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**Republika Kosova-Republic of Kosovo**  
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**MINISTRIA E ZHVILLIMIT EKONOMIK**  
**MINISTARSTVO EKONOMSKOG RAZVOJA**  
**MINISTRY OF ECONOMIC DEVELOPMENT**

**Kosovo Energy Efficiency Agency**

## Third National Plan of Action for Energy Efficiency (NEEAP) in Kosovo



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## Abbreviations:

KEEA	Kosovo Agency for Energy Efficiency
MED	Ministry of Economic Development
KAEP	Kosovo Agency for Environmental Protection
MESP	Ministry of Environment and Spatial Planning
MF	Ministry of Finance
PP	Power Plant
CH	Central Heating
KEK	Kosovo Energy Corporation, Share Holder Company
HP	Hydro Power
KOSTT	Transmission System Operator and Market Operator in Kosovo (TSOMK)
ECS	Energy Community Secretariat
ORF-EE/GIZ	Open Regional Fund for Energy Efficiency/German Agency for International Cooperation
CCEAM	Commission for Certification of Energy Auditors and Managers
AI	Administrative Instruction
LPG	Liquefied Petroleum Gas
SMEs	Small and Medium Enterprises
EU	European Union
EC	European Commission
EBRD	European Bank for Reconstruction and Development
MTI	Ministry of Trade and Industry
BRAC	Business Registration Agency in Kosovo
EPBD	Directive on the Energy Performance of Buildings
ERO	Energy Regulatory Office
NPISAA	National Program for Implementation of Stabilization Association Agreement
ERP	Economic Reform Program
SAA	Stabilization Association Agreement
ECT	Energy Community Treaty
WB	World Bank
WBI	World Bank Institute
DSO	Distribution System Operator
PE	Public Entity

# 1 GENERAL CONTEXT OF THE THIRD NEEAP

Based on the new Directive in power on energy efficiency 2012/27/EU (EED), 3rd National Action Plan on Energy Efficiency in Kosovo (NEEAP) 2016-2018, is intended to be more advanced and more comprehensive sectorial document in the economy of Kosovo, in accordance with national strategy and political objectives of Kosovo and in accordance with EED. In addition, are involved the new measures with special priority in the field of legislation, such as the drafting of the new law on energy efficiency in conformity with the new EED directive, which foresees the establishment of the Financial Mechanisms for Energy Efficiency, in order to create opportunities and financial capacity and implementing energy efficiency measures.

The first Kosovo NEEAP (2010-2018) was approved by the Ministry of Economic Development on 30 September 2011. It provides an indicative target of achieving 9% of 1021.08 ktoe until the end of the period covered by the plan (2010-2018). So, the target remains in effect until 2018 that Kosovo should save 91.89 ktoe.

The first Midterm Term Energy Efficiency Action Plan is approved by MED (2010-2012), on September 30, 2011, and had an intermediate indicative target of energy saving in the amount of 3%, respectively 31.00 ktoe.

The second Midterm Term Energy Efficiency Action Plan in Kosovo has been prepared based on Article 10 of the Law on Energy Efficiency, and the document "Guidelines and templates for preparation of the second national energy efficiency", by the Joint Research Centre of the European Commission, adapted from the EE Task Force of Energy Community Secretariat in October 2012, which reported to achieve energy saving of 3.1%.

Kosovo Energy Efficiency Agency (hereinafter KEEA) was established in April 2012. According to Article 6 of the Law on Energy Efficiency, among others KEEA is responsible for the following actions to be taken regarding the National Plans for Energy Efficiency:

- To draft National Energy Efficiency Action Plan (NEEAP),
- To prepare progress report on the implementation of the National Energy Efficiency Action Plan,
- To develop a system for monitoring the implementation of the National Energy Efficiency Action Plan and for achieving the indicative targets for energy savings.

KEEA, as the main institution responsible for developing and overseeing the implementation of the NEEAP, leads the process for developing this document. To support the KEEA, the Ministry of Economic Development (Decision no. 848, dated April 25, 2016) has created an interagency group composed of representatives from the following institutions:

1. Kosovo Energy Efficiency Agency
2. Department of Energy MED
3. The Office of the Prime Minister,
4. Ministry of Public Administration,
5. Ministry of Local Government,
6. Ministry of Education, Science and Technology,
7. Ministry of Justice,
8. Ministry of Finance,
9. Ministry of European Integration,
10. Ministry of the Kosovo Security Force,
11. Ministry of Environment and Spatial Planning,
12. Ministry of Labor and Social Welfare,
13. Ministry of Internal Affairs,
14. Ministry of Health,
15. Kosovo Clinical Hospital Service,
16. Ministry of Infrastructure,
17. Ministry of Foreign Affairs,
18. Ministry of Agriculture, Forestry and Rural Development,
19. Ministry of Diaspora,
20. Ministry of Communities and Returns,
21. University of Pristina,
22. Kosovo Energy Corporation – KEC,
23. Energy Regulatory Office - ERO,

24. Transmission, System and Market Operator of Energy in Kosovo - KOSTT,
25. Kosovo Statistical Agency,
26. The Association of Kosovo Municipalities,
27. District Heating Prishtina - TERMOKOS, and Gjakova
28. INDEP Civil Society/NGO

It is anticipated that this interagency collaboration platform to continue to function after the adoption of the third midterm NEEAP 2016-2018, and to assess regularly the progress of the implementation of the second NEEAP (2013-2015) and take appropriate measures to make the necessary adjustments in accordance with the provisions of the Administrative Instruction no. 02/2012 on procedures, criteria and methodology for the preparation and adoption of strategic documents and plans for their implementation and the relevant legislation in force.

## 1.1 Strategic Highlights of NEEAP

Based on Directive on Energy Efficiency 2012/27/EU (EED), entered in force on 5<sup>th</sup> December 2012, the European Union has set itself targets for the reduction of primary energy consumption to 20% by 2020, compared with current projections. Following the adoption of the new directive (EED), are repealed Directive on energy efficiency to end users and energy services (2006/32/EC - ESD), and that of cogeneration (2004/8/EC), and are amended directives 2009/125/EC and 2010/30/EU.

Through the third NEEAP 2016-2018, Kosovo Government partly fulfills its obligations under Article 24 (2) in conjunction with Annex XIV, Section 2 of the Directive and also provides details of the current status and achievements of EE policies in Kosovo. 3<sup>rd</sup> NEEAP document 2016-2018, contains the efforts and progress made by energy efficiency policies in Kosovo in the past through 2<sup>nd</sup> NEEAP 2013-2015.

Republic of Kosovo as a signatory of the Energy Community Treaty is designated to contribute towards achieving the targets of energy efficiency, creating incentives for energy savings by citizens, also for open markets and new business application of energy efficient technologies and services.

NEEAP structure and content is based on the framework guide for the drafting of the Plan, provided as a guide and as required by the reported new directive issued by EED.

### THE MACROECONOMIC FRAMEWORK - Doc. Program for economic reforms PRE 2016

Through the Economic Reform Program, Kosovo is considering 2014 as a year of economic reforms to reduce the debt of the private sector, to improve labor market and increasing competitiveness, all with the aim of ensuring sustainable economic growth, although developing economies continue to face structural problems accompanied by the tightening of fiscal policy, which has contributed to the economic growth perspective.

According to the WEO released by the IMF, the world economy was projected to grow by 3.1% in 2015, reaching 3.6% in 2016. GDP growth of the euro area is also attributed to the balanced monetary policy by improving financing conditions and providing more adoptable fiscal policy. Financial markets in the euro area gradually regained a positive position with regard to the perception of risk by investors, which contributed positively to the confidence of businesses, thus increasing investment together with consumption. Moreover, the decline in energy prices has had a positive impact on the disposable income of households and businesses.

#### 1.1.1 *Economic reforms and the impact on energy savings through efficiency measures*

In order to fulfill its commitments to the Treaty of the Energy Community, the priority of Kosovo is implementation of Law on Energy Performance in Buildings (transposition of the EPBD), the drafting and approval of secondary legislation, the revision of the Law on EE transposition of EED and the establishment of Financial mechanisms for EE provided under this law.

Creating and building energy efficiency financial mechanisms will focus on the following stages:

- Investments for implementation of measures in the field of EE and RES projects in central government buildings (about 140 buildings)
- Pilot Investment Program of EE measures in municipalities - including 1-2 rounds of competitive calls recent years for municipal project proposals for grants to support improvements in buildings and street lighting with some of the co-financing requirement, or through a budget revolving mechanism.



- Technical studies and supervision (includes consultations to support the investment component, including energy audits in buildings, development of detailed designs and tender documents and construction supervision).

- Training of companies (support training aimed to design companies, construction companies and other service EE/RES providers to ensure adequate technical competences and learning from previous projects as reasons such as the variations of energy audits and the allocation of percentages, typical technical and design weakness in construction, etc,

**Budget impact:** Improving energy efficiency for the period 2016-2018 is expected to have a cost of EUR 21.45 million, of which EUR 1.45 Millions are from the Kosovo budget, while EUR around 20 million from the World Bank and KfW and EBRD around EUR 2 Million at residential and SME Sector.

While the cost of the proposed measures within the program SINGLE PROJECT PIPELINE OF INFRASTRUCTURAL INVESTMENTS for energy efficiency in public buildings, is estimated to be 30.2 million EUR, which foresees measures for energy efficiency in public buildings and beneficiaries are the following institutions:

1. Ministry of Education, Science and Technology (public university buildings and schools)
2. Ministry of Health (regional hospitals and family centers)
3. Ministry of Local Government Administration (street lighting in 14 municipalities)
4. Ministry of Justice (prosecution and courts)

Investments that are needed for each institution from 1 to 4 are: 10mil. EUR + 10 million. EUR + 5.2 million EUR + 5 mil EUR = 30.2 mil. EUR. The expected savings from EE measures in these institutions are estimated to be 8.35 ktoe/year according to the level of 50% saving from EE measures the total energy consumption of 16.7 ktoe, with the return period for different types of investments is between 3-7 years - an average of 4 years (the exact value of savings from measures and return deadline of EE remains to be determined after detailed design and development of projects). These measures are in line with strategic exemplary example of measures in the public sector, and to ensure the planning and achievement of more ambitious savings targets under the National Plan of EE, in the subsequent period 2019-2025.

**The impact on competitiveness:** Implementation of energy efficiency measures will contribute to reduce domestic consumption. Reduction of energy consumption would serve to reduce the cost of energy and as a result will help businesses and increase investment in the private sector.

Energy efficiency can help address issues related to energy security (current deficits and reduced imports), reducing public expenditure on energy and environmental impacts of energy use. Efficiency measures allow significant budget savings. Estimates indicate that the Government spends around 41 million EUR per year in energy for its buildings and could save up to EUR 18.85 million a year through cost-effective EE measures.

#### [Link with national strategic documents and sectorial strategies](#)

This measure is in line with the National Development Strategy, namely the measure 27 under Pillar IV - infrastructure. In addition, the measure is in accordance with National Program for the Implementation of the Stabilization and Association Agreement (NPISAA), respectively with economic criteria Block II and Objective 3.16.

#### **Reform measure 4:** Reduction of energy consumption through energy efficiency measures

Priorities arising from the National Development Strategy 2016-2021, Program of the Government of Republic of Kosovo 2015-2018 and the New Energy Strategy 2017-2026.

Priority measures for structural reform are identified in the Economic Reform Program (ERP 2016) in the Republic of Kosovo. Selected measures represent existing strategic and the new priorities that Kosovo has identified as most important to address key barriers to growth and competitiveness. The measures presented are processed under a comprehensive policy dialogue of all structures of central and local government, private sector and civil society. In general and in essence emanating from Government Program 2015-2018 and the National Development Strategy 2016-2021

**The program of Government of the Republic of Kosovo 2015-2018**, foresees specific measures related to the construction of new production capacity of electricity from fossil and non-fossil sources; measures for better energy efficiency use and measures for the use of renewable energy sources and cogeneration, and measures in terms of preparing the conditions for bringing natural gas in Kosovo. In this program special importance is paid to environmental protection.

**National Development Strategy 2016-2021:** The Pillar 4 includes: infrastructure, with 4 priority measures for the development of the energy sector: 1. Construction of new generating capacity; 2. Creation of open and competitive market in electricity; 3. Reduction of energy consumption through energy efficiency measures and 4. Rational use of renewable energy

Each of these objectives for the energy sector is accompanied by concrete measures of action. This document has served as a reference base for compilation of the Energy Strategy.

Energy sector plays an important role in the Stabilization and Association Agreement (SAA), which entered into force on 1 April, 2016. Under this agreement, Kosovo is obliged to fulfill obligations related to the integration into the regional common market, which includes Contracting Parties of Energy Community for Implementation of the Acquis Communautaire related to: competition in the energy market, protection of environment, energy efficiency, renewable energy targets that pose serious obligations to be fulfilled in the energy sector. Energy Strategy 2017-2026 addresses these challenges.

### Energy Strategy of the Republic of Kosovo 2017-2025 (draft)

Energy Strategy based on policy documents and strategies of the Government of Kosovo and the results of tests and studies conducted in the energy sector financed by the Kosovo institutions or foreign donors, based on the analysis of the problems that the energy sector faces and the most appropriate way of resolving them, has defined five strategic objectives: 1. Security of supply and stability of the power system; 2. Integration in Regional Energy Market; 3. Increase the existing capacity of thermal systems and construction of new capacity; 4. Development of natural gas infrastructure; 5. Achieving the goals of energy efficiency and renewable energy towards obligations to the Treaty on the Establishment of the Energy Community and the SAA.

To realize the strategic objectives, there are done analyzes based on a variety of factors that affect the energy sector such as: forecasting of energy demand in three scenarios, based on economic growth forecast according to the National Development Strategy, measures to reduce technical and commercial losses, the impact of expanding the network of thermal energy systems, using renewable resources for heating sanitary water and energy efficiency measures.

During the drafting of the new Strategy of Energy three options have been considered in terms of meeting the demand for electricity, and after the analysis is given the recommendation to the strategic approach for achieving the strategic objectives that enable the achievement of the overall goal: *Creating conditions for provision of reliable and secure energy through the development of productive capacities, transmission and distribution, able to handle smoothly the increasing demands for energy, taking into account diversification of sources, the purchasing power of consumers efficient use of energy, maximum utilization of renewable energy sources and not damaging the environment during energy activities.*

To achieve the objectives, the recommended approach supports the following policies:

- ✓ Construction of new generation capacities and rehabilitation of existing ones using all types of primary sources that are available in Kosovo in order to meet the long-term requirements of end-user(consumer), meeting the requirements for overhauling the system and security of supply of the system according to the minimum ENTSO criteria;
- ✓ Union of the energy market with Republic of Albania;
- ✓ Use of RES potential that has been estimated feasible based on studies conducted so far, in order to achieve binding targets for Kosovo under the Treaty for the Establishment of the Energy Community and the Stabilization and Association Agreement;
- ✓ Promotion of energy efficiency usage by applying policies and measures set out in the European Directive 2012/27 and other obligations arising from the TEC and SAA in the field of energy efficiency;
- ✓ Creation of conditions for the effective opening of the energy market and its integration in regional Energy Community according to ECT obligations and SAA;
- ✓ Expanding the network of thermal energy system and building new systems in major cities of Kosovo for which feasibility studies have been developed;
- ✓ Implementation of criteria for environmental and climate protection according to ECT obligations and SAA

According to the SAA, energy specifically addressed in Article 114 which states inter alia:

- ✓ In accordance with the relevant acquis of the EU, the Parties (Kosovo and the EU) will develop and strengthen their cooperation in the field of energy in accordance with the principles of the market economy and of the Treaty establishing the Energy Community, signed in Athens 25 October, 2005.
- ✓ Cooperation will take place with the aim of gradual integration of Kosovo into the European energy markets. Cooperation could include support for Kosovo in particular in regards:
  - (a) the improvement and diversification of supply and improvement of access to the energy market, in accordance with the acquis of the EU on security of supply and the region's energy strategy Energy Community, and the application of EU rules and European transit, transmission and distribution and restoration of energy interconnections of regional importance with its neighbors;
  - (b) aid for Kosovo to implement the acquis of the EU energy efficiency, renewable energy and environmental impact of the energy sector, promoting energy savings, energy efficiency, renewable energy and research and mitigating the environmental impact of energy production and consumption;
  - (c) Developing the framework conditions for restructuring of energy companies and cooperation between enterprises in this sector, in accordance with the rules of the internal energy market of the EU's for profligacy.

Meanwhile, **the Sustainable Development Plan** (Pillar IV/1), treats the lack of energy, and is a policy analysis in support of the process of elaboration of the NDS (National Development Strategy), with the main highlights:

Power generation capacity in Kosovo is based on coal, which supplies about 97% of total energy production, operational production capacity of 1000MW. Other sources of energy production feasible in Kosovo include: hydro, wind and other renewable energy, to which Kosovo is committed to produce 29.47% (promoted target) of total energy consumption by 2020.

Three social dimensions must be achieved when defining energy problem in Kosovo, reliable, sustainable and affordable.

Addressing the problems of energy should be put on: limited options of supply, major systemic loss, low level of revenue collection and increased demand for energy.

Economic and ecological capacity of power generation can be achieved by pushing the closure of Kosovo A power plant by 2021, to rehabilitate Kosovo B until 2018 and build a new PP "Kosova e Re" (New Kosovo) with production capacity of at least 1000MW.

Open and competitive and complementary energy market with Albania strengthens the transmission network interconnection of energy and builds new reserve pumping capacity.

Reduction of consumption and improving energy efficiency can be achieved by creating a national fund for Energy Efficiency and using incentives through performance contracts for Energy Saving until 2018.

Based on analytical simulation by the World Bank, Kosovo will face a "vacuum of power" of about 3,000 GWh for 10 years, this is due to a growing demand of electricity, and disposal of scheduled Kosovo A power plant (PFR, World Bank, 2014).

According to the Progress Report of the European Commission (2015), "investment and maintenance continue to improve the reliability of power transmission system and reduce transmission losses. While distribution losses have declined, combined commercial and technical losses are high at 28.46%. "One of the major constraints in terms of commercial and technical losses is the collection of bills in the north of. Kosovo also faces the challenge of interconnecting with South-East Europe (SEE) energy market.

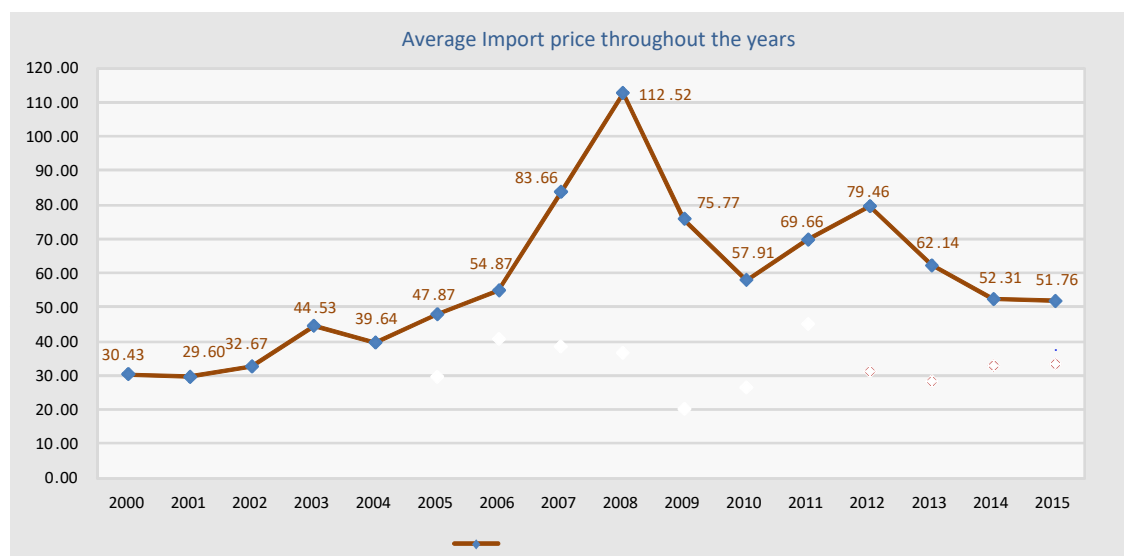
Despite the increasing amount of production year after year, the existing PP and HP, it is not a proof that we are dealing with a sustainable production system and consequently a stable security supply with electricity. Operating with outdated capacities without rehabilitation, the reliability of the production system is not sustainable. Electricity production faces serious problems in terms of technical security system as a result of ever greater obsolescence of the equipment and it is required to take possible measures as soon as possible. When we add the environmental problems resulting from over-outdated production technology on the one hand and international obligations that Kosovo has for reducing pollution from electricity generation, taking measures to improve the conditions of production becomes even more than necessary.

Rising demand for electricity is covered from the production of two lignite plants (Kosovo A and Kosovo B), which accounts for 97% of domestic production, from hydropower and imports, and in cases of inability of supply reductions have been applied.

Over the years there have been significant improvements in meeting energy requirements from domestic production. Electricity import of has been stable 10-14% of the amount of energy needed to cover the demand for electricity. Electricity production in 2000 was 1913 GWh, while in 2015 it was 5503 GWh. Increased production in this period was 187.67%. Trend of production growth has continued from 2000 to 2013, whereas in 2014 there was decrease in production compared to the previous year due to a malfunction occurred in PPC Kosova A<sup>1</sup>.

Coverage of electricity demand was mainly done by domestic production and from import (to the extent of 12-14%). Mainly in overload situations in the power system, there were planned reductions (according to the ABC plan) that was decreased in recent years, this plan is not being applied by the supplier with the public service obligations (KESCO).

From 2000 until 2014, 502.9 million euros were spent on the import of electricity. In some cases there was government intervention to subsidize imports. Since 2012 import subsidies were discontinued. After the privatization of the electricity supply, the cost of imported electricity has fallen sharply as a result of more efficient procedures of purchasing power.



<sup>1</sup> Annual reports of ERO

Figure 2 shows the demand for energy in Kosovo for the years 2000-2015:

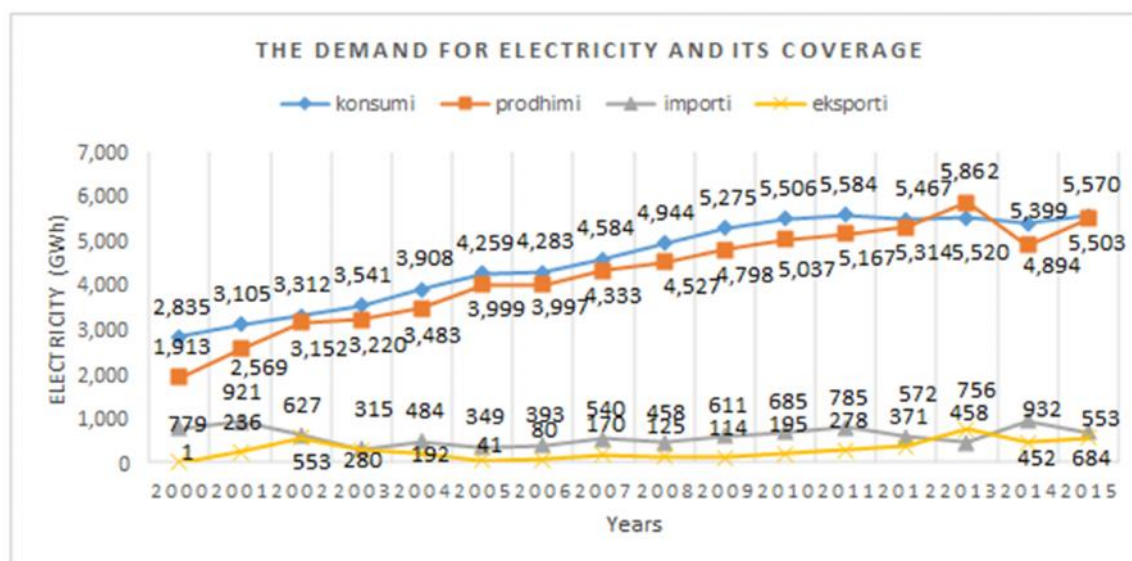


Figure 2 - The demand for electricity and its coverage

**National Economic Development Strategy 2016-2021** (currently still in draft) - defines energy as a priority of its pillars.

#### Economic development trends

Real GDP growth is estimated to reach 3.8% in 2015, a significant increase compared with 1.2% last year. It is worth noting that 2014 was characterized by uncertainty among agents because of the political situation; because there was a significant delay in forming the government after the elections held in June 2014, which has contributed to the slowing economy and the deviation from the expected growth rate in 2014.

In the following table are presented GDP data for 2009-2013.

Year	2009	2010	2011	2012	2013
GDP	3.6%	3.3%	4.4%	2.8%	3.4%

Table 1 - GDP for the period 2009-2013

Realistic GDP increase	2016	2017	2018	2019	2020 -2025
Lower Scenario (1)	2.50%	2.50%	2.50%	2.50%	3.00%
Basic Scenario (2)	4.0%	4.30%	4.30%	4.30%	4.30%
High Scenario (3)	7.50%	7.00%	6.00%	5.50%	5.00%

Table 2 - Projections of economic growth according to the document: Economic Reform Program

**Population:** The average number of members per household is 5.9. Demand for energy in the household sector, is more depending on the number of households (a household can have more than one family) than the number of population. Therefore, to estimate the number of families presents fundamental interest in forecasts of energy consumption in the household sector.

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Population	1,827,231	1,836,978	1,847,632	1,857,867	1,867,495	1,876,250	1,883,805	1,892,993	1,901,106	1,907,940
No. household	309,700	311,352	313,158	314,893	316,525	318,008	319,289	320,846	322,221	323,380

Source: ASK, DPE (MED)

Table 3 – Forecast of growth in the number of population, residents in family and household

Long term Energy balance for the period 2015-2024 is based on data from documents on energy balance, which in terms of consumption, are based on specialized surveys of consumer's sectors.

Data for electricity are obtained ready from the Long-Term Energy Balance data for the period 2015-2024, drafted by the System Operator, Transmission and Market Operator of Kosovo, because this is the responsible operator, according to Law No. 03/L-184 on energy, for drafting of documents annual and long term electricity balance. The data obtained for heating are taken from document for heating forecast, prepared by CH TERMOKOS - Prishtina and Gjakova city heating.

In this paper we also analyzed the effects of macro-economic developments in energy consumption. While the data collected are processed according to the EUROSTAT format requirements.

In calculating the forecast energy consumption, we are considering three basic factors:

1. Economic growth;
2. Number of households and
3. Consumption of the last three years.

### *1.1.2 Forecast of energy demand for all sectors*

If we analyze the energy consumption in the previous balance of energy for all sectors, it is clear that by 2013 the largest consumer of energy in Kosovo has been the household sector, being followed by the transport sector and industry.

Final energy consumption in 2024 is expected to be 1724.73 ktoe. Impacts that will have measures for the rehabilitation of the power system and construction of power plant "Kosova e Re" is expected to have their effects in terms of reduction of technical losses respectively improved efficiency of the system, which increases the amount of electricity for final consumption from the same capacity on the one hand and complete stabilization of stable supply of electricity, therefore increasing the security of supply. The sector which is expected to have a more significant increase of demand for energy is expected to be the sector of the industry. This is based on projections of GDP growth on the one hand and in comparison with the structure of consumption in developing countries.

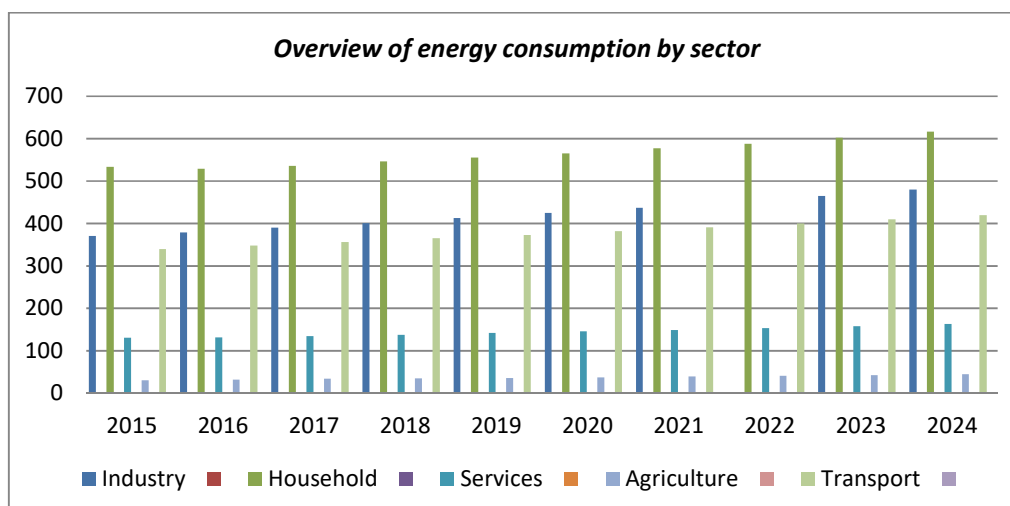
Despite predictions of increasing the pace of development of the industry, the share of industry in total energy consumption in 2024 is expected to be around 28% of final energy consumption.

Statement of energy consumption in all sectors is presented in Fig 3.

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Coal, energy pur	61	61	62	62	63	64	64	65	66	66
Coal, non- energ purposes	0.48	0.48	0.49	0.49	0.50	0.50	0.51	0.51	0.52	0.52
Petroleum produ	579	594	610	626	643	661	679	698	717	737
Petroleum produ n.e. purposes	50	51	53	55	57	58	60	62	65	67
Biomass	256	258	261	264	267	270	272	276	279	282
Electricity	451	443	452	466	476	489	503	516	535	556
Derived heat	9	10	10	11	11	11	12	13	13	14
Solar energy	0.71	1.03	1.20	1.38	1.63	1.81	1.98	2.15	2.32	2.67
Total	1406	1420	1451	1486	1520	1556	1594	1633	1678	1724

Source: Long Term Energy Balance of the Republic of Kosovo 2015-2024

*Table 4 - Overview of forecasted energy consumption in all sectors*



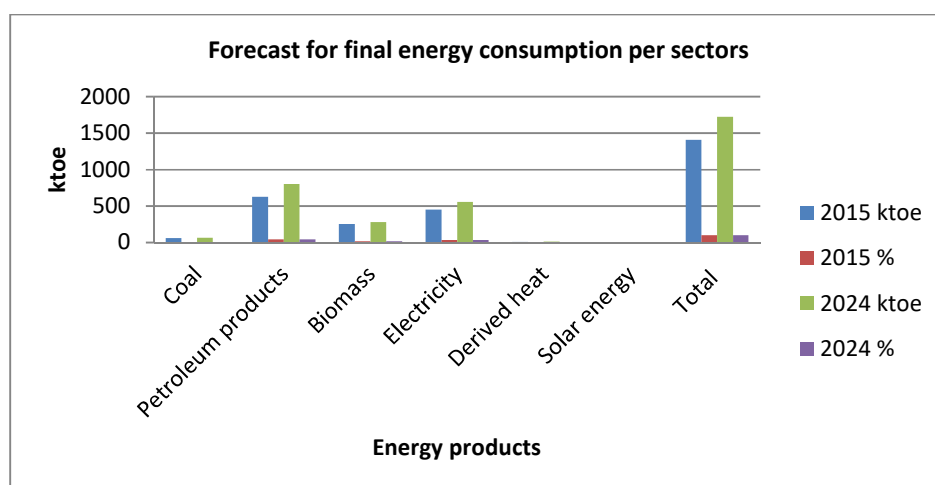
Source: Long Term Energy Balance of the Republic of Kosovo 2015-2024

Figure 3 - Energy consumption per sectors

Table 5 presents the contribution of each sector to total consumption, for characteristic years: 2015- the first year of the forecasted period 2015 to 2024 and in 2024 the last year of the forecast period.

Energy Products	2015		2024	
	ktoe	%	ktoe	%
Coal	61,07	4,3	66,79	3,9
Oil products	628,61	44,7	803,59	46,6
Biomass	255,73	18,2	281,98	16,3
Electric energy	450,74	32,1	555,72	32,2
Obtained heat	9,21	0,7	13,99	0,8
Solar energy	0,71	0,1	2,67	0,2
Total	1406,06	100	1724,73	100

Table 5 - Overview of consumption forecast for all products (in ktoe and %)



Source: Long Term Energy Balance of the Republic of Kosovo 2015-2024

Figure 4 - Overview of consumption forecast for all economic sectors (in ktoe)

Forecast of Electricity import 2015 - 2024 and emissions (NOx, SO2, Dust and CO2) based on the Energy Strategy 2016-2025, are presented in the figures below:

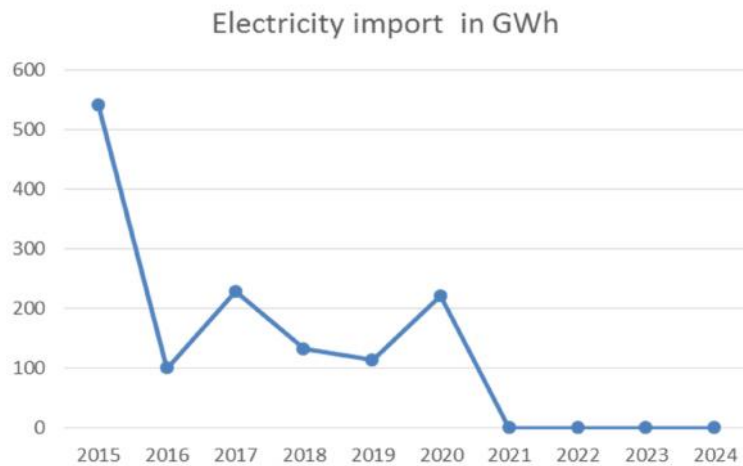


Figure 5 – Forecasted electricity import

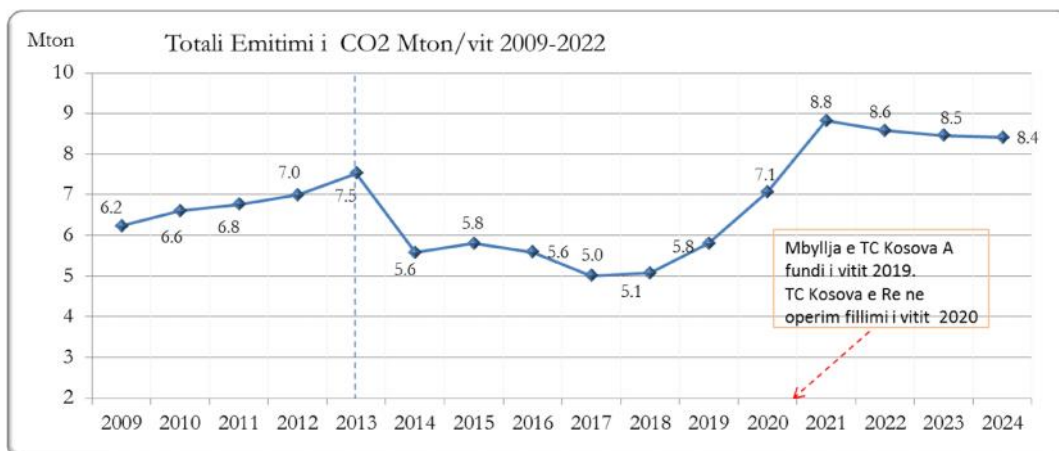
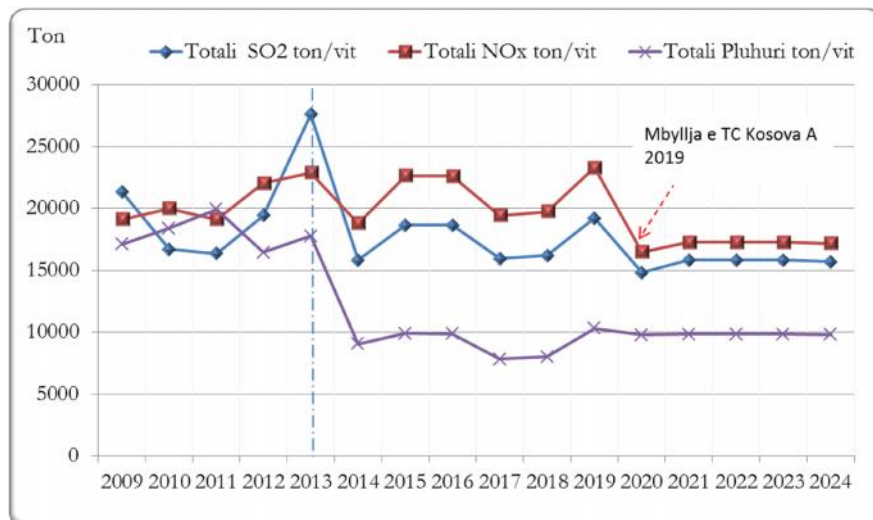


Figure 6 - Forecast of dust emissions, NOx and SO2 from Kosovo power plants for the period 2015-2024 & Forecasts for CO2 emission from thermal power plants in the period 2015-2024

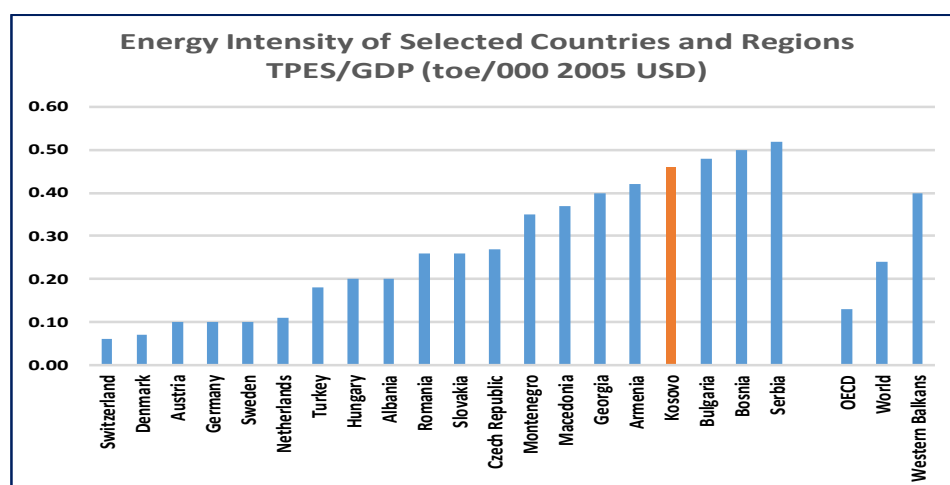


### 1.1.3 National context of energy saving

Republic of Kosovo, the newest country in Europe has had a distinguished performance of economic growth since 1999. The medium-term economic growth is expected to continue with 4% per year (World Bank 2014). Alongside economic growth has increased the demand for electricity. The system of local electricity supply, which is based on two lignite-fired power plants, which operates below installed capacity. Reliability of power supply is not firm, and that is the main concern of businesses in Kosovo. Demand for power it also exceeds supply options, so that Kosovo depends on the import of electricity. After decommissioning plan of outdated existing power plants in 2017 (or possibly until a new decision strategy for reconstruction based on the new study), the country will be faced with permanent uncertainty for power supply increasingly depending on imports.

Despite the recent enormous heating supply through cogeneration from TERMOKOS through PP Kosovo B, the main source of energy for heating space and hot water in buildings remain biomass (firewood) and electricity, both of which cover over 80 % of consumption for heating. High consumption without a management and regulation of the burning of firewood could cause forest destruction in Kosovo, raising even more negative impacts on environment, economy and health. Heating with too inefficient electricity, poses a threat to frequent interruptions of electricity supply, especially during the winter. Kosovo has two heating systems (Pristina and Gjakova), who have had serious problems since demand exceeds the ability of supplying heat; bill payments are low; while there are high thermal losses of energy (exceeding 18%)<sup>2</sup>.

Chart 7 shows the comparison of energy intensity of the economy of Kosovo with other countries in the Western Balkans and the European Union.



Source: IEA 2015

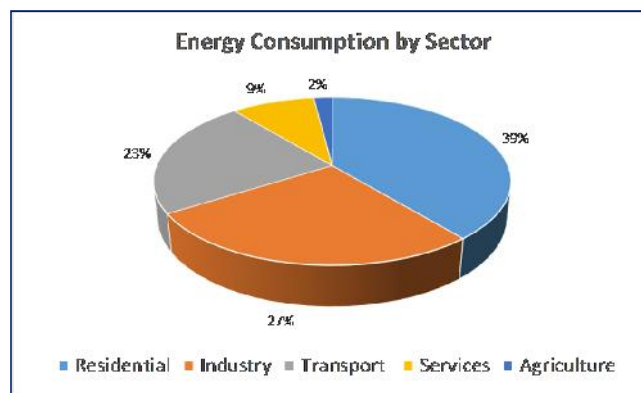
Figure 7 - Energy intensity in Kosovo and other countries

As seen from the diagram 7, energy intensity of Kosovo (0.46 toe/000 US \$ GDP) compared with the Western Balkan states, it is substantially higher than the intensity of OECD countries (0.12) and the global average (0.24), and over 4 times higher than in many EU countries. Taking into account the consumption of Kosovo (1.29 toe per capita) only 31% of the OECD countries (4.2 toe per capita), energy intensity could be further increased with the decrease of incomes (IEA 2015).

#### Need for Energy Efficiency in Public Buildings

Residential sector in Kosovo represents the largest amount of energy consumption (about 39%). And transportation industry includes 27% and 23%, and services (including public sector) consume 9%. The remaining 2% of consumption go to the agricultural sector (see Figure 8).

<sup>2</sup> Situation in CH Termokos has improved, now heat supply exceeds demand, the level of revenue collection and the cost of fuel has fallen



Source: World Bank 2014

Figure 8 - Energy consumption by sector

Recent studies for the building sector in Kosovo (NOEEB 2011 WBI 2013 and World Bank 2015) have estimated the level of buildings market and the potential for energy efficiency (EE). These studies have evaluated the potential of significant savings in Kosovo. While in the building sector dominates the residential sector, government and municipal buildings also provide opportunities to improve EE. WBI study estimates the potential savings for public buildings by 38 to 47% in municipal buildings and by 49% in the central buildings. These savings provide substantial budgetary savings - estimated that the Government consumes around 24.3 million € per year for energy in its buildings, and can save 20-30% per year through EE cost-effective measures (World Bank 2015). Simple period of return to municipal and government buildings is estimated to be 4.9 to 5.3 years (World Bank 2013), indicating that these buildings can provide potential pioneer within the building sector and can demonstrate sustainability for commercial financing in other sectors.

The main benefit of EE in the case of public buildings is the fact that the savings in energy costs bring improved fiscal balance of the country. EE therefore presents an opportunity for government and public sector to reduce the budget for energy costs. Moreover, a very significant benefit from EE in public buildings that needs refurbishment. Many public buildings in Kosovo are outdated (more than half of buildings were built in the period 1970-1985) and immediate investments are required for their thermal insulation, efficient dual-or triple window glass, and efficient space heating and hot water systems, to maintain the value of the property and to improve the comfort of the tenants in the building. This presents an ideal opportunity for EE investments. Implementation of energy efficiency in public buildings will contribute towards the realization of targeted energy savings of 1% per year, according to the NEEAP in the period until 2018, while reconstructions and renovations carried out in an efficient way, contribute to sustainable economic development. Finally, governmental action to improve energy efficiency in public buildings bring increased reliability and security of energy supply, and demonstrate the government's willingness to be an example to promote the national agenda for EE.

#### 1.1.4 Legal Framework of Kosovo

In accordance with the definitions and vision of the Energy Community, Kosovo has developed the legal framework of the energy sector and experts, for the internal regulation of the sector, and to ensure the implementation of obligations under the Energy Community Treaty. This framework has enabled positive developments within the sector, particularly the EE sector, despite the serious challenges during the implementation process. One of the main obstacles has been the regulation of energy price, still not cost-effective, which makes it less attractive EE improvement.

##### Primary legislation

Primary legislation for EE is the EE Law. This law represents a broad political framework for EE, which has led to the establishment of the Kosovo Agency for Energy Efficiency, and the definition of regulatory and mandatory targets. Additionally were adopted a number of secondary legal acts (regulations, administrative instruction, etc.), that specified measures and actions to be taken within the energy sector (and the economy in general) to achieve and implement levels of EE measures. Some are actual laws that regulate or indirectly affect EE in Kosovo. They include:

- Energy Law
- Electricity Law

Energy Regulatory Law  
Spatial Planning Law  
Construction Law  
Foreign Investment Law  
Competition Law  
Law on Heating  
Law on Public-Private Partnership and Concessions  
Law on Petroleum and Petroleum Products  
Law on Energy of performance of Building

## Secondary legislation

Primary legislation is supported by a number of decisions, regulations, and administrative instructions.

### Administrative Instructions and Regulations

- Administrative Instruction (AI) for the promotion of EE for final consumers and energy services
- AI for the labeling of household appliances
- AI on energy auditing
- AI on rules of balance of power
- AI for the opening of the electricity market for non-household customers
- AI on renewable energy targets
- Regulation for the support schemes of electricity with a certificate of origin and procedures for permit
- Regulation for creating the system of certification of origin of electricity produced from BRE20

### Regulations

- Regulation on the internal organization of the Kosovo Agency for EE/AKEE
- Technical Regulation on thermal energy saving and thermal protection in buildings
- Regulation on the establishment and functioning of the commission for certification of auditors and energy managers

In addition to this legislation, Kosovo institutions have drawn and renovated a number of strategies and plans for EE, mostly highlighted in NEEAP, which provides energy savings of 9% by 2018 according to the medium term 3, starting from 2010.

Furthermore, EE Law requires from municipalities to take action to support EE national level targets. The law requires municipalities to develop Municipal EE Plans (KEEP), according to AKEE instructions. These plans must be approved by the Municipal Assembly and sent to AKEE. Municipalities are also obliged to submit the progress report of the implementation of KEEP, on the instructions of AKEE. Until now they have been completed and approved by the Municipal Assemblies in 27 out of total 38 municipalities across Kosovo.

## Activities financed in energy efficiency

### BRK-funded projects:

- Energy audit to public service buildings, for 2011-2012-2013-2014-2015-2016, for each year of € 144,000.00.
- Public Campaign on Energy Efficiency and Renewable Energy Sources (RES), for 2011-2012-2013-2014-2015-2016, € 50,000.00 per year.

### Projects funded by donors / borrowings:

- Supervision, monitoring, verification and evaluation of energy efficiency measures in schools and hospitals in Kosovo (Funded by the European Commission amount 15.6 M Euro. The project has been implemented and measures will be taken in 63 schools and 2 hospitals.
- Study and implementation of measures of energy efficiency in public buildings of the center level (funded by WBIF/WB. The amount of funding \$ 31m: Negotiations between MED-MF-BB were completed in May 2014 and in June the Board of BB approved the loan. After signing the agreement between the MoF and the WB project is ratified in the Assembly. For the first 19 buildings were prepared design and bidding documents for the implementation of EE measures.
- Implementation of energy efficiency measures in municipal public buildings financed by WBIF/KfW. The amount of financing is Euro 7,500,000.00. Signed pre-agreement between MF and KfW.

- Support for the private sector and residential EE measures, financed by the EBRD, the amount of funding are € 12M. (Emphasis will be given to the private sector (Small and Medium Enterprises SMEs), where only the first contracts are made with a commercial bank TEB (value € 5M) and Kosovo Rural Lending KRL (value € 1.5M). the project is in the implementation phase. So far are spent € 8.2 M, with € 4M for SMEs and € 4.2 M for the household sector.
- Through UNDP have been developed projects to promote EE and two municipalities were assisted in drafting the Municipal EE Plans 2014-2020 as well as concrete measures in public lighting in the municipality.
- Through USAID were assisted 5 municipalities in drafting municipal plans for energy efficiency, while 10 municipalities were supported in the implementation of EE measures. The total value of these projects is 450,000 USD.

#### Sectorial context

Estimates made by the World Bank Institute (WBI), 2013, have shown that the buildings sector (public, commercial and residential) comprises 47.5% of final energy consumption with EE potential about 44%. It is especially evaluated the high level of savings potential for public buildings in the municipality - 38-47%, and over 49% for government buildings. Considering costs about 41 million per year for energy in government buildings, these energy savings offer substantial savings of about 18.85 million euro budget per year, which would be achieved through the implementation of cost-effective EE measures.

There is significant progress in improving the legal and regulatory framework of EE in Kosovo. In October 2005, Kosovo has become a party of the Energy Community Treaty, which provides the legal framework for the creation of an integrated energy market (electricity and gas) within the European Community and the contracting parties. Regarding the primary EE legislation, there are five laws in Kosovo: EE Law, Energy Law, Law on Electricity, the Law on Energy Regulator, Law on Construction and the Law on Energy Performance of Buildings. These six primary laws are supplemented by a number of secondary legislation in the form of administrative instructions. First National Energy Efficiency Action Plan (NEEAP) was approved with the goals of achieving energy saving target of 9% by 2018. Energy saving in buildings is named as a key action step to achieve this target. For this, within the Ministry for Economic Development, Kosovo has established the Kosovo Energy Efficiency Agency.

In terms of energy costs, the market price of petroleum import products (oil/gas in liquid state, LPG) is in similar levels to those of the EU. The price of electricity for the services sector is among the most expensive in Europe, and among the lowest in Europe for the household sector. The price of firewood in urban areas is similar to prices elsewhere in the Western Balkan region, while in rural areas, prices are difficult to assess because there are many informal markets. Similarly, the price of coal is low, and the quality of local lignite is low as well. These distortions in the local market power discourage customers to invest in EE measures, throughout the entire building stock.

Given the current circumstances specific to the country, according to the report from the EPTISA buildings study, the potential of building sector in Kosovo is estimated to be 20.7% of final energy consumption in 2010. The total energy savings for the entire stock of buildings is estimated to be about 45% of total energy consumption in the sector of household and services building calculated together. By realizing the potential of EE alone in the building sector, Kosovo could save 239 ktOE, through these contributions: 116 ktOE electricity, 76 ktOE firewood, 35 ktOE diesel and heating oil products, 7 ktOE lignite, and 5 ktOE from heating.

Despite this huge potential, only a small amount of these savings is affected in Kosovo. In cooperation with foreign partners in the developed countries, Kosovo is implementing several projects to improve EE. Those partial efforts, not necessarily address all the obstacles which the country has to face to achieve the savings targets of 9% by 2018 (located in the First NEEAP 2010-2018).

Through a deeper insight of economic investment in the building sector, they have developed typical cases of investment in buildings ("proxy case"), for the sectors of commercial buildings, residential and public buildings. Economic investment results for "proxy case", are modeled after the current commercial financing terms and using electricity as the energy source. Proxy of these cases have shown that the implementation of EE comprehensive measures has a relatively reasonable period of return on investment, particularly for services, and theoretically can play well in terms of opportunities. These data are likely to change if they use other sources of energy instead of electricity, or if of buildings units are maintained under the level of comfort before entering the implementation of EE measures, which implies that investments in EE in these cases will become more challenging.

## 2 PRIMARY ENERGY SAVINGS

### 2.1 *The strategic context of energy efficiency measures to save energy*

Basic problems in the energy transformation sector are as follows:

(1) The problems in the construction of new capacities of electricity production from coal and rehabilitation of existing ones; (2) Overload of electricity system especially in the winter season; (3) restrictions on the provision of electricity import; (4) The lack of effective competition in the electricity market; (5) The participation of small thermal power at the end use and lack of natural gas.

(1) Power Plant (PP) Kosova A and B have a joint installed capacity of 1478 MW, but due to their age, their operational capacity currently ranges about 915 MW. The current production capacity is outdated, needs constant repairs and is operating with inefficient technology. Kosovo's government has an agreement for the decommissioning of Kosovo A in 2017, however in addition to the process of building new capacity and the recommendations that will come from a relevant study the final decision<sup>3</sup> will be made on these issues. Although Strategy 2009-2018 envisages the construction of new generating capacity to replace Kosovo A, for various reasons the process was delayed and only in 2015 was the selection of bidders for the construction of PP Kosova e Re. Even the rehabilitation of Kosovo B has followed delays and is currently in the process of the feasibility study;

(2) The distribution network of electricity is also a weak link in the power system of Kosovo. Technical and non-technical losses are quite high. Particularly these losses are big during the winter due to the aggravation of the system due to increased demand for heating in the absence of other suitable sources for heating primarily in collective housing and in sector of service facilities;

(3) The energy enterprise, KOSTT, which owns the transmission network of electricity, has still not under control flows of electricity interconnection. Consequently import of electricity for supply of electricity, could not be planned unhindered and with favorable conditions;

(4) Legal framework. Although the legal framework for the energy sector adopted in 2016 has enabled a gradual opening of the electricity market, so far we don't have competitive electricity market;

(5) Thermal Energy & Natural Gas. Despite improving the situation of heating in Pristina, the share of heat in final energy consumption is still very small and has little impact on reducing the load of the power system. Lack of natural gas aggravates the power system.

**Comparison of primary and final consumption of energy, energy intensity and efficiency of the Kosovo Power System** - 2nd NEEAP, was prepared for the evaluation of the energy savings to achieve the targets set under Directive 2006/32/EC (ESD), for end users and energy services, while the format and guide based on the EC recommendations evaluating energy savings in the process of transformation and transmission of energy (energy efficiency measures for primary energy savings in the energy sector - in generation, transmission, distribution, and in the heating sector).

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<sup>3</sup> National Development Strategy (2016-2021)

Trend of primary and final consumption of energy is shown in the table below, according to reports over the years of the energy balance for the period 2010-2014, are as follows:

Year	Primary Consumption ktoe	Final Consumption ktoe	Difference
2010	2437.51	1167.31	1270.20
2011	2505.03	1284.25	1220.78
2012	2345.15	1226.30	1118.85
2013	2391.75	1238.80	1152.95
2014	2188.92	1261.90	927.02

Table 6 - Primary and final consumption of energy and the difference between them over the period 2010-2014

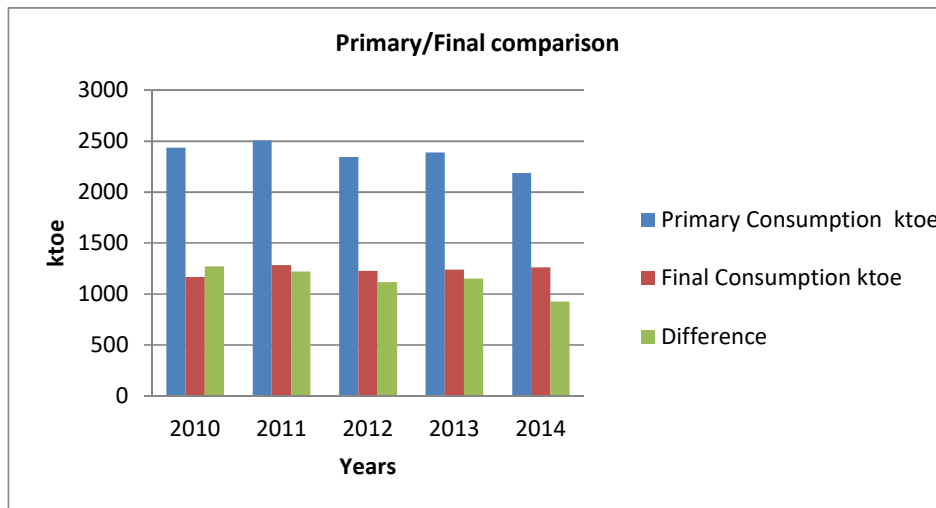
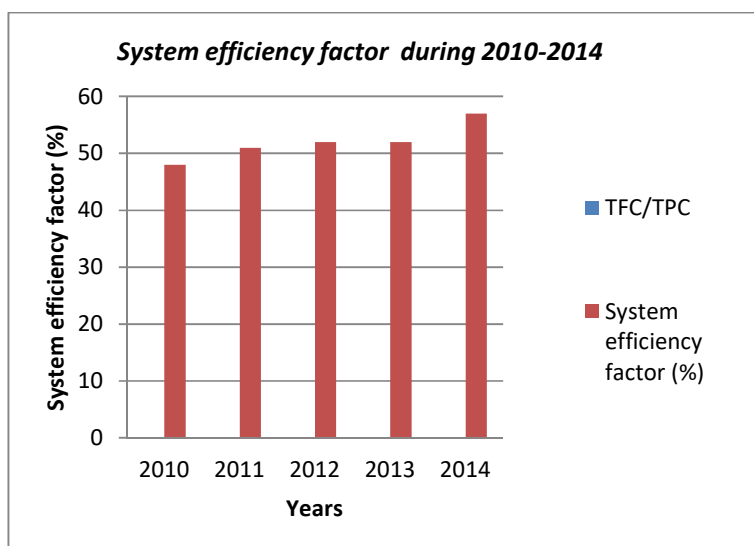


Figure 9 - Graphical presentation of primary and final consumption energy over the years 2010- 2014

Efficiency of Kosovo's energy system: TFC (total final consumption)/TPC (total primary consumption), over the years, as follows:

Year	TFC/TPC	System efficiency factor (%)
2010	1167.31/2437.51	47.89
2011	1284.25/2505.03	51.27
2012	1226.30/2345.15	52.29
2013	1238.80/2391.75	51.95
2014	1261.90/2188.92	57.65

Table 7 - The efficiency of the power system during 2010-2014



*Figure 10 - System efficiency factor during 2010-2014*

Causes attributable to the low efficiency of the energy system in Kosovo:

- Degradation of system post-war/rehabilitation not at an appropriate level
- Losses in the generation, transmission (recently improved significantly) and Distribution
- Lack of EE in final consumption

Explanation: The coefficient of utilization of the system, namely EE system in 2014 reached the highest degree. This is due to the improvement/renovation of the system, EE measures, rehabilitation and reduction of energy losses throughout the system. More precisely are the concrete measures taken by sectors separately to the system (in addition to the document.).

Final energy consumption is significantly lower due to the proportionally higher use of coal as primary energy. Analysis of the ratio of primary /final consumption points to an improvement in efficiency of the power system over the period 2010-2014.

*Table 8 - Overview of strategic objectives for primary energy savings*

Title of the strategy	Objective	Targeted sector	Legal status – other relevant documents	Technical indicators & others
Kosovo's Energy Strategy 2009-2018  New Energy Strategy 2016-2026 (Draft)	Rehabilitation of lignite sector - scheduled repair of lignite excavators from NEEAP 2 is not carried out and is not expected to be realized.	Lignite production	Existing strategy under review according to the energy law- Ready draft of the new energy strategy for approval.	
	Instead of the abovementioned rehabilitation of excavators, two new excavators will be delivered for coal production capacity of 2x2000 ton/h			
	Expansion of electricity transmission sub stations	Kosovo Operator for Transmission and Power Trade (KOSTT)	Transmission Development Plan 2012 - 2021	
	Privatization of Electricity Distribution (KEDS)	Electricity Distribution Plan 2010-2014	Distribution Development Plan 2010-2014	Privatized sector
Heating Strategy 2011-2018	Connecting the heating of Pristina (existing network) with PP "Kosovo B" (cogeneration system) - the extension of the life of PP Kosovo B	Central heating for Pristina - Kosovo capital	Heating Development Plan by Termokos	More efficient tariff system and more suitable for consumers of Pristina. Guarantees for continuous heating for citizens of Pristina.
Long-term energy balance of the Republic of Kosovo, 2015-2024	Kosovo's energy forecast 2015 - 2024	Energy sector	Kosovo Agency for Statistics and other documents of line ministries	
The program of economic reforms (PER) 2017-2019	General Description of the main objectives for sustainable economic development of Kosovo.	The economy in general and the energy sector in particular		



	<p>- Construction of 400 kV transmission line in the territory of Kosovo</p> <p>Reform Measure # 4: Reduce energy consumption through energy efficiency measures</p>	<p>EE and RE investments in central government buildings; Pilot EE investment program for municipalities; Technical studies and supervision; Training of companies. In the period 2016-2018 is planned the continued implementation of the following activities: EE and RE Investment in central government buildings; Pilot EE investment program for municipalities; Technical studies and supervision and training of companies.</p>		<p>Increasing the transportation capacity for the exchange of energy, increased security of electricity supply. Project completed.</p>
	<p>Building of RES capacities</p> <p>- Promotion of capacities for production of electricity from solar panels, wind, small hydro power plants and biomass/biogas.</p>	<p>Security of electricity supply from RES</p>	<p>ERO has approved Support Schemes which guarantee RES investors agreement for power purchase agreements (PPAs) with term of 12 years for the technology from Wind and Solar, and 10 years for small hydro and biomass/biogas and feed-in tariffs which guarantee the return of investment and operating costs for the period of MBE.</p>	<p>Increased security of electricity supply and 20% alignment with RES targeted consumption.</p>

## Forecast of electricity consumption for the period 2015-2024

*Table 9 - Forecast of electricity consumption for the period 2015 to 2024*

The baseline scenario of energy demand (GWh)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Households (residential)	2536	2643	2705	2763	2786	2636	2814	2726	2768	2842	2892	2958	3039	3116	3223	3340
Commercial customers	701	745	798	872	847	855	898	887	913	939	965	996	1028	1057	1097	1137
Industrial consumers total	1210	1296	1322	1201	1124	1309	1342	1358	1398	1437	1478	1525	1574	1619	1679	1741
Losses in KOSTT	175	131	115	128	110	115	116	116	117	118	121	122	123	124	126	128
Technical losses in DSO	799	780	785	778	767	659	685	747	739	732	725	717	710	703	696	689
<b>Gross consumption in Kosovo</b>	<b>5421</b>	<b>5594</b>	<b>5725</b>	<b>5742</b>	<b>5634</b>	<b>5574</b>	<b>5854</b>	<b>5833</b>	<b>5936</b>	<b>6068</b>	<b>6180</b>	<b>6318</b>	<b>6473</b>	<b>6620</b>	<b>6820</b>	<b>7036</b>

Source of data: "Long Term Energy Balance 2015-2024" – KOSTT

Household sector in 2013 consumed 2786 GWh or 49% of gross electricity consumption and in 2024 is expected to consume 3340 GWh or participation is expected to be 47%. Commercial sector in 2013 has consumed 847 GWh or 15% of gross electricity consumption, whereas in 2024 this sector is expected to consume 1137 GWh or 16% of total electricity consumption. The industry sector has consumed 1124 GWh of electricity in 2013, or 20% of gross consumption, whereas in 2024 this sector is expected to consumption 1741 GWh or 25% of gross electricity consumption.

Realized KOSTT losses in 2013 were 110 GWh or 2% of gross electricity consumption, while for 2024 is expected to have 128 GWh losses or 2% of gross electricity consumption.

DSO technical losses in 2013 were 767 GWh or 14% of gross electricity consumption, and in 2024 technical losses is expected to be 689 GWh or 10% of gross electricity consumption.

Table 10 - Forecast of electricity production for the period 2015-2024

PRODHIMI BRUTO I ENERGJISE SKENARI BAZE (MZHE) [GWh]		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	TC KOSOVA A	1622	1908	2203	2108	2186	1624	2143	2142	2142	2142	2142	0	0	0	0	0
2	TC KOSOVA B	3638	3573	3494	3739	4196	3894	4202	4195	3260	3348	4392	4392	4392	4392	4392	4392
3	TC KOSOVA E RE	0	0	0	0	0	0	0	0	0	0	0	3135	4703	4703	4703	4495
4	TC E REJA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	<b>TOTALI NGA TERMOCENTRALET (1+2+3+4)</b>	<b>5260</b>	<b>5481</b>	<b>5696</b>	<b>5847</b>	<b>6382</b>	<b>5518</b>	<b>6345</b>	<b>6337</b>	<b>5402</b>	<b>5490</b>	<b>6534</b>	<b>7527</b>	<b>9095</b>	<b>9095</b>	<b>9095</b>	<b>8887</b>
6	HC UJMANI	89	115	75	66	101	82	84	82	82	82	84	84	84	80	82	80
7	HC LUMBARDHI	33	36	22	23	30	26	60	92	92	105	105	105	105	105	105	105
8	HC DIKANCE+BURIMI+RADAVCI	0	14	14	23	22	18	18	23	22	26	26	26	26	26	26	26
9	HC ZHURI	0	0	0	0	0	0	0	0	0	0	0	398	398	398	398	398
10	HC E VOGLA	0	0	0	0	0	0	0	609	654	731	821	1001	1001	1001	1001	1001
11	<b>TOTAL NGA HIDROCENTRALET (6+7+8+9)</b>	<b>121</b>	<b>166</b>	<b>112</b>	<b>112</b>	<b>152</b>	<b>125</b>	<b>162</b>	<b>806</b>	<b>850</b>	<b>944</b>	<b>1036</b>	<b>1614</b>	<b>1614</b>	<b>1610</b>	<b>1612</b>	<b>1610</b>
12	CENTRALET NGA BIOMASA (Mbetjet natyrore)	0	0	0	0	0	0	0	45	60	75	90	105	105	105	105	105
13	CENTRALET NGA ERA	0	3	0	0	0	3	3	181	222	262	282	302	302	320	320	332
14	CENTRALET SOLARE	0	0	0	0	0	0	8	12	14	16	19	21	23	25	27	31
15	<b>Totali biomasa,era,solar (12+13+14)</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>11</b>	<b>239</b>	<b>296</b>	<b>353</b>	<b>391</b>	<b>428</b>	<b>430</b>	<b>450</b>	<b>452</b>	<b>468</b>
16	<b>TOTALI RIPËRTËRISHME (11+15)</b>	<b>121</b>	<b>169</b>	<b>112</b>	<b>112</b>	<b>152</b>	<b>128</b>	<b>173</b>	<b>1045</b>	<b>1146</b>	<b>1297</b>	<b>1426</b>	<b>2041</b>	<b>2043</b>	<b>2060</b>	<b>2064</b>	<b>2078</b>
17																	
18	<b>TOTALI BRUTO PRODHIMI (5+11+15)</b>	<b>5381</b>	<b>5650</b>	<b>5808</b>	<b>5959</b>	<b>6534</b>	<b>5646</b>	<b>6518</b>	<b>7382</b>	<b>6548</b>	<b>6787</b>	<b>7960</b>	<b>9568</b>	<b>11138</b>	<b>11155</b>	<b>11159</b>	<b>10965</b>
19	TOTALI SHPENZIMET VETANAKE TE CENTRALEVE	579	603	605	594	632	586	586	671	583	593	694	756	913	913	913	892
20	<b>TOTALI NETO PRODHIMI (18-19)</b>	<b>4802</b>	<b>5047</b>	<b>5203</b>	<b>5365</b>	<b>5902</b>	<b>5059</b>	<b>5932</b>	<b>6711</b>	<b>5965</b>	<b>6194</b>	<b>7266</b>	<b>8812</b>	<b>10226</b>	<b>10242</b>	<b>10246</b>	<b>10073</b>

Source of data: "Long Term Energy Balance 2015-2024"

## 2.2 Statement of energy savings and primary targets

### 2.2.1 List of strategies

The following list of strategies addresses the reduction of primary energy in the Republic of Kosovo:

- Kosovo Energy Strategy 2009-2018
- National Development Strategy 2016-2021
- Plan for Sustainable Development, IV Pillars, Energy treatment, Policy Analysis/Strategic Planning Office of the Prime Minister's Office
- ERP- Economic Reform Program (2016)
- Kosovo Public Finance Review of Fiscal Policies for a Young Nation 2014, Report No: ACS9351
- Heating Strategy 2011-2018
- Transmission Development Plan 2012 - 2021
- Distribution Development Plan 2010-2014 and 2016-2022
- Central Heating Development Plan - Termokos
- Action Plan of the Economic Vision of Kosovo 2011-2014
- Long Term Energy Balance 2015-2024

### 2.2.2 Assumptions/projections/targets of primary energy savings

Total energy savings for coal production from Plan 2:

$$1.770 \text{ (TPP A)} + 0540 \text{ (TPPB)} = 2.31 \text{ GWh/year} = 0.199 \text{ ktoe/year}$$

Total energy savings for the production of coal from the 3rd Plan:

$$1.911 + 5.394 = 7.315 \text{ GWh/year} = 0.629 \text{ ktoe/year}$$

*Supposedly higher than they had been foreseen by the 2nd Plan, since it is not about rehabilitation of existing excavators but to replace them with new ones*

Total energy savings for electricity production from Plan 2:

$$146 + 264 + 3.2 + 6.96 + 25.6 + 37 + 104 + 155 = 741.76 \text{ GWh/year} = 63.78 \text{ ktoe/year}$$

Total energy savings for the production of electricity from 3rd Plan:

$$231 + 314 + 5.09 + 8,414 + 6.29 + 1.55 + 4.06 + 5.86 + 246 = 822.26 \text{ GWh/year} = 70.70 \text{ ktoe/year}$$

Total targets to increase production capacity of electricity from Plan 2:

$$25 + 25 + 20 = 70 \text{ MW}$$

Total targets to increase production capacity of electricity from 3rd Plan:

$$25 + 25 + 34 = 84 \text{ MW}$$

EE savings targets for the transmission of electricity from Plan 2:

Reduction of losses 0.06% of the overall demand for energy as a result of the implementation of projects until 2016:  $467.67 \text{ ktoe} \times 0.06 \text{ ktoe} \text{ 28.06\%} = 326.34 \text{ GWh}$  respectively.

EE savings targets for the transmission of electricity from the 3rd Plan:

See chapter 2.2.3 - measures in the transmission system, which is explained in detail to a noticeable reduction of energy losses in transmission network from ERO data through capital investment measures until the period to 2015 from 2006 (reduced from 6.54% to 1.98%, as well as new measures in 2018 for the improvement and further expansion of the transmission network.

EE savings targets for electricity distribution from the Plan 2:

New targets to explore medium and long term savings for the sector of electric energy distribution are not known yet because this sector is already a new company, privatized (KEDS).

EE savings targets for the delivery of electricity from the 3rd Plan:

See Chapter 2.2.4 regarding the situation and measures/investments in distribution, which are explained in detail how is the situation with measures that are also expected to be taken to reduce the losses, which are not yet at a satisfactory level despite the privatization of this sector.

RES:

Total generators operated by RES are 7 projects with a capacity of 28.8 MW, of which are 4 hydro generators with capacity of 26.93 MW, two Solar generators with capacity of 0602 MW and the wind it is one project with a capacity of 1.35 MW.

New projections for the development of RES: Total 19 projects with an installed capacity of 119.26 MW, for which the final authorization issued by ERO, and all are in the process of construction.

The interest of investors in the RES sector is quite large, which can be evidenced by the large number of applications in the ERO. Total capacity to reach is 374 MW, for 137.11MW is with preliminary authorization and other applications 236.9 MW are in process. Also in process it is the largest hydropower project, HP in Vërmica, with a capacity of 2 \* 240MW.

Special measures of energy efficiency and targeted projections are included in the following tables for each energy sector during 2016-2018 (tables on EE measures in Chapter 2.2 below).

## *2.3 Measures of primary energy savings*

### *2.3.1 Measures in lignite production sector*

The strategic context - Production of electricity in Kosovo is largely based on thermal power plants operating with coal. Lignite represents the main reserve as a primary source of electricity in the Republic of Kosovo with around 97% of installed capacities and total production of electricity. Production and consumption of coal by months for 2015 is presented in Table 11.

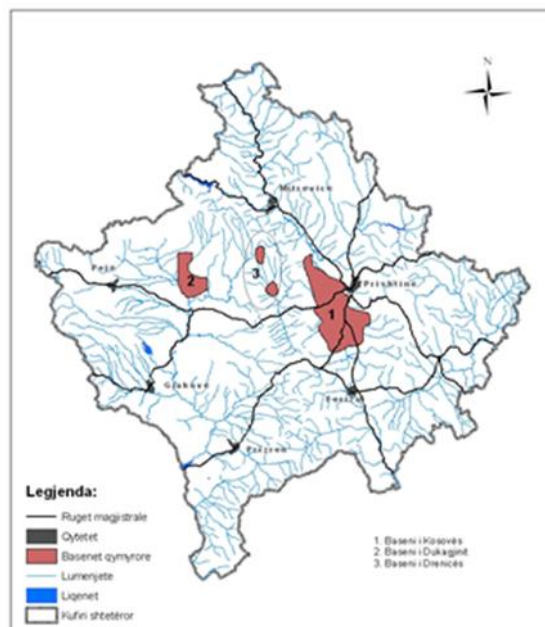


Figure 11 - Lignite basins in Kosovo

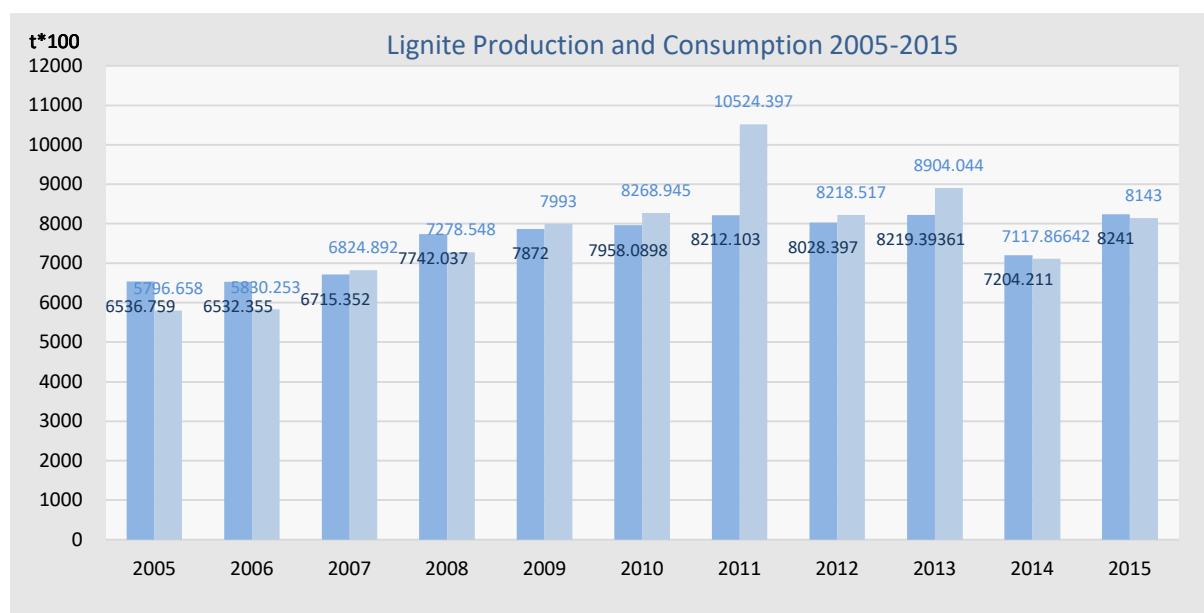
Source: Annual Report of ERO 2015

Lignite Production/Consumption 2014 t*1000	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lignite Production	8,241	771	692	518	504	725	756	585	602	771	692	793	833
Lignite TPP consumption	8,143	695	606	692	586	689	747	636	537	658	685	757	856
Lignite Market Consumption	224	18	18	19	20	19	16	16	19	21	21	17	20

Table 11 - Production and consumption of lignite

Lignite production in 2015 is 8.2 million. tons while consumption is 8.1 mil. tons, and it is higher in comparison with 2014.

In the following figure we can see coal production and consumption in years 2005-2015.



Source: Annual Report of ERO 2015

Figure 12 - Production and consumption of coal in the years 2005-2015

To have a sustainable production of electricity from the power plants, we should have enough coal from the mines. Current mine capacity in Western Southern Sibovc does not guarantee stable supply. The opening of a new coal mine in Sibovc south is urgently needed. In the tables below are presented necessary quantities of coal to meet the needs of existing and new power plants as set forth in this recommended approach.

From the entire amount of coal produced, 97.5% of the total available quantity of coal was consumed for supplying Kosovo power plants, while 2.5% of the market is devoted to meet the needs of the industry, households, agriculture and services.

Year	Waste [mbcm]	Coal [mt]	Waste - coal ratio [bcm/t]
2016	13.590	9.0	1.51 : 1
2017	13.990	9.0	1.55 : 1
2018	14.540	9.0	1.61 : 1
2019	14.760	9.0	1.64 : 1
2020	14.770	9.0	1.64 : 1
2021	14.390	9.0	1.60 : 1
2022	13.740	9.0	1.53 : 1
2023	13.730	9.0	1.53 : 1
2024	0.385	6.0	0.06 : 1
Total	113.895	78	1.41 : 1

Table 12 - Planning of waste removal and coal production from the mine Sibovc South West according to PPX for the years 2016-2018

No.	Title of measure	Target utilization of primary energy/sector	Deadline	Energy savings achieved by 2015, other indicators	Estimated savings of primary energy by 2018 and other indicators
1	Delivery of two excavators for coal	Increasing production capacity	2018-2019	Coal production capacity Q=2x2000 ton/h	Replacement of old Total energy savings expected: 0.623 ktoe

*Table 13 - Measures in the coal production sector - Execution Plan 2013-2015*

### **2.3.2 Measures in the sector of electricity generation**

**The strategic context of generation measures** – In the focus of Energy Strategy for the supply of electricity will be rigorous enforcement of legislation adopted in 2016 for the opening of the electricity market by allowing for the operation of as many suppliers as well to ensure supply if consumers remain without supply for the reasons set out in legislation.

#### **Measures**

1. The reduction of commercial losses to the same degree with the best practices of the SEE countries;
2. Effective market opening that can operate more than one supplier and consumers have a choice of suppliers.

#### **Electricity production**

To reach the goal of sustainability of the electricity sector and thus the security of reliable and uninterrupted electricity, Energy Strategy supports the policy of using local fossil and non-fossil resources, for the production of electricity needed to cover local consumption requirements, overload during the pik hours, in every period of the year and providing reserve power system to the extent of at least 50%.

The use of local fossil fuel resources, for transformation into electricity, will be made taking into consideration the preservation of the environment and efficiency of the use of primary sources, according to the requirements and criteria set forth in the Energy Community and the Stabilization and Association Agreement between Kosovo and the EU for the energy sector. Utilization of energy resources for transformation into electricity must be in harmony with other sectors of the economy of Kosovo (water economy, tourism, etc.).

The use of renewable energy sources for producing electricity from small power plants will be encouraged through support schemes that guarantee the sale under the guaranteed energy prices.

Kosovo is rich in lignite which is very convenient for providing basic overload in one hand, but on the other hand is not flexible optimization of the power system, to ensure the sustainability of the power system we must support the use of storage pumps, respectively reversible hydropower as a convenient mechanism for optimizing power systems similar to Kosovo's power system. Reversible hydropower applications are found not only in countries that have problems optimizing the system as it is the case of Kosovo, but also in countries that have suitable optimization of natural resources.

With all the recommended policies for building production capacities to ensure self-sustainability of the electricity system, uninterrupted and adequate supply that guarantees good regulated reserves, these should be accompanied by policies of market integration of Kosovo's energy markets with countries of the region starting with the Republic of Albania as one of the most complementary markets.



Based on the analysis of the market union of Kosovo electricity market with market of the Republic of Albania, creates an optimal rational use of production capacities. This merge meets the needs of the consumer markets and regulatory needs of both systems for a period of at least 15 years.

About 97% of installed capacities and electricity generation in Kosovo is realized by two coal power plants KEK, Kosovo A (5 units, 2 of which are out of operation) and Kosovo B (2 units). The overall capacity of the units generating assets would be sufficient to cover the demand of Kosovo for electricity if they were fully available, but due to the age, the net capacity of their generation is significantly reduced. The rest of the energy produced is from HP Ujmani, HP Lumbardhi and distribution generators, with about 3% of the overall capacity of Kosovo. HP Lumbardhi until September 2015 has been connected in the distribution network, and from this period is connected to the transmission network. Over recent years there is an increase in the installed generation capacity from renewable sources. Soon it is expected to put into operation some small generators as private investment within the RES.

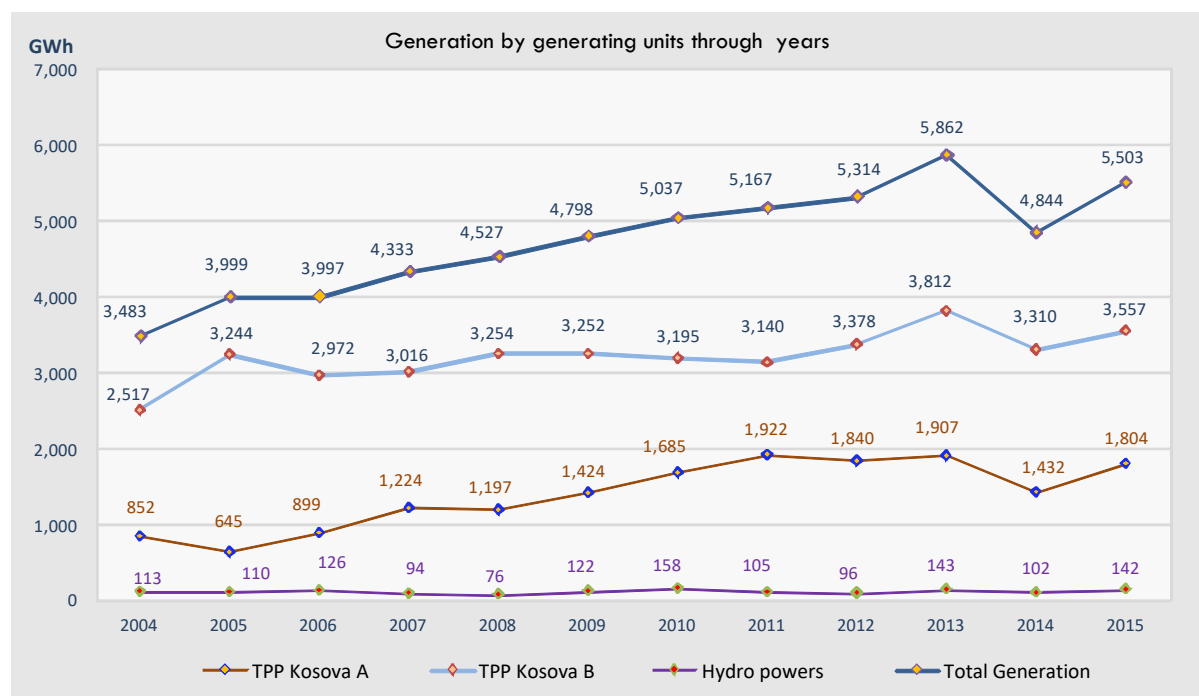
Coal mining assets, production and distribution of electricity are operated by KEK, public enterprise. Power supply is realized mainly from production from power plants Kosova A and Kosova B, and to a lesser extent by hydropower (Ujmani, Lumbardhi, Radaci, Dikanci and Burimi).

The table below presents the installed generation capacity by type and starting year of their operation.

Table 14 - Existing electro-thermal capacities in Kosovo

no.	Generation Units	Starting year	Installed power		Current situation of power	
			Generator	Netto production	Generator	Netto production
			MW	MW	MW	MW
1	PP-A1	1962	65	58	Not working since 2006 - outdated	
	PP -A2	1964	125	110	Not working since 2002 - outdated	
	PP -A3	1970	200	175	135-165	118-145
	PP -A4	1971	200	175	135-165	118-145
	PP -A5	1975	210	180	135-165	118-148
2	PP -B1	1983	339	310	290-305	263-276
	PP -B2	194	339	310	290-305	263-276
3	HP- Radavci G1	1934/2010	0.475/0.5	0.45	0.5	0.45
	HP - Radavci G2	1934/2010	0.475/0.5	0.45	0.5	0.45
4	HP Burimi-Istogu G1	1948/2011	0.422/0.475	0.427	0.475	0.427
	HP Burimi-Istogu G2	1948/2011	0.422/0.475	1.427	0.475	0.427
5	HP - Lumbardhi G1	1957/2006	5.05	4.04	5.05	4.04
	HP - Lumbardhi G2	1957/2007	5.05	4.04	5.05	4.04
6	HP - Dikanci	1967/2010	0.95/0.55	0.5	0.55	0.5
	HP - Dikanci	1967/2010	0.95/0.55	0.5	0.55	0.5
	HP -Dikanci	March/2013	2.921	2.34	2.921	2.34
7	HP - Ujmani G1	1981	19.5	17.5	17.5	16
	HP Ujmani G2	1981	19.5	17.5	17.5	16
8	HP Brodi G1	2015	3.2	2.8	3.2	2.8
	HP Brodi G2	2015	3.2	2.8	3.2	2.8
9	EGU Belaja G1	2015	5.88	5.29	5.88	5.29
	EGU Belaja G2	2015	3.11	2.79	3.11	2.79
10	EGU Deçani G1	2015	11.24	10.11	11.24	10.11
	EGU Deçani G1	2015	5.47	4.92	5.47	4.92
11	HP Restelica G1	2015	1.32	1.2	1.32	1.2
	HP Restelica G2	2015	1.32	1.2	1.32	1.2
12	HP Hidroline Albaniku III – G1	2015	3.46	3.147	3.46	3.147
13	HP Hidroline Albaniku III – G2	2015	1.17	1.068	1.17	1.068
14	Air generator (WP) – G1	2010	0.495	0.45	0.495	0.45
	Air generator (WP) – G2	2010	0.495	0.45	0.459	0.45
	Air generator (WP)- G3	2010	0.495	0.45	0.495	0.45
15	Solar panel	2015	0.112	1.102	0.112	0.102

The only important plant outside KEK is HPP Ujmani/Gazivoda/ (2 X 17.5 MW = 35 MW), which is administered by the Public Company Ibër - Lepenc. Electricity production in 2015 was 5.503 GWh, while in 2014 was 4,894 GWh, which means that production in 2015 is about 12.44% higher than production in 2014.



Source: Annual Report of ERO 2015

Figure 13 - Production by generating units over years

## Measures

1. The rehabilitation of two units in PP Kosovo B according to a good dynamic analysis that impacts the least in power cuts and the heating supply of Pristina. This measure should be implemented at the latest by October 2019.
2. Construction of TPP "Kosova e Re" (New Kosovo) with 450 MW net capacity by ensuring the co-generation system for at least 10% of its net capacity;
3. Reconstruction of PP Kosovo A, taking into consideration the common electricity market with the Republic of Albania;
4. Construction of HP Zhur for purposes of regulating power system according to the requirements of ENTSO;
5. Supporting reversible hydropower from the free private initiatives
6. Construction of small hydro capacity by utilizing the full capacity of identified from 2009 studies.
7. Support the construction of wind power plants on the basis of new models of EU support schemes.
8. Union of Kosovo electricity market with the electricity market of the Republic of Albania to cope with mid-term crises and create the conditions for placing energy in appropriate conditions for the two systems in the future after building new capacities.

Table 15 - Measures in electricity generation

no.	Title of measure	Target utilization of primary energy/sector	Deadline	Energy savings achieved in 2016/2017 other indicators	Estimated savings of primary energy in PP A -2016 and the PP B - 2017 and other indicators
1	PP Kosovo A & PP Kosovo B 1. Capital repair with replacement of some equipment in mills in PP B 2. Improving the quality of coal from mines to PP A & B 3. Maintenance of heating surfaces clean from strata of ash in the boiler pipes	Reduction of specific coal costs: PP A from 1.63 to 1.52 ton/MWh and PP B from 1.32 to 1.22 ton/MWh	PP A & B 2015-2017	PP A = 0,11 ton/MWh,  PP A with annual planning 2100000 MWh/year in generator  PP B = 0.10 ton/MWh  PP B with annual planning 3800000 MWh/year in generator	Forecast of coal savings:  PP A=2100000 MWh/year x 0.11 ton/MWh=231000 ton/year  PP B=3800000 MWh/year x 0.10 ton/MWh=380000 ton/year  Savings in EE: PP A=231000 ton/year: 1.52 ton/MWh=151974 MWh/year=152 GWh/year  PP B=380000 ton/year : 1.22 ton/MWh=311475 MWh/year=311 GWh/year
2	PP Kosovo A Reducing oil consumption due to the reduction in minimum of unplanned unit stops by increasing technical readiness at the highest level possible	Reducing specific oil costs in PP A from 1.7 to 1.1 lit/MWh	2016-2018	0,6 lit/MWh	1509917 liter/year=1253 ton/ year Specific oil expenditure 0.2882 lit/kWh=0.247 ton/MWh  1258/(0.247x1000)  Savings =5.09 GWh/year
3	PP Kosovo B Reducing consumption of fuel oil to a minimum unplanned stops of unit by in increasing technical readiness at the highest possible level	Reduction of specific fuel oil costs in PP B from 1.6 to 1.1 kg/MWh	2015-2016	0.5 kg/MWh	2069730 kg/year=2069 ton/ year Specific fuel oil expenditure 0.2459 ton/MWh  2069/(0.2459x1000)  Savings = 8.414 GWh/year
4	PP Kosovo A Rehabilitation of equipment (mills, coal dossers, heaters, air grill and Crutcher, soot blowers, gas supply, armature for ventilation, drainage, supply, boiler seal etc.) establishing regular technical conditions by strengthening preventive measures and planned repairs	Reducing the personal costs of electricity in PP A from 13.5 % to 11%	2015-2016	2.5 %	Savings: 6.29 GWh/year

5	TC Kosova B Rehabilitation of equipment (mills, coal dosers, heaters, air grill and Crutcher, soot blowers, gas supply, armature for ventilation, drainage, supply, boiler seal etc.) establishing regular technical conditions by strengthening preventive measures and planned repairs	Reducing the personal costs of electricity in PP B from 9.8 to 9.4 %	2015-2016	0.4 %	Savings: 1.55 GWh/year
6	PP Kosovo A & PP Kosovo B Decrease unplanned stops of units in minimum, increasing technical readiness at the highest possible level	Decrease unplanned stops of units in PP A & B for 30 %	2015-2016	Annual planned stops per unit: PP A – 6 stops/year PP B – 11 stops/year	Reduction for 30%: PP A – 13 stops/year PP B – 16 stops/year  Savings: PP A – 4.06 GWh/year PP B – 5.86 GWh/year
7	PP Kosovo A unit A4-2014/2015 Capital repair of unit is done on	Capital repair of turbine and generator, SM  Boiler repair	Conducted in 2014/2015	Before repair:  Unit power 130 MW	After capital repair: Unit power 155 MW  Increased installed capacity for 25 MW
8	PP Kosovo A unit A5-2014/2015 Capital repair of unit is done on	Capital repair of turbine and generator, SM Partial boiler repair	Conducted in 2014/2015	Before repair: Unit power 130 MW	After capital repair: Unit power 155 MW Increased capacity for 25 MW
9	PP Kosovo B – Revitalization of units  PPB1 – 2019 PPB2 - 2018	1. Increase the term of service of the unit 2. Increase the use of unit 3. Increase the availability of unit 4. Reduction of specific costs of coal, and Demi Deka water, chemicals and own expenses 5. Eliminating the bottlenecks 6. Increase of industrial safety	Revitalization of  PP B1-2018  PP B2 - 2019	Before revitalization: 1. The service term of units: PP B1 until 2024, PP B2 until 2024 2. The power of unit 305 MW. 3. Specific steam spendings 3:05 tons/MWh 4. Specific coal spending 1:22 tons/MWh 5. Own Electricity spending 9.4%	After revitalization:  1. The deadline for service after revitalization: PP B1 until 2040 PP B2 until 2041 2. 339-345 MW unit power 3. Specific costs of steam 2.8 tons/ MWh 4. Specific coal spending 1:21 tons/ MWh 5. Own electricity costs 8.6%  Increase in power for 34 MW / per unit Increase of Energy 246 GWh / per unit

### 2.3.3 Measures in the field of electricity transmission

The strategic context - Transmission network of Kosovo is part of a synchronous network area of Continental Europe. Kosovo's transmission network represents an important regional corridor that enables considerable transit flows of electricity from north to south Eastern Europe. It is strongly interconnected with neighboring systems through 400 kV and 220 kV. Construction of 400 kV cross-border line with Albania has contributed to the strengthening of horizontal network transmission capacity, increasing the exchanges of the two countries and regional transactions. Many investments in infrastructure projects and support to the transmission system completed in the past decade have resulted in the increase of essential transmission capacity, safety, reliability of operation, the quality of power supply and the reduction of power losses. Current developments and planned to enable support of new generating capacity, sources of renewable energy market development and its integration into the European market.

Further development of the transmission system is needed and is based in the following factors:

- Maintenance the process of basic functions of the transmission system to support the security of supply.
- Supporting the development of demand related to economic development
- Accommodating the new thermal generator capacity/hydro and renewables
- Facilitating common market with Albania and beyond
- Provide regulatory reserves (primary, secondary and tertiary) for balancing the system in real time.
- Full membership in ENTSO (During the period 2013-2015 there has been significant investment in transmission of electricity. Transmission capacity is doubled compared with the current generating capacity. It also has the N-1 security system. In 2015 it was completed construction of a 400kV line between Kosovo and Albania. During 2016 it is expected to put in function all lines that include two states).
- Enabling full TSO to operate as an independent regulatory area that will be the focus of policies and measures for the next decade

#### Measures:

1. Certification of the TSO;
2. TSO membership in ENTSO;
3. The feasibility study for construction of new interconnection capacity based on market demand and wider regional electricity;

**Investments** - the transmission system can be categorized as:

#### Main projects started in previous years that were completed in 2015:

- o Construction of 400 kV line Kosovo - Albania;
- o Secondary Control (LFC) KOSTT - OST;
- o Reallocation of Line 110 kV, no. 1806 SS Gjakova 1 - SS Gjakova 2 & Replacement of HV 110 kV in SS Gjakova 1;
- o Revitalization of 110 kV Substation, the 35 kV - SS Gjakova 1;
- o Supply and installation of Relay Protection of Autotransformers in SS Prizren 2.

#### The projects started in previous years that continued in 2015 and beyond

- o Rehabilitation of high voltage equipment 110 kV SS 110/10 (20) kV Prizren 3;
- o Rehabilitation of HV equipment in SS Gjakova 2;
- o Installation of metering groups according to the new boundary between KOSTT and DSO;
- o Installation of transformer TR2 in SS 110/10 (20) kV Skenderaj;
- o Installation of transformer TR3 in SS 110/10 (20) kV Pristina 2;
- o Installation of metering groups in the new boundary between KOSTT and KEDS/DSO.

#### Projects started in 2015 and continue further:

- o Installation of transformer TR2 in SS 110/10 (20) kV - Berivojcë and Year;
- o Improvement of Transmission Network Phase IV & V; LOT 1: Substations;

- o Improvement of Transmission Network Phase IV & V; LOT 2: Power transformers;
- o Improvement of Transmission Network Phase IV & V; LOT 3: transmission lines;
- o Improvement of Transmission Network Phase IV & V; LOT 4: Rehabilitation of 19 substations;
- o Inclusion of all changes in existing substations and incorporation of new substations in SCADA/EMS in the Dispatch Center and Emergency Dispatch Center.

Effects of measures: Capital projects for the period 2016-2018 that effect on reducing losses and increasing security.

Table 16 - Estimated effects of primary energy and other indicators

No.	Title of measure	Deadline	Assessed effects of primary energy and other indicators
1.	New 110 kV line SS Peja 3 SS Peja 1, and revitalization of SS Peja 1	2016	Elimination of radial supply. N-1 criterion. Increased safety of operation of the transmission network
2.	Rehabilitation of HV equipment in Sub Station (NS) 110/10 kV - Gjakova 2	2016	Increased safety and reliability of supply
3.	Rehabilitation of HV equipment in SS 110/10 kV - Prizreni 3	2016	Increased safety and reliability of supply
4.	Supply and installation of TR3, 40 MVA in SS Prishtina 2	2016	Increasing the capacity of transformation
5.	installation of TR2 in SS 110/10 kV - Berivojce and SS Viti	2016	Increasing the capacity of transformation
6.	AT2-300 MVA in SS PEJA3 and SS FERIZAJ 2	2016	Increasing the capacity of transformation and completion of security criteria N-1
7.	Revitalization of SS 110kV, on 35 kV (Gjilan1, Ferizaj 1,)	2017	Increased safety and reliability of supply
8.	Installation of metering groups in the new boundary between KOSTT and KEDS/DSO	2017	Increased accuracy in measurement
9.	Second 40MVA transformes in SS Skenderaj and SS Burim	2017	Construction of the line enables the fulfillment of N-1. Criteria. Revitalization of SS Peja 1 provides for increased security and reliability of system operation.
10.	Revitalization o 110 kV line: L126/2 SS Peja 2- SS Deçan	2017	Increasing the transmission capacity of the line from 83 MVA to 114 MVA with the aim of reducing power losses, improving the N-1 security criteria in 110 kV substation ring Peja3 Peja1-Peja2-Decan -Gjakova1..
11.	Construction of substations: [110/10(20) kV - Prishtina 6 dhe 110 kV HIS in SS Prishtina 4], [110/10(20) kV - Mitrovica 2], [110/10(20) kV - SS Theranda] , [220/10(20) kV - Drenasi 2 and [110/10(20) kV - Fushë Kosova]	2018	Increased safety and reliability of supply
12.	New 110 kV line SS Rahoveci – SS Theranda	2018	Increased safety and reliability of supply in Skenderaj. Optimization of the maintenance process of the substation. Creation of transformation reserves.
13.	40MVA Transformers 2x40 MVA(in SS Prishtina 6, 2x40 MVA in SS Fushe Kosova, 2x40 MVA in SS Mitrovica 2 and 2x40 MVA in SS Drenasi 2 )	2018	Increasing the capacity of transformation

Total demand of electricity in 2015 was 5.570 GWh, an increase of 17.3% compared with 2014, when there were 5.399 GWh. Compared with 2015 forecast electricity demand balance is 4.83% lower.

Table 17 represent total realized demand in 2015 and compared losses with Power Balance 2015.



2015	Gross demand Realized	Gross demand Balance	Real/Bal	Transmission losses realization		Transmission losses Balance	
	MWh	MWh	%	MWh	%	MWh	%
January	599,251	638,862	93.80	12,011	2.00	11,654	1.82
February	510,831	560,096	91.20	10,374	2.03	10,072	1.80
March	534,387	551,466	96.90	10,640	1.99	10,202	1.85
April	460,435	473,011	97.34	8,414	1.83	8,235	1.74
May	391,092	444,725	87.94	7,664	1.96	8,669	1.95
June	367,233	389,363	94.32	7,869	2.14	9,471	2.43
July	400,671	413,297	96.95	7,601	1.90	9,524	2.30
August	393,007	408,012	96.32	6,900	1.76	7,412	1.82
September	381,364	407,875	93.50	6,686	1.75	8,277	2.03
October	444,831	438,583	101.42	8,610	1.94	9,726	2.22
November	486,809	487,263	99.91	9,957	2.05	9,546	1.96
December	600,199	640,300	93.74	13,286	2.21	11,550	1.80
<b>Total</b>	<b>5,570,110</b>	<b>5,852,853</b>	<b>95.17</b>	<b>110,012</b>	<b>1.98</b>	<b>114,338</b>	<b>1.95</b>

Source: Annual Report of ERO 2015

Table 17 - General requirements and transmission losses in 2015

Losses in the transmission system in Kosovo in recent years are at an acceptable level thanks to investments made by KOSTT. Transmission losses also include losses caused by transit.

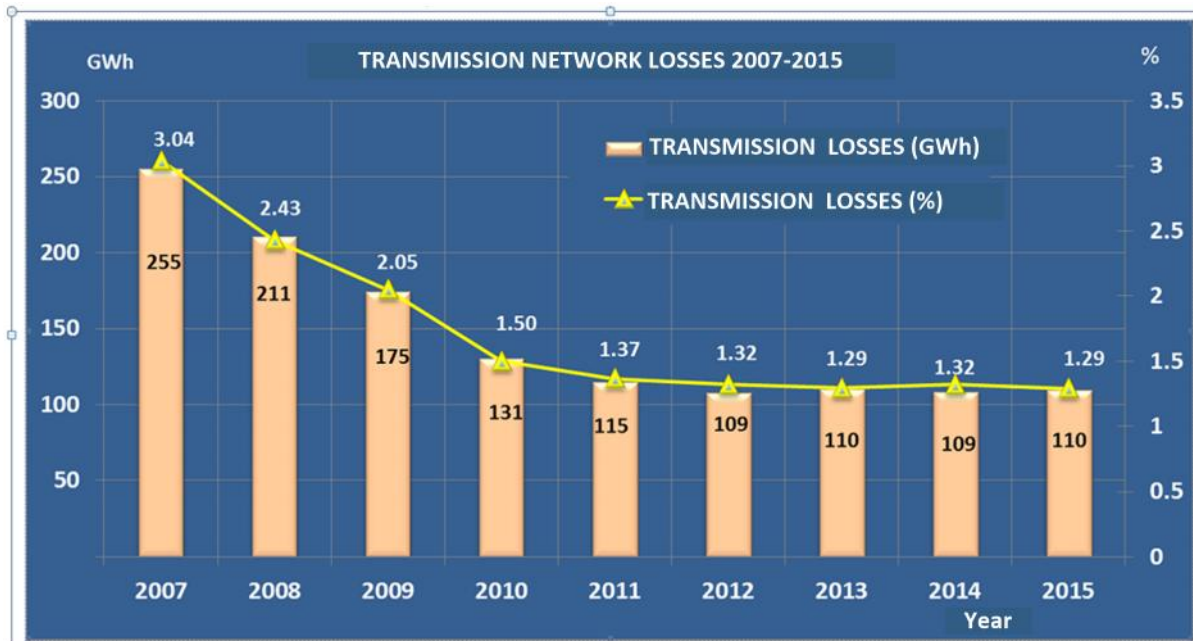


Figure 14 - Transmission losses presented in MWh (column) and % (line)

Losses in the transmission network in Kosovo are approximately at the same level of losses in transmission networks in the region and Europe, even better than in some of the neighboring countries. Losses in the transmission shown in Figure 5.13 are shown as a percentage of domestic demand, which is an indicator of the level of losses compared with consumption. But to estimate the transmission losses on the network loading we should calculate values of the total energy inserted in the transmission including transit and own generators expenses taken from the transmission network. Transmission losses in proportion to inserted transmission power are about 1:31%. This transmission loads the network, causes loss of energy and sometimes bottlenecks in the network.

### 2.3.4 Measures in the sector of electricity distribution

**The strategic context** - the main strategic goals in terms of the distribution system of power is to increase the efficiency of the system, reducing technical losses to an extent comparable with the countries of the region and enabling the Distribution System Operator (DSO) to provide services under the principles of open competitive market, preventing discrimination against parties who seek and use the service of the DSO.

In May 2013, distribution and supply system of electricity has passed into private ownership. At the end of 2015 it completed the process of legal unbundling of the DSO from the supply activity. Distribution system continues to suffer from the burden of technical losses that continues to be over 15%. Public supplier also suffers from the problem of commercial losses. Despite significant improvements in recent years, technical and commercial losses are 31.8%. Inability to control supply and distribution system in several municipalities in northern Kosovo has the consequences of failing to control about 5% of the total amount of electricity which is uploaded in distribution system.

DSO/PES is making continuous efforts to reduce distribution losses, especially commercial ones, and their implementation requires less investment. Since 2006 when the commercial losses were 30.21%, they are reduced to 16.38% in 2015, which is a significant reduction, for while technical losses have dropped from 18.15% in 2006 to 15.45% in 2015. One more important factor in promoting the loss reduction targets are set by ERO for losses directly reflected in incomes of DSO/PES.

Below are the data for some of the assets of the Distribution System Operator:

Transformation (kV/kV)	Owner	Number of sub-stations	Number of Transformers	Demand (MVA)
35/10	KEDS	44	90	632
10(20)/0.4	KEDS	2,158	2,251	780
10/0.4	KEDS	2,865	2,865	868
6/0.4	KEDS	65	65	9

Table 18 – KEDS assets

Tension (kV)	Owner	Air network (km)	Cable network (km)	Total (km)
35 kV	KEDS	361	12	373
10(20) kV	KEDS	1,146	393	1,539
10 kV	KEDS	4,584	917	5,501
6 kV	KEDS	42	8	50
3 kV	KEDS	3.5	1.0	4.5
0.4 kV	KEDS	16,598	2,017	18,615

Table 19 - Length of the distribution network

#### Measures

1. Replacing the old network and its expansion according to projected development demands;
2. Reduction of technical losses of at least 1% per year until 2022;
3. The establishment of the DSO control on the entire territory of Kosovo;
4. Feasibility Study for installment of intelligent metering;
5. If deemed feasible, deployment of smart meters to become dynamic plan approved by ERO

<sup>4</sup> KESCO

In May 2013 the distribution system and the power supply has passed into private ownership. At the end of 2014 it was completed the process of legal unbundling of the DSO from the supply activity. Despite the presence of problems in the distribution system and electricity supply in recent years there have been continuous improvements.

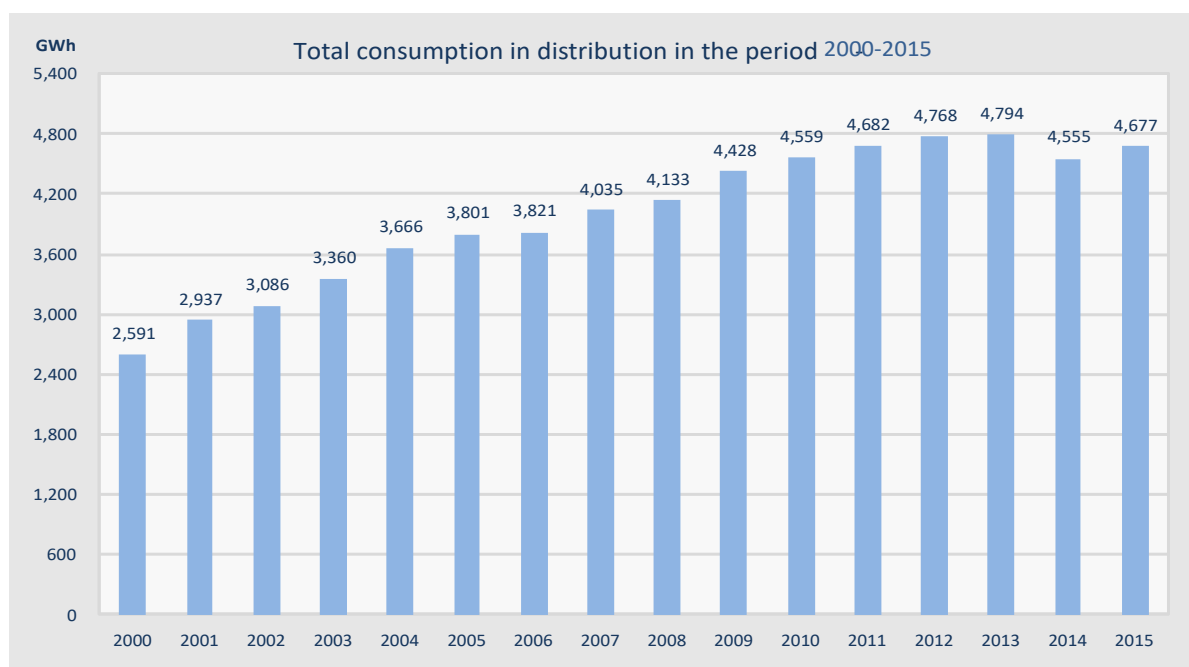
In the past three years have been developed investments in electricity distribution network (about 20 million euro per year). It is planned to continue with this dynamic throughout the period of ten years. Technical losses have been decreasing, although not very successfully, but the results of investment in network are expected to provide its effects in the coming years.

The most significant improvements in the last five years were observed in the reduction of commercial losses.

Problems in the distribution network and system power supply, along with economic growth and welfare of the citizens, demand for electricity has been increasing. Infrastructure capacity of electricity distribution system could not follow to the proper degree this increase due to low investment in the network. As a result of the distribution system it is constantly overloaded, especially during the winter season.

Major investments in the distribution system, which is partially a continuation of projects from the previous year, are:

- o Strengthening of 10 kV and 0.4 kV network in all districts;
- o Continue with changing of meters;
- o Increased capacity at substations 35/10 (20) kV Pirana, Xërxa, Mazgit, Zhur, Shtime and Gjakova I;
- o Supply of equipment for curves for voltage level 35kV and 10kV to 110kV and 35kV substations;
- o Increasing the capacity of overloaded lines of voltage level 35 kV, 10 kV;
- o Increasing the capacity of substations 10 / 0.4 kV and 0.4 kV overloaded lines;
- o Elimination/replacement of overhead lines for public safety;
- o Supply with transformers 10 (20) /0.4 kV;
- o Various Machines for detection and maintenance, and various means of transport;
- o Management software to increase the quality of projects;
- o Development of the master plan of distribution.



Source: Annual Report of ERO 2015

Figure 15 - The total consumption in the distribution system from 2000 to 2015

Below is the graph with data for technical, commercial and general losses from 2006 to 2015.

The cost of energy loss is quite high and is covered by the tariff customers are paying for electricity. KEDS (former KEK) is making continuous efforts to reduce distribution losses, especially commercial ones, and their implementation requires less investment. Since 2006 when the commercial losses were 30.21%, they are reduced to 16.38% in 2015, which is a significant reduction, while technical losses have dropped from 18.15% in 2006 to 15.45% in 2015.

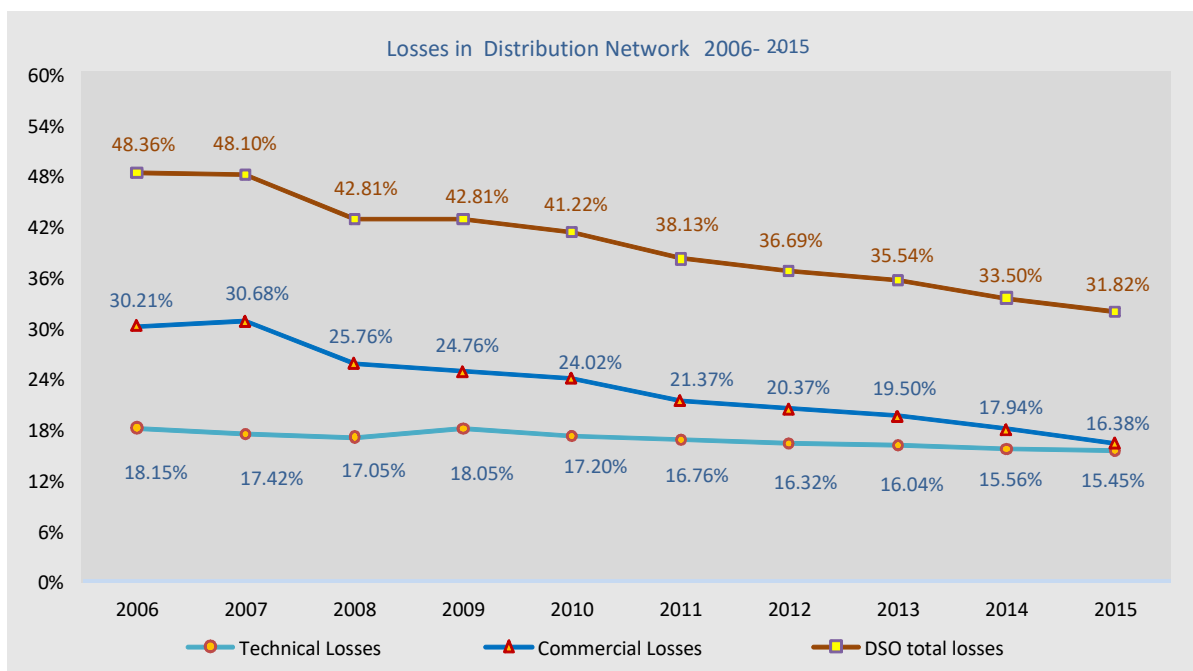


Figure 16 - Technical and commercial losses in the distribution for the period 2006-2015<sup>4</sup>

The problem of security of electricity supply has evolved as a result of lower billing for a long period since the war until the privatization of the distribution and supply of electricity. The consequence of this problem is the lack of investment in time due to lack of own financial system and supply network. This problem has continuously followed the distribution and supply sector as a result of the general failure of the state system to assist the Company if the system cannot set the control in the entire territory of Kosovo, whether to collect debts or punish perpetrators as a condition for a positive business and sustainable investment. Recent years, as seen from the indicators presented in the chart above, there are improvements but there is still a lot of improvement needed in terms of reduction of technical and commercial losses and placement under control all distribution and supply system.

Supplier in charge of public service obligations has managed to continuously improve performance in terms of collection. The collection to bills in distribution for 2015 was 94.41%, while the total when calculating the customers connected in transmission to which the collection is 100%, the total collection reaches 95.17%.

<sup>4</sup> Source of data: ERO Annual reports

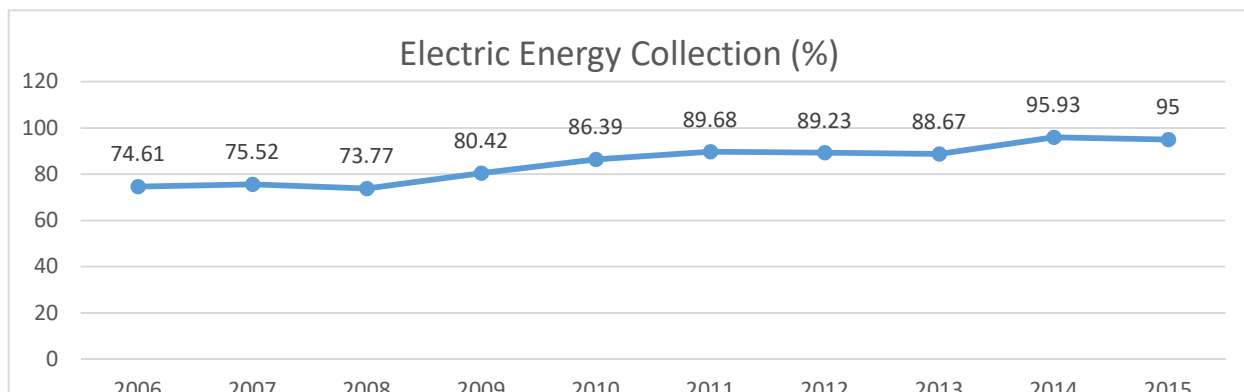


Figure 17 - Evolution of collection of electricity bill

### 2.3.5 Measures in the heating sector

**The strategic context - Thermal energy system** the same problems as the power system also followed thermal energy system in cities where there was central heating infrastructure. Only in recent years we have improved the situation in the district heating system in Pristina. Non proper functioning of heating systems was due to the unreasonable aggravation of power system due to the lack of heat supply to customers connected to the system has forced them to find solutions to meet their needs of electrical energy.

For years, the existing system of central heating in the four municipalities of Kosovo, has suffered from lack of proper investment to improve and expand its network.

**Legislative Developments** - In December 2015, the Assembly adopted the Law no. 05/L-052 for Thermal Energy, which repeals the law for heating No. 03/116 of 2008. This law establishes the conditions and the most advanced standards for the activities of production, distribution and supply of thermal energy through central thermal energy systems. It also specifies the organization of the thermal energy sector respectively thermal energy market, network access, and establishes the rights and obligations of entities operating in this sector.

#### Public Entity City Heating – Termokos Pristina

Until 2014, Termokos as a single generating unit of thermal energy in Kosovo's capital, it has used two fuel oil boilers with power 2x58MW. The high cost of fuel, high water losses (power) in distribution network and no technical viability of generating units, were the main factors that have determined poor services for customers.

In November 2014, Termokos started supplying customers with thermal energy obtained through co-generation system. This system is using thermal power steam from turbines in units B1 and B2 of Power Plant Kosovo B. Thermal power available from this system is 2x140MW thermal. But 2x70MW exchanger capacity in extraction power station (HES) and the carrying capacity of thermos conductor in Kosovo B - Termokos, DN600 (160 MW), currently limits the possibility of using this energy with thermal power up to 140MW.

This project is 37 million euro investment, and is funded through donations and soft loans (the German Government and KfW, EU, the Swedish Government, the Government of Luxembourg, the Government of Kosovo and the Municipality of Prishtina).

The cogeneration project has influenced for Termokos to become a stable technical and financial company, gaining confidence of its customers. At the same time, very important impact of this project is to protect the environment and reduce greenhouse gas emissions in the atmosphere.

Currently, in the central heating system are connected Termokos consumers, the installed capacity of which is about 110 MW thermal.

## Thermofication in other urban areas of Kosovo

There were also positive developments in the City Heating of Gjakova. After completion of the feasibility study for heating, we have a commitment to support investments in energy and heat production as well as improving the existing network and expanding it.

Ministry of Economic Development in 2012 has funded a study on urban thermofication of Peja, Prizren, Gjilan and Ferizaj<sup>5</sup>. This study concludes that they are profitable investments in building systems for density areas of thermal energy consumption. According to the results of this study, installed thermal capacity is: Peja = 53.75 MW, Prizren = 95mW, Gjilani = 47.5MW, Ferizaji = 58.5MW.

The government, in its program 2015-2018 envisages that action should be taken for thermofication of large cities. Thermofication of major cities of Kosovo is in the list of priority projects of the National Investment Council approved by the Government<sup>6</sup>. Investments in thermofication according to this list have a value of 150 million euro.

Above mentioned study of World Bank (2007) has recommended expanding central heating (CH) market and the government supports the development of CH systems.

Existing CH system supplies parts of cities and buildings with the densest population, such as hospitals, schools and administration buildings.

Enterprise (City)	Installed capacity [MW <sub>t</sub> ]	Operational Capacity [MW <sub>t</sub> ]	Distribution Network	
			Network Lengh [km]	Subst. No.
DH TERMOKOS (Prishtinë)	2 x 58 = 116	2 x 58 = 116		
	2 x 7 = 14	2 x 7 = 14	36.50	347
	2 x 0,81 = 1.62	0		(324 active)
	1 x 4 = 4	1 x 4 = 4		
	2 x 70 = 140 [Cogeneration]	2 x 70 = 140		
Sub-total	275.62	274.00	36.50	347
DH GJAKOVA (Gjakovë)	1 x 20 = 20	1 x 20 = 20	27.00	300
	1 x 18.6 = 18.60			(251 active)
Sub-total	38.60	20.00	27.00	300
Total	314.22	294.00	63.50	647

Source: Annual Report of ERO 2015

Table 20 - Technical data of central heating systems

### 2.3.6 The performance of district heating enterprises

In season 2014/2015 and 2015/2016 CH Termokos has marked a substantial improvement of the production and supply of thermal energy as a result of the implementation of the cogeneration project. **Production of thermal energy** in season 2014/2015, total gross production of thermal energy has been MWhth 159.264, while total net production was 154.669 MWhth. While in season 2015/2016 total gross production was MWhth 198.696 and 192.279 MWhth total net productions.

<sup>5</sup>Study for central heating in Peja, Prizren, Gjilan and Ferizaj, financed by the MED in 2012

<sup>6</sup> SINGLE PROJECT PIPELINE OF INFRASTRUCTURAL INVESTMENTS (page 303-308)

**Production of thermal energy from cogeneration - PP Kosovo B:** In season 2014/2015, namely the period from 28 November, 2014 until 23 April, 2015, the amount of thermal energy extracted from cogeneration in Kosovo B (Unit B1) was 153.496 MWhth. While the amount of energy received in thermal heat exchange station in CH Termokos was 149.001 MWhth - the difference between these values actually represents losses in the transport network (also referred to as "net generation" of thermal energy). In season 2015/2016 thermal energy extracted from cogeneration was 198.696 MWhth while the amount received in CH Termokos was 195.269 MWhth.

**Heat Supply -** The following table presents summarized data for production, supply and total losses in the system for the last two heating seasons of CH Termokos.

DH Termokos	Bruto thermal production	Neto thermal production	Losses in transport and production	Losses	Thermal energy in distribution	Consumers supply	Losses in distribution	Losses in distribution
	(MWh <sub>t</sub> )	(MWh <sub>t</sub> )	(MWh <sub>t</sub> )	(%)	(MWh <sub>t</sub> )	(MWh <sub>t</sub> )	(MWh <sub>t</sub> )	(%)
2014/2015	159.264	154.669	4.565	2,89	154.669	127.890,00	26.779	17,31
2015/2016	198.696	192.279	6.417	3,23	192.279	164.969	27.310	14,20

*Table 21 - Energy performance of the CH Termokos - season 2014/'15*

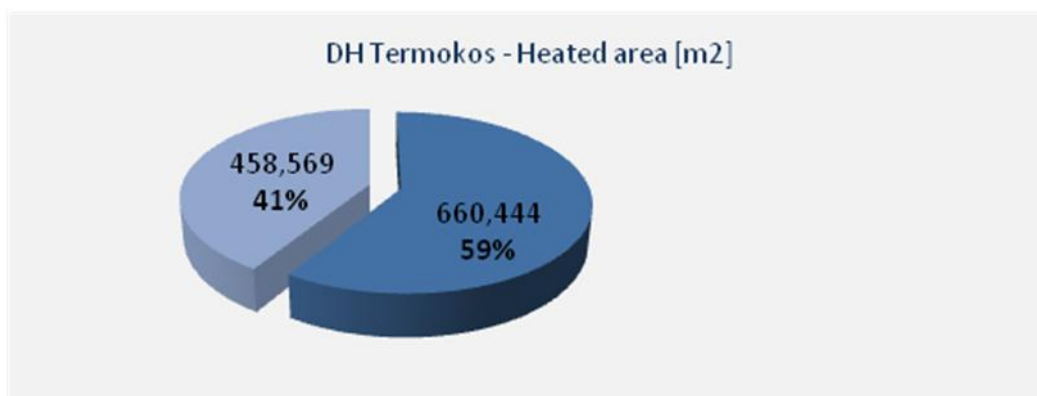
As a result of the functioning of the co-generation project that has enabled the production of thermal energy from the extraction of steam from PP Kosova B, it has been an improvement in the quantity and quality of thermal energy supply.

Supplying consumers with thermal energy (heating), in season 2014/2015 is estimated to be 127.890 MWhth. The supply is quite satisfactory and has nearly met planning, moreover when we considering the fact that the season 2014/2015 started late (on 28 November, 2014) due to postponement of work of equipment installed in cogeneration units of Kosovo B. In season 2015/2016 the supply has improved significantly and it is 164.969 MWhth.

- Losses in the distribution network of thermal energy:

Losses in primary distribution network are normally determined by the measurement of thermal energy at the entrance of the distribution network and the supply of thermal energy to consume substations. However, in the absence of reliable measurement of the amount of supply of thermal energy (substation), for the calculation of supply we are making some approximations using primarily parameters like: specific requirement for heat capacity (W/m<sup>2</sup>) and hours of full capacity load, respectively specific consumption kWh/m<sup>2</sup>. The estimated value of consumption is 127.890 MWhth. By subtracting this value is the amount of energy consumption by thermal inputs in the distribution network (154.669 MWhth) shows that quantitative losses in the distribution network for the season 2014/2015 are 26.779 MWhth, which in percentage is 17:31%. In the season 2015/2016, according to data from the company it was marked an improvement in the level of quantitative losses. Losses in distribution network are 27.310 MWh which represents the level of losses from 14:20%.

**Heating surface -** total heating area for customers in season 2014/2015 was 1,119,013 m<sup>2</sup>. Group of domestic (household) heating surface is 660.444 m<sup>2</sup> - 59% of the total; the group of commercial and institutional customers has 458.569 m<sup>2</sup> surface heating - 41% of the total;



*Source: Annual Report of ERO 2015*

*Figure 18 - The participation of consumer groups in the total heating area - CH Termokos, season 2014/2015*

Projects in the following period 2017-2020 are related to:

- Rehabilitation of existing network aiming to reduce technical losses in the distribution network of heating from 18% in 2015 to be at the level of 10-12% at the regional level.
- Expansion of the network in areas where there are existing network/main pipeline (connection of buildings that are not connected) 10-15MW.
- Expansion of the network in areas where there is no existing network 55-65MW.

In the current season it is not used at all heating with fuel oil, but it remains as an alternative in case of failure of supply from the cogeneration system.

As alternative heating sources Medical Center Pristina often used two boilers, each with a 7.5MW power, which use oil as fuel. Since the beginning of the cogeneration system 12/2014 they are not using these boilers with diesel fuels.



Table 22 - Measures in CH Termokos

No.	Title of measure	Target utilization of primary energy/sector	Deadline	Energy savings in 2013-2015/ other indicators	Estimated savings of primary energy by 2018 and other indicators
1	Cogeneration PP Kosovo B – CH “Termokos” Pristina 2013-2014	Thermal heating system for city of Pristina	Implementation:  Functioning has started since 12/2014	Electricity (MWhel) which will be reduced for the benefit of using thermal energy (MWhth):  PP-B = 140 MWhth. and PP (B1+B2)	Reduced electricity consumption for the city of Pristina, in the absence of relevant detailed analysis, data not available Approx. from 80 MWhel in 22-24 MWhel The possibility of connection to cogeneration PP Kosova e Re after 2017
2	Reconstruction of 50 thermal substations in the distribution network of Termokos	Improved quality of heating; Balancing the system; The reduction of energy losses from 18% to 15%;	Works are expected to start immediately after the heating season, that is from 04/2016 and completed within 2016	Savings due to the reduction of hot water: 1.94 GWh  Savings in water 8447m <sup>3</sup>	Reconstruction of substations includes SCADA system for monitoring and controlling these 50 substations from the main office in Termokos
3	Replacement of 11.6 km of pipelines in the primary network	Reducing water losses by 15% compared with the current average losses; Reduction of energy losses by 18% to 15% through improved insulation of pipes.	Works are expected to start immediately after the heating season, that is from 04/2016 and completed within 2016		
4	Rehabilitation of central heating system -distribution  Termokos:  Installation of equipment for measuring the energy delivered;	Accurate information about energy delivered to district heating;  Real assessment of energy losses in the distribution network by comparing the received energy in substation.	During 2016 will be installed energy meter in all substations  To give their exact number (340 planned)	0.412 GWh	These measures increase the efficiency of boilers, save fuel, protect the environment and minimize work stops.

## Rehabilitation projects and network expansion

For the period 2016-2020, are planned investments for Termokos projects from donors and various funding, mainly from the German government through KfW, estimated at 21.5 million euro. These investments aimed at increasing the performance of the company with components expansion and modernization of distribution network, reducing energy losses, construction of thermo new substations and optimization of the system of distribution of thermal energy (balancing system, metering and billing according to spending etc.).

To meet the increasing demands of Pristina for thermal energy (scenarios presented above), Termokos plans expansion and modernization of distribution network. In this regard, main projects for the period 2015-2025, funded by donors and own resources, are:

- Rehabilitation of 300 substations out of existing 360. Rehabilitation means the replacement of heat exchangers and circulation pumps, installation of the regulatory system and the measurement of thermal energy.
- Replacement of distribution network in length of 10km (20km pipe). Critical positions have been identified, mainly in main network and main branches, where water and energy losses are greater.
- Extension of heating network to new Ares, which will be evaluated after the hydraulic network analysis and energy reserves in certain positions. Such analysis is done by the consultancy engaged by the EU, in cooperation with Termokos and Pristina municipality.

It was planned, according to the scenarios presented in Energy Strategy 2017-2026, connection of additional areas in Termokos network at the end of this period to be up to 1,000,000.00 m<sup>2</sup>, (see tab. 23 below).

- Supply of the city of Pristina, parts that are connected to the heating, with sanitary water. This project is worth 10.5 million euro and it is on the priority list of energy projects which are approved by the government of the Republic of Kosovo.

	Medium scenario		High scenario	
Efficiency factor f=6.56				
	Connected surface (m²)	Needed energy (GWhel)	Connected surface (m²)	Needed energy ( GWhel )
2016	1220539	38.70	1220539	38.70
2017	1395539	44.25	1445539	45.83
2018	1620539	51.38	1695539	53.76
2019	1720539	54.55	1845539	58.52
2020	1805539	57.25	1970539	62.48
2021	1880539	59.63	2075539	65.81
2022	1955539	62.00	2160539	68.50
2023	2030539	64.38	2245539	71.20
2024	2105539	66.76	2330539	73.90
2025	2180539	69.14	2415539	76.59

*Table 23 - Network expansion scenarios for the period 2016-2025*

### *Water loss reduction for heating*

Water losses in the distribution network of the city are large and directly impact on the quality of service and performance of the enterprise. Termokos objective is that these losses from 18% that are currently, at the end of this period be reduced below 10%. By reducing the losses, thus saving energy will increase the chance that Termokos, with the same capacity, to supply more customers.

### *The situation in the heating system CH "CITY HEATING" SHHC GJAKOVA*

Due to the high cost of fuel oil imported, losses in the generation and distribution, but also the excessive use of electricity and water due to obsolete equipment and frequent defects increased operating expenses in Gjakova CH.

Heating in the City of Gjakova is currently working with 2 fuel oil boilers with a nominal capacity of 18 MW and 20 MW. First mounted on in 1980 and the second in 1990. There were substantial investments in two boilers for years, such as the igniters as well as screens and economizers/water heaters/. Their level of efficiency is around 65-70%. Due to the limited amount of fuel oil, in recent years only about half of the customers connected to the heating system are being supplied with heat during the period of about 90 days, or from December to March so the financial situation of enterprise is unstable.

### *Measures in the heating system "CITY HEATING" SHHC GJAKOVA*

In search of alternatives for the production of electricity and thermal energy (district heating) by other primary energy sources it is concluded by the relevant studies that biomass as local renewable fuel is the optimal solution.

The cogeneration system is planned to enable the production of electricity 1.55 MWhel and thermal energy 16.2 MWhth. After completion of the feasibility study with support of WBIF (EU investment framework for the Western Balkans), the European Commission under the IPA II program for Kosovo (2014-2020) has approved a grant in the amount of 12 mil.euro for the construction of the new facility. Plot division has already been initiated by the Government of Kosovo at the request of the Municipality of Gjakova. By the end of 2016 are planned to be finished all the procedures by stakeholders in order to build the new plant in 2017.

After starting operations in 2018 it is projected to increase efficiency in generation and also to provide quality heating where operating costs will be covered entirely by the revenues collected and subsequently the enterprise will be independent from subsidies. Benefits of switching fuel in power generation in Gjakova Heating City after the implementation of the project are scheduled as follows:

1. Co-operation technology with 95% efficiency over current fuel oil which is operating below 70%.
2. Using the same amount of fuel for generating electricity and thermal energy.
3. The cost of fuel by calorific value is several times lower than currently.
4. Carbon emissions and other pollutants within minimum values.
5. 24h quality heating for customers

Indicator	Reference year (2010)	Latest at disposal (2014)	Determining year of return (2018)	Target (2020)	Source of information
CSP indicator (impact/result...1					
Total production of thermal energy in CH Gjakova vs Cogeneration Gjakova (Electric and thermal energy)	9363 MWh	4358 MWh	13407 MWh	6232 MWh <sub>e</sub> 45346 MWh <sub>th</sub>	Reports of feasibility study of the project, WBIF
Losses in production unit (boiler)	28%	25%	2-5%	2-5%	Kosovo's annual energy balance and ERO reports
Losses in distribution network	30%	30%	0-15%	0-15%	
Reduction of greenhouse gases(GHG) from CH Gjakova/KEK	-	124,146 CO <sub>2</sub> eqv	≈ 615 CO <sub>2</sub> eqv	≈ 615 CO <sub>2</sub> eqv	

Table 24 - Performance CH Gjakova

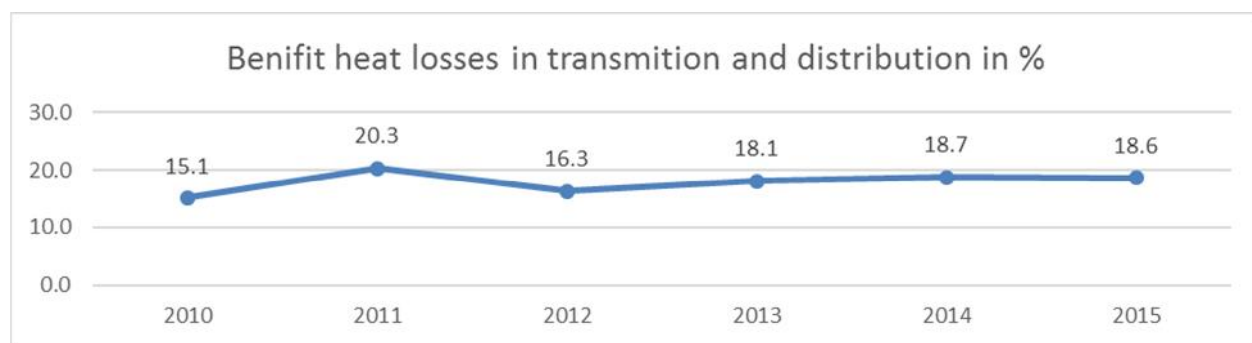


Figure 19 - Presentation of technical losses in CH TERMOKOS and CH Gjakova<sup>7</sup>

<sup>7</sup> CH in Mitrovica and Zveçan still don't send their data.

Forecast of demand and production in CH Termokos and CH Gjakova 2016-2019

Naming	Unit	2016/2017	2017/2018	2018/2019
Thermal bruto production	MWh	244.014,00	280.413,98	327.213,96
Thermal neto production	MWh	239.865,76	275.646,95	321.651,33
Losses in transport and coogeneration network	MWh	4.148,24	4.767,04	5.562,64
Losses in distribution of DH	MWh	35.979,86	37.212,34	38.598,16
Total losses	MWh	40.128,10	41.979,38	44.160,80
Losses in percentage	%	16%	15%	13%
Quantity of supplied thermal energy	MWh	203.885,90	238.434,61	283.053,17
Total surface	m <sup>2</sup>	1.221.480	1.395.539	1.620.539
Number of substations		385	410	445
Installed capacity	MW	275,60	275,60	275,60
Network length	km	75	82	100

Table 25 - CH Termokos

DH Gjakova - Planning				
Nr.	Naming	Unit	2017/2018	2018/2019
1	Bruto production of thermal energy	MWh	8.949,00	17.899,00
2	Losses in transport and distribution	MWh	2.071	2.147
3	Losses in station	MWh	403	407
4	Amount of supplied heating	MWh	6.475,00	15.345,00
5	Heating surface (m <sup>2</sup> ) in household and services	m <sup>2</sup>	89.914	176.933
6	Number of household consumers		338	1250
7	Number of consumers ins service sector		62	250
8	Amount of consumed fuel (from biomase)	ton	2.500,00	7.500,00
9	Electricity consumption	MWh	450,00	500,00
10	Number of substation		180	250
11	Installed coogeneration capacity	MW	17	17
12	Length of network	km	27	27

Table 26 - CH Gjakova

### *2.3.7 Energy efficiency criteria in network tariffs and regulations*

*1. About question how is ensured that national energy regulatory authorities pay due regard to energy efficiency when carrying out their regulatory duties (EED Article 15(1)):*

One of the primary objectives of ERO is also efficient use of energy in all sectors by taking effective measures in this regard. ERO in 2012 following public consultation has set some targets which encourage the efficient use of electricity, such as targeted transmission and distribution losses. In addition, ERO's determination of Maximum Allowed Revenues at Periodic Review, has allowed substantial volume of investments which reach the value of around 100 million Euro per year for Generation, Transmission and Distribution. As a result of these measures, losses at the level of transmission in recent years have decreased significantly, which compares with advanced systems of transmission and in 2015 they were 1.98%, while the level of distribution losses have reached level 31.82% in 2015 from 48.36% as they were in 2006.

*2. About planned or adopted measures to ensure that incentives in tariffs that are detrimental to the overall efficiency (including energy efficiency) of the generation, transmission, distribution and supply of energy, or might hamper participation of demand response in balancing markets and ancillary services procurement, are removed (EED Article 15(4), Annex XIV Part 2.2 first sentence):*

Fees set by the ERO aimed at improving the infrastructure in the energy sector and promoting efficiency in the sector. In determining the long-term tariffs ERO defines the capital investments for entire sector, which necessarily affect the improvement of the supply and efficient use of energy to the final customer, reducing losses to a great extent, and improve services.

A very important aspect is renewable energy, which is treated with great dedication by ERO, approving support schemes which encourage investment in this sector which is efficient and necessary for security of supply. During this year ERO plans to approve rules for micro generator, which would help greatly in promoting investments in this sector, since it remains the only aspect of secondary legislation without adequate cover.

*3. Planned or adopted measures to incentivize network operators to improve efficiency through infrastructure design and operation (EED Article 15(4), Annex XIV Part 2.2. first sentence):*

ERO in determining the tariffs established efficiency factors in operating costs by setting some goals to reduce those costs. In addition ERO has set rigorous targets for reduction of losses in the distribution network, seeking to reduce them by 3% for the first three years starting from 2012, and by 2.5% for three following years. Also the determination of 5-year tariffs in 2012, ERO has allowed investment in electricity meters and other capital investments which increase the level of energy saving and reduction of losses.

*4. Planned or adopted measures to ensure that tariffs allow suppliers to improve consumer participation in system efficiency including demand response (EED Article 15(4), Annex XIV Part 2.2. first sentence):*

One of the primary duties of ERO is to set electricity tariffs, providing revenues that cover all reasonable operating and capital costs across sectors and also by promoting efficient energy use. One of the most important steps in this direction is the model of block fees, daily or seasonal fees are set for measuring the consumption of electricity from the public supplier. The tariff model has proven to encourage more efficient consumption, reducing greatly the uncontrolled consumption of energy, which affects the chains of increasing efficiency sector.

*5. If network tariffs support the development of demand response services (EED Annex XI 3.):*

ERO during tariff setting allows substantial investments in network, which amount about 20 million euros per year, which are dedicated to improving the current network and expanding the network depending on the increased demand in the future. Here we are taken into account all national development plans and strategies for development.

As mentioned above, ERO in determining tariffs and other acts related to the energy market, taking into account economic development strategies and energy strategy, which forecasted increase in consumption and other relevant gauging. In this way ERO adjust the fees to these forecasts allowing additional investments in unit generation, determining the support scheme for the promotion of renewable energy which would effectively increases the security of supply of electricity having in mind that this is a clean energy and directly affects the efficiency of energy generation. Finally ERO also reviewed very carefully the RES support scheme which has created favorable conditions for investments.

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ERO has taken concrete steps to improve the mechanisms of balancing, approving the methodology for determining the prices of non-balance, which directly affects the efficiency to all licensees. ERO inter alia allow extra cost for secondary regulation, which is expected to begin by KOSTT this year (2016).

### **2.3.8 Energy efficiency in network design and operation**

*About report on plans or progress achieved in the assessment of the energy efficiency potential of national gas and electricity infrastructure, as well as adopted and planned measures and investments for the introduction of cost effective energy efficiency improvements in network infrastructure and a timetable for their introduction - and information (if available) from the assessment of the energy efficiency potential of gas and electricity infrastructure, in particular relating to transmission and distribution, load management and interoperability, and connection to generating installations including access possibilities for micro generators. Please describe the measures and investments identified or planned to utilize the energy efficiency potentials of gas and electricity infrastructure (EED Article 15(2), Annex XIV Part 2.3.5.):*

**The strategic context of the Kosovo gasification** - Diversification of energy sources and increase the security of energy supply is considered as a very important component for the reliable and quality supply of electricity. In this regard the inclusion in the regional pipeline system (TAP-IAP) is considered as a real opportunity to supply natural gas to the country. The project natural gas is listed in the framework of 13 projects initiated for energy, and approved by the National Investment Council (NICI) on. 09/12/2015.

In order to open up prospects for the development of the natural gas sector and the fulfillment of obligations that Kosovo as a member to the Treaty of the Energy Community, the Government of the Republic of Kosovo in 2009 has prepared legislation for Natural Gas, approved by the Assembly of Kosovo on 2 November, 2009 (Law no. 03/L-133 on Natural Gas), based on the requirements of EU legislation. In addition there is also the primary legislation, secondary legislation, Administrative Instruction Nr.01.2010 "For the security of supply in the natural gas sector", adopted by the former Ministry of Energy and Mines (MEM), now the Ministry of Economic Development (MED). This Administrative Instruction sets out the policies and measures to guarantee long-term security of natural gas supply and the establishment of rules dealing with short term protective measures an adequate level of security of supply, by defining the roles and responsibilities of various actors to natural gas market and specification of appropriate standards of security of supply in a transparent and non-discriminatory manner.

Harmonization of the legal framework for the gas sector in line with the *Acquis Communautaire* is the main priority. Within this process, Kosovo through MED is in the final process of the amendment of the Energy package of laws including the Law on Natural Gas and harmonize them according to the requirements of the Package III of the EU legislation on energy.

Regarding the latest developments related to natural gas, Kosovo through Albania in February 2016 has applied in a joint project within the framework of the Round 15 in the WBIF for the implementation of the Feasibility Study for Pipeline Albania - Kosovo under TAP/IAP pipeline. With the same project, Kosovo through Albania has applied to the Energy Community for the inclusion of this project in the framework of projects of interest in the Energy Community (PECI list 2016)<sup>8</sup>. Development of this study will give the necessary analysis and recommendations for measures and other development activities towards the development of natural gas infrastructure in Kosovo.

Dilemmas that have existed in the past in terms of feasibility of linking Kosovo with the international natural gas systems, since 2013, are no longer present. Approval of the Trans Adriatic Pipeline (TAP)<sup>9</sup> has created great opportunities for Kosovo.

Besides this possibility, being part of the Energy Community and having a geographical position that enables interconnection with other natural gas sources, Kosovo is likely to provide a supply of natural gas in several directions.

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<sup>8</sup> [www.energy-community.org](http://www.energy-community.org)

<sup>7</sup> <http://www.tap-ag.com/>; <http://www.tap-ag.al/>



The development of the gas infrastructure for a small market like Kosovo, is not a small challenge, but being part of the market of the Energy Community that favors the position of Kosovo, it is considered entirely possible involvement of the Kosovo in international network of natural gas in the next decade and supports policies and measures for the construction of natural gas infrastructure that will contribute to increasing the diversification of energy sources for the purposes, primarily, the industrial development of Kosovo.

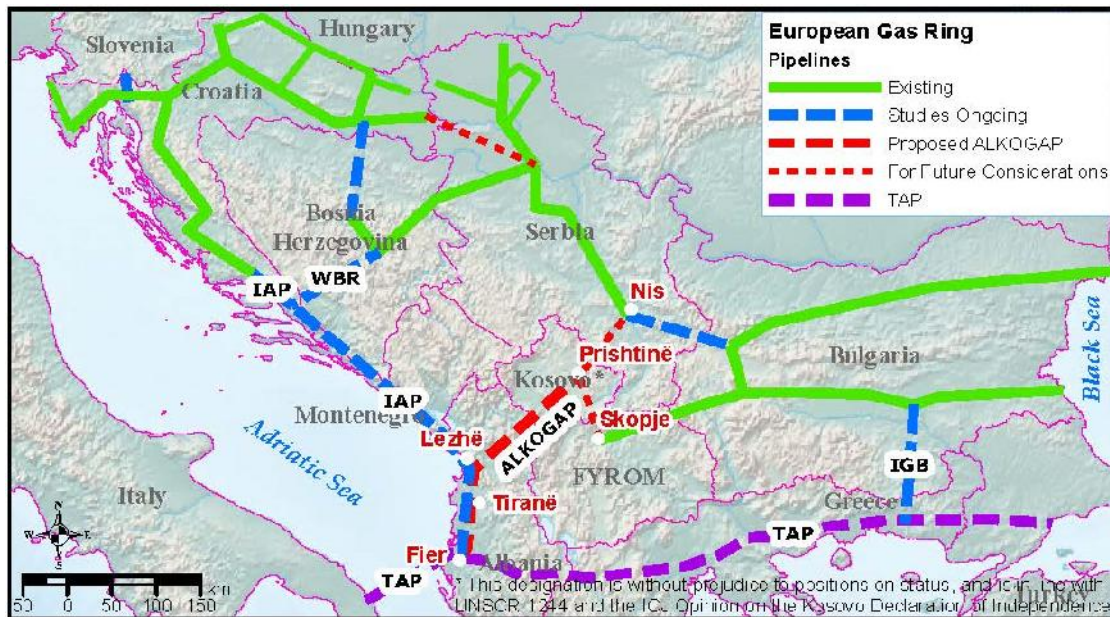


Figure 20 - European Gas Ring

Measures for the realization of gasification in Kosovo

1. Feasibility study for building the infrastructure of the natural gas system;
2. Development of primary and secondary legal framework to the requirements of the third package of EU legislation for natural gas;
3. Establishment of the Transmission System Operator of natural gas - the signing of agreements necessary for the inclusion of Kosovo in the international natural gas networks.

In the framework of the Energy Community and supported by the World Bank in June 2015 it was issued report "intermediate" Study on Electricity Gas Consortium of Eastern Europe - Access Consortium for Capacity Development of electricity from gas. MED/ERO in cooperation with relevant inputs provided and comments on this document enabling a more realistic presentation of the current energy situation and opportunities for development of the gas sector in Kosovo.

ERO participates actively in the work of the Energy Community, namely the Working Group on Gas Regulatory Board of the Energy Community Gas Forum and the Coordination Group of the Security of Supply, Gas sub-group.

### Electricity supply context

KEDS under license is obliged to prepare a 10-year development plan, which presents all the necessary investments related to infrastructure improvements. KEDS in May has made a public presentation of the plan and their other actions, and is holding public consultations in each region to introduce concrete plans and to discuss with the public about these plans. Later this detailed plan will be submitted to ERO for review and approval, where a plan is reviewed and adjusted by ERO for a 5 year period will be incorporated in future fees perennial. KEDS Plan I definitely aim to improve the infrastructure, measurement and operational aspects for the benefit of efficient use of resources and energy to final customers.



### 3 EE SAVINGS REPORT ON THE IMPELMENTATION of the 2nd and NEW EE MEASURES for 3rd NEEAP

#### Executive summary

The following document is the 2<sup>nd</sup> preliminary report for the intermediate period 2013-2015 of the Kosovo Energy Efficiency Action Plan (2010-2018). The report present the goals achieved from the implemented EE measures for the 2013-2015 period, within the intermediate energy savings targets that provided an achieved target of 3% of energy savings in the framework of the long-term plan of energy savings target of 9 % by 2018.

The calculation of the indicative targets of Kosovo's NEEAP was done in compliance with the methodology of Annex I of the EC Directive 2006/32/EC. The set indicative target of 9% for the NEEAP period of 2010-2018 corresponds to the amount of energy savings of 91,89 ktoe, whilst for the mid-term indicative target to be achieved in 2015 of 3% corresponds to the energy savings of 31,95 ktoe.

The intermediate energy savings target was set based on an analysis conducted by the Inter-Institutional Working Group for Drafting the Kosovo Energy Efficiency Plan, composed of representatives of different institutions, energy stakeholders, municipalities and donor with the aim of setting real indicative targets and support for monitoring and their implementation.

Within the implementation period of the 2<sup>nd</sup> Intermediate Energy Efficiency Plan (2013-2015), the Assembly of Kosovo adopted a Law on EE on 23.06.2011 and the Ministry of Economic Development established the Kosovo Agency for Energy Efficiency on 15.12.2011. The Agency is still in the stage of institutional development of own professional capacities.

Even though the capacities and the adequate institutional infrastructure for the development and implementation of EE measures were and are still absent, as well as the respective financial potentials to achieve the set targets, following the adoption of a Law on EE and the establishment of KEEA and depending on the financial supports, technical and intuitional assistance, Kosovo will have more real opportunities for the development and implementation of EE programs.

Consequently, the set target of 3%, respectively 31,95 ktoe, was more ambitions that the means of achieving it due to the lack of investments/sufficient projects that would have resulted in increased energy savings, i.e. EE.

In this period there are no great differences in energy savings in the services sectors with 51% or 4.83 ktoe, whilst the household with 36% as seen in table 1. Therefore, the household sector with 36% or 3.42 ktoe, is the second by priority in relation to the implementation of EE measures and then the Industry sector with me 9% or 1.17Ktoe. Based on this forecast, the energy savings achieved is 9.42 ktoe.

The reason for this priority lies in the measures foreseen to increase energy savings in public buildings (government and local) and public lighting.

Table 1 of the report presents the total amount of energy savings based on the measures for all sectors, including only specific EE measures.

Table 2 of the report presents the achieved energy savings as per the measures for each sector.

Monitoring of EE measures was not implemented due to the lack of a sustainable M&V&E system, and there are no data that make possible the evaluation of energy savings according to BU measures. Therefore, the use of respective methodology for the calculation of energy savings according to the Bottom-Up method (BU) is still limited for the implementation of measures in buildings, central heating system, water heating, use of solar panels and improvement of public lighting, and thus with the implementation of the Monitoring and Verification Platform for EE projects there will be improvements in accurate data.

### 3.1 Report on the implementation of the 2<sup>nd</sup> National Energy Efficiency Action Plan

In relation to the calculation based on the TB method in the 2<sup>nd</sup> preliminary report, there is still no respective institutional and organizational infrastructure at the central or local level.

The main conclusions of the report are as in the following:

1. National Indicative targets set by the 1<sup>st</sup> NEEAP 2010-2012 and the intermediate target for 2013-2015. Republic of Kosovo has drafted the NPEE for the 2010-2018 period that includes the indicative energy savings target of 9 %. The 2<sup>nd</sup> intermediate plan of NEEAP includes the 2013-2015 period that foresees an energy savings target of 3 %.
2. Based on the projects implemented to date, the energy savings achieved for 2013-2015 period and an approximate evaluation of energy savings until 2018 are presented in table 27.
3. Table 2 summarizes and presents all EE measures with quantitative and qualitative evaluation of their implementation and recommendations for improvements per sectors of energy consumption.
4. The measurable results presented in table 27 are calculated based on the BU.

*\*Columns in grey contain data from the 1<sup>st</sup> NEEAP.*

	Long-term national indicative target for national plan 2010-2018		91.89 ktoe			
	Intermediate target for 2013-2015		31.00 ktoe			
Targets per sector	Sector target		Energy savings for 2013- 2015		Approximate assumption of energy savings in 2018	
	Planned		From measures (BU)			
	2013 - 2015	2010 - 2018	Planned	Reported	Total (TD)	From measures (BU)
Household (ktoe)	10,21	30.64	10,21	3,42 ktoe		46.98
Services (ktoe)	4,08	12.26	4,08	4.71 ktoe		18,91
Industry (ktoe)**	8,28	24.84	8,28	1,17 ktoe	14.00	
Transport (ktoe)	8,05	24.15	8,05	Not evaluated	12.00	
Total (equivalent units): ktoe	30,63	91.89	30,63	9.3 ktoe	91.89 ktoe	
Total (GWh):	356,23	1068.68	356,23	109.55 GWh	1068.68 GWh	
Percentage (%) (compared to ESD reference consumption)	3%	9 %	3%	0.91%	9.00%	

*Table 27 –National Indicative target and its achievement*

#### 3.1.1 Energy savings achieved in the energy end use sectors

Kosovo has assumed a cautious approach to establishing intermediate indicative targets for energy savings in compliance with the 1<sup>st</sup> Energy Efficiency Action Plan (2010-2012), which amounts to 3% of the total energy savings for the aforementioned period (1021.08 ktoe), i.e. 31 ktoe.

The national indicative target is allocated between the sectors of final energy demand, so that the effectiveness of the proposed measures could be monitored at a more disaggregated level. The sectorial allocation of the national target is based on the following parameters:

- Proportion of final energy consumption assigned to individual sectors;
- Potential for improvements, i.e. in relation to efficiency;
- Concept of economic efficiency of various energy efficiency measures for different sectors (in order to promote as best as possible the effective measures), and
- Level of necessary political and legal intervention in the individual sectors.

The following table presents a summary of levels of targets for each sector.

*Table 28 - Intermediate energy savings targets per sector*

Indicative target of energy savings: 31.00 ktoe			
Period	(2013-2015)		
Sector	%	ktoe	GWh
Household	36	3.42	39,77
Services	51	4.71	56,17
Industry	13	1.17	13,61
Transport	-	0	-
Total	100	9.3	109,55

Source: Kosovo NEEAP (2013 – 2015)

*\*The agriculture sector has been included within the industry sector.*

The approved intermediate indicative target of 31 ktoe was allocated between different energy consumption sectors in order to monitor the effectiveness of proposed measures. In the 2<sup>nd</sup> NEEAP 2013-2015, 10 energy efficiency measures were implemented including:

- 3 measures in the household sector,
- 6 measures in the services sector (public and private services),
- 1 measure in the industry sector.

### 3.1.2 Calculation of achieved energy savings

The Bottom-Up (BU) method was used to calculate energy savings achieved in the period of implementation of the 2<sup>nd</sup> NEEAP. The methodology, which was recommended by SKE, is based on an analysis of changes to key energy efficiency indicators selected for the end-use sectors during the period from the selected reference year to the reporting year.

However, in compliance with the AI no. 14/2012, KEEA undertook the calculations by using the official methodology described in Annex IV to measure and verify energy savings.

Due to a lack of adequate statistical data and surveys, KEEA was not able to apply the top-down (TD) methodology for calculation of EE indicators. KEEA is working with relevant institutions to ensure that adequate statistical data shall be collected for the implementation of TD.

At the end of 2015, the KEEA carried out a survey of municipalities and central government ministries to collect information on projects implemented in the public sector:

- In municipalities (projects related to insulation refurbishment measures applied in building components for existing public buildings, street lighting projects implemented).
- In central government buildings (insulation refurbishment measures applied in building components for existing central government building).

Taking into consideration that the aforementioned data were used for adequate evaluation of energy savings achieved, the bottom-up calculation were used only for six energy efficiency measures implemented out of 37 measures included in the 1<sup>st</sup> NEEAP.

Table 29 - Overview of EE measures and indicators used for calculation of energy saving achieved

Sector	Id	Measure	Indicator used
Household	R1	Improvement of EE through the implementation of EE measures in residential buildings	Replacement of new household appliances (washing machines, refrigerators, dishwashers) in residential buildings
	R 2	Promotion of EE in household	Insulation refurbishment measures applied in existing residential buildings
	R 3	Public campaign on energy savings and improved EE	Replacement or new installation of lamps in residential buildings
Services	S 1	Promotion of EE at the municipal level	Insulation refurbishment measures applied in existing tertiary buildings
	S2	Promotion of EE at the central level	Insulation refurbishment measures applied in existing tertiary buildings
	S3	Improved EE through renovation of public buildings in municipalities	Insulation refurbishment measures applied in existing tertiary buildings
	S4	Improved EE through renovation of public buildings in municipalities	Insulation refurbishment measures applied in existing tertiary buildings
	S5	Improved EE through renovation of public buildings in central level	Insulation and changing of windows
	S6	Public lightning at the central and local level	Replacement or new installation of public street lighting systems in tertiary buildings
Industry	I1	Improved EE through the implementation of energy efficiency measures in SME	Replacement of old technology

### 3.1.3 Description of energy savings achieved

Calculation of energy savings as a result of change of windows, thermal insulation, installation of solar system, awareness raising campaigns, and public lighting was undertaken based on the commented formula in the following.

#### Promotion of EE in household (R1)

Energy savings from insulation refurbishment measures applied in building components in existing residential buildings have been calculated using the following formula:

$$UFES_{comp} = \frac{(U_{ini\_comp} - U_{new\_comp}) \cdot HDD \cdot 24 \cdot a \cdot \frac{1}{b} \cdot c}{1000} \left[ \frac{kWh}{m^2 \text{ of ins.comp} \cdot year} \right]$$

Calculation of energy savings as a result of replacement of household equipment was done through the following formulae:

$$UFES = AEC_{ref\_year\_stock} - AEC_{ref\_marketpromoted} \quad [kWh/unit \cdot year]$$

(U<sub>ini\_comp</sub>=1.4 W/m<sup>2</sup>K and U<sub>new\_comp</sub>=0.35 W/m<sup>2</sup>K, HDD=2915 Kd/y)

Remarks:

- ✓ After 1999 a large number of private houses and buildings in Kosovo were in a destroyed or damaged condition.
- ✓ As a result of public awareness raising campaigns on the energy savings that can be achieved by applying EE measures, a considerable number of households improved the insulation of their houses during the reporting period.
- ✓ EBRD and Pro-Credit Bank have provided substantial loans under the Eco-program launched in 2013-2015.

Service sector

The bottom-up formulas for calculation of energy savings as result of implementation of following energy efficiency measures were used:

- EE measures applied in building components in existing tertiary buildings,
- Replacement or new installation of lighting systems in tertiary buildings,
- Replacement of or new installation of street lighting systems.

Improved EE through the renovation of public buildings at the central and local level (S1)

Energy savings from insulation refurbishment measures applied in building components in existing public buildings were calculated using the following formula:

*Doors and windows*

Refurbishment of doors and windows in municipal buildings in 11 municipalities, using U-values stipulated in table 12 of the BU methodology ( $U_{ini}=5.1 \text{ W/m}^2\text{K}$ ,  $U_{new}=2.8 \text{ W/m}^2\text{K}$  and  $HDD=2915 \text{ Kd/y}$ ):

$$UFES_{comp} = \frac{(U_{ini\_comp} - U_{new\_comp}) \cdot HDD \cdot 24 \cdot a \cdot \frac{1}{b} \cdot c}{1000} \left[ \frac{kWh}{m^2 \text{ of ins.comp} \cdot year} \right]$$

*Insulation of walls*

Refurbishment of walls in municipal buildings in 11 municipalities, 63 schools and 6 ministries, using U-values stipulated in table 12 of the BU methodology ( $U_{ini}=1.03 \text{ W/m}^2\text{K}$ ,  $U_{new}=0.36 \text{ W/m}^2\text{K}$  and  $HDD=2915 \text{ Kd/y}$ ):

$$UFES_{comp} = \frac{(U_{ini\_comp} - U_{new\_comp}) \cdot HDD \cdot 24 \cdot a \cdot \frac{1}{b} \cdot c}{1000} \left[ \frac{kWh}{m^2 \text{ of ins.comp} \cdot year} \right]$$

Total savings: 44.42 GWh, or 3.82 ktoe

Remarks:

- ✓ Calculations are based on the data received from 11 municipalities throughout Kosovo, 5 ministries and 1 hospital of UCCK, which have implemented EE measures from their own budgets.
- ✓ It is considered that the majority of refurbished public buildings belongs to the construction period 1960-1998, defined in the BU-Methodology
- ✓ U- Reference values were calculated from BU- Methodology as weighted average for public buildings and schools constructed in the period 1960-1998.

### Stimulation of use of solar systems and panels for public lighting (S6)

Energy savings resulting from the installation of solar systems in public lighting were calculated using the following formula:

$$UFES = \frac{USAVE}{y_{stock\_average\_heating\_systems}}$$

Total savings: 0.611 GWh/year or 0.053 ktoe

### Efficient Public Street lighting (S6)

Energy savings resulting from the replacement of existing or installation of new street lighting bulbs Na, Hg and economic to LED or installation of new lighting systems were calculated using the following formula:

$$UFES = \frac{P_{s,ini} \cdot n_{sh\_ini} - P_{s,new} \cdot n_{sh\_new}}{1000} \quad [kWh/m/year]$$

Total savings: 3.72 GWh/year or 0.96 ktoe

Remarks:

- Energy savings were based on the data received from 5 municipalities and Ministry of Infrastructure.

### 3.1.4 Description of energy savings measures implementation

The 2<sup>nd</sup> NEEAP included 5 energy efficiency measures in total. Most of these measures were related to the sectors of household, services and industry; sectors that have the greatest energy consumption and highest energy savings targets to be achieved.

Table 21 presents an overview of the measures included in the 2<sup>nd</sup> NEEAP and an evaluation of their implementation.

*Table 30 - Overview of EE measures and evaluation of their implementation*

Household sector					
Id	Name of the energy saving measure	Energy savings planned to be achieved according to the 2 <sup>nd</sup> NEEAP (2013-2015) by 2015 (ktoe)	Energy savings reported (ktoe)	Status of implementation	Comments
R1, R2, R3	Improved EE through implementation of EE measures in residential buildings	9.5	3,42	The process of the implementation of the program is ongoing – from the funds foreseen in compliance with R1, R2 and R3, 12 million EUR	EBRD and Procredit Bank have granted loans in the amount of 7.56 euro in the eco-loan program, the household sector has implemented the EE measures to replace windows, thermal insulation and solar system for heating of sanitary water
Total from P1 and P2 measures		13.27 + 9.5	13.27 + 3.42		
Services sector					
Id	Name of the energy saving measure	Energy savings planned to be achieved according to the 2 <sup>nd</sup> NEEAP (2013-2015) by 2015 (ktoe)	Energy savings reported (ktoe)	Status of implementation	Comments
S 1	Improved EE through renovation of public buildings in municipalities	2.17	1,85		EC grant in the amount of 15,6 million EUR for the implementation EE measures in 62 schools at the local level has been used, and 11.74 million EUR spent
S2	Improved EE through the renovation of public buildings at the central level	2,34	Project implementation started		Energy saving measures will be applied in all audited government buildings. Energy saving measures provide insulation of walls, replacement of windows, insulation of roofs and basements (total amount of the project is 31 million \$, loan by the WB)

<b>S3</b>	Improved EE through the renovation of public buildings at the municipal level	1,0	Project implementation started		Contribution by KfW/EC (credit line/grant) – 5.0 million euro, Total 5.0 million EUR
<b>S4</b>	Improved EE through renovation of public buildings in municipalities	In the planning period there was no data for funding of this measure	1.62	Municipalities with their own budget continue to undertake projects to implement EE measures	Implementation of EE municipal plans and 2.17 million EUR, and the central level with 1.42 million EUR for implementation of EE measures in public buildings
<b>S5</b>	Improved EE through renovation of central government buildings municipalities	In the planning period there was no data for funding of this measure	0.13	Central level government with its budget continues to undertake projects to implement EE measures	Government with a budget of 4.8 million EUR has implemented EE measures in 5 ministries parliament and University Clinical Center of Kosova
<b>S 6</b>	Improved EE through renovation of municipal buildings and public lighting	In the planning period there was no data for funding of this measure	1.011	Municipalities continue to undertake projects for the implementation of EE measures in public lighting	Replacement of lighting bulbs, 250W Hg with LED 40W solar system, project implemented in three municipalities and was funded by UNDP, MLGA and municipalities, total budget 1,35 million EUR
<b>S7</b>	Improved EE through the renovation of public buildings in municipalities	In the planning period there was no data for funding of this measure	0.1		Beautiful Kosovo Program 2 by IOM, supported by the EC 420,417.72€
Total from measures		5.51 ktoe	4.71_Ktoe		
<b>Industry sector</b>					
<b>Id</b>	<b>Name of the energy saving measure</b>	<b>Energy savings planned to be achieved according to the 1<sup>st</sup> NEEAP (ktoe)</b>	<b>Energy savings reported (ktoe)</b>	<b>Status of implementation</b>	<b>Comments</b>
<b>I 1</b>	Improved EE through the implementation of energy efficiency measures in SME	3.5	1,17	SME to be continued to be supported by EBRD through its eco-loan program	SME were supported by EBRD, with 2, 88 million EUR in its eco-loan program
Total from measures		2.2 ktoe	1,17ktoe		
<b>Transport sector</b>					
Total from measures		0.15 ktoe	9.3 ktoe		
<b>TOTALI</b>		<b>30,26ktoe</b>	<b>9.3 ktoe</b>		



Remarks: In the 2<sup>nd</sup> NEEAP only specific EE measures were taken into consideration and not the soft measures.

*Table 31 - Energy savings achieved per sector*

Indicative energy savings target: 31.00 ktoe			
Period	(2013-2015)		
Sector	%	ktoe	GWh
Household	36	3.42	39,77
Services	51	4.71	56,17
Industry	13	1.17	13,61
Transport	-	0	-
Total	100	9.3	109,55

### 3.1.5 Summary of energy savings planned and achieved

The saving target set in the 2<sup>nd</sup> NEEAP of 31.00 ktoe has not been achieved - 9.3 ktoe.

Preliminary evaluations show that energy savings achieved during the second intermediate period (2013-2015) are lower than the one forecasted, due to the lack of investments by donors and lack of a government budget to support the EE sector and thus result to be not achieved.

*Table 32 - National indicative target and its achievement*

	Long-term national indicative target for 2010-2018		91.89 ktoe			
	Intermediate target for 2013-2015		31.00 ktoe			
Targets per sectors	Sector target		Energy savings for 2013- 2015		Approximate assumption of energy savings in 2018	
	Planned		From measures (BU)			
	2013 - 2015	2010 - 2018	Planned	Reported	Total (TD)	From measures (BU)
Household (ktoe)	10,21	30.64	10,21	3,42		46.98
Services (ktoe)	4,08	12.26	4,08	4.71		18,91
Industry (ktoe)	8,28	24.84	8,28	1,17	14.00	
Transport (ktoe)	8,05	24.15	8,05	Not evaluated	12.00	
Total (equivalent units): ktoe	30,63	91.89	30,63	9.3	91.89 ktoe	
Total (GWh):	356,23	1068.68	356,23	109.55 GWh	1068.68 GWh	
Percentage (%) (compared to ESD reference consumption)	3%	9 %	3%	0.91%	9.00%	

### 3.2 Energy Efficiency Measures in the Third KEEAP, in End Energy User Sectors

Third KEEAP includes in total 9 energy efficiency measures. Most of the energy efficiency measures are planned to be implemented in the services sector – 7, whereas the residential household sector is ranked in the second place.

#### 3.2.1 Measures in the household sector

The household sector is the sector with the highest energy consumption in the last three years.

It is assumed that the savings potential in the energy sector reaches between 10-40%. This leads to the recognition that the household sector will contribute most to energy consumption, but it also represents the sector in which said savings are most difficult to accomplish, due to the lack of incentive measures for their accomplishment and lack of sanctions for non-achievement.

Decreasing energy consumption at residential sector will represent one of the greatest challenges for the future. This is necessary, since the increasing energy prices will place an additional burden on households in the future, especially in low income households, for which it will be more difficult to afford the payment of their energy bills.

The new draft-law on common ownership residential buildings was approved by the Kosovo parliament. The law will regulate use, management and maintenance of collectively owned buildings. Noteworthy, the establishment of owners' associations will be obligatory. The implementation of the law will regulate rights and obligations of apartment owners, division of profits, charges and costs, overall meetings and obligatory decisions issued by the majority, prerequisites for unanimous decisions, etc.

The policy document which addresses residential matters in Kosovo is the Ministry of Environment and Spatial Planning's Strategy (2011-2014). The following two strategic objectives address matters related to the establishment of the legal and institutional framework for energy efficiency promotion:

- Improvement of the access to affordable residence, and in accordance with the economic circumstances of the families, and preservation of residential areas;
- Regulation of construction activities through technical engineering regulations, in line with EU standards.

Issues related with the promotion of energy efficiency in collective residential buildings will represent the main priority of the Ministry of Environment and Spatial Planning in the following years.

In the third KEEAP, the following four measures are envisaged for the household sector:

- EE improvement through the implementation of EE measures in the households sector

*Table 33 - Summary table of measures for improving energy efficiency in the household sector*

No.	Title of the energy saving measure	Target group	Length P2	Length P3	Energy savings incurred in 2015 Summary of sectorial savings	Expected energy savings in 2018
R1	EE improvement through the implementation of EE measures in residential buildings	Households	2013 to 2015	2016 to 2018	P2 estimate 3,42 ktoe	P2 estimate 51,56 ktoe

<i>Title of the energy saving measure</i>		<i>EE improvement through the implementation of EE measures in residential buildings</i>
<i>Measure index</i>		<i>R1</i>
Description	Category	<i>Financial instrument</i>
	Timeframe	<i>Start: 2016 End: 2018</i>
	Objective/short description	<i>The measure aims to increase energy efficiency in central level public buildings</i>
	Target end use	<i>Existing buildings</i>
	Target group	<i>Households</i>
	Regional application	<i>National</i>
Information related to the implementation	List and description of energy saving activities that support the measure	<i>It is planned for energy saving measures to be implemented in residential buildings. Energy saving measures in residential buildings include wall insulation, window replacement, insulation of roofs and basements and application of RES systems.</i>
	Budget and financial sources	<i>EBRD and Commercial Banks continue to issue loans as per this program (eco loans)</i>
	Implementing body	<i>Banks</i>
	Monitoring authority	<i>KEEA</i>
Energy savings	Method for monitoring/measuring savings results	<i>KEEA has established a post-implementation monitoring system which foresees that final beneficiaries need to submit information on real energy consumption upon project implementation</i>
	Estimated savings in 2018	<i>Implementation of the measure is ongoing</i>
	Accomplished savings in 2018	<i>Implementation of the measure is ongoing</i>
	Estimated energy savings in 2018	
	Expected impact of the energy saving measure in 2018 (if any)	
	Assumptions	<i>Evaluation of estimated energy savings is based on an evaluation of energy savings achieved by similar investments in the second KEEAP, while assuming that ½ of the available budget will be invested in the Household sector</i>
	Duplication, multiplication effect, synergies	-

### 3.2.2 Measures in the transport sector

The following measure will be included in the Third KEEAP for the transport sector:

- Improvement of the public transport system in Prishtina city.

Table 34 - Summary table of measures for improvement of energy efficiency in the transport sector

No.	Title of the energy saving measure	Target group	Length	Energy savings accomplished in 2015	Energy savings expected in 2018
<b>T1</b>	Improvement of the public transport system in Prishtina city	Public transport users in Prishtina city	2017 to 2018	No savings were reported due to the lack of project implementation	12 ktoe

Title of the energy saving measure		Improvement of the public transport system in Prishtina
Measure index		T1
Description	Category	Specific measure in the transport sector
	Timeframe	2017 – 2018 (Investment component to be conclude by end-2018)
	Objective/short description	Improvement of the public transport system, enhancement of the quality of services offered, in the city of Prishtina, in order to increase the use of public transport and decrease the use of private vehicles.
	Target end user	Public transport system in Prishtina city.
	Target group	Public transport system users in Prishtina city.
	Regional application	City of Prishtina
Information related to the implementation	List and description of energy saving actions that support the measure	<p>Program for the improvement of the public transport system in Prishtina city envisages the undertaking of the following activities:</p> <ul style="list-style-type: none"> <li>• Awareness raising campaigns, supported by special offers to promote the use of public transport</li> <li>• Investment component – the purchase of 51 new buses is foreseen, in order to improve public transport services in Prishtina city.</li> </ul>
	Budget and financing resources	Prishtina municipality has obtained a 10mln grant from EBRD
	Implementing body	Prishtina municipality
	Monitoring authority	Prishtina municipality/KEEA
Energy savings	Method for monitoring/measurement of saving results	Municipality
	Estimated savings in 2018	Implementation of the measure will commence in 2017

	Accomplished savings in 2018	<i>Implementation of the measure will commence in 2017</i>
	Estimated energy savings in 2018	<i>0.54 ktoe – to be reported as energy savings by the conclusion of the implementation period.</i>
	Estimated impact of the energy savings in 2018 (if any)	
	Assumptions	<i>(old bus – new bus) – by the end of the implementation period, the number of replaced buses will be reported, along with the related energy savings.</i>
	Duplications, multiplication effect, synergies	

### 3.2.3 Measures in the tertiary sector

Energy efficiency measures in the tertiary sector, which includes public administration, healthcare institutions, etc. will be of specific significance for investment projects of the third KEEAP. Third KEEAP contains seven implementation measures, for which funds are mostly committed from the state budget, municipal budgets, WB and KfW. Over 200 buildings will be renovated as a result of the implementation of investment projects under said activity.

7 measures below are included in the tertiary sector in the third KEEAP:

- EE improvement in public institution buildings at the central level (WB project)
- EE improvement in public institution buildings in five facilities of the central level (MED)
- EE improvement in public institution buildings at the central level (MPA, MoJ, CHCK, MIA and UP)
- EE improvement in public institution buildings at the central level, in the lighting sector
- EE improvement in public institution buildings at the local level (four municipalities, KfW project)
- EE improvement in public institution buildings at the local level (MTEF)
- EE improvement in public lighting at the local level

Table 35 - Summary table of measures for improving energy efficiency in the public sector

No	Title of the energy saving measure	Target group	Length	Savings accomplished by 2015 Summary of sector savings, based on measures defined in the second KEEAP	Estimated energy savings by 2018
S1	EE improvement in public institution buildings at the central level (WB project)	Central level buildings – public services	2016 to 2017	4.71 ktoe	10.21 ktoe
S2	EE improvement in public institution in five central level buildings - MED	Public services – central level buildings	2016 to 2017		
S3	EE improvement in public institution buildings at the central level – MPA, MoJ, KCUC, MIA and UP – MTEF	Central level buildings – public services	2016 to 2017		
S4	EE improvement in public institution buildings at the central level - lighting sector	Central level buildings – public services	2016 to 2017		

S5	EE improvement in public institution buildings at the local level, in four municipalities – KfW project	Central level buildings – public services	2016 to 2017		
S6	EE improvement in public institution buildings at the local level - MTEF				
S7	EE improvement in public lighting – local level.				

<i>Title of the energy saving measure</i>		<i>EE improvement in public institution buildings at the central level (WB Project)</i>
<i>Measure index</i>		<i>S1</i>
Description	Category	<i>Financial instrument</i>
	Timeframe	<i>Start: 2017 End: 2021</i>
	Objective/short description	<i>Measure aims to increase energy efficiency in central level public institutions</i>
	Target end use	<i>Existing buildings</i>
	Target group	<i>Services</i>
	Regional application	<i>National</i>
Information related to the implementation	List and description of energy saving actions that support the measure	<i>It is planned for the energy saving measures to be implemented in central level public buildings. Energy saving measures in public buildings foresees insulation of walls, replacement of windows, and insulation of roofs, basements and application of RES systems.</i>
	Budget and funding sources	<i>WB borrowing (loan) – 31mln \$ (overall budget for measure S1, until 2018, reaches 10.8mln, whereas it is envisaged to continue until 2021).</i>
	Implementing body	<i>MED/KEEA</i>
	Monitoring authority	<i>KEEA</i>
Energy savings	Method for monitoring/measuring savings results	<i>KEEA already has a functional Monitoring and Verification Platform</i>
	Estimated savings in 2018	<i>Measure implementation will start in 2017</i>
	Accomplished savings in 2018	<i>Measure implementation will start in 2017</i>
	Estimated energy savings in 2018	<i>2.16 ktoe</i>
	Estimated impact of energy savings in 2018 (if any)	
	Assumptions	<i>Expected energy savings are based on energy audits conducted in all central government buildings.</i>
	Duplications, multiplying effect, synergies	<i>-</i>

<i>Title of the energy saving measure</i>		<i>EE improvement in public institution buildings in five central level institutions</i>
<i>Measure index</i>		<i>S2</i>
Description	Category	<i>Financial instrument</i>
	Timeframe	<i>Start: 2016 End: 2017</i>
	Objective/short description	<i>The measure aims to increase energy efficiency in central level public institution buildings</i>
	Target end use	<i>Existing buildings</i>
	Target group	<i>Services</i>
	Regional application	<i>National</i>
Information related to the implementation	List and description of energy saving actions that support the measure	<i>It is planned for the energy saving measures to be implemented in five central level public buildings. Energy saving measures in public buildings foresee insulation of walls, replacement of windows, insulation of roofs, basements and application of RES systems.</i>
	Budget and funding sources	<i>MED 2,063 million euro</i>
	Implementing body	<i>MED/KEEA</i>
	Monitoring authority	<i>KEEA</i>
Energy savings	Method for monitoring/measuring savings results	<i>KEEA already has a functional Monitoring and Verification Platform</i>
	Estimated savings in 2018	<i>Measure implementation started in 2016</i>
	Accomplished savings in 2018	<i>Measure implementation started in 2016</i>
	Estimated energy savings in 2018	<i>0.34 ktoe</i>
	Estimated impact of energy savings in 2018 (if any)	
	Assumptions	<i>Expected energy savings are based on energy audits conducted in all central government buildings.</i>
	Duplications, multiplying effect, synergies	<i>-</i>

<i>Title of the energy saving measure</i>		<i>EE improvement in public institution buildings at the central level – MPA, MoJ, KCUC, MIA and UP – MTEF</i>
<i>Measure index</i>		<i>S3</i>
	Category	<i>Financial instrument</i>

Description	Timeframe	<i>Start: 2016 End: 2018</i>
	Objective/short description	<i>The measure aims to increase energy efficiency in central public institution buildings</i>
	Target end use	<i>Existing buildings</i>
	Target group	<i>Services</i>
	Regional application	<i>National</i>
Information related to the implementation	List and description of energy saving actions that support the measure	<i>It is planned for the energy saving measures to be implemented in central level public buildings. Energy saving measures in public buildings foresee insulation of walls, replacement of windows, and insulation of roofs.</i>
	Budget and funding sources	<i>The budget for the central level for years 2016-2017 was analyzed. The overall budget for measure S3 is 10,31 million euro.</i>
	Implementing body	<i>MPA, MoJ, KCUC, MIA and UP</i>
	Monitoring authority	<i>KEEA</i>
Energy savings	Method for monitoring/measuring savings results	<i>KEEA already has a functioning Monitoring and Verification Platform</i>
	Estimated savings in 2018	<i>Measure implementation started in 2016</i>
	Accomplished savings in 2018	<i>Measure implementation started in 2016</i>
	Estimated energy savings in 2018	<i>3 ktoe</i>
	Estimated impact of energy savings in 2018 (if any)	
	Assumptions	<i>Expected energy savings are based on energy audits conducted for all central level buildings.</i>
	Duplications, multiplying effect, synergies	<i>-</i>

<i>Title of the energy saving measure</i>		<i>EE improvement in public central institution buildings, in the lighting sector</i>
<i>Measure index</i>		<i>S4</i>
Description	Category	<i>Financial instrument</i>
	Timeframe	<i>Start: 2017 End: 2019</i>
	Objective/short description	<i>The measure aims to increase energy efficiency in central level public buildings</i>
	Target end use	<i>Existing buildings</i>
	Target group	<i>Services</i>
	Regional application	<i>National</i>



Information related to the implementation	List and description of energy saving actions that support the measure	<i>It is planned for energy saving measures to be implemented in central level public buildings. Energy saving measures in public buildings envisages replacement of existing lighting bodies (fluorescent, CFL and Na) to LED.</i>
	Budget and funding sources	<i>The budget for the central level for years 2016-2017 was analyzed, and the overall budget for R6 measure is 0,8 million euro.</i>
	Implementing body	MPA
	Monitoring authority	KEEA
Energy savings	Method for monitoring/measuring savings results	<i>KEEA already has a functional Monitoring and Verification Platform</i>
	Estimated savings in 2018	<i>Measure implementation will start in 2017</i>
	Accomplished savings in 2018	<i>Measure implementation will start in 2017</i>
	Estimated energy savings in 2018	<i>0.31 ktoe</i>
	Estimated impact of energy savings in 2018 (if any)	
	Assumptions	
	Duplications, multiplying effect, synergies	-

Title of the energy saving measure		<i>EE improvement in public institution buildings at the local level, in four municipalities</i>
Measure index		<i>S5</i>
Description	Category	<i>Financial instrument</i>
	Timeframe	<i>Start: 2017 End: 2018</i>
	Objective/short description	<i>The measure aims to increase energy efficiency in local level public buildings</i>
	Target end use	<i>Existing buildings</i>
	Target group	<i>Services</i>
	Regional application	<i>National in four municipalities</i>
Information related to the implementation	List and description of energy saving actions that support the measure	<i>It is planned for energy saving measures to be implemented in central level public buildings. Energy saving measures in public buildings foresee insulation of walls, replacement of windows, insulation of roofs and basements.</i>
	Budget and funding sources	<i>Grant (German government 2.5 million euro) and (loan) – 2.5 million euro. The overall budget for measure S5 - 5 million euro.</i>

	Implementing body	<i>kfW</i>
	Monitoring authority	<i>KEEA</i>
Energy savings	Method for monitoring/measuring savings results	<i>KEEA already has a functional Monitoring and Verification Platform</i>
	Estimated savings in 2018	<i>Measure implementation will start in 2017</i>
	Accomplished savings in 2018	<i>Measure implementation will start in 2018</i>
	Estimated energy savings in 2018	<i>1.7 ktoe</i>
	Estimated impact of energy savings in 2018 (if any)	
	Assumptions	<i>Expected savings are based on energy audits conducted by MED for central level buildings.</i>
	Duplications, multiplying effect, synergies	-

Title of the energy saving measure		<i>EE improvement in local level public buildings</i>
Measure index		<i>S6</i>
Description	Category	<i>Financial instrument</i>
	Timeframe	<i>Start: 2016 End: 2018</i>
	Objective/short description	<i>The measure aims to increase energy efficiency in local level public buildings</i>
	Target end use	<i>Existing buildings</i>
	Target group	<i>Services</i>
	Regional application	<i>National in municipalities</i>
Information related to the implementation	List and description of energy saving actions that support the measure	<i>It is planned for energy saving measures to be implemented in local level public buildings. Energy saving measures in public buildings foresee insulation of walls, replacement of windows, insulation of roofs, basements.</i>
	Budget and funding sources	<i>The local level budget for years 2016-2017 was analyzed, and the overall budget for measure S6 is 6,97 million euro.</i>
	Implementing body	<i>Municipalities</i>
	Monitoring authority	<i>KEEA</i>
Energy savings	Method for monitoring/measuring savings results	<i>KEEA already has a Monitoring and Verification Platform</i>

	Estimated savings in 2018	<i>Measure implementation started in 2016</i>
	Accomplished savings in 2018	<i>Measure implementation started in 2016</i>
	Estimated energy savings in 2018	<i>2.1 ktoe</i>
	Estimated impact of energy savings in 2018 (if any)	
	Assumptions	<i>Expected energy savings are based on municipal EE plans and energy audits conducted for local level buildings by MED.</i>
	Duplications, multiplying effect, synergies	-

<i>Title of the energy saving measure</i>		<i>EE improvement in public lighting, at the local level.</i>
<i>Measure index</i>		<i>S7</i>
Description	Category	<i>Financial instrument</i>
	Timeframe	<i>Start: 2016 End: 2018</i>
	Objective/short description	<i>The measure aims to increase energy efficiency in public lighting</i>
	Target end use	<i>Existing buildings</i>
	Target group	<i>Services</i>
	Regional application	<i>National, in four municipalities</i>
Information related to the implementation	List and description of energy saving actions that support the measure	<i>It is planned for energy saving measures to be implemented in public lighting, by replacing Na, Hg and CFL lighting bodies to LED.</i>
	Budget and funding sources	<i>The budget for the local level for years 2016-2017 was analyzed, and the overall budget for measure R7 is 1,6 million euro.</i>
	Implementing body	<i>Municipality</i>
	Monitoring authority	<i>KEEA</i>
Energy savings	Method for monitoring/measuring savings results	<i>KEEA already has a functioning Monitoring and Verification Platform</i>
	Estimated savings in 2018	<i>Measure implementation started in 2016</i>
	Accomplished savings in 2018	<i>Measure implementation started in 2016</i>
	Estimated energy savings in 2018	<i>0.6 ktoe</i>

	Estimated impact of energy savings in 2018 (if any)	
	Assumptions	<i>Expected energy savings are based on Municipal EE Plans</i>
	Duplications, multiplying effect, synergies	-

### 3.2.4 Measures for the industry and SME sector

Data on electricity consumption in the industrial sector was retrieved from documents issued by KOSTT (Kosovo Transmission, System and Market Operator), in terms of electricity demand in general. Recently, the industry sector shows a moderate increase of the coal demand, especially upon the commencement of its use by the metallic and food processing industries. However, the industry sector will continue to be dominated by petroleum products, followed by electricity. An approximate evaluation is based on the assumption that the electricity system will be consolidated and electricity consumption increased, as a result of two elements:

1. The construction of Kosova e Re Power Plant – which will increase reliability of electricity supply, and
2. Cessation of the use of generators – electricity interruptions will be less frequent than the previous years.

By 2024 it is expected that the amount of electricity consumed by the industry sector will comprise 33% of the available energy. The underlying reason is that long-term development projects foresee that Kosovo will transit from an early stage development country to a sustainable development country.

The following measure is included in the Third NEEAP:

- EE improvement through the implementation of energy efficiency measures in SMEs,

*Table 36 - Summary table of measures to improve energy efficiency in the industry sector*

No.	Title of the energy savings measure	Target group	Timeframe	Accomplishment of energy savings in 2015 Summary of sectorial savings based on measures defined in the Second KEEAP	Estimated energy savings in 2018
I1	EE improvement through the implementation of energy efficiency measures in SMEs	SMEs	2016 to 2018	1.17	3,50 ktoe

<i>Title of the energy saving measure</i>		<i>EE improvement through the implementation of energy efficiency measures in SMEs</i>
<i>Measure index</i>		<i>I1</i>
<i>Description</i>	Category	<i>Financial instrument</i>
	Timeframe	<i>Start: 2014 End: 2018</i>
	Objective/short description	<i>This measure aims to increase energy efficiency in SMEs through the implementation of energy saving measures.</i>
	Target end use	<i>Industry and SMEs</i>
	Target group	<i>Industry and SMEs</i>
	Regional application	<i>National</i>

Information on the implementation	List and description of energy saving actions that support the measure	<i>It is planned for energy saving measures to be implemented in SMEs Measures for energy saving in SMEs envisage replacement of old, non-efficient production units and implementation of efficient lighting solutions.</i>
	Budget and funding sources	<i>EBRD/EC contribution (loan/grant) – 12 million euro in total for measure I1</i>
	Implementing body	<i>MED/KEEA</i>
	Monitoring authority	<i>KEEA</i>
Energy savings	Method for monitoring/measuring savings results	<i>KEEA has already established a post-implementation monitoring system which foresees that end beneficiaries shall submit information on real energy consumption upon project implementation.</i>
	Estimated savings in 2018	<i>Implementation of the measure shall start in 2014</i>
	Accomplished savings in 2018	<i>Implementation of the measure shall start in 2014</i>
	Estimated energy savings in 2018	<i>3,50 ktoe</i>
	Estimated impact of energy savings in 2018 (if any)	
	Assumptions	<i>Evaluation of the expected energy savings is based on the evaluation of energy savings accomplished with the implementation of similar projects under the Second KEEAP, foreseeing that at least 2/3 of the available budget shall be invested in the SME sector.</i>
	Duplications, multiplying effect, synergies	<i>-</i>

### 3.2.5 Measures in the construction sector

Table 37 - Summary table of measures to improve energy efficiency in the building sector

No.	Title of the energy saving measure	Target group
R1	EE improvement through the implementation of energy efficiency measures in residential buildings	Households
S1	EE improvement through the implementation of energy efficiency measures in public central level institution buildings (WB project)	Public services
S2	EE improvement through the implementation of energy efficiency measures in five public central level institution buildings - MED	Public services
S3	EE improvement through the implementation of energy efficiency measures in public central level institution buildings – MPA, MoJ, KCUC, MIA and UP – MTEF	Public services
S4	EE improvement in public institution buildings in the lighting sector	Public services
S5	EE improvement in public institution buildings of four municipalities – KfW	Public services
S6	EE improvement in public institution buildings of the local level - MTEF	Public services
S7	EE improvement in public lighting at the local level	Public services
I1	Improvement of the public transport system in Prishtina city	Public transport in Prishtina city

### 3.2.6 Summary of overall final energy savings

Accomplished and planned end-use energy savings are presented in Table 39.

Table 38 - Summary of final energy savings

Sector	Calculation methodology	Accomplishment of energy savings in 2015 – Summary of sectorial savings based on measures defined in the Second KEEAP	Estimated energy savings in 2018
Residential sector	TD/BU	3,42 ktoe	51,56
Transport sector	TD/BU	No measures implemented	12,00
Services sector	TD/BU	1,17 ktoe	20,71
Industry and SMEs	TD/BU	4.71ktoe	15,50
Horizontal measures	TD		9
Total		9.3 ktoe	108,77 ktoe

Note: Calculation of energy saving targets and estimation of energy saving measures was performed in conformity with Directive 2006/32/EC (ESD), Annex II.

### *3.2.7 Exemplary role of the public sector*

Various market assessments conducted in the recent years have identified a high level of potential energy savings which could be implemented in Kosovo through the implementation of energy efficiency measures in buildings. Certainly, the greatest energy saving contributions derive from the residential sector, followed by the private and commercial sectors. Although energy saving potential in municipal and central public buildings is low, in total less than 10%, compared to the other two sectors, currently public buildings represent the best possibility for implementing energy savings, since in most cases they fulfill minimum performance level requirements defined in the Technical Regulation on Thermal Energy Savings and Thermal Protection in Buildings No. 03/2009. This fact suggests that each energy efficiency program should commence with measures implemented in public buildings.

Therefore, implementation of national energy efficiency policies in Kosovo is focused on the public sector, not only because of ESD requirements, but also because of the fact that it is more practical to start activities in this sector. Moreover, this represents a pragmatic approach to EE, due to the undeveloped energy efficiency market in Kosovo. Through certain activities and decisions the public sector could impact citizens and organizations from other sectors, and entice them to undertake similar activities in order to diminish energy consumption.

Despite its relatively low saving potential, the commencement of implementation of EE measures in public central and municipal buildings sector will give a strong message that the government is ready to lead by its own example, and ensure good exposure to encourage other EE initiatives in Kosovo. On the other hand, this will help stimulate an EE goods and services market and establish better access to public and donor funds. On the supply side (including provision of goods and services that improve EE, such as installation of efficient heating and cooling systems, solar systems for water heating, more efficient electric bulbs, etc.), the successful implementation of the program will provide real opportunities for construction, heating and air conditioning companies, which will be stimulated to enhance their abilities and knowledge, in order to have more work in the future. Upon successful conclusion of a number of EE projects, the experience in other countries suggests that some of these companies will be developed and transformed into ESCOs. Secondary legislation to support the contractual framework for ESCOs, now also subject to review of the Law on Energy Efficiency, is supposed to provide a more favorable environment for the development of ESCO businesses.

The implementation of an EE investment program will generate an array of benefits for Kosovo's economy, thus providing increased energy savings, diminishment of energy imports and a lower trade deficit, greater longevity of adjusted buildings and decreases in the emission of greenhouse gases and acid rains.

Available data show that the construction sector in Kosovo provides vast opportunities for the implementation of energy savings. Since heating spaces comprises the greatest energy consumption factor for buildings, the greatest part of energy saving is related to thermal insulation, reduction of heat loss and introduction of efficient boilers. More than half of the Kosovo building stock is constructed in the period 1970-1975, the heating-related consumption in these buildings is characteristically high. The current level of heating consumption in Kosovo is estimated to be around 219 kWh/m<sup>2</sup> annually, compared to between 80 and 150 kWh/m<sup>2</sup> in Western Europe, leaving room for significant EE improvements.

In order to utilize the existing energy savings potential, every piece of legislation and support program needs to benefit from the existing EE market incentives. One such incentive could of increasing significance in the recent years is security of energy supply. Despite the increased utilization of local energy sources, such as lignite and biomass, Kosovo is entirely dependent on imports of petroleum products and, to a smaller extent, on the import of electricity, which comprised around 25% of its energy demand in 2010. Introduction of EE can increase security of supply by (a) decreasing imports of petroleum products, thus diminishing trade deficit; (b) by decreasing logwood consumption and preventing deforestation; and (c) minimizing the volume of electricity imports, thus diminishing the need for government subsidies.

Improvement of the fiscal balance represents a high priority for the Government of Kosovo (GoK), especially taking into consideration the current economic situation. EE measures represent a possibility for the government and public sector to decrease their energy-related budget expenses. This will represent a cost-effective measure, since investments made in improving EE in government facilities will compensate

themselves through savings at national level. In addition, in the event that the Government wishes to consider the introduction of financial incentives to support the development of a EE market, such incentives can be partially compensated by reducing subsidies for internal energy sale.

EE investments have a positive economic impact, as they contribute to the development of a modern industry that provides jobs and an array of possibilities for business development. In addition, they generate income from increased taxation for construction works necessary to implement EE measures, which creates a positive situation, in which the Government of Kosovo strives to optimize tax income by supporting the development of an EE market that provides for various social and environmental benefits.

The need to reach compulsory commodity levels (i.e. minimum levels of energy performance) in buildings, in line with EU directives on energy performance of buildings means that the renovation of the existing residential stock in Kosovo is of high priority. Old buildings require immediate investments in thermal insulation, introduction of double/triple efficient glass and efficient heating and hot water systems. Considerable energy savings are identified in other energy services, such as cooking, lighting and usage of other electronic appliances. This represents an opportunity for GoK to ensure that such renovations are implemented in an efficient manner, which contributes to sustainable economic development for Kosovo. In addition, renovation of old and damaged buildings will contribute to the accomplishment of energy saving objectives set in KEEAP for the period leading to 2018.

Implementation of EE measures represents an economically rational reaction to the lack of energy and the increasing energy prices, alongside environmental concerns. However, in all sectors the idea of obtaining loans to pay for EE investments is not as enthusiastic as expected. Therefore, it is necessary to identify the nature of obstacles that are restricting the implementation of EE measures in Kosovo and to analyze how such obstacles can be overcome.

Such restrictions in Kosovo are best understood by characterizing them by construction sector – residential/commercial, public or ‘cross-sectorial’, and according to their origin – economic, institutional, legal and regulatory, financial. The rigorousness of obstacles differs between different building subsectors, for example the low income residential market segment faces more problems related to access to finance and will be less able to invest in repairing and renovating buildings.

Therefore, certain restrictions can be treated by introducing financial mechanisms, such as grants, soft loans, guarantee schemes, dedicated funds, credit lines, more efficient procedures in financial institutions, and so on. In certain circumstances, successful financing programs can serve as mechanisms to remove certain market restrictions, although the removal of other hindrances may require legislative or organizational amendments in the institutional frameworks.

The cost and benefit analyses of buildings that have been subject to energy audits show that in most cases economic IRR (based on economically efficient ‘shadow prices’) is higher than the financial IRR (based on current prices), which proves the significance of increasing energy prices (especially of electricity, lignite and logwood) at the level of their long-term marginal costs for uninterrupted supply.

### **3.2.8**     *Horizontal and cross-sectorial measures*

Energy efficiency horizontal measures are those that apply to more than one energy end-use sector and in the long-term these measures can show real energy savings.

Three measures that have the greatest potential for promotion of energy efficiency are included in the 3<sup>rd</sup> NEEAP continuing the same activities as in the 2<sup>nd</sup>:

- Review of existing Energy Efficiency Law in the process of the transposing EED,
- Green public procurement policies,
- Implementation of the Law on Energy Performance of Buildings - improving minimum energy efficiency requirements for new buildings and existing buildings that are to be reconstructed.



Table 39 - Summary table of horizontal energy efficiency improvement measures

No	Title of the energy saving measure	Target group	Duration	Achieved energy savings in 2015 - summary of sectorial savings based on measures defined in 3 <sup>rd</sup> NEEAP	Energy savings expected in 2018
H.1.	Review of existing Energy Efficiency Law	All end-users	2017 to 2018	Implementation of the measure will start in 2017	9 ktoe
H.2.	Green public procurement implementation	State authorities Local authorities	2017 to 2018		
H.3.	Improving minimum energy efficiency requirements in new buildings and in existing buildings that are to be reconstructed according to the Law on Energy Performance of Buildings	Owners of buildings	2017 to 2018		

<b>Title of the energy saving measure</b>		<b>Review of the Energy Efficiency Law</b>
<b>Index of the measure</b>		H1
<b>Description</b>	<b>Category</b>	Regulation
	<b>Timeframe</b>	Start: 2016 End of October 2017
	<b>Aim/brief description</b>	Measure aims at the further development of the legal framework and laying the basis for secondary legislation that will introduce penalties/incentives for promotion of implementation of energy measures
	<b>Target end-use</b>	All end-users
	<b>Target group</b>	All end-users
	<b>Regional application</b>	Nationwide
<b>Information on implementation</b>	<b>List and description of energy saving actions substantiating the measure</b>	Review of the Energy Efficiency Law will include the following main initiatives: To be determined according to recommendations of the Parliamentary Commission.
	<b>Budget and financial source</b>	KEEA budget – Not yet estimated
	<b>Implementing body</b>	MED/KEEA
	<b>Monitoring authority</b>	KEEA
<b>Energy savings</b>	<b>Method for monitoring/measuring the resulting savings</b>	TD

	<b>Expected savings in 2018 as per 1<sup>st</sup> NEEAP</b>	<i>Implementation of the measure will start in 2017</i>
	<b>Savings achieved in 2018</b>	<i>Implementation of the measure will start in 2018</i>
	<b>Expected energy savings in 2018</b>	
	<b>Expected impact on energy savings in 2018 (if available)</b>	
	<b>Assumptions</b>	
	<b>Overlaps, multiplication effect, synergy</b>	

<b>Title of the energy saving measure</b>		<b>Green public procurement</b>
<b>Index of the measure</b>		<i>H2</i>
<b>Description</b>	<b>Category</b>	<i>Cooperative instruments</i>
	<b>Timeframe</b>	<i>Start: 2017 End: 2018</i>
	<b>Aim/brief description</b>	<i>Measure aims at facilitation of the penetration of energy efficient technologies through public procurement procedures, leading to a reduced impact on the environment as well as to budget savings.</i>
	<b>Target end-use</b>	<i>Public sector</i>
	<b>Target group</b>	<i>State authorities Local authorities</i>
	<b>Regional application</b>	<i>Nationwide</i>
<b>Information on implementation</b>	<b>List and description of energy saving actions substantiating the measure</b>	<i>In its procurement policy the contracting entity will set out environmental requirements for suppliers' abilities and include them in the technical specifications for the subject of the procurement, by making use of the relevant standards and eco-labelling, and also by including environmental and energy efficiency factors in the selection criteria for the most economically advantageous tender.</i>
	<b>Budget and financial source</b>	<i>State or local authority budgets, according to the authorities' procurement plans</i>
	<b>Implementing body</b>	<i>State and local authorities</i>
	<b>Monitoring authority</b>	<i>KEEA</i>
<b>Energy savings</b>	<b>Method for monitoring/measuring the resulting savings</b>	<i>TD</i>

	<b>Expected savings in 2018 as per 1<sup>st</sup> NEEAP</b>	<i>Implementation of the measure will start in 2018</i>
	<b>Savings achieved in 2015</b>	<i>Implementation of the measure will start in 2018</i>
	<b>Expected energy savings in 2018</b>	
	<b>Expected impact on energy savings in 2018 (if available)</b>	
	<b>Assumptions</b>	
	<b>Overlaps, multiplication effect, synergy</b>	

<b>Title of the energy saving measure</b>		Improving minimum energy efficiency requirements in new buildings and in buildings that are to be reconstructed
<b>Index of the measure</b>		H3
<b>Description</b>	<b>Category</b>	<i>Legislation</i>
	<b>Timeframe</b>	<i>Start: 2017 End: 2019 It is planned that by the end of 2017 the government will finalize and amend the Building Code. Part of this code will be a Chapter which defines standards for energy savings and thermal protection of buildings.</i>
	<b>Aim/brief description</b>	<i>Measure aims at facilitating the implementation of energy saving measures and at introducing higher standards for new and reconstructed buildings. The aim is to set standards and facilitate measures for implementation of energy savings in new and existing buildings.</i>
	<b>Target end-use</b>	<i>Buildings</i>
	<b>Target group</b>	<i>Owners of buildings In new and renovated dwellings and administrative buildings.</i>
	<b>Regional application</b>	<i>Nationwide</i>
<b>Information on implementation</b>	<b>List and description of energy saving actions substantiating the measure</b>	<i>The Building Code will set minimum energy efficiency requirements for new buildings and for reconstructed buildings.</i>
	<b>Budget and financial source</b>	<i>Budget of the Ministry of Environment and Spatial Planning Financing from EBRD</i>
	<b>Implementing body</b>	<i>Ministry of Environment and Spatial Planning, Municipalities, MED, MTI</i>
	<b>Monitoring authority</b>	<i>Ministry of Environment and Spatial Planning</i>
<b>Energy savings</b>	<b>Method for monitoring/measuring the resulting savings</b>	<i>TD Implementation of this regulation requires professional and human capacities</i>

	<b>Expected savings in 2018 as per 1<sup>st</sup> NEEAP</b>	<i>Implementation of the measure will start in 2018</i>
	<b>Savings achieved in 2018</b>	<i>Implementation of the measure will start in 2018</i>
	<b>Expected energy savings in 2018</b>	
	<b>Expected impact on energy savings in 2018 (if available)</b>	
	<b>Assumptions</b>	
	<b>Overlaps, multiplication effect, synergy</b>	

## 1. Residential and Commercial Sector Issues

Still remains (as it is mentioned in 2<sup>nd</sup> NEEAP) the barriers constraining the implementation of energy efficiency measures in Kosovo. They are very significant.

Those are:

### (i) Economic Constraints

- Market distortions in local energy markets mean that the prices of some fuels do not reflect their true production costs (e.g. firewood, lignite) and therefore energy savings are undervalued.

### (ii) Institutional Constraints

- Many households adhere to traditional methods of cooking and space and water heating, either because of preference, lack of awareness or, in areas where power cuts are common, for security of supply reasons.

### (iii) Legal and Regulatory Constraints

- Since 2000, a large number of 'illegal' buildings have been constructed in Kosovo without the required building permits. As a result, building energy performance standards are not enforced or monitored, often resulting in excessive energy consumption.
- There is no secondary legislation to promote the establishment of 'owners' communions' (or Housing Associations) and current structures to deal with refurbishment of the fabric of joint dwellings and 'common areas' in apartment blocks are ineffective.
- Inefficient electricity tariffs are not yet fully cost-reflective,

### (iv) Financial Constraints

- Lack of affordable EE financing schemes for lower income households unable to access the loan market.

## 2. Public Sector Issues

### (i) Economic Constraints

- EE is not a top priority for municipality mayors - water supply, waste disposal, and sewage treatment are considered more important issues.
- In order to improve the EE measures MED/KEEA is in the process of drafting the Administrative Instruction for establishing of MEOs (Municipality energy Offices) based on Energy Law Nr.05/L-081, Art.7, and Paragraph4.

### (ii) Institutional Constraints

- Insufficient EE expertise and resources at municipal level, even that 29 from 38 MUNI-s have already approved their MEEPs (municipality EE Plans).

### (iii) Legal and Regulatory Constraints

- Budgetary rules do not allow municipalities to benefit from any energy savings they achieve in the longer term – each year's budget allocation is based on the previous year's outturn.

- Technical Regulation Nr. 03/2009, which states that ‘energy sustainability’, requires the achievement of planned comfort levels in public buildings, as well as energy efficiency.
- The Law on Public Procurement should ensure that the process for evaluating government tenders takes account of any EE related benefits that a particular proposal will deliver.

(iv) Financial Constraints

- The Law on Public Debt imposes various restrictions on municipalities’ ability to borrow money. (Although for those municipalities that meet the required standards, the legal and regulatory environment appears to be favorable to municipality lending.)
- Central government budgetary constraints prevent direct finance of EE projects and the creation of an energy efficiency fund is at present not allowed.

### 3. Cross Sector Issues

(i) Economic Constraints

- Underdeveloped local EE/RES business infrastructure.
- Absence of ESCOs and ESCO based schemes from the local market

(ii) Institutional Constraints

- Inadequate data and institutional capacity to monitor evaluate and verify the impact of EE programs.
- Lack of impartial and detailed technical information on EE markets and the goods and services they provide.
- Lack of surveys on the quality of EE services and products means that potential customers are not well positioned to make informed decisions.
- Lack of a comprehensive and reliable EE data base for Kosovo. Poor quality of data leads to poor decision making which in turn results in ineffective investments.
- In order to improve this situation described above, it is developed MVP (Monitoring Verification Platform) with support of ORF GIZ.

(iii) Legal and Regulatory Constraints

- The Kosovo Energy Efficiency Agency is still under resourced relative to its responsibilities and obligations
- The Draft Law on Energy Efficiency has foreseen establishing adequate financial mechanism (EE fund) in order to promote EE and RES measures.

Specific initiatives to address and alleviate and/or remove these constraints are planned.

### ***Recommendations for future periods***

The **Kosovo Energy Efficiency Agency** remaining the focal point for all EE related projects and initiatives. The Agency is now overseeing and coordinating the following projects:

1. “Support on implementing the 3rd Energy Package with focus on Energy Efficiency and Renewables”, funded by EU (€2.5 m) – has started in 2016. The purpose of this project is to support the relevant Kosovo institutions at central and local level in enhancing the legal framework and developing policies and action plans to increase energy efficiency and the use of renewable energy sources. The purpose is to support the process of transposing the acquis on energy efficiency and renewable in the Kosovo legislation, to enhance the planning and implementation process at both central and local levels on increasing the energy efficiency and the share of renewables in final energy consumption, accompanied with awareness raising activities.

Support and strengthening of existing institutions, especially to KEEA is implementing body as important part of the project. Equally important is support in development of the structures at state and local levels (e.g. EE Fund, local info offices).

2. National Building Energy Efficiency Study for Kosovo was carried out in 2012 with the support of the World Bank and is to be followed by implementation a program of EE measures in 100 to 140 central and local government buildings, funded by supported by WB/EC with total investments 31 mil \$.

3. “Energy Efficiency measures in Public Buildings at the Municipality level in Kosovo” financed by KfW. Total investment in 4 selected Municipalities (Prishtinë, Ferizaj, Gjilan and Gjakova) is €7.5 Mil., where €2.5 mil. Is credit line KfW, €2.5 mil., donation German government and €2.5 mil., donation from EC.

4. “Regional Energy Efficiency Programme for the Western Balkans” (REEP plus) financed by EBRD will continue to support Kosovo on transposing of EPBD.

### 3.2.9 Measures to support EPBD implementation

KAEE in coordination with MESP is responsible for reporting on the implementation of the EPBD. With this regard in December 2016 Kosovo has approved Law on Energy performance of Buildings. Technical assistance which was in charge to help Kosovo transposing EPBD was EBRD. This technical assistance will continue with the REEP plus program to complete the program for secondary legislation during 2017.

## 4 Policy measures implementing EED

### 4.1 Legislative measures and reporting on 2020 targets

Transposition of the Directive 2012/27/EU (Energy Efficiency Directive – EED) for Energy Community contracting parties became obligatory by the decision of the Ministerial Council (D/2015/08/MC-EnC) held in Tirana, Albania. Target date for the full transposition of EED for all contracting parties of the Energy Community is October 2017. Directive imposes a set of obligations which should be a part of the next NEEAP under the EED principles which should be delivered to the EnC Secretariat by end of the April 2019 (see Figure 21).

In comparison with EU member states where the deadline for transposition of EED was before the third NEEAP delivery date, in EnC contracting parties the third NEEAP is supposed to be prepared according to the second NEEAP Template (for EU MS) with added part (this Chapter) dealing with planned EED policy measures.

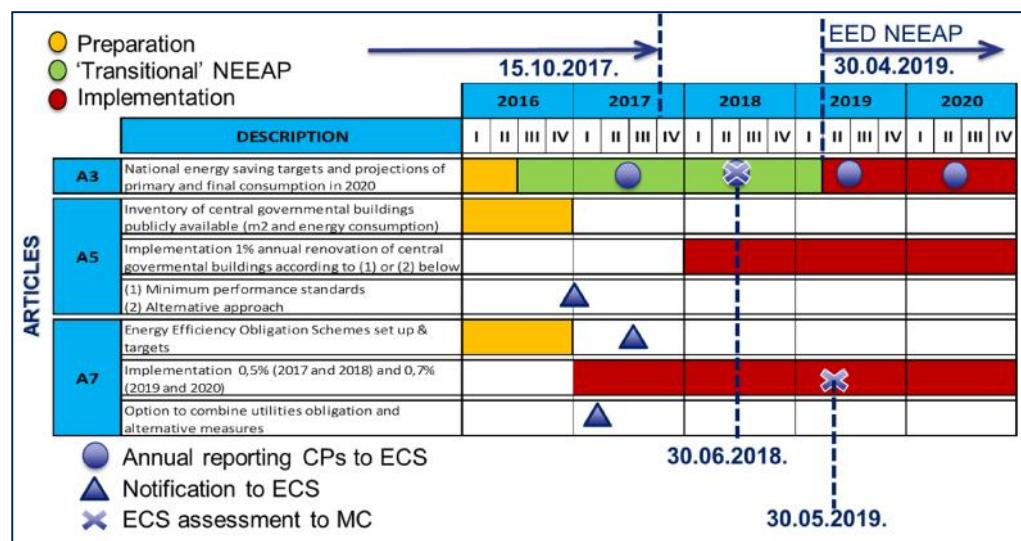


Figure 21 - Timeline for EED implementation (Articles 3, 5 and 7).

In Figure 21 the timeline for deliverables and reporting according to EED is given. One may notice that the Article 3 which deals with overall national energy saving targets covers the period June-2016 to end of April-2018. In this period the transitional NEEAP should be valid, until the next NEEAP, fully under the EED, should be prepared. Full transposition of EED is expected by mid of October-2017, meaning the changes in the existing Energy efficiency law (if not already done) and preparation of the secondary legislation in forms of rulebooks and ordinances.

However, the Article 7 which deals with Energy Efficiency Obligation Schemes (EEO) should deliver the expected savings starting from 2017. Neither Kosovo nor any of the EnC contracting parties already has an EEO scheme in place. Ministry of Energy in Kosovo during the negotiations on EED raised the question about the legal background for the EEO schemes, since the savings should start in 2017 and the legal transposition should be finalized by mid of October 2017. Problem becomes more complex by the fact that Article 7 targets, irrespective of the implementation instrument (obligation schemes or alternative measures), are cumulative and lacking the implementation only in first year(s) could mean that the targets will not be reached at the end of the period (end of 2020).

In terms of the Article 5, regarding the annual renovation of buildings owned and occupied by central government, the things are bit better. Namely, the implementation of this article should start beginning of 2018, after the deadline for full transposition of the EED. For both mentioned articles the relative energy saving targets (percentages) are different compared to EU MS. More about this topic will be given in subsections describing these two articles.

It is important to say that the deadlines for particular articles implementation of the EED in EnC contracting parties are in general set with the time shift of approximately 3 years compared to EU MS. This means that significant effort will have to be invested in EnC contracting parties having in mind that the available time for implementation is more demanding than in EU MS. At the other side, the EnC contracting parties can learn on EU MS experience, good and bad practices during the implementation, and can set up the solid foundations for implementation of the EED requirements.

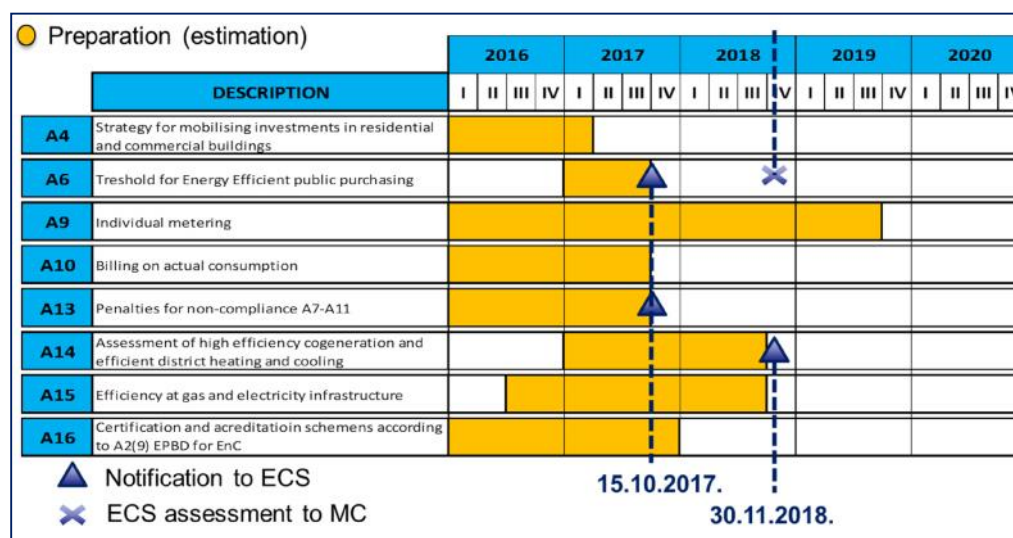


Figure 22 - Time plan for reporting/notification to EnC Secretariat on different EED articles.

In Figure 22 the time plan for different article implementation is given including the required notification to EnC Secretariat related to different articles from the EED. Yellow data bars in Figure 22 represent the indicative time for preparation of different studies, reports and conclusions necessary to deliver the countries opinions and notification according to deadlines.

Full transposition would mean the changes in the existing Energy efficiency law and preparation of secondary legislation in terms of the rulebooks and guidelines.

The Draft Law on Energy Efficiency in Kosovo covers the provision of some requirements of the EED. The compliance of the law will be discussed with the EnC Secretariat. However, it is already known that the provisions of some articles should be incorporated either into EE law or the secondary legislative acts, such as: the requirements of Article 3 (targets), 6 (purchasing by public bodies), 8 (energy audit and management), 9-11 (metering and billing), 12 & 17 (information and training) and 18 (energy services). Furthermore Article 24 could provide more details about programs that may be financed by the Energy Efficiency Fund (if it is planned) and would allow for transposition of Article 7 using the preferred option: default or alternative.

Secondary legislation should specify in details the key provisions of some articles of the EED. The list below is an indicative list and could be used as the general guidelines in this direction but the content and the topic of the rulebooks will depend mostly on the content and the definitions within the EED compliant law. Further explanations should be obtained by the Energy Community Secretariat according to the legal requirements of the directive.

The following list is indicative and is not limited only to the EED requirements:

- Rulebook on Methodology for calculation of energy savings (top-down and bottom-up),
- Rulebook on energy efficient public procurement,
- Rulebook on eco-design of energy consuming products,
- Rulebook on methodology for conducting energy audits in buildings,
- Rulebook on minimum requirements of energy performance of buildings,
- Rulebook on energy related products washing machines, AC systems <12 kW, TV, refrigerators, freezers, lights and illumination),
- Rulebook on regular inspection of heating and air-conditioning systems,
- Rulebook on energy certification of buildings,
- Rulebook on categories, conditions and qualification requirements for issuing a licence to Energy Auditors,
- Rulebook or law on metering, compliant with EED (district heating, hot water preparation, district cooling if applicable)
- Rulebook on energy performance contracts,
- Guidelines for energy performance contracting and contract model(s),
- Ordinance on obligatory energy audits for non-SMEs (large consumers),
- Ordinance for conducting CBA for high efficiency cogeneration (as part of the permitting procedure?).

The secondary legislation is not limited to the above list and can contain also the topics such as:

- Guidelines for implementation of energy efficiency measures for central and local authorities,
- Order on the form and format for the submission of energy data to the Agency/Ministry for Energy Efficiency by energy consumers (where required),
- Guidelines on the determination of thermal energy consumption by shared buildings without individual metering,
- Development of standard contracts for projects supported by the Energy Efficiency Fund (if the fund exists or will be established),
- Rulebook on privileged electricity producer – electricity produced from high efficiency cogeneration,
- Decision on determination of indicative energy savings targets.

Republic of Kosovo recalculated individual targets in order to make sure that the projected energy consumption in primary and final energy does not exceed the cap consumption for Kosovo. It is known that the cap consumption is prescribed for the EnC contracting parties at the level of the Energy Community and that no individual country targets were set. However, in order to make sure that the consumption at the EnC overall will remain under the prescribed cap consumption in 2020, it is recommended to recalculate the individual targets per EnC countries.

For the below given exercise, the available Kosovo national energy balances are used and the constant relative maximum increase in energy consumption is calculated for the period 2015 - 2020 in order to keep the consumption at the cap level in 2020. In Figure 23 can be seen that the allowed increase in primary energy consumption can be 3,5% annually which will still keep Kosovo under the recalculated individual cap by 2020.

Note that the primary energy consumption cap for Kosovo is 2,95 Mtoe.



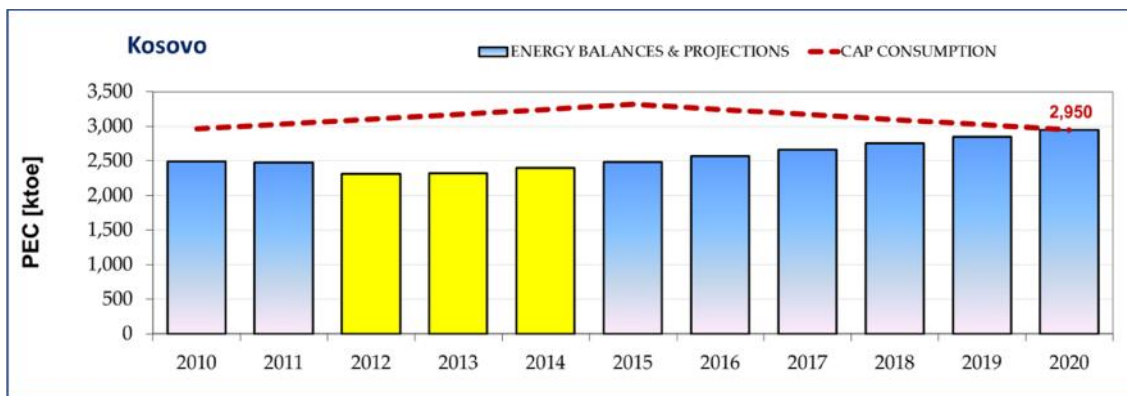


Figure 23 - Primary energy consumption from Kosovo energy balances (yellow) and projections (blue).

The same principle is applied for final energy consumption and is illustrated in Figure 24. It is important to underline here that the final cap consumption in 2020 is 1,89 Mtoe.

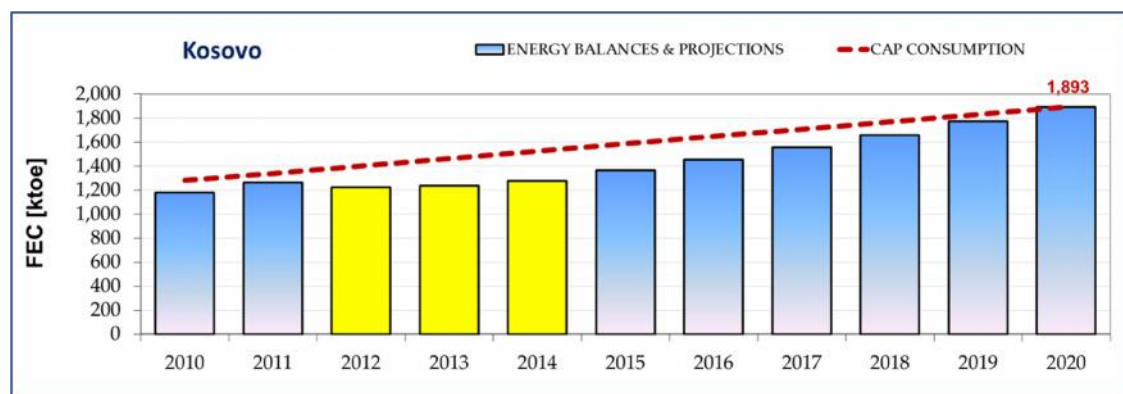


Figure 24 - Final energy consumption from Kosovo energy balances (yellow) and projections (blue).

Yellow data bars in Figures 23 and 24 are taken from the official energy balances of the Republic of Kosovo and the light blue data bars are either initial balances from the International Energy Balances for years 2010 and 2011 or the projections of future maximum energy consumption (2015-2020) so that the Kosovo will remain below its envisaged individual cap consumption. Calculation shows that the cap consumption will be reached in the 2020 only with an 6,8% relative annual increase in final energy consumption. This is practically impossible and it can be said that the Republic of Kosovo will for sure remain below the individual cap consumption limit.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Industry	356.20	376.20	389.37	398.19	398.87	399.93	410.89	420.75	431.71	442.37
Households	503.93	525.84	541.7	555.6	574.25	589.63	607.57	623.32	641.82	658.35
Services	114.51	120.88	125.74	130.54	136.66	142.03	148.11	153.59	159.20	163.95
Agriculture	21.18	21.98	23.18	23.77	24.51	25.16	25.89	26.56	27.29	28.02
Transportation	342.36	349.21	356.19	363.31	370.58	377.99	385.55	393.26	401.13	409.15
Total	1338.19	1394.12	1436.18	1471.40	1504.87	1534.74	1578.01	1617.48	1661.16	1701.84

Table 4039 - Overview of the energy consumption forecast in Kosovo by 2022 (Energy Strategy).

It is also important to emphasize that the **Republic of Kosovo in its Energy Strategy (2013)** presented the final energy consumption projections **by 2030**, which is illustrated in **Table 40** by different sectors.

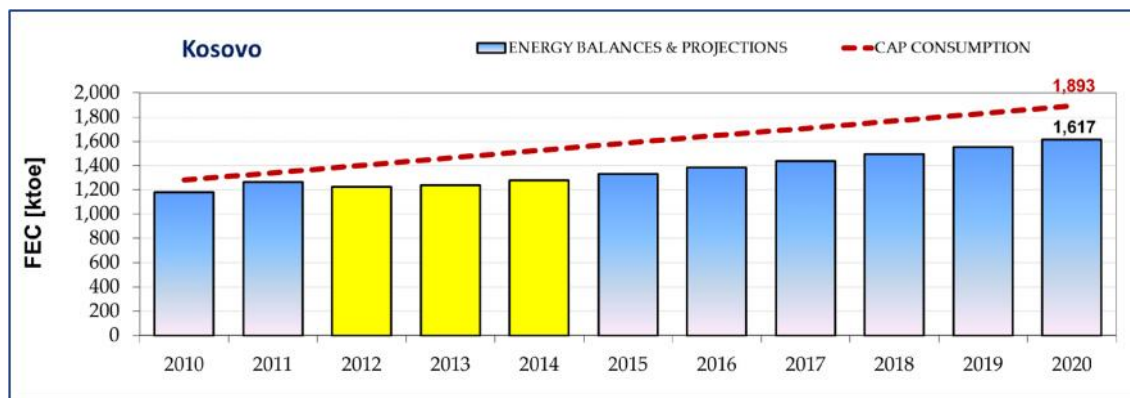


Figure 25 - Recalculated individual cap consumption for Kosovo and projections by 2020 (Energy strategy).

In Figure 25 the final energy consumption according to energy balances (yellow) and projections from the Energy Strategy of the Republic of Kosovo (2013) are given. It can be seen that the projected final energy consumption in 2020 is significantly below the cap consumption for Kosovo and still the final energy consumption can grow 4% on annual basis which will again lead Kosovo to reach the planned energy consumption prescribed by the Energy Strategy.

#### 4.1.1 Implementation status and plans

As already said in the text above, the current draft of new Energy efficiency law in Kosovo already addresses some of the provisions of the EED. The EnC Secretariat will be consulted in order to check the compliance of the law with EED requirements before the document is officially adopted by the Kosovo government. At the end of the Chapter IV the Summary will be given with indicative time plan for implementation of the main provisions of the EED.

In terms of the current primary and final energy consumption, including the projections, it can be said that Kosovo will remain below the envisaged individual cap consumption. When the time comes for the preparation of the next NEEAP, fully consistent with EED (planned to be delivered by the end of April 2019), Kosovo will consider which option will be the most convenient option as a national indicative target: primary/final energy consumption or primary/final energy savings. Out of other important things it should be mentioned that Kosovo needs the technical assistance for Article 7 and the EnC Secretariat will be asked to support this issue.

#### 4.2 Building renovation strategy (Article 4)

Building Renovation Strategy does not exist at the moment in Republic of Kosovo. However, some preparatory work has been done in a structured way and two relevant studies can be used during the preparation of the Study. In what follows the basic data from these studies will be outlined. First Study is "National Building Energy Efficiency Study for Kosovo (2013)", under the World Bank Institute's Program on "Scaling up Climate Friendly Energy Efficiency Policies across South East Europe", which was a technical assistance, funded by the Austrian Ministry of Finance. The second Study is "Feasibility Study of Energy Efficiency and Implementation Measures in Public Buildings in Kosovo (2015)" prepared for the World Bank as a client under the Contract number PO 7169649.

First Study provided valuable input in the following. Calculation of Heating Degree Days (HDD) for the most important municipalities, based on long-term external average air temperatures was performed. It is important to say that these data were missing before.

According to the KEEAP and CENSUS 2011, there were approximately 310,000 residential buildings in Kosovo in 2011, over 55,000 commercial buildings and around 1,800 municipal and central public buildings. Therefore, even with the data on public sector buildings that the KEEA made available, the 106 energy audits that have been included in this study have to represent a population of some 370,000 residential, public and private service sector buildings.

Municipality	HDD (°C)	Municipality	HDD (°C)
Shtime	2830	Zubin Potok	3185
Obiliq	2890	Prizreni	2157
Graçanicë	2892	Ferizaj	2862
Novo Bërdë	2875	Gjakovë	2589
Suharekë	2168	Gjilan	2832
Rahovec	2176	Peja	2384
Deçani	2598	Prishtinë	2890
Junik(Deçan)	2596	Klinë	2621
Vushtrri	3004	Podujevë	2900
Skenderaj	3015	Mitrovicë	3064
Leposaviq	3165		

Table 40 - Calculated heating degree days for different municipalities in Kosovo (Source: National Building Energy Efficiency Study for Kosovo).

For the purposes of introducing standard HDD data and geographic diversity into the sampling process, this study classifies the building stock of Kosovo according to three municipal groupings Mitrovica, Pristina and Prizren. In what follows the results of the preliminary energy audits in 107 buildings from the different building categories were shown. For different types of buildings mentioned in the text the number of buildings will be given.

Processing data from the residential sector shows that actual energy consumption (kWh/m<sup>2</sup>, year) for 46 buildings for each of the three regions fluctuated between 50 and 550 kWh/m<sup>2</sup> year according to the respective sub-categories of the residential building stock. Weighted actual average specific energy consumption values for three regions and for the whole residential building stock of Kosovo are presented in Figure 8.

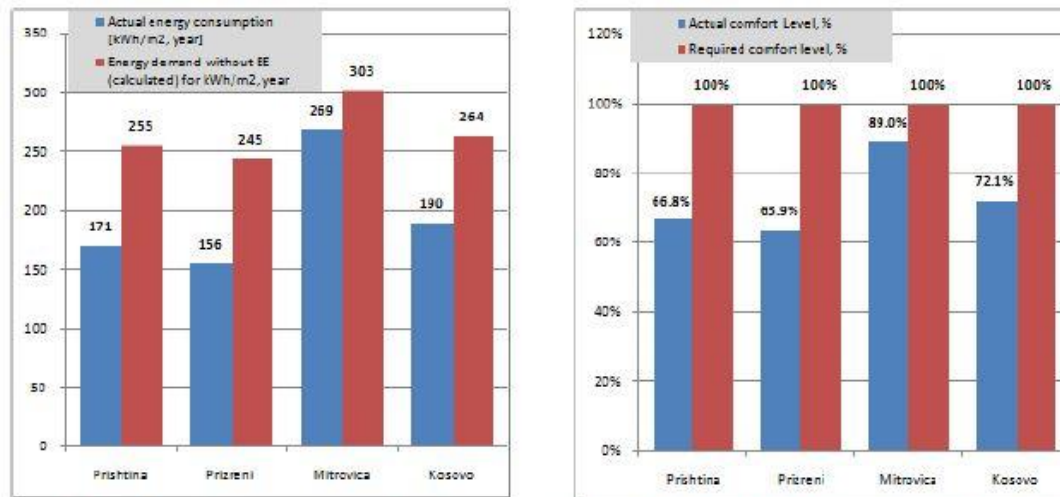


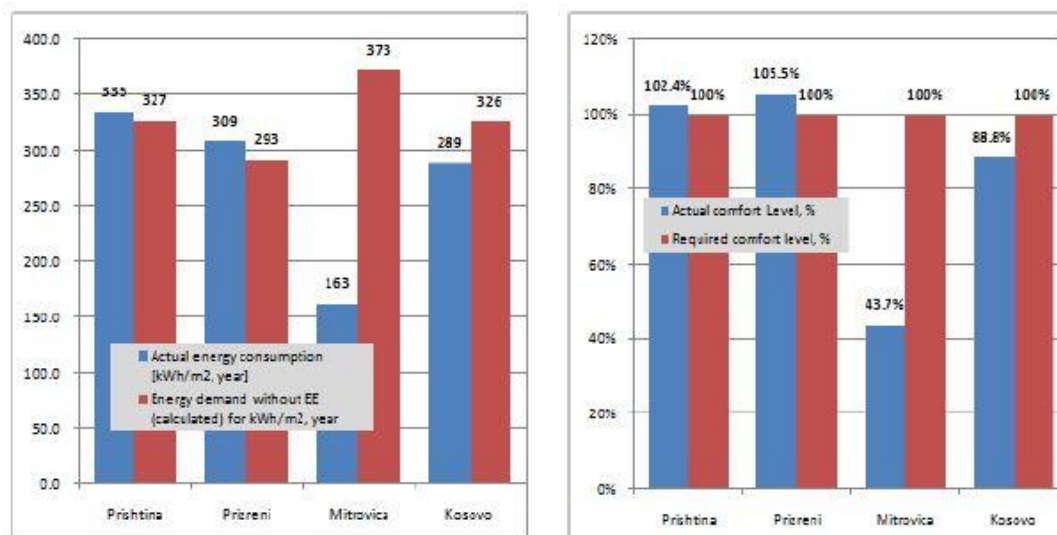
Figure 26 - Actual and normalized energy consumption for residential buildings (left) and relative comfort level (right) for three climatic zones and average for Kosovo.

The baseline energy demand was calculated and compared with actual energy consumption (Figure 8 left). Analysis shows that in most cases actual energy consumption is lower than the baseline energy demand required to achieve full comfort levels (blue and red data bars in Figure 26). In relative amount the normalized data for different regions were as well as the averaged values for Kosovo are presented in Figure 26 right.

In order to analyze energy consumption in the Public Building Stock, 30 audits from across the three regions of Kosovo were reviewed based on the other projects mentioned above. Processing of the data shows that the actual energy consumption for all municipality public buildings in each of the three regions fluctuated from a minimum value of 70 (kWh/m<sup>2</sup> year) up to 605 (kWh/m<sup>2</sup> year).

Municipal public buildings in two regions (Prishtina and Prizren) have actual comfort levels higher than 100%, which means that energy services in those buildings are secured inefficiently and introducing EE measures will bring real energy savings.

Both above mentioned studies were dealing also with the central governmental buildings and the results obtained are quite different. In the next paragraph under the Title: Central Governmental Buildings, the differences will be outlined and discussed.



According to the conclusions made in the next paragraph and targeting only the central governmental buildings, the general conclusions valid for preparation of the Building Strategy will be given. As a bottom line, there are some useful materials as a starting point for preparation of the Strategy but this data should be used carefully because of the significant differences related to the energy consumption of the central governmental buildings. General approach is that the Building Strategy should cover all buildings in Kosovo: residential, commercial and public. Similar approach will be used in order to examine the most cost-effective approach among the following measure options:

- Energy audit and introduction of energy management system,
- Replacement of windows and outside doors,
- Insulation of external walls,
- Insulation of roofs/ceilings towards the non-heated areas,
- Insulation of walls towards non-heated basement,
- Insulation of ground floor,
- Replacement of centralized heating systems with use of renewables if possible,
- Replacement and centralization of air-conditioning & ventilation with use of renewables,
- Replacement and centralization of system for hot water preparation with use of renewables,
- Replacement of lighting system,
- Measures targeting rational water consumption,
- New central energy management unit,
- Equipment for reactive power compensation,
- Photovoltaic modules for electricity production.

Calculations will be performed for different climatic regions in Kosovo and the results will be the cost-optimal renovation measures or package of measures. It is the plan of the Republic of Kosovo that the Building renovation strategy should initiate the state programs to support the implementation, provide the solid basis for negotiations with financial institutions and estimate current market potential for energy services (ESCO). This can be a win-win situation if one takes into consideration the local employment, which should be the one of the key arguments in energy efficiency policy implementation.

#### 4.2.1 Implementation status and plans

According to the time plan for EED transposition valid for EnC contracting parties all countries should finalize Strategy for mobilizing investments in residential and commercial buildings, both public and private, by 30<sup>th</sup> of March 2017. Kosovo plans to use two mentioned studies as the baseline for development of the Building Strategy. In that sense the assistance via REEP+ program is expected and welcomed. It is therefore proposed that the solid Building inventory should be developed which will afterwards be used for the preparation of the Strategy. Estimated implementation time for preparation of the study as a prerequisite for Strategy is 6-9 months and estimated costs are 50,000-100,000 euro. Possible financing via REEP+ would be ideal, since regional approach should minimize the management costs because of the regional dimension of the project.

#### 4.3 Central government buildings (Article 5)

Energy Efficiency Directive, adapted for EnC contracting parties imposes a rate of 1% annual renovation of the central governmental buildings, starting from year 2018 (see Figure 21). The critical issue here is the accurate data on the building stock as well as the interpretation of the definition coming from the directive – buildings which are owned and occupied by the central government. Central governmental buildings in Kosovo are elaborated as part of the Study “Feasibility Study of Energy Efficiency and Implementation Measures in Public Buildings in Kosovo (2015)” prepared for the World Bank as a client under the Contract number PO 7169649.

As part of the aforementioned Study the terminology of central governmental buildings took into consideration the following buildings:

- Ministry or public administration
- Dormitories,
- Universities,
- Court/Prosecution,
- Police,
- Hospital,
- Army and
- Prison/Detentions.

Total evaluated floor surface of all buildings from the list above is 745,300 m<sup>2</sup> and the average energy consumption of final energy was 123 kWh/m<sup>2</sup>. If one takes into consideration the average efficiency of the heating system of 67% (reference value taken from the BU Methodology for Kosovo), then this small specific final energy indicates that the specific heat demand should be around 80 kWh/m<sup>2</sup>. Having in mind the current status of these buildings one may say that the thermal comfort conditions were not satisfied. In that sense the proper normalization and additional analysis should be conducted, otherwise the feasibility of any energy efficiency measure will be questioned.

If one takes, as EED allows, only buildings owned and occupied by the central government or Ministry or public administration buildings according to the division above, then the total floor surface will be 130400 m<sup>2</sup> in 43 buildings out of this category. This means that the average building floor surface is approximately 3000 m<sup>2</sup>. At the other side, 1% annual renovation recalculated from the 130400 m<sup>2</sup> would be 1300 m<sup>2</sup> per year, or in other words, one building to be refurbished in two years!

The Study under the Title: “National Building Energy Efficiency Study for Kosovo (2013)” also dealt with central governmental buildings from processing energy audits of ten central public buildings. The results of audits show that the actual energy consumption fluctuated from a minimum value of 120 (kWh/m<sup>2</sup> year) up to 500 (kWh/m<sup>2</sup> year) as shown in Figure 7-7. Weighted actual average specific energy consumption values for central public buildings stock of Kosovo are presented in Figure 28.



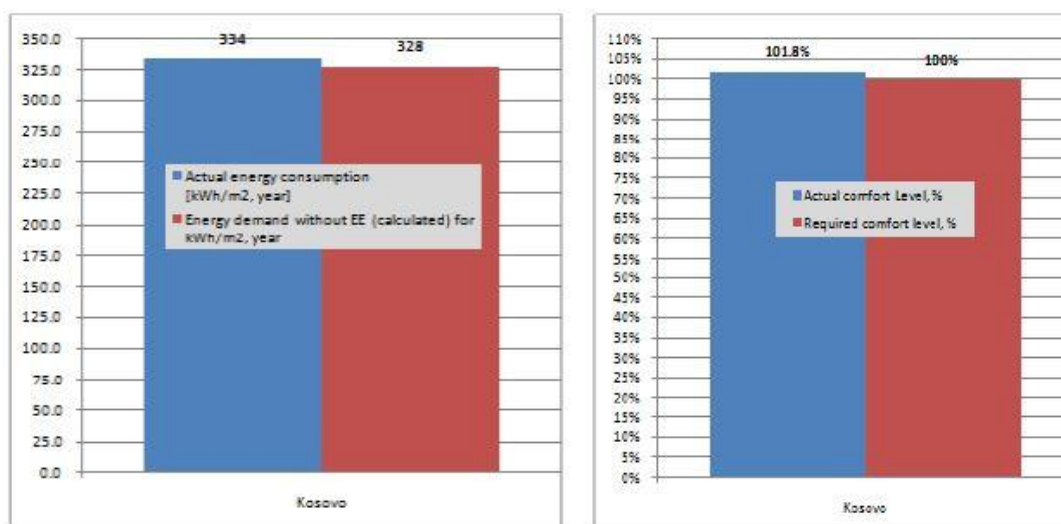


Figure 28 - Actual and normalized energy consumption for 10 central governmental buildings in Prishtina (left) and relative comfort level (right)

Most central public buildings are located in Prishtina and they are included in this study as a single group for whole of Kosovo. Analysis shows that for central public buildings the actual energy consumption in most cases is higher than the baseline energy demand required to achieve full comfort levels. Results are shown in Figure 10. It can be seen that the central public buildings enjoy actual comfort levels higher than 100%, which means introducing EE measures will result in real energy savings.

One can observe the huge differences between the results from two studies. In one Study the specific final energy consumption is 123 kWh/m<sup>2</sup>, while the second study based on the preliminary energy audits outlined the average consumption of 334 kWh/m<sup>2</sup>. The differences are huge and the special attention should be paid that the reliable numbers are proposed. In that sense, the key issue in Kosovo, and we assume in all other countries from the region, will be to set up the reliable baseline conditions.

#### 4.3.1 Implementation status and plans

As mentioned in the text above, two Studies prepared for the World Bank as a client are available. However, as already underlined, the data on energy consumption for central governmental buildings differ significantly and it is a key point to establish a reliable baseline conditions. Only when the reliable baseline conditions are defined, one may talk about the cost-optimal building renovation and choose between the options which Article 5 from EED offers. Kosovo ministry and the KEEA are planning to lobby for technical assistance via REEP+ in order to support the preparation of the building stock for Kosovo.

#### 4.4 Purchasing by public bodies (article 6)

Article 6 will be regulated with secondary legislation. Based on Draft law on Energy Efficiency which partly will transpose the EED 2012/27/EU it is foreseen to be regulated with secondary legislation. Deadline for full filling the criteria will be Q4 2018.

#### 4.5 Energy efficiency obligation scheme and alternative policy measures (Article 7)

No obligation has been placed to date on energy companies regarding reducing final end-use energy consumption in Kosovo. In the text which follows the main focus will be put on calculation of preliminary targets based on the Kosovo energy statistics data and last available energy balances for 2014.

#### Calculation of Targets

Energy efficiency directive adapted for EnC contracting parties says that the implementation of Article 7 should generate a cumulative energy savings in end-use sector by 31. December 2020. This target should be equivalent to achieving new savings every year starting from January 1<sup>st</sup> 2017 of 0,7% annual energy sales to final customers of all energy distributors or retail energy sales companies by volume, averaged over the last three years period prior to 1 January 2016. The sales of energy in transport sector, by volume, may be partially or totally excluded from the calculations.

Paragraph 2 of the EED offers the possibility to take into account the energy savings from the transformation, distribution and transmission sectors, including efficient district heating and cooling infrastructure. Also, the energy savings measures coming from the projects implemented from December 2008 onwards which will continue to have an impact in 2020 can contribute to the achievement of target. However, the maximum relative amount of savings under the paragraph 2 is the 25%.

It is estimated that Kosovo fulfills the criteria outlined in Paragraph 2 and that the following calculation of targets is possible. Instead of fixed 0,7% mentioned in the first paragraph, Kosovo will opt for the 0,5% targets in years 2017 and 2018, and 0,7% targets in years 2019 and 2020.

In Figure 42 the annual targets coming from the Article 7 are shown. The cumulative amount of targeted energy savings by 2020 is 51,2 ktoe, which comes from the expected savings in 2017 and 2018 in the amount of 4,6 ktoe annually and 6,4 ktoe savings annually in 2019 and 2020. It has to be said that the presented numbers are preliminary numbers since the exact data for 2015 are still not available but it will be until the deadline of the EED transposition.

KOSOVO	Baseline FEC - transp [ktoe]	913	NATIONAL BALANCES 2010-2012		
Savings per year [ktoe]	0.50%	0.50%	0.70%	0.70%	TOTAL
2017	4.6				4.6
2018	4.6	4.6			9.1
2019	4.6	4.6	6.4		15.5
2020	4.6	4.6	6.4	6.4	21.9
CUMULATIVE [ktoe]					51.2
ANNUAL AV. [ktoe]					5.5

*Table 412 - Illustrative example of how cumulative energy savings according to A7 are calculated.*

In what follows the simplified calculation is presented which shows an impact of the introduction of energy efficiency obligation schemes on the price of electricity in this case.

Sectors	Final consumption [ktoe]	Final consumption [MWh]	Final consumption [kWh]	conv. factor [ktoe] - [MWh]
TOTAL	1,279	14,871,979	14,871,978,800	11630
Industry	282	3,283,731	3,283,730,500	En savings price Euro/kWh
Households	518	6,024,107	6,024,107,400	0.6
Services & Agriculture	146	1,700,190	1,700,189,700	Avg. price MWh 0.4 KV
Transport	332	3,863,951	3,863,951,200	80.1
Relevant for the target	368	4,280,067	4,280,067,362	Avg. price MWh VN
Annual savings per A7	Savings [ktoe]	Savings [MWh]	Savings [kWh]	Costs [€]
2017 i 2018 (0.5%)	1.8	21,400	21,400,337	12,840,202
2019 i 2020 (0.7%)	2.6	29,960	29,960,472	17,976,283
El energy	El. energija [ktoe]	El. energija [MWh]		Price [€]
El en. In final cons.	406.0	4,721,780		378,114,510
El. en. All voltage levels	406.0	4,721,780		359,525,658
El. en. HH and rest	300.0	3,489,000		279,394,958
El. en. 10 kV i 35 kV	106.0	1,232,780		80,130,700
Years	2017	2018	2019	2020
Annual investments [€]	12,840,202	12,840,202	17,976,283	17,976,283
Ann. El. price increase [%]	3.6%	0.0%	1.4%	0.0%
Total investments [€]	61,632,970			
% kWh price increase	5.0%			
Avg. household [30 €]	31.5			
Avg. household [60 €]	63.0			
VT kupci ???				
				oblig. schemes ratio in A7
				40%

Table 423 - Simple sheet for calculation of price increase for introduction of obligation schemes.

In Figure 43 simplified calculation is conducted for estimation of the electricity price increase as a result of the implementation of the obligation schemes on energy retail sales or distribution companies. It is assumed that the only fuel which will be covered by the obligation schemes is electricity and that the average price of the kWh saved is 0,6 euro. The estimation of the kWh saved costs is based on the data of already implemented energy efficiency projects in Kosovo. The data on electricity consumption in final use is taken from the energy balance of the Republic of Kosovo for 2014 and the price of MWh at the different voltage levels are averaged and for detailed and more precise analysis the rigorous segmentation and analysis should take place. However, preliminary results show a big influence of the schemes on electricity price.

Simple calculation showed that for full implementation of the obligation schemes on retail or distribution companies, means approximately 12% electricity price increase is expected within four year period. This is partly result of the fact that the electricity prices in Kosovo are low but at the other hand it is hard to expect that the envisaged electricity price increase will be approved. If one assumes that the maximum realistic price increase is up to 5% in four years period, than the obligation schemes can provide 40% of cumulative expected savings given in Figure 43. The rest of the 60% would than need to be obtained by alternative measures.

#### 4.5.1 Implementation status and plans

At the moment there are no activities regarding the Article 7 implementation in Kosovo. There is a pending IPA project under the Title: "Support on implementing the 3rd Energy Package and EU acquis on Energy Efficiency and Renewables". This project is mainly focused on the transposition of the relevant acquis in the sectors of electricity, energy efficiency and renewable, which includes the preparation of the secondary legislation. However, the Article 7 by side the legal definition and formal transposition, carries also the additional complexities in terms of the implementation, management and monitoring of the eventual scheme for obligated parties. The technical assistance on Article 7 is provided to some countries from the region via REEP program and KEEA will analyze the outcomes and set up the implementation plan for Kosovo. Until now, no choice has been made whether the obligation schemes will be put on the retail sales companies and/or distributors or the equivalent amount of energy savings will be reached by alternative measures or any combination of these two.

#### 4.6 Energy audits and management systems (Article 8)

Energy audits and management systems till now are not regulated and based on EE draft law an article on that will regulate. This topic will be covered by GIZ, technical assistance starting from 2017.



#### 4.7 Metering and billing (Articles 9-11)

This article of the EED says: Contracting parties shall ensure that, in so far as it is technically possible, financially reasonable and proportionate in relation to the potential energy savings, final customers for electricity, natural gas, district heating, district cooling and domestic hot water are provided with competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use.

Individual metering for electricity and gas (not applicable in Kosovo case) are covered by directives related to the market liberalization and the third energy package implementation in the EnC contracting parties (Directives 2009/72/EC and 2009/73/EC as incorporated and adapted by Ministerial Council Decision 2011/02/MC-EnC). As an example the extraction from the 2009/72/EC is given below:

*Contacting parties shall ensure the implementation of intelligent metering systems that shall assist the active participation of consumers in the electricity supply market. The implementation of those metering systems may be subject to an economic assessment of all the long-term costs and benefits to the market and the individual consumer or which form of intelligent metering is economically reasonable and cost-effective and which timeframe is feasible for their distribution.*

...

*where roll-out of smart meters is assessed positively, at least 80 % of consumers shall be equipped with intelligent metering systems by 2020.*

Draft of the Energy efficiency law in Kosovo does not treat the consumption based billing or individual metering of the heat consumption. The reason is that only around 3% of Kosovo heating demand is covered by three district heating companies in Prishtina, Gjakova and Mitrovica. They commonly generate thermal energy of around 130 GWhth/year. However, according to the *Republic of Kosovo Heating Strategy 2011-2018* all three systems face great commercial losses caused by failure to collect heating payments, which is based on m<sup>2</sup> of heated surface.

Having in mind the current problems of the existing district heating systems, the individual metering is out of the question at the moment. However, due to expected expansion of the district and centralised heating systems in the future, the Kosovo government will consider which option will be the most cost-effective approach.

In general, in district or centralized heating systems in Kosovo the two-pipe systems prevails and with these systems it is not possible to have the one measuring point per apartment in multi-apartment buildings. So, the only option for individual metering would be the installation of the individual metering at every heater (heat allocators).

In order to comply with the requirement of the EED, the KEEA considers the option to analyse the feasibility of the individual metering and to formally prescribe the conditions where this option should be considered. In that sense, the role model from EU member states is the Finish example. Finland demonstrated that individual heat meters would be considered cost effective only if they would drive the occupants to save heat energy by more than 45% in apartment buildings and by 30% in row (terraced) houses. Heat cost allocators would be considered cost effective only if they would drive the occupants to save energy by more than 21 % in apartment buildings and by 14% in row houses. This means that, in 99% of existing multi-apartment buildings, individual heat measurement or indirect cost allocation carries such high costs that it is not possible to cover these costs through the energy savings typically achieved by behavioral changes.

##### 4.7.1 Implementation status and plans

Individual metering for final consumers of electricity should be conducted by responsible institutions from the electricity sector, involved into the transposition of the third package directives. Irrespective of the choice which will be implemented in the electricity sector, Kosovo plans to prepare the strategic approach in the heat metering. Based on such analysis, the rulebook for metering in heating systems should be prepared in which the rules and conditions for individual metering and/or heat cost allocators installation will be precisely

defined. Also, the results of the building renovation strategy (Article 4) as well as the potential for high-efficiency cogeneration and district heating systems (Article 14), should be used as the relevant in order to estimate the potential of energy savings and to evaluate heat demand, which should at the end, determine the cost-effectiveness of the individual metering. Estimated preparation time: 6 – 9 months, prerequisites – Building renovation strategy (baseline energy consumption for different categories of buildings), estimated costs up to 50,000 euro.

#### 4.8 Consumer information programs and training (Articles 12, 17)

Regarding to the Articles 12 it is regulated with secondary legislation, with Administrative Instruction No. 14/2012 "On the Promotion of Energy End-Use Efficiency and Energy Services". Government of Kosovo organize public campaign on Energy Efficiency and Renewable Energy Sources (RES), started 2011 and continued till 2019 € 50,000.00 per year. Based on draft law on Energy Efficiency, which will partially transpose EED 2012/27/EU article 17 will be regulated through the EE law. Law on Energy Performance of Buildings is approved from the parliament of Kosovo and farther step are completion with secondary legislation for implementation. Training on National Calculation Methodology for assessing the Energy performance of Building using of the software an Interface for Simplified Building Energy Model (iSBEM) has been done and farther steps in this regard are training of the local level staff.

#### 4.9 Promotion of efficient heating and cooling (Article 14)

Article 14 adapted for EnC contracting parties says: By 30 November 2018, Contracting Parties shall carry out and notify to the EnC Secretariat a comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling, containing the information set out in Annex VIII. If they have already carried out an equivalent assessment, they shall notify it to the EnC Secretariat.

Kosovo draft of the Energy efficiency law treats the provisions of this Article within Chapter V: Energy efficiency at supply side. This chapter underlines that the Potential of the high efficiency cogeneration and district heating will be made. This estimation will be based on the cost-benefit analysis which will take into consideration the climatic conditions, economic and technical feasibility. Cost benefit analysis should be prepared for the following cases:

- When a new thermal electricity generation installation with a total thermal input exceeding 20 MW is planned;
- When an existing thermal electricity generation installation with a total thermal input exceeding 20 MW is substantially refurbished;
- When an industrial installation with a total thermal input exceeding 20 MW generating waste heat at a useful temperature level is planned or substantially refurbished;
- a new district heating and cooling network is planned or in an existing district heating or cooling network a new energy production installation with a total thermal input exceeding 20 MW is planned

Energy strategy of the Republic of Kosovo underlines the importance of the district heating within the Objective I.2. and under the Title: Security of thermal energy for heating. It is said that the use of thermal energy for heating is of special significance, due to the high participation and impact it has in the country's energy balance, as well as its impact on national and municipal budgets due to required subsidies for electricity and district heating purposes.

The use of electricity for heating purposes represents a great burden for electricity supply, therefore, the development of district heating systems and improvement of the performance of existing district heating facilities aims to diminish use of electricity for heating purposes. For the implementation of measures for thermal energy, private, public investments and grants, and co-financing are envisaged.

Measures to be undertaken according to the Energy strategy:

- Reduction of electricity for heating, encouraging the development of district heating systems;
- Promotion and development of cogeneration of thermal energy and electricity in all plants, where possible, including industrial;

- Decrease of commercial losses and increased financial sustainability of existing district heating enterprises;
- Encourage the use excess (unused) thermal energy from the industrial sector;
- Creating conditions for the use of alternative sources and RES for heating, with a positive impact in the environment and sustainable development of the sector;
- Encourage the use of efficient heating equipment, and increase thermal performance in buildings.

Among the other interesting things is for sure the technical assistance project under IPA 2015/38066.6/Kosovo/ with the Title: “Improving district heating in Prishtina and Gjakova”. The aim of the project is to improve the district heating supply in Prishtina and Gjakova in order to:

- decrease losses of heat energy in the district heating systems thus contributing to higher efficiency within the system;
- improve the quality of heating supply for the customers in order to substitute the use of electricity for heating purposes;
- improve environmental performance, i.e. reduce greenhouse gas emissions from the two district heating systems by switching to renewable energy sources (biomass) in Gjakova/Djakovica and by reduction of energy losses and improved energy efficiency within the Prishtina district heating system.

#### **4.9.1 Implementation status and plans**

Draft of the Energy efficiency law already treats the provisions of the Article 14 of EED and imposes the obligations of preparation of cost benefit analysis for cogeneration all new or refurbished facilities over the 20 MW capacities valid for thermal power plants and for district heating systems. Also, the Energy Strategy of Kosovo promotes the expansion of the district heating systems and the technical assistance under IPA aims at improving of the district heating system in Prishtina and promotes the use of biomass for heating in Gjakova. Ministry of economic development in Kosovo will prepare the comprehensive assessment of the high-efficiency cogeneration and district heating until the deadline prescribed by the EED adapted for EnC contracting parties, which is end of November 2018. KEEA will follow the development of the mentioned activities and will report on the primary energy savings from the project which will be implemented in Prishtina and Gjakova.

#### **4.10 Energy transformation, transmission, distribution and demand response (Article 15)**

According to the Energy Strategy of the Republic Kosovo 2013 – 2022, the overall length of transmission lines (400 kV, 220 kV and 110 kV) is 1,187 km. In the recent years, considerable investments have been made and have had an impact in increasing transmission capacities, enhancing their security and reliability, and in diminishment of losses in the transmission system. Hence electricity losses in transmission, in relation to the overall consumption, were expected to decrease from 109.028 GWh in 2012 to 107.3 GWh in 2017, thus diminishing by 1.8%.

##### **Transmission system development**

The main objective of the strategy, as far as the transmission system is concerned, was to establish a sustainable infrastructure able to handle the increased domestic demand for electricity and enhance Kosovo’s power exchange capability in the regional market. Further upgrading and new investments are needed in the transmission network. Targeted investments will improve the reliability of the transmission system, support the development of new generation capacities and the development of a competitive and non-discriminatory market, facilitate regional power exchanges, and help reduce technical losses.

The development of the transmission system should continue to maintain system security and reliability as per required standards and it is a condition for non-discriminatory market development in the country and the region.

##### **Development of the distribution network**

Further upgrading and new investments are necessary in the distribution network to reduce losses, increase distribution capacities, and improve the quality of supply to end-consumers. Investments will improve the security and reliability of the distribution system, and will help to reduce technical losses and improve the quality of services and reliability.

Kosovo Energy Distribution Services (KEDS) has been increasing the number of points of supply, and is strengthening all outgoing lines to 10/35kV and 35/10kV substations and interconnection lines. In addition, improved network configuration is required, as well as the supplier/distribution lines and transformer stations.

In cooperation with Kosovo Electricity System and Market operator (KOSTT), KEDS will decide on new points of supply for 110/10(20)kV, and shall define the transfer from current voltage level of operation 35 and 10kV to 20kV, and to develop the medium and low voltage network and implement new technologies for monitoring and control of network operation, including efficient control of electricity consumption by consumers.

Measures to be undertaken:

- Necessary rehabilitations, strengthening and modernization of the network with the aim of eliminating bottlenecks, reduction of technical losses and improvement of the security of supply and quality of electricity for our end-consumers;
- To define further needs for new substations and transfers from 20 kV to 10 and 35 kV;
- To create conditions for connection in the distribution system of energy generation capacities, based on renewable sources;
- As requested by ERO, the new KEDS Company must draft a five-year action plan for the reduction of technical and commercial losses, and for increased billing and collection to a satisfactory and acceptable level.

#### **4.10.1 Implementation status and plans**

As already stated in the text, the Energy Strategy of the Republic of Kosovo and the action plans of KOSST and KEDS cover the topic of decreasing the technical losses in the transmission and distribution systems. On behalf of the Ministry of the Economic Development of Kosovo, the KEEA is responsible for monitoring of the energy efficiency implementation, including the measures on the primary side savings. In that light, the KEEA is planning to report on implemented projects by KOSST and KEDS which result in primary energy savings. This reporting will be done on the annual basis after the preparation of the next NEEAP fully consistent with the EED.

#### **4.11 Availability of qualification, accreditation and certification schemes (Article 16)**

Based on EE draft law this will be regulated within project foreseen to be implemented from GIZ, starting from 2017.

#### **4.12 Energy services (Article 18)**

***New Draft law on EE has foreseen with an article to open possibilities for establishing the ESCO. With the secondary legislation will be modalities of function of ESCO-s.***

#### **4.13 Summary**

This document presents the Kosovo preliminary plan of how to deal with the requirements coming from the different articles of the Energy Efficiency Directive. This directive puts some very ambitious targets and deadlines which will not be easy to fulfill. Ministry of economic development in Kosovo and the KEEA were working in close cooperation with the other ministries from the region and mutual preliminary plan has been developed, which reflects the real gaps and the needs of most of the EnC countries. This implementation plan for EED is given in the form of the indicative table in which the key points were discussed in the text of this Chapter.

The time plan in Figure 11 proposes the preparation of several studies – not directly linked with the legal requirements of the EED. The example is the elaboration of the current building stock and inventory of buildings. Namely, it is impossible to calculate the cost-optimum solution for buildings or even near zero energy buildings – if the baseline conditions are not known in Kosovo and in other EnC countries as well. This mutually prepared time plan underlines the preconditions which are missing for successful implementation of the EED (EPBD as well). The table is prepared in a way that it addresses key activities, expected deliverables and notification to EnC Secretariat. Since the REEP+ program is to start soon – the recommendation is given that some of the activities should be covered by this program. More than that, the national software which was part of the previous technical assistance project by REEP – Simplified Building Energy Model (SBEM) also requires the correct national database of the objects.

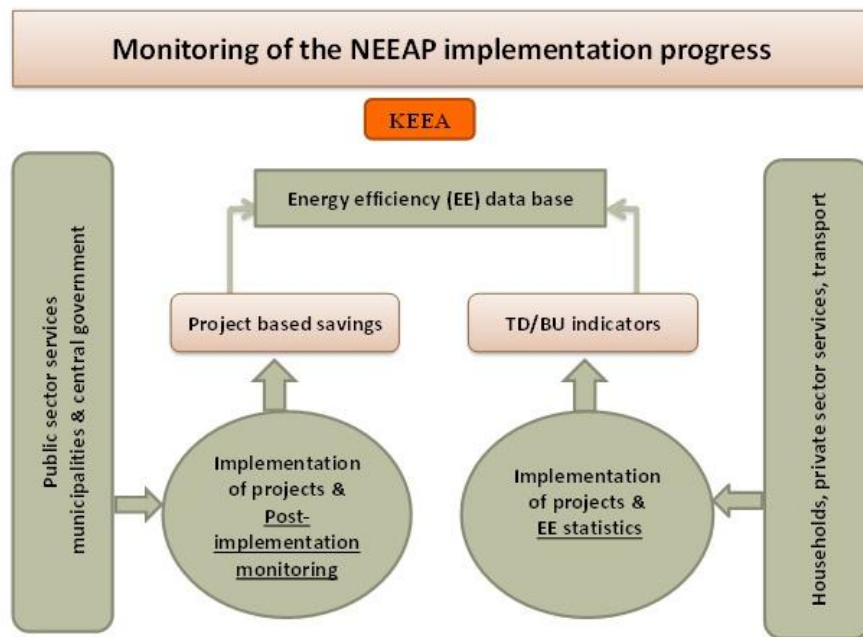
Article	Activity	2016		2017				2018				Responsible	Legend
		III	IV	I	II	III	IV	I	II	III	IV		
*	Buildings inventory an typology (residential, public & services)											REEP+	Deadline/notification
A5	Central gov. buildings inventory (>250 m2)											CP	Rulebook/ordinance
*	Cost-optimal and nZEB calculations											CP/TA	Strongly dependent
A5	Program for Central governmental buildings											CP/TA	Influenced by
A4	Program for residential buildings											REEP+	Contracting Party
A4	Program for public & commercial buildings											CP/TA	Regional EE program
A9	Metering law (bylaw) for heating/cooling/hot water (el./gas?) based on savings potential											CP/TA	Technical assistance
A14	CHP national potential (mapping of existing and planned, exemptions, monitoring, access)											CP/SUP/TA	Energy supplier
A6	Threshold for EE public purchasing											CP	Not defined in EED
A7	Article 7 EEDS and/or alternative measures, decision, legal framework, notification											CP/TA	
A8	Energy Audits for large consumers (SMEs, energy mngmt or env. mngmt systems)											CP/TA	
A13	Penalties for non-compliance (obligated parties for A7, large consumers for A8)											CP	
A15	Assesment & measures identified for el & gas. Privileged producer CHP! (A24I)											CP/SUP	
A16	Certification and accreditation schemes and training programmes in place											CP	
A18	Energy services (promotion, SMEs, public sector, contract models)											CP/TA	
A24	Reporting (annual progress on targets, statistics on cogeneration)											CP	

Table 434 - Indicative plan for EED implementation with addressing the implementation gaps.

## 5. Establishment of competent authorities and delegated organizations

Ministry of Economic Development is the key ministry for development of energy sector, energy efficiency planning and supervision of its implementation. Also, it has a key role in the design and implementation of structural economic sectorial policies, design of industrial policy and other policies in areas specified in the relevant laws.

AKEE will be responsible for monitoring the progress of implementation of the second NEEAP. It has already established a database on energy efficiency for the collection and analysis of information about the achievements of energy savings based on projects. Creating statistics energy efficiency was identified as the activity with the highest priority to be carried out by all parties involved.



*Figure 29 – Monitoring of the NEEAP implementation progress*

Relevant line ministries as other stakeholders in the energy sector have been involved actively in the process of preparing the third NEEAP and will have an important role to ensure the success of its implementation.

The Ministry of Infrastructure will be responsible for implementing the policies related to the development of the transport sector and promote energy efficiency in the transport sector.

Ministry of Environment and Spatial Planning has identified as necessary drafting the Law on energy performance and drafted the law through technical assistance from project REEP 1 which transposes Directive 2010/31/EU and at the same time has drafted regulations for its implementation. AKEE in coordination with MESP is responsible for reporting on the implementation of the EPBD.

Article 7 of Law no. 05/L-081 ON ENERGY for local level paragraph 4 words as follows:

To implement the tasks dealing with the Strategy, the Government adopts a bylaw for the establishment, financing and operation of municipal energy offices, to address issues of implementation and monitoring at the local level.

Kosovo has created a special fund for financing of energy efficiency measures, but is expected to be regulated by the new law for EE which will partially transpose the EED 2012/27/EU.