIONAL
TARGET GROUP		AUDITORS, ESCOs, CONSULTANTS, ETC.
FINAL CONSUMPTION ACTIONS TARGETED BY EEI		Energy auditor certification, upon finishing all specialized training, and their registration in the official register. This training has been supported for the first 50 EA from EU technical assistance programme which will be finalized at the middle of December 2010. Also Certification Committee will be supported by GTZ.
EFFECTIVENESS		Creation of prerequisites for undertaking voluntary energy auditing by association of household sector consumers, (condominium association); as per expected requirements. Provision of support to public institutions in preparing technical procurement documentation for capital projects for determining EE related criteria.
RESULTS EXPECTED IN 2011 AND 2016		This measure is ancillary for other measures that relate to energy auditing stimulation. Outcomes will be determined in enforcement measures for voluntary energy auditing in the household sector.
IMPLEMENTATION STATUS AND TIMEFRAME		This measure has been implemented during 2010 by certifying first 50 EA and in the following years by carrying out EA at the beginning in public buildings and in the later stage to condominium household association.

KOSOVO ENERGY EFFICIENCY PLAN

V.2.12.: PUBLIC CAMPAIGN ON ENERGY SAVING AND ENERGY EFFICIENCY IMPROVEMENT (CODE: KA 14)

TITLE	PUBLIC CAMPAIGN ON ENERGY SAVING AND ENERGY EFFICIENCY IMPROVEMENT	
CATEGORY	EDUCATION/INFORMATION	
LEVEL OF APPLICATION	NATIONAL	
TARGET GROUP ²	CONSUMERS OF ALL SECTORS	
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Implementation of focus awareness raising campaigns, of informative and educational character, relating to energy saving and EEI. The project is foreseen to be implemented in a timeframe of three years (2009 – 2011). This project for the year 2009 has been financed from MED iex MEM)and for the year 2010 has been financed from EU programme and will be finalized on middle of December 2010.	
EFFECTIVENESS	Awareness raising among consumers, including household consumers, on the many-fold effects of energy saving, and their acquaintance with energy saving methods and manners.	
RESULTS EXPECTED IN 2011 AND 2016	3-4% of electricity consumed in the household sector. Expected saving in 2012 amounts to 4 85ktoe. By the end of 2015, energy saving of 17.64ktoe is expected.	
IMPLEMENTATION STATUS AND TIMEFRAME	This measure has been implemented during from 2010, while the results of this measure will be visible in the three following years. Strategy and detail plan of the campaign has been adopted as separate documents taken into consideration particularities of each economic sector like household (with the main focus), service, industry/SME, etc. .	

KOSOVO ENERGY EFFICIENCY PLAN

V.2.13.: ADMINISTRATIVE INSTRUCTION ON THE HEATING OF NEW COLLECTIVE RESIDENTIAL BUILDINGS (CODE: KA13)

Title CATEGORY LEVEL OF APPLICATION	AI ON THE HEATING OF NEW COLLECTIVE RESIDENTIAL BUILDINGS	
	REGULATIVE / NORMATIVE	NATIONAL
	PUBLIC AND PRIVATE CONSUMERS, ENERGY UTILITIES, ENERGY MANAGERS, CONSTRUCTION COMPANIES, CONSTRUCTION INSPECTION (CENTRAL AND LOCAL)	
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	• Drafting, discussion and adoption of the document • Institutional capacity building of implementers • Support of entities subjected to this instruction	
EFFECTIVENESS	AI on the heating of new collective apartment buildings shall make possible the management of the energy consumption in those buildings; shall determine new heating criteria for the space within these facilities, and shall oblige consumers not to use electricity for heating and to use other heating alternatives. This action will stimulate owners of such new collective apartment buildings to seek new alternatives in supplying heat to their customers. These alternatives include central heating, district heating as well as small and big scale (like project of CHP from Kosovo B) co-generation (CHP) equipment used for distributed generation and heating, etc.	
RESULTS EXPECTED IN 2011 AND 2016	By use of other than electricity heating sources, energy shall be saved in the household, service, and other sectors, respectively in the collective apartment buildings. ENERGY saving can be assessed after this measure is implemented, the effects of which will be visible by 2010. Basic alternative of this measure is the implementation of decentralized heating. According to prediction data for the household increase in 2010-2018, on average 3200 new apartment buildings per year are expected to be constructed. Currently, new buildings only to a symbolic extent link to the central heating systems. This measure will help in multi disciplinary directions: increasing energy efficiency, stabilize the implementation of AI of Thermal losses in Buildings as well as reduce green houses.	
IMPLEMENTATION STATUS AND TIMEFRAME	AI for Heating of New Collective Residential Buildings can be expected to be adopted in 2011.	

KOSOVO ENERGY EFFICIENCY PLAN

V.2.14.: REFORMS OF PUBLIC PROCUREMENT LEGISLATION TO THE BENEFIT OF EEI (CODE: KA14)

TITLE	REFORMS OF PUBLIC PROCUREMENT LEGISLATION TO THE BENEFIT OF EEI	
CATEGORY	COOPERATIVE	
LEVEL OF APPLICATION	NATIONAL	
TARGET GROUP	CENTRAL AND LOCAL INSTITUTIONS AND PUBLIC UTILITIES OPERATING ON PUBLIC BUDGET ALLOCATIONS	
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Advancing the procurement legislation and practices by setting criteria for improving energy efficiency. The aim is to use the public sector as an example of energy saving and improving energy efficiency.	
EFFECTIVENESS	Transformation of the public procurement legislation and adjusting it with the Energy Efficiency requirements and criteria shall have an impact in improving EE in the public sector and in the effective management of funds. The exempt any role of public sector is an efficient measure for dissemination of the best practices in the field of energy efficiency.	
RESULTS EXPECTED IN 2011 AND 2016	Results are not measurable in the mid-term 2010-2018	
IMPLEMENTATION STATUS AND TIME-FRAME	Planning in 2010, supplements and amendments in 2011. Real effects of this measure are expected in 2011 and will continue in the long-term, including 2018.	

KOSOVO ENERGY EFFICIENCY PLAN

V.2.15.: STIMULATING THE USE OF SOLAR HEATING SYSTEMS FOR SANITARY WATER HEATING (CODE: KA15)

Title	STIMULATING THE USE OF SOLAR WATERHEATING SYSTEMS FOR SANITARY WATER HEATING	
CATEGORY	FINANCE/EDUCATION	
LEVEL OF APPLICATION	NATIONAL	
TARGET GROUP	HOUSEHOLD CONSUMERS	
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Installation of solar energy systems for heating of sanitary water in four hospital clinics in the UCK in Prishtina and in one dormitory of the student center in beginning of 2010 has proven to be a successful example based on the financial support of MEDex MEM. These and other examples of energy saving shall be used to stimulate the use of solar energy systems for heating sanitary water by the household sector. In 2010, solar energy systems for heating sanitary water are in the process of installation in three other public facilities (a donation by the European Commission)	
EFFECTIVENESS	This measure lowers the energy consumption for hot sanitary water purposes, lowers the cost of energy generation, lowers the CO2 emission rate, and increases the achievement of Indicative Targets for Renewable Energy Sources.	
RESULTS EXPECTED IN 2011 AND 2016	Annual ENERGY saving will be 0.03 ktoe. By the end of 2012, the saving will reach 0.06 ktoe, and by end 2016, 0.24 ktoe. The solar water heating systems as well in the future photovoltaic systems shall help to cut peak loads in the power system during the summer period, having impact (except reduced final energy consumption) on reduction of technical losses of electricity in distribution, transmission and production systems.	
IMPLEMENTATION STATUS AND TIMEFRAME	MED project has started in November 2008 and was completed in February 2010. Also during 2010 are in final stage of installation three other solar system integrated with central heating system for two schools and for one hospital. The effects shall be measured in 2012, after at least one whole year monitoring.	

Chapter VI. Services Sector

The services sector includes government buildings (local and central), education, health, cultural, sports servicing (public and private), tourist, and catering facilities, trading enterprises, service providers, etc. As was mentioned in the above analysis, this sector comprises around 13% of Kosovo's total energy consumption.

The forecast of possibilities for improving energy efficiency is 30% of total savings for the period 2010-2012. These assessments have been made taking into consideration the fact that in 2010 the plans are to begin with the implementation of the secondary legislation for energy auditing (Administrative Instruction) which requires public facilities to undertake energy auditing and to undertake measures for energy saving in accordance with auditors' recommendations. The public service sector also includes installation of pilot EE facilities, which shall undertake efficiency measures that impact EEI.

Since it is a clear requirement of Directive 2006/32/EC that the public service sector should take on an important leading role, providing first examples for all other sectors to follow, it has been estimated that the public services sector has a significant potential for energy savings in the future in Kosovo. It is important that particular attention is given to the reduction of electricity and fuel demand. Changes have been made in the reduction of energy intensities and in the supply structure of energy resources, for each service. Different measures are foreseen, such as enforcement of electricity payments, an increase in electricity prices based on the cost of service (the whole cost chain must be covered, including mining, generation, import, transmission, distribution and retail steps), implementation of energy building codes in public and private building stock, application of fiscal incentives for investing in energy renewable resources and other efficient resources, awareness campaigns, etc.

The most important measures are as follows:

- Enforcement of electricity payment from all sub-categories of private and public services buildings;
- A strong penetration of heating oil for meeting space heating and water heating energy demand instead of electricity and this will bring support for power system and energy savings as primary energy sources;
- A strong penetration of LPG for space heating and cooking in small public and private service buildings;
- An improvement of thermal insulation in existing public and private building stocks of the service sector and rigorous application of the New Energy Building Code (named in Kosovo – Administrative Instruction regarding Regulation on Thermal Losses in Buildings) for new service sector buildings;
- An extension in the use of solar panels for preparation of hot water in public and commercial buildings in the service sector;
- Introduction of CHP scheme from Kosovo B to cover much larger areas of Prishtina and for this project a feasibility study has been financed by KfW Bank, which might also finance this investment.
- A gradual introduction of small-scale combined heat and power plants (SSCHP diesel) and central heating schemes for large and small consumers (hospitals, boarding-schools, hotels, etc.), particularly through substitution of existing conventional systems;
- Implementation of Energy Audits in public and private service sector buildings (hospitals, boarding schools, hotels, etc.) and big commercial and hotel centers;
- An efficiency increase in public and private service sector buildings through various other measures, such as increased use of fluorescent lighting, introduction of intelligent electronic techniques, use of modern electric appliances with improved costs, in pumps, refrigerators etc, for different service sector consumers.

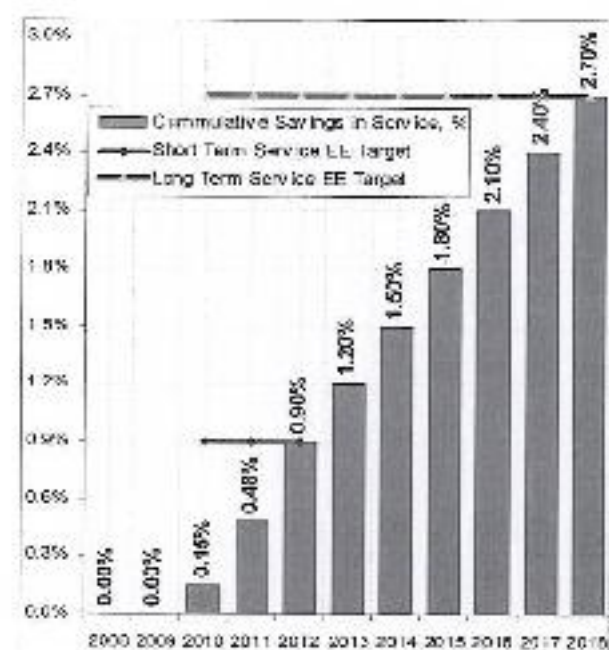
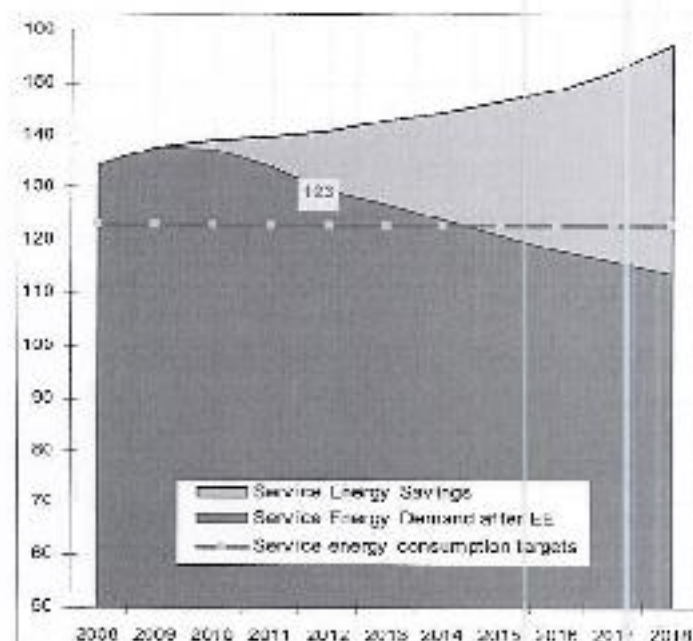
Table 15: Energy consumption by the Services Sector in 2003-2008, expressed in ktoe.

Services Sector	2003	2004	2005	2006	2007	2008
Participation in consumption	137.69	131	145	149	130.1	143.3

Table 16: Types of energy sources and their participation in the energy consumption of the Services Sector, during 2003-2008

Participation of Energy sources in Services Sector ktoe	2003	2004	2005	2006	2007	2008
Coal	6.17	2.92	5.16	4.76	4.32	4.45
Oil products	40.48	34.13	43.89	45.40	39.93	41.21
Biomass	54.08	54.08	54.08	54.08	54.08	54.80
Electricity	34.23	36.09	38.99	40.40	28.34	30.00
Solar energy	0.02	0.03	0.03	0.04	0.04	0.05
District heating	2.71	3.11	3.97	4.17	3.41	3.79
Total	137.89	130.66	146.12	148.93	130.12	134.30

In Figures 15 and 16 the relative and absolute energy savings needed for the service sector to reach the objectives defined in the above mentioned sections, are summarized.

Figure 15: Short and Long Term Target of EE for service sector in %**Figure 16:** Total Energy Demand after EE measured will be implemented in service sector and absolute EE savings in (ktoe)

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Table 17: Measures for Improving Energy Efficiency (EE) in the Services Sector

CODE	TITLE	STATUS	TYPE	START YEAR	END YEAR	RESULT	Energy Savings (toe)	Cost of Savings (Euro)	Monitoring indicator	IMPLEMENTERS
KS1	AI for labeling electrical office Appliances	Adopted but implementation has not started	regulative / normative	2010	2018	Implementation of this instruction should provide its first outputs after three years of implementation (2010-2012)	2357	Budget is included at household	AI prepared	MED, MTI, Traders, MEF/Customs, donors
KS2	AI for Energy Auditing	adopted	regulative / normative	2010		Implementation of Energy Auditing recommendations provides for the preconditions for ENERGY saving in the Services Sector.	3536	Budget is included at household	AI prepared	MED, MEST, GTZ, EAK, UNIVERSITY, ENERGY COMPANIES, ASSOCIATIONS,
KS3	AI for the promotion of ENERGY efficiency for end customers	adopted	regulative / normative/ informative	2010	On-going	Relates to all EE measures undertaken in the Services Sector	1571	Budget is included at household	AI prepared	INSTITUTIONS, ENERGY OPERATORS,
KS4	Municipal capacity building for project management and energy auditing (phase one)	complete	educational/ training	2007	2007	No assessment	3536	1891141	60 Energy Auditors trained from RIN/VEST and 30 from EU Programme	MED, EU, Rinvest
KS5	Energy Auditing in Municipal Level (phase one)	complete	educational/ training	2008	2008	No assessment	2750	1470897		MED, EU, experts of the private sector,
KS6	Increasing collection rate and ENERGY efficiency	complete	educational/ information	2007	2007	No assessment	3028	Budget is included at household		MDA
KS7	Promotion of energy efficiency in municipal level	Complete	financial/ education and information	2008	2008	GTZ has implemented 40 EE projects in different public services facilities (schools, hospitals, municipal buildings, etc.). Project assessment of this measure has resulted with an annual ENERGY saving of 4.8 GWh or 0.09 Mtoe, and 14 GWh or 1.23 Mtoe in the period between 2010-2012 and 40 GWh, or 3.43 Mtoe for the period 2010-2018.	2750	Budget is included at household		Municipalities, GTZ,

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KS8	Promotion of LPG for meeting energy for cooking demand	Study	Education	2009	2011	The estimation is that the public awareness campaign will result with an energy saving of approximately 1% of the total energy consumption used for cooking which comprises around 25% of the energy currently used for this purpose.	1964	Budget is included at household	MED, MTI
KS9	Technical regulation on the energetic performance in buildings	Draft	regulative / normative	2007	Adoption in 2008, implementation until 2018	The Regulation is expected to produce results after the start of implementation	2357	Budget is included at household	MED, MEST, Municipalities
KS10	EE Law	Draft	regulative / normative	2009	Adoption in 2011, implementation until 2018	Outputs are linked with all general IEE measures.	1964	Budget is included at household	MED, Institutions (Central and local)
KS11	EE promotion in SMEs	Contracted	financial loans with better conditions (soft loans)	2009	2014	Dedicated funds by KfW for EE purposes in households and SMEs in Kosovo (13-10 million Euros). The implementation of this measure has started and RBKO and Pro Credit Kosovo are financing projects in household as well as in the SME (including private buildings in service sector). KfW is programming to start also a new soft loan line with different municipalities for financing all measures related with EE. EU from other side will grant the technical assistance for this purpose.	3143	2009-2018	Institutions (central and local), KfW, GTZ Raiffeisenbank
KS12	Establishment of the system base for auditors' certification	Contracted	Finance	2009	2009	In 2008, MED, with the support of EAR, has organized a beginners training course for 80 specialists in energy auditing. In 2010 the second level of the training has followed resulting with the certification of approximately 50 energy auditors. This training was financed by the EU.	1964	Budget is included at household	MED, GTZ, Energy companies, private sector experts

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	Public campaign for energy saving and IEE through efficient lighting	Planning	financial/ education	2009	2011	It is expected that the services sector will save a certain amount of energy consumed in this sector.		Budget is included at household	MED; Government Institutions (central and local); Donors
KS13	Transformation of the public procurement legislation to the benefit of improving EE	Planning	regulative/ informative	2010	2010	Outputs depend from other undertaken measures.	1571	40000	MEF, Parliament,
KS14	Simulating the use of solar panel systems for heating of sanitary water	Planning	regulative/ financial/ educative	2010	2016	MED and other government institutions have implemented several demonstrative projects with regard to the use of solar ENERGY for heating sanitary water. These measures have been implemented in public institutions. Such steps are planned for the upcoming years, with the aim of affirming the importance of Solar Energy and making the services sector owner in this area.	1964	1187673	MED; Government Institutions (central and local); consumers of the services sector; Donors
KS15	Improving EE through efficient lighting in public buildings	Planning	Educative/ regu active	2010	2018	This IEE measure shall be focused in the section of efficient lighting in public institution buildings. This measure shall be supported with the respective regulations determining the efficient form in public institution buildings of the services sector, in order to make this sector a positive model.	1964	630515	MED; Government Institutions (central and local); Donors
KS16	Efficient public lighting	Planning	Educative/ awareness	2011	2018	Efficient lighting of streets and squares has to be implemented in the Country's biggest cities. This measure shall precede with a demonstrative project of digitalizing public lighting, which will be done in one city of Kosovo.	1964	539516	
KS17	Improving EE of heating appliances in the Services Sector	Planning	Educative/ awareness	2010	2010	Installation of examination machines (calorimeters etc.) in the heating appliances in the services sector (the mail stoves, radiators).	35285	7238125	

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VI. 1. INDIVIDUAL MEASURES FOR IMPROVING ENERGY EFFICIENCY IN THE SERVICES SECTOR

VI.1.1. ADMINISTRATIVE INSTRUCTION FOR LABELING SERVICE ELECTRIC APPLIANCES (CODE: KS1)

TITLE	AI FOR LABELING OFFICE ELECTRICAL APPLIANCES
CATEGORY	LEGISLATIVE/INFORMATIVE
Level of application	NATIONAL
Target group	CUSTOMERS OF THE SERVICES SECTOR, SUPPLIERS OF OFFICE ELECTRICAL APPLIANCES, TRADERS AND MANUFACTURERS
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Designing labels and the set up of an inspection system for office electrical appliances. In particular, the aim is to create a perfect example of office electrical appliances' supply with labeling schemes. Clear criteria will be established for central and local government institutions and utilities supplying with labeled appliances with high energy efficiency. There will be a clear guide (manual) for use for the procurement of all institutions and utilities.
EFFECTIVENESS	Informing customers of the services sector on the EE quality and category of their home and kitchen appliances. Provision of the choice of selecting efficient appliances.
EXPECTED SAVING IN 2011 AND 2016	This measure should result with a certain Energy Saving, the effects of which will be noticed after the measure start implementation.
IMPLEMENTATION STATUS AND TIMEFRAME	AI has been signed in 2008. Its implementation will begin in 2010, thus generating outputs.

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VI.1.2.: ADMINISTRATIVE INSTRUCTION ON ENERGY AUDIT (CODE: KSH2)

TITLE	ADMINISTRATIVE INSTRUCTION ON ENERGY AUDIT
CATEGORY	LEGISLATIVE/INFORMATIVE
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	Certain categories of end consumers and energy auditors
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	• Encouraging auditors' certification • Encouraging auditing of buildings with over 1000m² • Set up of a monitoring system for the AI implementation for mandatory audits
EFFECTIVENESS	• Creation of conditions for auditors' certification. • Establishment and maintenance of a certified auditors' registry. • The establishment of a certified auditors market, creates the conditions for assessing Energy Efficiency in a group of public buildings with a mandatory requirement for energy auditing in certain periods. • Auditors certification enables the possibility for professional auditing, including the implementation of administrative instruction with mandatory requirements for periodic auditing for certain groups; • Auditors certification creates the conditions to have better assessments of projects which provide for affordable loans on energy efficiency • Establishment of conditions for professional support to bids and bidding documentation drafters of the public sector with regard to requirements for energy efficiency improvement, particularly projects involving construction and reconstruction of schools, clinics, cultural buildings in the first phase of the implementation of the AI (2010-2012).
EXPECTED ENERGY SAVING IN 2011 AND 2016	This measure shall assist the implementation of measures on energy auditing such as the Implementation of the Administrative Instruction on the Performance of Facilities and the Energy Performance Certificates of Buildings.
IMPLEMENTATION STATUS AND TIMEFRAME	AI has been signed. Different activities are envisaged for the auditors' certification (see KA2)?

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VI.1.3.: ADMINISTRATIVE INSTRUCTION ON THE PROMOTION OF ENERGY EFFICIENCY AT END CONSUMERS (CODE: KS3)

TITLE	AI ON THE PROMOTION OF ENERGY EFFICIENCY AT END CONSUMERS
CATEGORY	LEGISLATIVE/ INFORMATIVE
Level of application	NATIONAL
Target group	• Providers of measures for energy efficiency improvement, • Energy suppliers, • Distribution operators and retail companies • Energy service providers,
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	The Administrative Instruction is already in force. This AI is in compliance with the Directive 2006/32/EC. The Kosovo Plan for Energy Efficiency has been drafted on the basis of AI requirements, respectively the Directive 2006/32/EC. Kosovo Plan for Energy Efficiency has determined numerous measures which enable the implementation of the AI. KEEP envisages that by 2011 there is an energy saving of 3% of the consumption average for the period 2003-2007. Main basis for supporting this Plan are specific measures which produce direct effects of energy saving, such as: loans for energy efficiency projects for SMEs and households.
EFFECTIVENESS	• Establishment of national bodies and mechanisms for monitoring and supervision of the implementation of measures for energy efficiency improvement and documents and acts in energy efficiency, • Quality increase of supply companies, distribution system and network, retail companies; • Quality increase of the database and communication between enterprises-consumers-managing bodies of energy efficiency • Increase of energy saving in all energy sectors and all energy source types
EXPECTED ENERGY SAVING IN 2011 AND 2016	Energy saving during the implementation of this instruction are estimated in other measures which derive as a result of this implementation.
IMPLEMENTATION STATUS AND TIMEFRAME	AI is in force from 2008. Its implementation began with the adoption of the Kosovo Plan for Energy Efficiency.

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VI.1.4.: MUNICIPAL CAPACITY BUILDING FOR PROJECT MANAGEMENT AND ENERGY AUDITING (CODE: KS4)

TITLE	MUNICIPAL CAPACITY BUILDING FOR PROJECT MANAGEMENT AND ENERGY AUDITING
CATEGORY	EDUCATION/ TRAINING
Level of application	MUNICIPAL
Target group	Municipal staff
FINAL CONSUMPTION ACTIONS TARGETED BY EE	Training municipal officials or the collection of essential energy statistical data, energy efficiency project management, etc.
EFFECTIVENESS	• Establishment of active and functional communication between Municipalities and the Energy Department in the Ministry of Economic Development (ex MEM) • Awareness raising of the Municipal Management Staff on the requirements of energy efficiency during projections of municipal development plans and programs • Establishment of the basis for interaction in drafting EE documents and acts
EXPECTED SAVING IN 2011 AND 2013	This measure creates the organizational conditions for monitoring the state of energy efficiency.
IMPLEMENTATION STATUS AND TIMEFRAME	The Training course has been organized by the Ministry of Energy and Mines (now MED). The Project has been accomplished by the Institute for Development Research Rinevst. Training has been provided for 60 municipal officials. The course duration was 45 days, 5 hours per day, in November and December 2008. Most renowned experts on energy, economy, statistics, project management and experts of programs for energy predictions, etc., were used as lecturers.

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VI.1.5.: BEGINNING OF COURSE FOR ENERGY AUDITOR TRAINING (PHASE ONE) (CODE: KS5)

TITLE	BEGINNING OF COURSE FOR AUDITOR TRAINING (PHASE ONE)
CATEGORY	EDUCATION/TRAINING
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	Experts of different areas have expressed interest for acquiring training in energy auditing.
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	This measure aims to establish an initial foundation of future energy auditors. Training has been provided for 60 participants. Training has been organized in three groups of 20 participants. The Project is a donation of the European Commission. Preparations for test-based selection of 20 persons for certification have started. A German donation is expected to fund this project.
EFFECTIVENESS	The establishment of certified auditors market creates the conditions for mandatory auditing in large customer facilities of the public services sector, as stipulated by the AI on Energy Auditing. This process implies the institutionalization of Energy Audit, which is also costable, essential and profitable for the private services sector consumers.
EXPECTED ENERGY SAVING IN 2011 AND 2016	The outputs of this measure are not measurable. Outputs of the auditors work are shown in other measures involving mandatory energy audits, and where specialized assessments are required for projects of the services sector requesting loans for energy efficiency purposes or projects of public institutions and agencies requiring specialized assessments of energy efficiency in terms of public tenders.
IMPLEMENTATION STATUS AND TIMEFRAME	The project was realized in 2007 and 2008, and the follow-up project on the certification was done through EU Funds for 50 auditors whom are going to get the certification on December 10. This measure is related to other measures on encouraging audits, both mandatory and voluntary.

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VI.1.6.: INCREASING COLLECTION RATES AND ENERGY EFFICIENCY IMPROVEMENT (CODE: KSH6)

TITLE	INCREASING COLLECTION RATES AND ENERGY EFFICIENCY IMPROVEMENT
CATEGORY	AWARENESS RAISING
LEVEL OF APPLICATION	MUNICIPAL
TARGET GROUP	CONSUMERS THAT ARE NOT PAYING ELECTRICITY CONSUMED
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	For many years, Kosovo is facing with the phenomena of regular nonpayment of used electricity by a significant number of consumers. Furthermore, the Energy Corporation, KEK, respectively the Division of Supply is unable to bill over 30% of the consumed electricity consumed. Over 30 % of billed electricity is not paid for by the consumers. KEK is facing many difficulties in its operations. It survives thanks to financial support from the public budget and previously from foreign donations. By increasing energy collection rates, we change the behavior of consumers and the services sector, which continue to use unpaid energy. This will have also influence rational use of electricity in this sector. Reducing the electricity consumption level in the services sector requires different action which lead to the eradication of this occurrence, which seriously hampers the normal functioning of the energy market. As long as this phenomenon is present in Kosovo, it will be very difficult to measure the concrete effects of measures for energy efficiency improvement, since the constraints of energy payment will also produce effects of energy saving, whereas payment is not subject to energy efficiency measures. This Project is supported by EAR.
EFFECTIVENESS	Awareness effect among consumers to meet their obligations to the public energy supplier with the aim of stabilizing the energy supply.
EXPECTED ENERGY SAVING IN 2011 AND 2016	This measure has already been completed and its effects have not been measured. No survey was done prior to, or after the implementation of the measure in order to measure the effect of the collection rate increase as an expected output.
IMPLEMENTATION STATUS AND TIMEFRAME	This measure was realized in 2007.

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VL1.7.: PROMOTION OF ENERGY EFFICIENCY IN MUNICIPALITIES (CODE:KSH7)

TITLE	PROMOTION OF ENERGY EFFICIENCY IN MUNICIPALITIES	
CATEGORY	FINANCIAL/EDUCATION/INFORMATION	
LEVEL OF APPLICATION	MUNICIPAL	
TARGET GROUP	Public Consumers, Municipalities, Kosovo Association of Municipalities	
FINAL CONSUMPTION ACTIONS TARGETED BY FFI	In 2006-2008, GTZ has co-funded 40 different projects on energy efficiency in Kosovo municipalities. The projects mainly involve external thermal thermo of older buildings, replacement of windows, doors and fixing building rooftops, mainly in the public services sector. Furthermore, some projects involve renovation and complete replacement of the existing heating system including the replacement of stoves. Facilities in which energy efficiency measures were implemented are mainly schools (primary and secondary), kindergartens, clinics, municipal buildings, etc., in different Kosovo municipalities. Respective Municipalities have co-funded projects that were developed in these territories	
EFFECTIVENESS	EE improvement and increasing the quality of services provided for these facilities.	
EXPECTED SAVING IN 2011 AND 2016	Annual energy saving as a result of these EEI measures in public services sector, through the accomplishment of 40 projects is 0.39 ktce and in end of 2011 the saving will be 1,20 ktce, and in end 2016 3.43 ktce.	
IMPLEMENTATION STATUS AND TIMEFRAME	Projects have been completed from 2006-2008.	

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VI.1.8.: PROMOTION OF LPG FOR MEETING ENERGY COOKING DEMAND IN SERVICE BUILDINGS (CODE: KSH8)

TITLE	PROMOTION OF LPG FOR MEETING ENERGY COOKING DEMAND IN SERVICE BUILDINGS
CATEGORY	STUDY FOR THE ASSESSMENT OF POSSIBILITIES AND AWARENESS CAMPAIGN
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	CONSUMERS OF THE SERVICES SECTOR (HOTELS, HEALTH INSTITUTIONS, ETC.) WHICH MAINLY USE ENERGY FOR COOKING NEEDS
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Study of possibilities for replacing electricity with LPG. This is done with the aim of drafting policies and measures leading to this replacement. The study generates the energy saving results.
EFFECTIVENESS	The services sector uses a considerable amount of electricity for cuisine purposes. LPG, however, is currently used for this purpose, but only to a small extent. Replacement of electricity with LPG will have an impact on reducing the electricity consumption for this purpose, and in reducing costs for energy supply. Moreover, larger use of LPG for cooking purposes in the services sector will lower the level of CO ₂ emissions, taking into consideration the fact that electricity in Kosovo is generated from lignite and the operation efficiency of Power Plants is very low. Kosovo A 29% and Kosovo B around 34 %.
EXPECTED SAVING IN 2011 AND 2018	It is expected that the implementation of the recommendations of the study will stimulate an annual saving of the energy used for cooking in the services sector amounting to 0.2 ktoe. In end 2012, the saving expectations are 0.5 ktoe, and in end 2018, 1.4 ktoe.
IMPLEMENTATION STATUS AND TIMEFRAME	The project is under implementation. Terms of references have been drafted. The study will place special consideration in the requirements for energy efficiency.

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VI.1.9.: TECHNICAL REGULATION ON THE ENERGY PERFORMANCE OF BUILDINGS (CODE: KSH9)

TITLE		TECHNICAL REGULATION ON ENERGY PERFORMANCE OF BUILDINGS
CATEGORY		REGULATIVE/NORMATIVE
LEVEL OF APPLICATION		NATIONAL
TARGET GROUP		Owners of buildings, projection experts, energy auditors, association of architects and construction engineers, construction material producers
FINAL CONSUMPTION ACTIONS TARGETED BY EEI		Kosovo has adopted no Regulation, Instruction or other bylaw for energy performance of buildings, in compliance with the Directive 2002/91/EC. Despite several attempts to draft such a document, this issue remains. The plan is to adopt the Energy Performance Certificates of Buildings in 2011.
EFFECTIVENESS		This measure will regulate EE in buildings of all sectors of energy consumption, including the services sector, thus enabling energy consumption control, and improving their energy performance. It will also enable the energy certification of buildings, as a result of energy auditing, including the public and private services sector. Largest consumers among the public services facilities will be subjected to regular three-year energy auditing.
EXPECTED SAVING IN 2011 AND 2016		After this energy code enters into force, the indicative results of measures it imposes will be visible in the mid-term (2010-2012), starting from 2010.
IMPLEMENTATION STATUS AND TIMEFRAME		It enters into force in 2010 and its full implementation begins in 2011.

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V1.1.10.: LEGAL AND INSTITUTIONAL ENERGY EFFICIENCY FRAMEWORK (CODE: KSH10)

Title	LEGAL AND INSTITUTIONAL ENERGY EFFICIENCY FRAMEWORK
CATEGORY	LEGISLATION/REGULATIVE/ORGANIZATIONAL
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	INSTITUTIONS, MECHANISMS AND AGENCIES, ENERGY COMPANIES, ENERGY SERVICES COMPANIES, DISTRIBUTION SYSTEM OPERATORS, ENERGY AUDITORS, PROCUREMENTS
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	All developed activities, including those to be developed in the future on energy efficiency, until the Law on Energy Efficiency enters into force. This law also addresses the issue of energy efficiency regulation. The act of a law on energy efficiency has caused numerous obstacles related to the development of institutional staff. This law aims to regulate energy efficiency to a higher responsibility level. This law shall also determine the authority of national mechanisms and institutions dealing with EEI policies and measures, including energy efficiency fund.
EFFECTIVENESS	The adoption of LEL will strengthen the EE area from a legal, institutional and organizational perspective. It shall include all energy consumption sectors, including the services sector. The law shall also determine the implementing and assessing instruments for the EE measures.
EXPECTED SAVING IN 2011 AND 2016	Results are related to concrete Law implementation measures.
IMPLEMENTATION STATUS AND TIMEFRAME	The Law is expected to be adopted and to enter into force in 2011. It is hoped that Energy Efficiency Agency will also be established this year.

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VI.1.11.: PROMOTION OF ENERGY EFFICIENCY IN SMEs CODE: KSH11)

TITLE	PROMOTION OF ENERGY EFFICIENCY IN SMEs
CATEGORY	FINANCIAL/SOFT LOANS FOR SMEs
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	SMALL AND MEDIUM SERVICE PROVIDING ENTERPRISES
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	With the aim of promoting Energy Efficiency in the Household and SME sector, the German Bank for Development has allocated a loan of 10 million Euros for crediting energy efficiency projects. The beneficiaries shall also be Services Sector SMEs. Loans will be with facilitated conditions. Disbursement for this loan have started with the implementation of loans through Raiffeisenbank in a five-year term (2009-2014). KfW is financing as well as ProCredit Bank with the same amount of 10 MEuro to finance as soft loan investment in EE for households (as it was mentioned above) and for SME. The SME sector is benefiting mainly through isolation of walls and rooftops, doors and windows, for heating systems and solar energy system equipment for Heating of Sanitary Water and other EEI measures.
EFFECTIVENESS	Energy Efficiency Improvement in services buildings and increase of awareness on the effects of energy saving through the use of isolation materials.
RESULTS EXPECTED IN 2011 AND 2016	The results of energy saving are not directly measurable.
IMPLEMENTATION STATUS AND TIMEFRAME	Projects will be implemented from 2009-2014.

KOSOVO ENERGY EFFICIENCY PLAN

VI.1.12: SET UP OF THE ENERGY AUDITORS' CERTIFICATION SYSTEM (CODE: KSH12)

TITLE	SET UP OF THE ENERGY AUDITORS CERTIFICATION SYSTEM
CATEGORY	REGULATIVE/INFORMATIVE
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	AUDITORS, ESCOs, CONSULTANTS ETC.
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Auditors' certification after the completion of specialized trainings and their entry in the official registry. This training has been supported by EU programme. Initially, 50 experts has been trained in specialized courses after having completed the first phase of the Energy Auditing training for building and also they finalized the second phase for industrial enterprises.
EFFECTIVENESS	Establishment of the conditions for mandatory audits of certain public facilities and voluntary energy auditing, according to expectations. Establishment of the conditions to support public institutions in preparing the technical documentation for capital project procurement by setting up EEI criteria and requirements.
RESULTS EXPECTED IN 2011 AND 2016	This measure assists other measures related encouraging energy auditing. Energy saving results are indirect.
IMPLEMENTATION STATUS AND TIMEFRAME	The implementation of this measure will begin in 2009.

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VI.1.13: PUBLIC CAMPAIGN ON ENERGY SAVING AND ENERGY EFFICIENCY IMPROVEMENT (CODE: KSH13)

TITLE	PUBLIC CAMPAIGN ON ENERGY SAVING AND ENERGY EFFICIENCY IMPROVEMENT	
CATEGORY	EDUCATION/INFORMATION	
LEVEL OF APPLICATION	NATIONAL	
TARGET GROUP	CONSUMERS OF ALL SECTORS	
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Realization of focused awareness, information and educational campaigns on energy saving in the services sector. The project duration is estimated at three years (2010-2012) and funded by the Kosovo public budget.	
EFFECTIVENESS	Awareness raising of consumers on the numerous effects of energy saving and familiarizing them with ways and methods for energy saving.	
RESULTS EXPECTED IN 2011 AND 2016	This measure shall result with an energy saving of 5 % of the Electricity consumption in the services sector. Annual energy saving is expected at 1.78 ktoe. By end of 2011 energy saving is expected at 7.2 ktoe	
IMPLEMENTATION STATUS AND TIMEFRAME	The measure shall be realized from 2010 or at least 2012 and will continue not only until 2013. Details of strategy and plan for the campaign are elaborated in separate documents. Its first results shall be visible within 3 years of the plan 2010-2012.	

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VI.1.14.: TRANSFORMATION OF PUBLIC PROCUREMENT LEGISLATION TO THE BENEFIT OF EE IMPROVEMENT (CODE: KSH14)

TITLE	TRANSFORMATION OF PUBLIC PROCUREMENT LEGISLATION TO THE BENEFIT OF EE IMPROVEMENT	
CATEGORY	COOPERATIVE	
LEVEL OF APPLICATION	NATIONAL	
TARGET GROUP	CENTRAL AND LOCAL INSTITUTIONS, AND PUBLIC UTILITIES OPERATING ON PUBLIC BUDGETS	
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Advancing the procurement legislation and practices by setting criteria for improving energy efficiency. The aim is to use the public sector as an example of energy saving and improving energy efficiency	
EFFECTIVENESS	Transformation of the public procurement legislation and adjusting it with the Energy Efficiency requirements and criteria shall have an impact in improving EE in the services sector and in the effective management of funds	
RESULTS EXPECTED IN 2011 AND 2016	Outputs are not measurable	
IMPLEMENTATION STATUS AND TIMEFRAME	Planning for its supplements and amendments will be done during 2012. Real effects of this measure are expected in 2012 and will continue in the long-term.	

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VI.1.15.: ENCOURAGING THE USE OF SOLAR SYSTEMS FOR SANITARY WATER HEATING (CODE: KSH15)

ENCOURAGING THE USE OF SOLAR SYSTEMS FOR SANITARY WATER HEATING	
TITLE	
CATEGORY	FINANCE/EDUCATION
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	PUBLIC AND PRIVATE SERVICES SECTOR
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Installation of solar systems for heating of sanitary water in four hospital clinics in the UCCK in Prishtina and in one dormitory of the student center in beginning of 2010 has proven to be a successful example. Solar panels for sanitary water heating will be installed in the period 2010-2011 in three other public facilities, as part of the project "Implementation of EE Measures in Public utilities", funded by the European Commission. These and other examples of the use of solar energy for heating sanitary water, thus saving energy consumption from other sources used for this purpose, will be used as examples for encouraging the services sector in improving energy efficiency.
EFFECTIVENESS	This measure lowers the energy consumption for hot sanitary water purposes, lowers the cost of energy generation, lowers the CO2 emission rate, increases the quality of services, and increases the achievement of Indicative Targets for Renewable Energy Sources.
RESULTS EXPECTED IN 2011 AND 2016	Taking into consideration the fact that a considerable amount of electricity is consumed in the services sector for heating sanitary water, the introduction of the solar panel systems will decrease the costs of this consumption. The annual energy saving is expected at 2.17 ktoe. By end 2011 (period 2010-2012) there saving will amount at 4.34 ktoe, and by 2019 at 15.2 ktoe.
IMPLEMENTATION STATUS AND TIMEFRAME	The first project started in November 2008 and ended in February 2009 and its effects have been visible and reach the objectives.

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VI.1.16.: IMPROVING EE THROUGH EFFICIENT LIGHTING IN PUBLIC BUILDINGS (CODE: KSH16)

Title	Improving EE through efficient lighting in public buildings
CATEGORY	AWARENESS/ REGULATIVE
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	Public governmental institutions
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	This IEE measure shall be focused in the section of efficient lighting, to be applied in public institution buildings. One of the steps of this measure will be the installation of automatic systems and placement of sensors in the internal lighting systems. This measure shall be supported with the respective regulations determining the efficient form in public institution buildings of the services sector, in order to make this sector a positive made.
EFFECTIVENESS	The effects of this measure are the application of efficient measures of energy spending, through the introduction of efficient lighting practice.
RESULTS EXPECTED IN 2011 AND 2016	Concrete results of energy saving through this EEI measure will be visible after its implementation and monitoring.
IMPLEMENTATION STATUS AND TIMEFRAME	The implementation of this measure has started in September 2010 with financial support of MED (ex MEM) and GTZ.

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VI.1.17.: EFFICIENT PUBLIC LIGHTING (CODE: KSH17)

Title	EFFICIENT PUBLIC LIGHTING	
CATEGORY	Education/awareness	
LEVEL OF APPLICATION	Regional (in the Country's largest cities)	
TARGET GROUP	Central and local institutions of the Services Sector	
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Efficient lighting of streets and squares should be applied in the biggest cities of the Country, such as Prishtina, Peja, Prizren, Ferizaj, etc. This measure shall preceded with a demonstrative project of digitalizing public lighting, which will be done in one city of Kosovo.	
EFFECTIVENESS	This measure will generate awareness of the public institutions managing public lighting, in order to save energy and improve energy efficiency in public lighting.	
RESULTS EXPECTED IN 2011 AND 2016	Concrete results of energy saving through this EEI measure will be visible after its implementation and monitoring.	
IMPLEMENTATION STATUS AND TIMEFRAME	The implementation of this measure will start during 2011.	

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VI.1.18.: EE IMPROVEMENT OF HEATING APPLIANCES (CODE: KSH18)

Title		EE IMPROVEMENT OF HEATING APPLIANCES
CATEGORY	EDUCATION /AWARENESS	
LEVEL OF APPLICATION	NATIONAL	
TARGET GROUP	Services Sector	
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Reduction of electrical and thermal energy consumption through the installation of examination machines in the heating appliances in the services sector. Installation of automatic control equipment in thermal heating systems.	
EFFECTIVENESS	Control of energy consumption and reduction of excessive consumption.	
RESULTS EXPECTED IN 2011 AND 2016	Concrete energy saving results through this EEI measure will be noticed after its implementation and monitoring.	
IMPLEMENTATION STATUS AND TIMEFRAME	The implementation of this measure shall start at 2011	

Chapter VII. Industrial Sector

The Industrial Sector is an important sector for energy consumption, despite the fact that its development has been hampered by numerous difficulties and slow progress. In the absence of an inter-institutional implementing mechanism for energy efficiency, it is extremely difficult to give an accurate description of the existing situation of this sector or of the availability of data required to measure the potential impact of energy efficiency initiatives. As a result, there was no awareness campaign for this sector and no possibility of implementing projects, as envisaged by the KEERERP 2007-2009, to describe the sector and forecast its energy demand, nor for the implementation of demonstration projects in industry. These activities will be realized within the 1st period of this Action Plan during 2010-2012.

The energy consumption level in the industrial sector during the period 2003-2008 has been subject to fluctuations. In the last two years, however, there was a reasonable increase (286.86 ktoe in 2007 and 289.01 ktoe in 2008). If one could say that the consumption level reflects the industrial growth level, it can then be assumed that this sector is facing a development trend, and will consume more energy. From this perspective, EEI needs to follow this development trend.

Energy consumption forecasts for 2010-2018 show an increase of energy consumption in the industrial sector, by almost one hundred percent compared to 2008. In particular, electricity consumption will see consistent increases of almost 300 ktoe per year, as a result of the future development of different industrial activities, including heavy industry and perhaps even mining. In 2009, fuel consumption will again be the highest for the entire sector, perhaps as a result of the lack of electricity. Industrial enterprises are forced to spend on oil products in order to compensate for the lack of electricity.

The Three Year Plan for Energy Efficiency (2010-2012) shows that the Industrial Sector will be the third best in terms of energy saving of total energy consumption, after the household and services sector, with 25 % and 90 GWh annual energy saved.

With the Transport and Agriculture sectors, it aims to achieve 30% of energy saving in the mid-term (2010-2012). A general look at the state of these three sectors can show that there is plenty of room for Energy Efficiency. The first three years of the KEEP do not include ambitious EE measures because these three sectors have not been previously addressed in terms of energy efficiency. It is considered that there is a greater need for undertaking studies and promotional campaigns in these sectors, rather than for more concrete mandatory measures. More time is needed in order to establish the necessary instruments and mechanisms with a direct impact in EEI.

Figures 17 and 18 summarise relative and absolute energy savings needed for the industry sector to reach the objectives defined in the sections above.

Figure 17: Short and Long Term Target of EE for industry sector in %

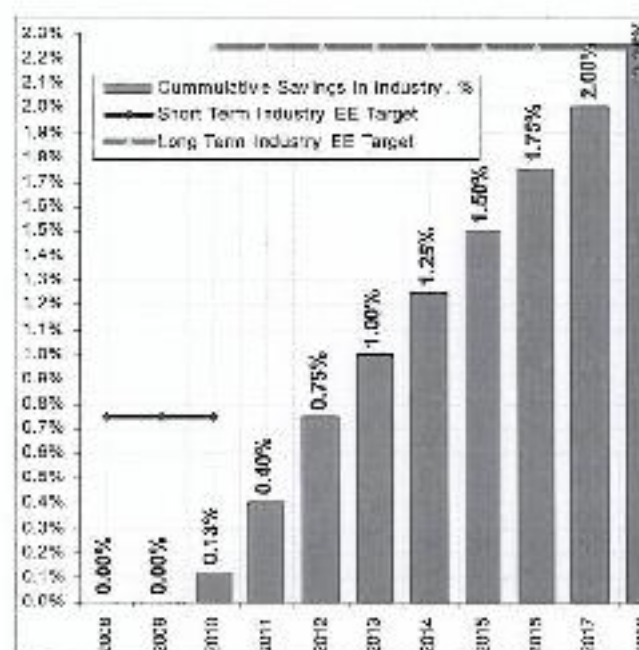


Figure 18: Total Energy Demand after FF measured will be implemented in industry sector and absolute EE savings in (ktoe)

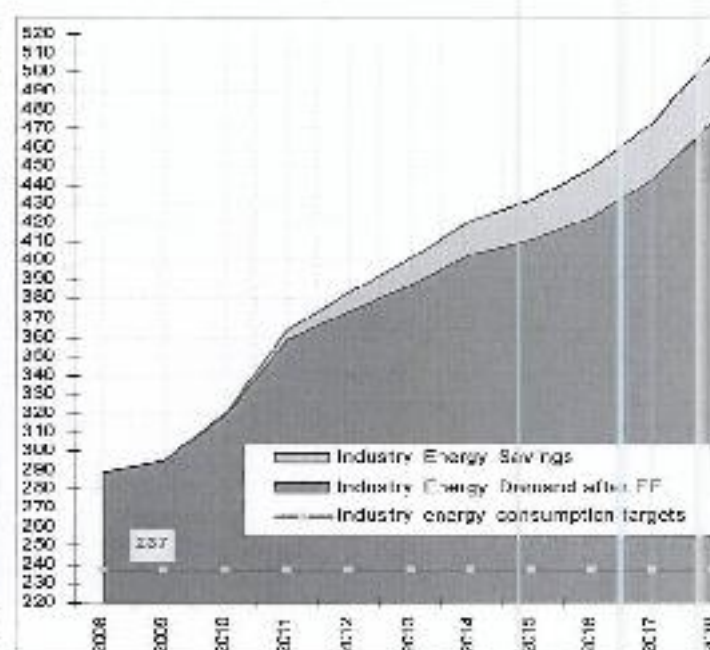


Table 18 shows the measures for energy efficiency improvement (EEI) in the Industrial Sector.

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Table 18: Measures for energy efficiency improvement (EEI) in the Industrial Sector

CODE	TITLE	STATUS	TYPE	START YEAR	END YEAR	OUTPUT	Energy Savings toe	Cost of Savings Euro	Monitoring indicator	IMPLEMENTERS
KI1	EE Promotion in SMEs	Planned	finance/soft loans	2008	2014	Loans are provided from KfW and their distribution is done through Raiffeisenbank.	1456	Budget is included at household sector	Amount of loans disbursement for implementing EE Saving Measures in industry	MED(ex MEM), MTI, NVM, donors, Energy companies
KI2	Encouraging simple auditing in the industrial sector, and awareness campaigns in this sector	Planned	Informative/educational	2010	2015	General awareness on the saving potential in industrial SMEs SME owners and management acquire knowledge on the importance of EE and energy efficiency technologies. A number of EA to be carried out in SMEs and the importance of business planning, with the implementation of EE measures identified in EA.	4356	Budget is included at household sector	Number of Energy Audits carried out in sub-industrial sectors	MED(ex MEM), MTI, MEF, Respective SMEs

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VII. 1. INDIVIDUAL MEASURES OF ENERGY EFFICIENCY IMPROVEMENT IN THE INDUSTRIAL SECTOR

VII.1.1: PROMOTION OF ENERGY EFFICIENCY IN SMES (CODE: K11)

TITLE	PROMOTION OF ENERGY EFFICIENCY IN SMES
CATEGORY	FINANCIAL/SOFT LOANS
LEVEL OF APPLICATION	NATIONAL
TARGET GROUP	INDUSTRIAL SMALL AND MEDIUM ENTERPRISES
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	With the aim of promoting Energy Efficiency in the Household and SME sector, the German Bank for Development has allocated a loan of 10 million Euros for creating energy efficiency projects. Beneficiaries also include the SMEs sector. Loans will be with facilitated conditions. The projection is to start with the implementation of loans through Raiffeisenbank in a five-year term (2009-2014).
EFFECTIVENESS	Energy Saving shall be a result of improving conditions of the Energy Usage and other process developed in SMEs.
RESULTS EXPECTED IN 2011 AND 2016	Implementation of projects is expected in the period 2009-2014.
EXPECTED SAVINGS IN 2011 AND 2016	Expected annual energy saving in the industrial sector by end 2012 is 5.5 ktoe, by 2018 will be equal to 27.5 ktoe.

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VII.1.2.: ENCOURAGING SIMPLE AUDITING IN THE INDUSTRIAL SECTOR (CODE: K12)

ENCOURAGING SIMPLE AUDITING IN THE INDUSTRIAL SECTOR	
CATEGORY	INFORMATION / EDUCATION
TARGET GROUP	Industrial Enterprises
FINAL CONSUMPTION ACTIONS TARGETED BY EEI	Simple energy efficiency audits in industrial enterprises. Familiarizing industrial enterprise management with the benefits of undertaking energy efficiency measures. Provision of general recommendations for simple measures on the behavior of services, and cost-effective measures which provide faster results.
Effectiveness	Changing the behavior of the management and employees of the industrial sector: increasing the interest of the management in replacing inefficient technologies with efficient ones.
EXPECTED OR ANNUAL SAVING IN 2011-2013	Annual energy saving is expected at 1 % of the energy consumption of the industrial sector, or 2.2 ktoe. The measure will start generating effects in 2011 and end 2012, energy saving is expected at 2.2 ktoe, and by end 2013, energy saving of the sector is seen at 13.2 ktoe.
IMPLEMENTATION STATUS AND TIMEFRAME	The program will be prepared in 2009. The implementation of the Program will start in beginning of 2010. The results will be measurable from 2011.

VII.1.3.: Demand-Side Management (CODE: KI3)

Background and problem definition

Demand side management consists of the steps taken by a utility to ensure that the demand for energy does not exceed its capacity to fulfil its contracts. It includes a range of energy efficiency measures that enable it to reduce the consumption, shift loads in time, and keep the demand below the maximum supply capacity. Demand side management also leads to further gains in energy efficiency because the energy losses are higher in a transmission and distribution system that is overloaded.

The most important tool of demand side management is the set of tariffs which are designed to provide the consumer with incentives to modify his energy demand to give a more desirable load pattern which in turn enables the overall generation, transmission and distribution system to operate more efficiently. The main elements of the tariffs that encourage a better demand curve are:

1. Reduced rate for energy used at night or at low demand periods,
2. Specific tariff may give a strong incentive to the customers who are able to reduce or even interrupt the demand during some periods,
3. Higher rate for energy used at high demand or peak periods,
4. Maximum demand charge (maxigraph charge) to discourage the consumer from installing large loads that are only used occasionally and create peaks in the demand curve,
5. Charge for reactive power to encourage the consumer to install power factor correction equipment.

The present tariff system already includes seasonal and daily differentiated tariffs, as well as demand and reactive power charges. However, due to frequent power cuts the customers pay very little attention to such measures at the moment. This is further associated with a very low collection rate. Nevertheless, with the planned increase of payment discipline and economic recovery of industry, DSM measures will become increasingly important in the future.

To be effective the user has to be aware of the cost savings that he can achieve by taking advantage of the available tariffs. He can then implement appropriate measures, such as reducing the demand in peak periods, implementing clocks to control power consuming equipment, reorganising his working schedule to take advantage of the low tariffs periods, setting up load management systems (LMS) that automatically control the operation of main electric consumers, etc.

The existing tariff system in Kosovo is causing a severe problem for industries trying to recover from a very low production level. If a company is obliged to run at a high level of demand for only a few hours or a few days a month to fulfil a small order then the full maxigraph charge will be charged, which will make its overall unit cost for electricity prohibitively expensive (several times the normal cost).

There are several approaches to overcoming this problem. Firstly, the factory needs to do everything in its capacity to reduce the peak demand, for example, by scheduling its start-up and running the production as a batch process so that not all the equipment is needed at the same time. Secondly, it may be possible for KEK to offer a tariff in which the maximum demand incurred during an off-peak period is not charged. Such a tariff would enable industries in this predicament to produce small production runs by operating at night. Alternatively KEK may be able to offer a tariff in which energy is charged at a high rate in lieu of a maxigraph charge. Finally, another possibility is to give an incentive to consumers who are able to plan their working programme and to send a request to KEK for energy use, which would permit KEK to limit peak demands.

Another concern for the industrial sector is that, after a power cut, factories may have a maximum demand much higher than the "natural" maximum demand (the demand that the factory would have reached if there had not been power cut), which leads to an increase of their invoice. It does not seem fair to punish customers for KEK failures, and it should be expected that KEK helps its clients in reducing the consequences of power cuts, by the promotion and the support of load management technologies and other DSM measures.

A limit of KEK's proposed tariffs is that the charge for the maximum demand is the same whenever the demand takes place, even if it is in the middle of the night. A tariff that would offer a lower charge if the maximum demand is out of the high period would give a stronger incentive for limiting the demand during the peak period. For instance, investment such as cold storage, that technically may be possible in agro food industries or in centralised air conditioning systems and that allows shifting electric demand for refrigeration from the high period to the low period, cannot be profitable with the present tariff structure. Visits to factories showed that managers are not aware about the cost of reactive energy and how to correct the power factor.

The objectives of the project are:

1. Increase load factor of SMEs and big industrial enterprises
2. ERO to develop appropriate tariffs for industry to take into consideration Demand Side Management
3. to increase awareness of industrial customers about the potential benefits of DSM measures.

The project includes 3 main activities:

1. General study on tariffs and their relevance on industrial consumers needs and capacity, leading to recommendations to the Energy Regulator,
2. Demonstration project of DSM measures in industry,
3. Awareness campaign targeting industry.

The study will be based on a survey on a sample of industrial customers. For each customer, the invoice will be analysed in detail in order to quantify the different types of costs. Brief visits on site will permit the identification of the type of equipment and potential measures to benefit from the current tariffs, and the definition of what type of tariff would be more appropriate or would give more incentive for load management. A list of recommendations will be given to the factory. Ten factories will be invited to benefit of this action. Typical recommendations are likely to include:

- Monitoring and correction of invoices
- Correction of power factor
- Reduction of the maximum demand by suitable management of the equipment
- Reduction of the electric consumption and maximum demand

The demonstration project will be implemented in an industry from the survey sample. A financial contribution may be asked from the company for covering the implementation costs, which gives some flexibility for the design and the size of the demonstration project. The project will include power factor correction if it is economically justified on the selected site. An initial study will cover:

1. Detailed analysis of the invoices
2. Electrical consumption and demand record for a period that is representative of the activity (typically one week)
3. Detailed electric balance and reconstruction of the load curve and of the maximum demand
4. Definition of the baseline consumption and cost (before implementation of the LMS)
5. Review of all electric equipment, impact on the maximum demand, feasibility of interrupting or reducing the demand depending on the tariff periods,
6. Identification of no cost measures for reducing the maximum demand

The load management system will then be designed, purchased and installed together with appropriate equipment software and electric works. The results will then be monitored in terms of load curve, electric invoices, post-installation consumption and costs, comparison with baseline, actual savings. A case study will then be produced.

A leaflet on Demand Side Management will be produced for distribution to industries, presenting appropriate information such as:

- the different tariffs available for industry and typical cases where they apply,
- information on the power factor and penalties in case of low power factor, as well as the solutions for increasing it,
- typical measures for reducing the electric bill by a better use of the tariff structure,
- the results of the demonstration project

Different channels for disseminating it to industry could be used: KEK, for good relationship with its clients, or MTI, or associations of enterprises such as KREA (Kosovo Regional Enterprise Agency).

Goals and deliverables

1. Report of end-users behaviour and needs, leading in the future to more suitable tariffs
2. Demonstration project implemented and evaluated
3. Information campaign implemented

Indicative target

Apart from possibly more efficient operation of the generation, transmission and distribution of electricity, this programme is aimed more at reducing the costs of electricity paid for by consumers, through an easing of the load for KEK.

Implementing partners

1. The Energy Regulator will be consulted in the approach to the tariffs.
2. KEK will be invited to participate in the tariff assessment task. KEK could also be a possible channel for the dissemination of the leaflet to industry.
3. MTI could provide support for contact with industries for the survey, and could also participate in the dissemination process to its adherents.

Planning of main activities within the first 3 year programme

Tariff Assessment: year 1.

Demonstration Project: year 2.

Awareness Campaign: year 3

Resources required

Project costs: 100,000 Euro

Chapter VIII. Transportation Sector

The Transportation Sector has remote possibilities for Energy Efficiency Improvement. The Mid-Term Period of the Energy Efficiency Plan (2010-2012), envisages 4.5 % energy saving, 24.37% of the total energy consumption. With a deteriorated infrastructure and many other problems, the transportation sector has no possibilities to realise any significant potential for energy saving in the mid-term. The amount of energy saving will come as a result of a public awareness campaign, which will influence the culture of rational use of vehicles, and the possibilities of introducing biofuels, to a modest extent, which would have an impact in engine efficiency, decreasing the burned oil products and lowering CO₂ emissions. Table 19 show the Energy Consumption in the Transportation Sector (ktoe), as amounts of energy sources for the period 2003-2008

Table 19: Energy Consumption in the Transportation Sector (ktoe), as amounts of energy, 2003-2008

Transportation Sector	2003	2004	2005	2006	2007	2008
Petroleum products	273.3	232.4	296.3	306.45	269.53	278.2
Total	273.3	232.4	296.3	306.45	269.53	278.2

With the objective of reducing the energy consumption according to defined targets, the following main measures are needed:

- Road rehabilitation, which has already started in a large scale;
- Construction of new roads;
- Better management of the transport sector;
- Use of efficient vehicles with lower engine power;
- Increased average speed of transportation vehicles.
- Increased share for public transport.
- Improvement of railway infrastructure in order to use more rail transport, etc.

Figures 19 and 20 summarise the relative and absolute energy savings required for the transport sector to reach the objectives defined in the above sections.

Figure 19. Short and Long Term Target of EE for transport sector in %

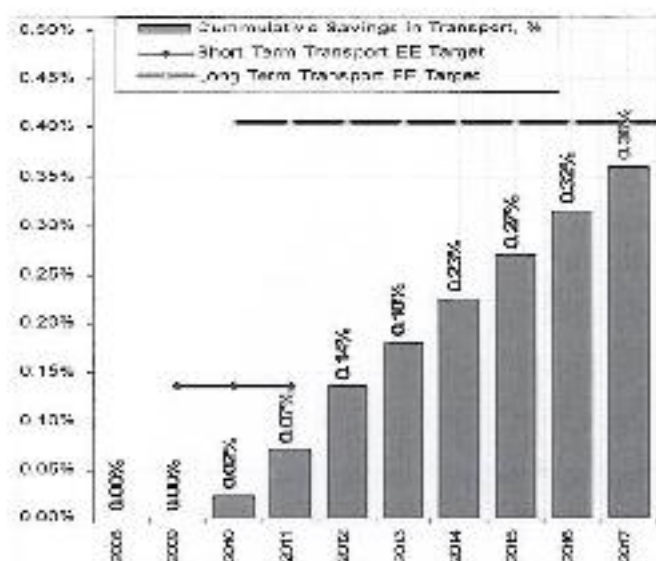


Figure 20. Total Energy Demand after EE measures are implemented in the transport sector and absolute EE savings in (ktoe)

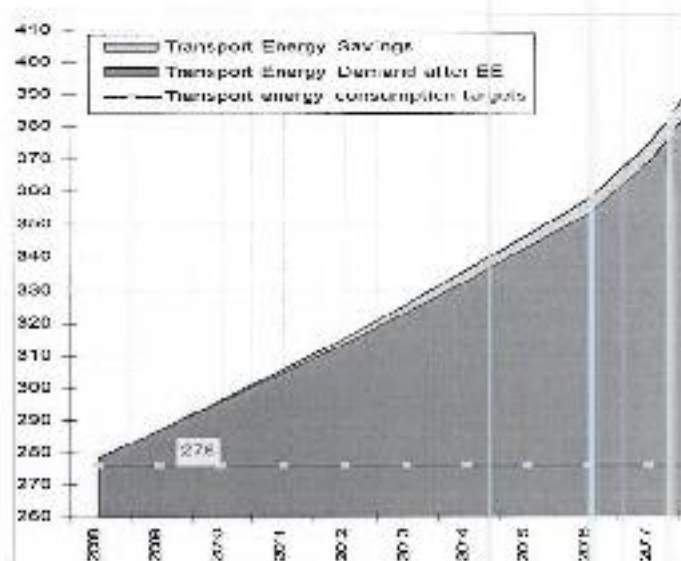


Table 20: Measures for energy efficiency improvement (EEI) in the Transportation Sector

CODE	TITLE	STATUS	TYPE	START YEAR	END YEAR	OUTPUT	Energy Savings (toe)	Cost of Savings (Euro)	Monitoring Indicator	IMPLEMENTERS
KT1	All for the introduction of Biofuels in Transportation	Administrative instruction should be drafted	regulative / normative / informative	2010	2010	Results to be achieved are related with other long-term EE measures, to be implemented in this sector in line with this legal act.	878	No commitment	Not defined yet	Central and local institutions, road companies, railroads, customs, transport companies
KT2	Public awareness campaign in transportation	Planned	Educational/ awareness	2010	2011	This campaign is expected to result in a certain level of annual energy savings in the Transportation Sector, as a result of a public awareness raising on efficiency in this sector.	1452	No commitment	Not defined yet	MED, MTI, transport companies, energy companies

VIII.1. INDIVIDUAL MEASURES FOR ENERGY EFFICIENCY IMPROVEMENT IN THE TRANSPORTATION SECTOR

VIII.1.1.: AI FOR THE INTRODUCTION OF BIOFUELS (CODE: KT1)

CATEGORY	TITLE	AI FOR THE INTRODUCTION OF BIOFUELS IN TRANSPORTATION
TARGET GROUP		Regulative / normative Central and local institutions, Road and railroad enterprises, customs, transportation enterprises
FINAL CONSUMPTION ACTIONS TARGETED BY EEI		Introduction of the use of biofuels to a certain percentage for transportation purposes; Prevention of the use of inefficient vehicles and fuels; Reduction of CO ₂ emissions
Effectiveness		Replacing fluid fossil fuels with biofuels for transportation purposes, or mixing them to a certain extent; Encouraging the generation of biofuels; Forcing large oil and oil product traders to import certain proportional amounts of biofuels.
EXPECTED OR ANNUAL SAVING IN 2011-2016		Energy saving through the implementation of this measure is not directly measurable.
IMPLEMENTATION STATUS AND TIMEFRAME		The implementation of the AI on Biofuels is expected to start in 2011

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VIII.1.2.: PUBLIC AWARENESS CAMPAIGN IN TRANSPORTATION (CODE: KT2)

CATEGORY	TITLE	PUBLIC AWARENESS CAMPAIGN IN TRANSPORTATION
TARGET GROUP ²		Information / education Central and local institutions, road and railroad companies, customs, transport companies, energy companies
FINAL CONSUMPTION ACTIONS TARGETED BY EEI		Identification and information on the obstacles in implementing energy efficiency in the Transportation Sector and ways to eliminate them, such as: poor road quality and the importance repairing them and construction of new roads for the reduction of energy consumption; use of efficient engine vehicles; limiting the use of vehicles in public and private transportation with a high gas emission rate; replacing smaller vehicles in public transportation with buses; use of biofuels.
EFFECTIVENESS		Awareness raising on the use of efficient cars, with low fuel costs, with lower motor power, encouraging a more advanced organization in the urban and road transportation.
EXPECTED OR ANNUAL SAVING IN 2011-2016		Expected annual energy saving in the transportation sector is seen at 0.5 %, or 1.4 ktoe. In the end of 2012 the saving are expected at 1.4 ktoe, and in 2016 at 3.4 ktoe
IMPLEMENTATION STATUS AND TIMEFRAME		The campaign will start in 2010 and will continue in the long-term.

Chapter IX. Agriculture Sector

Kosovo will continue to remain for many years a country where agriculture dominates the GDP compared to all other economic sectors. The specific weight of agriculture in the GDP remains at about 40%. Energy is used for the cultivation of plants and livestock and for forestry and these sub-sectors continue to provide the main opportunity for economic and social development, especially in rural areas.

The development of the agriculture sector is conditioned by many factors, of which the most important are:

1. Farms of minimal sizes and fragmented,
2. Problems concerning the ownership of arable land,
3. Very high prices of inputs and a disorganised and ineffective production and distribution system of agricultural production,
4. Lack or insufficiency of agriculture credit,
5. Lack or insufficiency of agriculture mechanics.

With the objective of reducing energy consumption in line with the energy saving targets, the following quantitative and qualitative measures were taken into consideration and analysed:

1. First, a reduction of 10% in energy intensities due to better management was foreseen. This will be achieved by restructuring the agriculture sector. Such measures will double profits, increase agriculture production and on the other hand, reduce the fuel specific consumption.
2. Introduction of biomass schemes and production of biogas from plants and agriculture and animal farming waste is an effective way to meet the growing demand of the agriculture sector.
3. The high potential for solar energy in Kosovo makes it a preferred energy source, especially if solar collectors that produce hot air for drying of various agricultural cultures are used.
4. Use of efficient irrigating schemes, which means that superficial irrigation with drills or flooding will be substituted by pressured irrigation in the form of rain or drops, is foreseen to reduce energy consumption for irrigation by 50%.

In Figures 21 and 22 the relative and absolute energy savings required for the agriculture sector to achieve the objectives defined in the above sections are summarized.

Figure 19: Short- and Long-Term Target of EE for agriculture sector in %

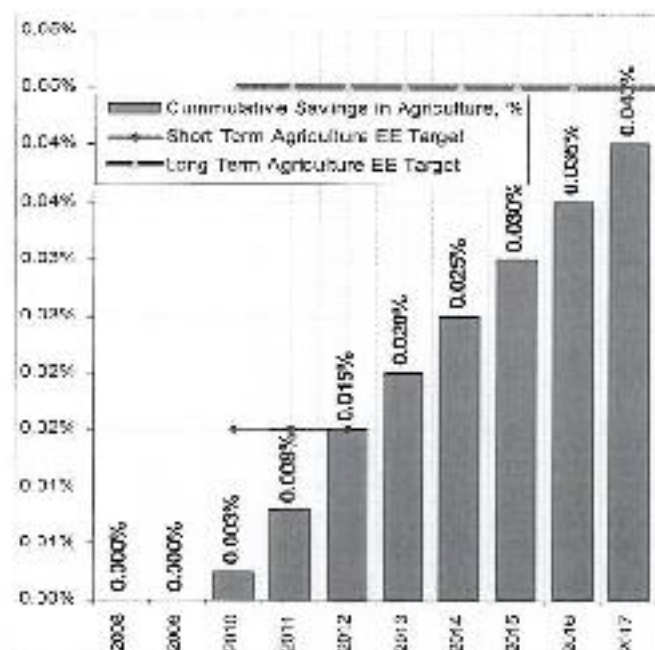
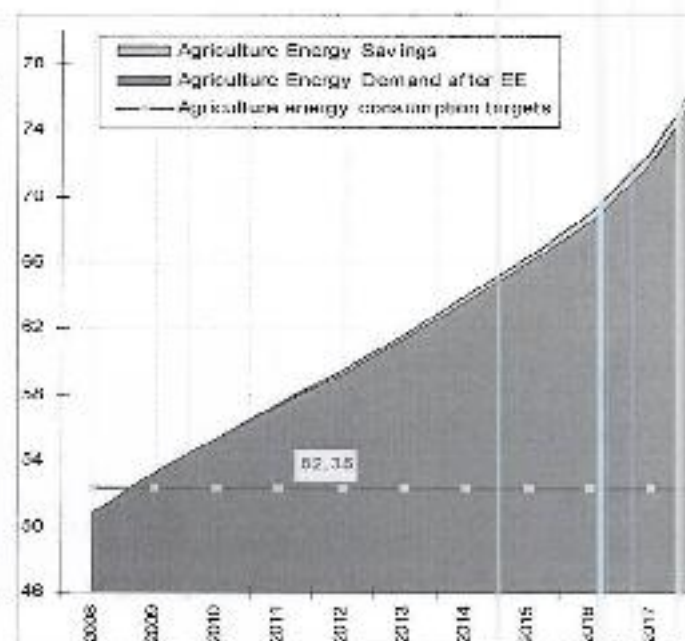


Figure 20. Total Energy Demand after EE measures are implemented in the agriculture sector and absolute EE savings in (ktoe)



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Table 22: Measures for Energy Efficiency Improvement (EEI) in the Agriculture Sector

CODE	TITLE	STATUS	TYPE	START YEAR	END YEAR	OUTPUT	IMPLEMENTERS
KB1	Public awareness campaign in the Agriculture sector	Planned	Education / awareness	2010	2011	Indicative energy saving in the Agriculture Sector is expected after the development of the campaign	MED/EX MEMI, MAFRD, agricultural companies, energy companies

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IX.4. INDIVIDUAL MEASURES FOR ENERGY EFFICIENCY IMPROVEMENT IN THE AGRICULTURE SECTOR

IX.4.1.: AWARENESS CAMPAIGN IN THE AGRICULTURE SECTOR (CODE: KB1)

TITLE	AWARENESS CAMPAIGN ON ENERGY EFFICIENCY
CATEGORY	EDUCATION/ AWARENESS
TARGET GROUP	MED. MAFRD, CENTRAL AND LOCAL INSTITUTIONS, AGRICULTURE COMPANIES, ENERGY COMPANIES
ACTIONS TARGETED BY EEI	An integrated public campaign with a focus in the Agriculture Sector on Energy Efficiency in this sector. In addition to explaining the techniques of energy saving and reduction of consumption of certain energy sources in land cultivation, livestock and farming, the aim is to also introduce the use of different types of biofuels in agricultural machinery.
Effectiveness	Awareness campaign is expected to result with an energy saving in the agricultural sector, and with the introduction of the use of biofuels, domestically produced or imported.
EXPECTED OR ANNUAL SAVING IN 2011-2016	Annual energy saving in the Agricultural Sector is projected at 0.05 ktoe. By end 2012 the saving is seen at 0.15 ktoe, and by 2016 at 0.4 ktoe.
IMPLEMENTATION STATUS AND TIMEFRAME	The campaign will yield energy saving results in 2011.

Chapter X: Policy and Programmatic Measures for Implementation of NEEAP of Kosovo

The updated Energy Strategy review is based on the Kosovo Government Programme and a number of Government decisions, the document of the medium-term energy sector policies and a variety of relevant studies and analyses conducted in recent years. Special care has been taken to ensure that this Strategy is fully compliant with the European Union acquis which are legally binding to Kosovo in the context of its MEMBERSHIP in the Energy Community Treaty. The main objective of the Energy Strategy of Kosovo is to achieve effective management of existing energy resources and protection of the environment. The Strategy focuses on enhancing security of energy supply in accordance with European standards, as well as on the diversification of energy resources. This strategy aims also to stimulate rational utilisation of energy, promote energy efficiency, promote development of renewable energy resources and introduce new technologies that do not cause irreparable damage to the environment, thus respecting the application of internationally accepted environmental standards.

The Law on Energy, 2004/8, Article 10, provided the framework for the implementation of energy efficiency and renewable energy policies in Kosovo. In particular, paragraph (a) of Article 10 concerns the preparation of an implementation programme to promote the efficient use of energy and renewable energy resources. Energy efficiency and demand side management measures are critical for reducing the high rate of annual demand growth, which is largely the result of the use of electricity for heating purpose. The ministry responsible for energy- MED (ex MEM) has prepared the Draft Energy Efficiency Law and this will give even greater importance for increasing energy efficiency in all the economic sectors of Kosovo. The main barriers to introducing energy efficiency to the building stock of Kosovo and the ways of mitigating them, are as follows:

- a. **Non-payment of energy by consumers** – With relative ease, a consumer can avoid paying for all or part of the district heating or electrical energy that he consumes. It is not worth investing to reduce the consumption of a commodity that can be obtained for free. This is probably the biggest impediment at present to investments or measures to improve energy efficiency in all sectors in general and in the building stock in particular. Over the last three years the Government of Kosovo has improved the rate of collection and it is in the final phase of privatizing the distribution sector. This should increase the collection rate very quickly and help to increase the implementation of EE measures in building stock.
- b. **Lack of information and awareness from the consumer's side** - This is a potential barrier in every end-use sector. For example, a consumer may lack information on his pattern of energy consumption - how it compares with his peers, how it may be improved - and on the financial and other benefits of changing it. He may also be unaware of the technologies and financing schemes that are available, or of how he can use the tariff system to purchase energy more cheaply. Given these conditions, the MED (ex MEM), supported by ECLO, has carried out an EE awareness campaign to promote EE and this will help in mitigating this barrier.
- c. **Lack of incentives to take actions leading to energy efficiency** - One very important barrier in the in public sector is that the rules do not allow a hospital, school or other unit to benefit directly from energy savings. The Draft Energy Efficiency Law will establish the Regional/Communal Energy Office which will help in this direction.
- d. **Lack of capital** - There is frequently a shortage of capital and there are often alternative uses for capital that are more cost-effective. Loans can be difficult to obtain and when obtained, high interest rates have to be paid. KfW has provided about 20 Million Euro to ProCredit and Raiffaisen Banks in soft loans for EE and RES. The EU Infrastructure Programme and KfW is starting the second programme for increasing energy efficiency in buildings for selected municipalities to invest in improving their public building stock.

Lack of professional skills and knowledge - Architects, engineers, importers and installers may not have the necessary technical skills or knowledge to take full advantage of the opportunities for saving energy using modern methods. MED, supported by ECLO, has almost completed a project for training and certifying the first 50 Energy Auditors, who are going to help by disseminating their knowledge and implementing into practice those skills.

- e. **Lack of a strong legal and regulatory base** - There is, at present, a lack of a suitable legal and regulatory base for the promotion of energy efficiency and renewable energy applications or for allocating responsibilities and competencies for improving the situation. The ministry responsible for energy MED (ex MEM), supported by ECLO has prepared the final Draft Law on EE, which should be approved by the middle of March 2011. Its enforcement will help greatly in filling the existing gap in the legal and regulatory fields.

Chapter XI: Monitoring indicators for 2010 - 2012

The last and very important aspect of Energy Efficiency Action Plan for Kosovo is the monitoring process to be used during its implementation. In order to have a proper monitoring process, the following set of monitoring indicators is proposed to assess all energy efficiency measures which have been analysed above, especially in the household and service sectors, which together account for 70% of the total potential energy saving targets.

The first set of indicators is related to those EE measures that have been introduced for space heating in buildings in the household and service sectors. Quantifying savings in both the above mentioned sectors is very important since 70% of the targets are to be fulfilled by them - for other sectors monitoring indicators are necessarily only qualitative, since EE data is almost entirely missing (in the industry, transport and agriculture sectors).

The first monitoring indicator is the number of households and the number of service sector buildings (see the table below) where refurbishment measures to reach the above mentioned short-term energy savings will be introduced. The Average Unit Cost of this EE measure will be 0.048 Euro/kWh for household buildings and 0.045 Euro/kWh for service buildings and this is a very important conclusion to be kept in mind during the promotion of this measure: i.e. energy saving cost is lower than actual electricity price.

Number of buildings to be refurbished in order to reach the targets set for each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings needing refurbishment measures	1504	2197	3693	329	467	610

The below formula provides for the evaluation of annual energy savings due to improvements of the building envelope and the heating system. The unitary final energy savings are calculated based on the difference in the specific heat demand before and after the refurbishment measure.

$$UFES = \frac{SHD_{init}}{\eta_{init}} - \frac{SHD_{new}}{\eta_{new}} \quad [kWh/m^2 \text{ of useful floor area} \cdot \text{year}]$$

SHD_{init} = Specific heating demand before the implementation of the refurbishment measure [kWh/m²*year]

SHD_{new} = Specific heating demand after the implementation of the refurbishment measure [kWh/m²*year]

η_{init} , η_{new} = Energy efficiency of the heating system before (init) and after (new) the refurbishment measure

(seasonal) is the average efficiency of the stock of heating systems. With $b = 0.95$ for direct electric heating and 0.6 for fossil fuel boilers, if no national correction value is available. c = Intermittency coefficient depending on not continuous operation of the heating system. With $c = 0.5$, if no national correction value is available. HDD = Heating degree-days [K*day/year]

The savings are expressed in kWh/m² per year. The 'before' situation shall be based on the specific building or reflect the energy efficiency of the category of building (relative to building types, installed technologies and/or insulation types and construction periods). The values for the specific heat demand shall be corrected using the relevant heating degree days. The total final energy savings in kWh per building and per year will be calculated by multiplying the measured unitary annual energy savings per m² by the total area of the refurbished building's useful floor area. The total energy savings achieved by the measure are calculated by summing up the savings of each refurbished buildings.

The second monitoring indicator will be number of households and number of service buildings (table below) where will be introduced refurbishment measures applied to building components (walls, roof) to reach the above mentioned energy savings for the short term period. Average Unit Cost of this EE Measure will be 0.021 Euro/kWh for household buildings and 0.020 Euro/kWh for service buildings.

Number of buildings needing refurbishment measures applied to building components (walls and/or roof)						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings needing refurbishment measures applied to building components (walls, roof).	1105	1485	2153	242	315	345

The below formula (which shall be used also for third monitoring indicator) provides for the evaluation of the annual energy savings resulting from insulating measures of buildings' shell.

$$UFES = \frac{(Uvalue_{init}^{wall,roof} - Uvalue_{new}^{wall,roof}) \cdot HDD \cdot 24 \cdot a \cdot b \cdot c}{1000} \quad [kWh/m^2 \text{ of building} \cdot \text{year}]$$

$Uvalue_{init}^{wall,roof}$ and $Uvalue_{new}^{wall,roof}$ = U-value before (init) and after the refurbishment (new) [$W/m^2 \cdot K$], use the values for thermal transmittance of the insulation materials and the existing structure of the wall or roof.

a = correction factor depending on the climatic zone of the building, with a=1, if no national correction value is available

b = Correction factor depending on the heating system efficiency and energy source. This correction factor is the average efficiency of the stock of heating systems. With b= 0,95 for direct electric heating and 0,6 for fossil fuel boilers, if no national correction value is available.

c = Intermittency coefficient depending on non-continuous operation of the heating system. With c= 0,5, if no national U-value of the building which is refurbished or average

U-value of existing stock average of the year of construction of the building undergoing refurbishment.

The unitary annual energy savings (in kWh/m²·year) are based on the difference between the U-values before and after the implementation of the refurbishment measure. The U-values shall be corrected with the relevant heating degree days and, as far as practicable, with the efficiency and the intermittency of the heating system. The total annual energy savings in kWh per building and per year are calculated by multiplying the measured unitary annual energy savings per m² by the total insulated area (m²) of the refurbished building shell (walls or/and roof).

The third monitoring indicator is the number of existing households and service buildings (see table below) where substitution of existing windows with double/triple glazing is required in order to reach the above mentioned energy savings in the short-term. Average Unit Cost of this EE Measure will be 0.030 Euro/kWh for household buildings and 0.028 Euro/kWh for service buildings.

Number of existing buildings requiring substitution of existing windows with double/triple glazing each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of existing buildings requiring substitution of existing windows with double/triple glazing	936	1367	2298	205	290	380

The below formula provides for the evaluation of the annual energy savings resulting from insulating measures window replacement.

$$UFES = \frac{(Uvalue_{init}^{windows} - Uvalue_{new}^{windows}) \cdot HDD \cdot 24 \cdot a \cdot b \cdot c}{1000} \quad [kWh/m^2 \text{ of building} \cdot \text{year}]$$

$Uvalue_{init}^{windows}$ and $Uvalue_{new}^{windows}$ = U-value before (init) and after the refurbishment (new) [$W/m^2 \cdot K$], use the values for thermal transmittance of the existing and new windows.

a = correction factor depending on the climatic zone of the building with a=1, if no national correction value is available

b = Correction factor depending on the heating system efficiency and energy source. This correction factor is the average efficiency of the stock of heating systems. With b= 0,95 for direct electric heating and 0,6 for fossil fuel boilers, if no national correction value is available.

c = Intermittency coefficient depending on non-continuous operation of the heating system. With c= 0,5, if no national U-value of the building which is refurbished or average

U-value of existing stock average of the year of construction of the building undergoing refurbishment.

The unitary annual energy savings (in kWh/m²·year) are based on the difference between the U-values of Windows before and after the implementation of the refurbishment measure. The U-values shall be corrected with the relevant heating degree days and, as far as practicable, with the efficiency and the intermittency of the heating system. The total

annual energy savings in kWh per building and per year are calculated by multiplying the measured unitary annual energy savings per m² of the refurbished building (changing of the windows).

The fourth monitoring indicator will be the number of households and the number of service buildings (see table below) where the energy building code for new residential buildings has to be introduced in order to reach the above mentioned energy savings for the short-term period. Average Unit Cost of this EE Measure will be 0.054 Euro/kWh for household buildings and 0.052 Euro/kWh for service buildings.

Number of buildings where the energy building code for new buildings is introduced each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings where the energy building codes for new buildings is introduced	0	0	345	0	0	73

The following formula provides for the evaluation of annual energy savings derived from the introduction of a new building code with stricter requirements in relation to the building's heat demand.

$$UFES = \frac{SHD_{oldcode}}{\eta_{oldcode}} - \frac{SHD_{newcode}}{\eta_{newcode}} \quad [kWh / m^2 \cdot year]$$

SHD_{oldcode} = Specific heating demand of building according to the initial energy building code (or set of thermal regulation which existed in Kosovo) in place since 1998 [kWh/m²·year]

SHD_{newcode} = Specific heating demand of building according to the new building code implemented. [kWh/m²·year]

η_{oldcode} , *η_{newcode}* = Energy efficiency of the heating system in building according to the old (oldcode) and the new (newcode) building code. (seasonal)

The total annual energy savings in kWh per building and per year are calculated by multiplying the unitary annual energy savings per m² by the useful floor area (m²) of the new building constructed. The total energy savings achieved by the measure are calculated by summing up the savings achieved with each new building.

The fifth monitoring indicator will be number of households and number of service buildings (below table) where will be replacement of heating supply equipment to reach the above mentioned energy savings for the short term period. Average Unit Cost of this EE Measure will be 0.036 Euro/kWh for household buildings and 0.034 Euro/kWh for service buildings.

Number of buildings needed to be replaced of heating supply equipment in buildings for each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings needed to be replaced of heating supply equipment in buildings	78	402	1054	17	86	221

The formula provides for the evaluation of annual energy savings derived from the replacement or new installation of heating supply equipment in residential and tertiary buildings. The unitary annual energy savings are calculated on the basis of the change in efficiency of the heating system after its replacement multiplied by the specific heat demand and the heated useful floor area (in kWh/unit·year) per building

$$UFES = \left(\frac{1}{\eta_{old}} - \frac{1}{\eta_{new}} \right) \cdot SHD \cdot A \quad [kWh / unit \cdot year]$$

η_{old} = Energy efficiency of the old heating supply equipment x before the replacement (seasonal)

η_{new} = Energy efficiency of the new heating supply equipment (seasonal)

SHD = Specific heating demand [kWh/m²·yr]

A = Average area of the space heated by the heating supply equipments (household, office etc.) [m²]

The total annual energy savings in kWh per building and per year are calculated by summing up the unitary annual energy savings achieved by each unit of replaced heating supply equipment. The total energy savings achieved by the measure are calculated by summing up the savings achieved in each building.

The sixth monitoring indicator will be number of households and number of service buildings (below table) where will be replacement of water heating boilers with label A category in household and service building to reach the above mentioned energy savings for the short term period. Average Unit Cost of this EE Measure will be 0.040 Euro/kWh for household buildings and 0.035 Euro/kWh for service buildings.

Number of buildings requiring replacement of water heating boilers with label A category in household and service building sectors for each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings requiring replacement of water heating boilers with label A category in buildings	390	409	476	41	44	53

The formula provides for the evaluation of annual energy savings derived from the replacement or new installation of water heating equipment in existing residential and tertiary buildings. The unitary annual energy savings (in kWh/building*year) are calculated on the basis of the difference in the energy efficiency between before and after the replacement of the water heater, multiplied by the specific hot water demand.

$$UFES = \left(\frac{1}{\eta_{old}} - \frac{1}{\eta_{new}} \right) \cdot SWD \quad [kWh / household \cdot year]$$

$$SWD = \frac{C_{hot_water_daily} \cdot 365 \cdot n_{persons/hhds} \cdot (t_{hot_water} - t_{cold_water}) \cdot c_{water} \cdot cf}{1000} \\ [kWh / household \cdot year]$$

η_{old} , η_{new} = Energy efficiency of the old and the new water heating equipment

SWD = Specific hot water demand [kWh/household*year]

365d = 365 days

Chot_water_daily = Average hot water daily consumption per person

[I] npersons/hhds = Average number of persons in one household thot_water = Hot water temperature (usually 40 °C)

tcold_water = Cold water temperature (usually 15 °C)

cwater= Specific heat of water =1kcal/kg*°C

cf = Conversion factor 0.001163 kWh/kcal with 1 liter of water = 1 kg

The total annual energy savings [kWh/year] are calculated by summing up the unitary annual energy savings by the number of replaced water heater units.

The seventh monitoring indicator is the number of households and number of service buildings (see table below) where solar water heating systems will be introduced to reach the above mentioned energy savings for the short-term period. Average Unit Cost of this EE Measure will be 0.037 Euro/kWh for household buildings and 0.026 Euro/kWh for service buildings.

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Number of buildings needing installation of solar water heating systems in household and service buildings each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings needing installation of solar water heating systems in buildings	228	372	676	29	48	89

The formula provides for the evaluation of annual energy savings derived from the installation of solar panels for water heating in existing or new residential and tertiary buildings. The unitary annual energy savings are calculated on the basis of the average annual energy savings per m² of solar panel, considering the average efficiency of the water heating systems stock in the reference year, for either new or existing buildings (in kWh/m²*year).

$$UFES = \left(\frac{USAVE}{\eta_{stock_average_heating_system}} \right) \quad [kWh / m^2 \cdot year]$$

USAVE = Average yearly savings per m² of solar panel, representing the average heat production per m² of solar panel [kWh/m²] $\eta_{system\ heating\ average\ stock}$ = Efficiency of the average stock water heating systems

The total annual energy savings [kWh/year] are calculated by multiplying the unitary annual energy savings by the total installed area in m² of solar panels.

The eighth monitoring indicator will be number of households and number of service buildings (below table) where efficient stoves for cooking with label A category will be introduced in household and service buildings so as to reach the above mentioned short-term energy savings. Average Unit Cost of this EE Measure will be 0.038 Euro/kWh for household buildings and 0.034 Euro/kWh for service buildings.

Number of buildings needing the introduction of efficient cooking stoves with label A category in household and service buildings each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings needing the introduction of efficient stoves for cooking with label A category in buildings	746	1015	1632	100	148	261

The formula provides for the evaluation of annual energy savings derived from the replacement or new installation of cooking equipment in existing residential and tertiary buildings. The unitary annual energy savings (in kWh/building*year) are calculated on the basis of the difference in the energy efficiency between before and after the replacement of the cooking equipment, multiplied by the specific cooking energy demand.

$$UFES = \left(\frac{1}{\eta_{old}} - \frac{1}{\eta_{new}} \right) \cdot SCD \quad [kWh / households \cdot year]$$

SCD = specific energy demand for cooking as baseline figure might be used 2000-2200 kWh/household

η_{old} , η_{new} = Energy efficiency of the old and the new cooking equipment

The total annual energy savings [kWh/year] are calculated by summing up the unitary annual energy savings by the number of replaced cooking equipment.

The ninth monitoring indicator will be the number of households and number of service buildings (below table) where EE lamps will be installed to reach the above mentioned energy savings for the short term

period. Average Unit Cost of this EE Measure will be 0.013 Euro/kWh for household buildings and 0.011 Euro/kWh for service buildings.

Number of buildings where EE lamps will be installed in household and service buildings each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings where EE lamps will be installed in buildings	167	227	365	8566	11491	17963

The formula below provides for the evaluation of annual energy savings derived from the replacement of lamps with new more energy efficient ones or installation of new lamps. The unitary annual energy savings (in kWh/unit*year) for lamp replacement are calculated by the difference between the lamp stock average power consumption in the reference year ('before' situation) and the power of the efficient lamps promoted by the measures and programmes ('after' situation = year of promotion). In case of additional lamps the market average power consumption in the reference year shall be used for the before situation.

$$UFES = \left(\frac{P_{PSTOCK_AVERAGE} - P_{PBEST_MARKET_PROMOTED}}{1000} \right) \cdot F_{rep} \cdot n_h \quad [kWh/unit \cdot year]$$

PSTOCK_AVERAGE = Power average of the existing lighting bulbs in households [W]

PBEST_MARKET_PROMOTED = Power of the market promoted efficient bulb [W]

nh = Number of operating hours

Frep – Correction factor taking into consideration that a proportion of bulbs sold will not immediately replace existing bulbs;

The total annual energy savings in [kWh/year] are calculated by multiplying unitary annual energy savings by the number of efficient light bulbs sold or installed under the measures and programmes for residential use

The tenth monitoring indicator will be the number of households and number of service buildings where efficient label A category Washing Machines will be introduced to reach the above mentioned energy savings for the short-term period. Average Unit Cost of this EE Measure will be 0.346 Euro/kWh for household buildings and 0.040 Euro/kWh for service buildings.

Number of buildings where efficient label A category washing machine will be introduced in household and service buildings each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings where washing machines with label A category will be introduced	1048	1361	2104	1781	4095	7671

The following formula provides for the evaluation of annual energy savings derived from the replacement of existing household energy-using appliances with new more energy efficient the washing machine. The unitary annual energy savings for household appliances are calculated based on the difference between the annual energy consumption of the reference year stock average (for new washing machine the market average) and the annual energy consumption of the washing machine promoted by the measures and programmes.

$$UFES = AEC_{WM_reference\ year\ stock\ average} - AEC_{WM_reference\ market\ promoted\ energy\ class} \quad [kWh/WM \cdot year]$$

AEC reference year stock average = Annual energy consumption of the Washing Machine (WM) stock in the reference year (2006) [kWh/unit*year]

AEC reference market promoted energyclass = Annual energy consumption of the washing machine promoted by the measures and programmes (2007) [kWh/unit*year]

The total annual energy savings in kWh per appliance type and per year are calculated by multiplying the unitary annual energy savings by the number of energy efficient the washing machine units sold.

The eleventh monitoring indicator will be the number of households and number of service buildings where efficient label A category refrigeration will be introduced in order to reach the above mentioned energy savings for the short-term period. Average Unit Cost of this EE Measure will be 0.041 Euro/kWh for household buildings and 0.033 Euro/kWh for service buildings.

Number of buildings needing efficient refrigeration with label A category in household and service buildings for each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings needing efficient refrigeration with label A category in buildings	133	177	276	267	354	552

The following formula provides for the evaluation of annual energy savings derived from the replacement of existing household/service energy-using appliances with new more energy efficient the refrigerator. The unitary annual energy savings for household/service appliances are calculated based on the difference between the annual energy consumption of the reference year stock average (for new refrigerator the market average) and the annual energy consumption of the refrigerator promoted by the measures and programmes.

$$UFES = AEC_{RF_reference\ year\ stock\ average} - AEC_{RF_reference\ market\ promoted\ energyclass} \quad [kWh / R \cdot year]$$

AEC reference year stock average = Annual energy consumption of the Refrigerator (R) stock in the reference year (2005) [kWh/unit*year]

AEC reference market promoted energyclass = Annual energy consumption of the refrigerator promoted by the measures and programmes (2007) [kWh/unit*year]

The total annual energy savings in kWh per appliance type and per year are calculated by multiplying the unitary annual energy savings by the number of energy efficient the refrigerator units sold.

The twelfth monitoring indicator will be the number of households and number of service buildings where efficient Inverter Air Conditioning with label A category will be introduced to reach the above mentioned short-term energy savings. Average Unit Cost of this EE Measure will be 0.052 Euro/kWh for household buildings and 0.047 Euro/kWh for service buildings.

Number of buildings needing efficient inverter AC with label A category in household and service building for each year						
Year	Household Sector			Service Sector		
	2010	2011	2012	2010	2011	2012
Number of buildings needing efficient inverter AC with label A category in buildings	119	211	408	67	83	120

The following formula provides for the evaluation of annual energy savings derived from the installation or the replacement of air conditioning split systems in residential and tertiary buildings. The unitary annual energy savings are calculated on the basis of the improvement of the energy efficiency ratio (EER) of the air conditioning equipment, normalised by nominal cooling power of the equipment and the annual operation hours (in kWh/unit*year).

$$UFES = \left(\frac{1}{EER_{average}} - \frac{1}{EER_{best\ pay\ off\ model}} \right) \cdot P_{fr} \cdot n_a \quad [kWh / unit \cdot year] \quad \text{with: } n_a = n_{ex} \cdot f_o$$

EER = Energy efficiency ratio of the equipment: (supplied cooling power) / (electric power of the equipment)

EER average = Seasonal energy efficiency ratio of the reference equipment; *EERbest part_on_market* = Seasonal energy efficiency ratio of the high-efficiency substituting equipment. *P₀* = Nominal cooling power of the equipment [kW]

n_h = Annual operation hours at full power

n_{sh} = Annual switch-on hours

f_u = Part-load factor (suggested default value: 56%)

The total annual energy savings achieved by the measure [kWh/year] are calculated by summing up the unitary annual energy savings of all replaced or newly installed air-conditioning units.

Chapter XI. Unit Conversion Table

	Kcal	kJ	kWh	Kgoe
1kcal=	1.00	4.185	11.63	10000
1kJ=	1.2388	1.00	27,778	239,850
1kWh=	859.845	3,600	1.00	85984.5
1kgoe=	10,000	41,868	11.63	1.00
Liquid fuels 1ton = 0.001 ktoe				
Crude oil: 1ton = 0.000948 ktoe				
Biomass (firewood): 1m3 = 0.0001004 ktoe				
Coal (lignite): 1ton = 0.0001911 ktoe				
Dried coal: 1ton = 0.00096 ktoe				
Electricity: 1GWh = 0.086 ktoe				