

"Official Gazette of the Republic of Serbia", No. 98/2013

Pursuant to Article 8, paragraph 3 Law on Efficient Use of Energy ("Official Gazette of the Republic of Serbia", No. 25/13) and Article 43, paragraph 3 of the Law on Government ("Official Gazette of RS", No. 55/05, 71/05 corrigendum, 101/07, 65/08, 16/11, 68/12 - US and 72/12), at the proposal of the Ministry of Energy, Development and Environmental Protection

The Government shall adopt the

#### CONCLUSION

- 1) The Second Energy Efficiency Action Plan of the Republic of Serbia for the period from 2013 to 2015 shall be adopted, enclosed in hard copy to this Conclusion as its integral part.
- 2) The Ministry of Energy, Development and Environmental Protection shall submit the Second Energy Efficiency Action Plan of the Republic of Serbia for the period 2013 - 2015, referred to in Section 1 of this Conclusion (translated into English), to the Energy Community Secretariat of South East Europe.
- 3) This Conclusion shall be published in the "Official Gazette of the Republic of Serbia".

05 No. 312-8611/2013  
In Belgrade, 21 October 2013

Government

Prime Minister,  
Ivica Dačić, in person

# THE SECOND ENERGY EFFICIENCY ACTION PLAN OF THE REPUBLIC OF SERBIA FOR THE PERIOD FROM 2013 TO 2015

## LIST OF ABBREVIATIONS

ECMT	European Conference of Ministers of Transport
EAR	European Agency for Reconstruction
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EMEEES	Evaluation and Monitoring for the EU Directive on Energy End-Use Efficiency and Energy Services
EPBD	Directive 2010/31/EU on the energy performance of buildings
ESCO	Energy Service Company
EURO 1-6	European regulations on exhaust emissions of motor vehicles
EWBJF	European Western Balkans Joint Fund
GTZ/GIZ	German Society for International Cooperation (Deutsche Gesellschaft für Technische Zusammenarbeit /Deutsche Gesellschaft für Technische Zusammenarbeit since 2011)
IDA	International Development Association
JICA	Japan International Cooperation Agency
KfW	Reconstruction Credit Institute (Kreditanstalt für Wiederaufbau)
LCC	Life-cycle cost
ORG	Open Regional Fund GTZ/GIZ
SEE	South-East Europe
UNECE	United Nations Economic Commission for Europe
UNDP	United Nations Development Programme
WB	World Bank
WBIF	Western Balkans Investment Framework
RTSA	Road Traffic Safety Agency
EEARS	Energy Efficiency Agency of the Republic of Serbia
EEAP	Energy Efficiency Action Plan
GDP	Gross domestic product
DH	District heating
DEEC	Directive 2006/32/EC on energy end-use efficiency and energy services
DMS	Information system for energy consumption monitoring and issuance of permits in the building sector (Data Management System)
ETD	Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading
EE	Energy efficiency
EC	Energy Community
EPS	Electric Power Industry of Serbia
EU	European Union
Law on EUE	Law on Efficient Use of Energy
SCE	Serbian Chamber of Engineers
SEE	South-East Europe
PC	Public and Commercial sector
HVAC	Heating, ventilation, and air conditioning systems
MV	Monitoring and Verification

MVE	Monitoring, Verification, and Evaluation
SIEEN	Serbian Industrial Energy Efficiency Network - SIEEN
MEDEP	Ministry of Energy, Development and Environmental Protection
ME	Ministry of Economy
SME	Small and medium enterprise
MF	Ministry of Finance
IFI	International financial institutions
NGO	Non-governmental organisations
RES	Renewable energy sources
BU	Bottom-up
TD	Top-down
PE	Primary energy
SEEP	Serbian Energy Efficiency Project
SCC	Serbian Chamber of Commerce
IPESDS	Implementation programme of the Energy Sector Development Strategy
PSEMR	Provincial Secretariat for Energy and Mineral Resources
FEC	Final energy consumption
TF	Task Force
SORS	Statistical Office of the Republic of Serbia
RS	Republic of Serbia
REEC	Regional Energy Efficiency Centres
DHS	District heating system
OG RS	Official Gazette of the Republic of Serbia
EMS	Energy Management System
SCTM	Standing Conference of Towns and Municipalities
EEI	Energy Efficiency Improvement
PPO	Public Procurement Office
FE	Final energy

## 1. INTRODUCTION

The Second Energy Efficiency Action Plan of the Republic of Serbia for the period from 2013 to 2015 (hereinafter referred to as: the Second EEAP) has been prepared at the request of DEEC, and in accordance with the model developed by the Working Group on Energy Efficiency established in the Energy Community Secretariat.

In October 2013, a new Directive 2012/27/EU on energy efficiency was adopted, which replaces DEEC but it is not binding yet on the Parties to the EC Treaty.

The reporting period for the achievement of the national indicative target for the EU Member States is 2008-2016, in accordance with DEEC. The main goal is that all Member States achieve the planned savings of 9% of the average final energy consumption for the period 2001-2005 in the ninth year of application of this Directive. The above objective is not related to energy consumers covered by the Directive 2003/87/EC, as well as end consumers whose energy consumption falls into sectors of air and river transport.

In the case of the Republic of Serbia, and in accordance with the Decision 2009/05/MC-EnC of 18 December 2009 adopted by the Ministerial Council of the Energy Community, the First Energy Efficiency Action Plan of the Republic of Serbia for the period from 2010 to 2012 (hereinafter referred to as: the First EEAP) covered the period from 2010 to 2012, and defined an average indicative target for this period at the level of 1.5% of the final domestic energy consumption in 2008 (0.1254 Mtoe), i.e. the total target of at least 9% of the final energy consumption in the ninth year of application, calculated with regard to the final energy consumption in 2008 (0.7524 Mtoe). An absolute amount of the indicative target that should be confirmed by the state as the sum of energy savings over a period of nine years was determined in the First EEAP on the basis of data on the final energy consumption in 2008, since these data were the most reliable at that time in terms of energy consumption in the Republic of Serbia.

The Second EEAP covers the period from 2013 to 2015, and it defines average indicative target of savings in final energy consumption for this period, report on the degree of fulfillment of the indicative target for the first reporting period, and the problems that followed the implementation of the First EEAP. The average indicative target for the coming period from 2013 to 2015 was defined at the level of 3.5% of the final domestic energy consumption in 2008 (0.2952 Mtoe), so that in the period from 2010 to 2015 the overall savings of 0.3975 Mtoe (4.7%) are achieved, i.e. the total target of at least 9% of the final energy consumption in the ninth year of application, 0.7524 Mtoe. The aim of the final energy savings over a period 2013-2015, of 3.5% (0.2952 Mtoe), will be achieved by the implementation of EEI measures in the following sectors: household 0.0693 Mtoe (approx. 23.4%), PC sector 0.0499 Mtoe (approx. 16.8%), industry 0.081 Mtoe (approx. 27.7%) and transport 0.095 Mtoe (approx. 32.1%). A new distribution of the targets was presented in accordance with the current implementation dynamics of the First EEAP and it is in accordance with the revised estimates of savings opportunities of individual measures.

The development, implementation, control and reporting on the Action Plan for Energy Efficiency are regulated by the Law on Efficient Use of Energy ("Official Gazette of the RS", No. 25/13) and are comprised within the scope of work of the ministry in charge of energy, i.e. the Ministry of Energy, Development and Environmental Protection. The First EEAP defined that in the implementation process a part of the responsibility for the implementation is attributed to the Energy Efficiency Agency of the Republic of Serbia, but it ceased to exist on the date of entry into force of the Law on Amendments and Supplements to the Law on Energy ("Official Gazette of the RS", No. 93/12) so its operations were taken over by MEDEP.

In accordance with the Law on EUE, the Government adopts the Action Plan for the period of three years, and MEDEP annually submits a Report on the implementation of the Action Plan. MEDEP also provides a methodology for monitoring, verification and evaluation of the effects of implementation of the Action Plan. For the implementation of the Action Plan, in addition to MEDEP, the responsibility is also attributed to state authorities, provincial or local governments, within their respective jurisdictions.

The Second EEAP is a strategic document which defines, in the area of improving energy efficiency in the Republic of Serbia, specific quantitative targets for energy savings in line with the general objectives of other policy documents in this area. The Second EEAP includes: 1) Analysis and performance evaluation of the implementation of the First EEAP, and key parameters of the Second EEAP; 2) Proposed measures to increase energy efficiency, i.e. measures to reduce the final energy consumption and set indicative targets for the second reporting period 2013-2015; 3) A review of horizontal measures, as well as institutional and financial framework for the implementation of EEI measures aimed to improve the implementation, monitoring and evaluation of achieved savings.

In respect of the First EEAP, in the Second EEAP the measures are defined somewhat differently. Each old measure is comprised within a new measure, and in some cases the new measure includes a number of old ones, while the old measures that in the First EEAP related to the establishment of funds and credit lines, in the Second EEAP are presented as financing mechanisms. Measures that are related to multiple sectors are shown as horizontal measures, i.e. measures that contribute to the implementation, monitoring and evaluation of achieved savings, namely energy consumption monitoring.

In the preparation of the Second EEAP, data on final energy consumption in industry, transport, households and other sectors were used, obtained from the official Energy Balances of the Republic of Serbia. It should also be taken into account that, with a view to defining the energy savings targets within the Second EEAP, consumption in the air transport was excluded from the final energy consumption shown in the official Energy Balance of the Republic of Serbia, in accordance with the methodology defined in the DEEC. Data on the final energy consumption in the river transport are not available, but it was estimated that it is quite insignificant, and thus was not exempt from the transport consumption. In the calculation of the final energy consumption in terms of DEEC, no part of the industry energy consumption was excluded on the basis of ETD, considering that Serbia has not accepted yet the application of the ETD.

A part of the Report referring to the savings achieved in the previous period was performed by using the "bottom-up" methodology for the verification of energy savings due to the lack of all relevant statistical data needed to apply the "top-down" methodology. In reporting on the situation in the sectors of energy consumption and total final energy consumption, data are taken from the official Energy Balances of the Republic of Serbia and the assessment of trends provided in these.

Out of the planned 1.5% savings in final energy consumption, defined in the First EEAP, for the previous reporting period a saving of 1.22%, i.e. 0.1023 Mtoe was achieved, thus the plan fulfilment is 81.5%. The paper discussed in detail the reasons for the original plan failure.

Table 1 shows in detail, by the sectors of final energy consumption, what was planned in the First EEAP, what has been achieved, and what are the savings plans for 2015 and 2018, foreseen in the Second EEAP.

Table 1: Overview of planned and actual savings according to the First EEAP and the Second EEAP

Consumption sectors	Planned savings in 2012 according to the First EEAP Mtoe	Actual savings in 2012 according to the First EEAP Mtoe	Planned savings in 2015 according to the Second EEAP Mtoe	Planned savings in 2018 according to the First EEAP Mtoe	Planned savings in 2018 according to the Second EEAP Mtoe
Household and PC sector	0.0235	0.0195	0.1387	0.3031	0.2749
Industry	0.0566	0.0746	0.1556	0.2626	0.2668
Transport	0.0453	0.0082	0.1032	0.1867	0.2107
Total	0.1254	0.1023	0.3975	0.7524	0.7524

Table 2 shows the percentage of different sectors in the final energy consumption and percentage of savings according to the First EEAP and the Second EEAP. The redistribution of savings target was due to changes in the structure of final energy consumption, according to a new energy balance after 2010, and due to identified potential savings of new measures, which are analyzed in detail in the Second EEAP.

Table 2: Percentage of different sectors in the final energy consumption and percentage of savings

Consumption sectors	Percentage of different sectors in the final energy consumption in 2008 %	Percentage of different sectors in the final energy savings in 2018 according to the First EEAP %	Percentage of different sectors in the final energy consumption in 2011 %	Percentage of different sectors in the final energy savings in 2018 according to the Second EEAP %
Household and PC sector	38.50	40.2	49.16	36.55
Industry	33.88	35	29.39	35.45
Transport	27.63	24.8	21.43	28

Table 3 shows all EEI activities that will be carried out through the implementation of the Second EEAP, with a note specifying on what previous measure applies the new one, assigning responsibilities for the implementation of the measures and the presumed sources of financing these measures.

Table 3: Overview of measures by sectors

Reference No.	Name of measure	Previous name of measure	Expected savings in 2018 [Mtoe]	Institutions and persons responsible for the implementation of activities under the measure	Sources of funding
Measures in the household sector					
H1	Energy efficiency improvement measures in residential buildings	1.1 Improvement of the building thermal envelope in terms of increasing energy efficiency to reduce energy consumption for heating and ventilation 1.4 Reduction of the electricity use for heating 1.8 Introduction of credit lines for energy efficiency and renewable energy credit lines for households	0.0436	MEDEP, Ministry of Construction and Urban Planning, and other relevant institutions in individual sectors	Budget fund for energy efficiency, budget and fund for energy efficiency of the autonomous province and local self-government, or favourable credit lines of IFIs and commercial banks
H2	New rules for the design and construction of buildings, the minimum requirements in terms of energy performance of buildings and their certification in accordance with the revised EPBD	1.5 New rules for the design and construction of buildings, the minimum requirements in terms of energy efficiency and certification of energy performance of buildings in accordance with the revised EPBD	0.0848	Ministry of Construction and Urban Planning, Chamber of Engineers, and other relevant institutions	Budget of the Republic of Serbia, share of the Ministry of Construction and Urban Planning other investors' funding.
H3	Promotion of the use of energy-efficient household appliances	1.2 Improvement of internal lighting in terms of increasing energy efficiency 1.3 Promotion of the use of energy-efficient household appliances	0.012	MEDEP, and other relevant institutions in the residential sector	Budget Fund for Energy Efficiency, budget and fund for energy efficiency of the autonomous province and local self-government

Measures in the public and commercial sectors					
PC1	Energy efficiency improvement measures in public and commercial buildings	2.1 Improvement of internal lighting in terms of increasing energy efficiency 2.3 Reduction of electricity use for heating 2.7 Serbian Energy Efficiency Project (SEEP) 2.9 Introduction of credit lines for energy efficiency and renewable energy sources for public and commercial buildings.	0.0169	MEDEP, Ministry of Construction and Urban Planning, and other relevant institutions in individual sectors	Resources of buildings' residents, Budget Fund for Energy Efficiency, budget and fund for energy efficiency of the autonomous province and local self-government, or favourable credit lines of IFIs and commercial banks. ESCO, credit line of KfW for "Energy efficiency improvements in public buildings (schools)"
PC2	New rules for the design and construction of buildings, the minimum requirements in terms of energy performance of buildings and their certification in accordance with the revised EPBD	2.4 New rules for the design and construction of buildings, the minimum requirements in terms of energy efficiency and certification of energy performance of buildings in accordance with the revised EPBD	0.0535	Ministry of Construction and Urban Planning and other relevant institutions	Budget of the Republic of Serbia, other investors' funding.

PC3	Modernization of public lighting system in towns and municipalities	2.2 Agreements with municipalities for the modernization of public lighting system	0.0083	Local self-governments, MEDEP, Ministry of Regional Development and Local Self-Government, SCTM	Budget Fund for Energy Efficiency, budget and fund for energy efficiency of the autonomous province and local self-government, or favourable credit lines of IFIs and commercial banks, local self-government budget for the maintenance of public lighting system ESCO
PC4	Introduction of energy management systems in the public and commercial sectors	2.5 Introduction of energy management systems in public and commercial buildings	0.0448	MEDEP, designated organisations	Budget Fund for Energy Efficiency, budget and fund for energy efficiency of the autonomous province and local self-government
PC5	Determination of energy efficiency as one of the criteria for the most economically advantageous tender in public procurement	2.6 Determination of energy efficiency as one of the criteria for the most economically advantageous tender in public procurement	Not estimated	MEDEP, PPO, local self-governments, public companies	Resources of institutions in charge of public procurement

PC6	Incentive rates for highly efficient coupled / combined heat and power generation in public and commercial buildings	This measure in the first EEAP included only the industry sector, even though the incentives were foreseen for all plants for combined production of heat and electricity, provided they meet the required conditions	0.0086	MEDEP, public and commercial companies	The funds are provided under the Regulation on the Amount of special fees for incentives in 2013 ("Official Gazette of the RS", No. 8/13) and the Regulation on the Method of calculation and the method of distribution of funds collected from the fees to stimulate privileged power producers ("Official Gazette of the RS", No. 8/13)
PC7	Mandatory regular control of the combustion process of boilers and other combustion chambers with the capacity over 20 kW, as well as air conditioning systems	New measure set forth by the Law on Efficient Use of Energy. Specifically, it is envisaged that regular control of the combustion process of boilers and other combustion chambers with the capacity exceeding 20 kW is mandatory to determine the utility level, as well as air conditioning systems with the capacity exceeding 12 kW.	0.0024	MEDEP, public and commercial companies and legal persons authorised by MEDEP in accordance with the Law on Efficient Use of Energy.	Owners of boilers of the installed capacity over 20 kW within the funds allocated for regular repairs and maintenance of boilers of the owners of air conditioning systems of the installed cooling capacity over 12 kW within the funds allocated for regular repairs and maintenance of these systems. In the initial phase, it is possible to obtain incentives of the Budget Fund for energy efficiency.

Measures in the industry sector					
I1	Introduction of the Energy Management System for large energy consumers in the industrial sector	3.2 Introduction of the Energy Management System for large industrial sector consumers	0.0819	designated organisations, MEDEP	Budget Fund for Energy Efficiency, budget and fund for energy efficiency of the autonomous province and local self-government, and favourable credit lines of IFIs and commercial banks, ESCO
I2	Programme of Industrial energy efficiency improvement	3.3 Energy audits in the industry sector 3.6 Introduction of favourable credit lines for the implementation of EEI measures in the industry sector	0.165	Industrial companies that are not designated organisations, MEDEP, energy advisors	Budget Fund for Energy Efficiency, budget and fund for energy efficiency of the autonomous province and local self-government, or favourable credit lines of IFIs and commercial banks, ESCO
I3	Incentive rates for the use of highly efficient coupled / combined heat and power generation in the industry sector	3.4 Incentive rates for highly efficient coupled / combined heat and power generation in industrial companies.	0.017	MEDEP, EPS	The funds are provided under the Regulation on the Amount of special fees for incentives in 2013 ("Official Gazette of the RS", No. 8/13) and the Regulation on the Method of calculation and the method of distribution of funds collected from the fees to stimulate privileged power producers ("Official Gazette of the RS", No. 8/13)

I4	Minimum energy efficiency requirements for new and revitalized facilities for electricity and heat production, and plants for combined heat and power generation	New measure, in accordance with the Law on Efficient Use of Energy. Specifically, the Law prescribes the obligation that all new and revitalized facilities meet minimum requirements in terms of energy efficiency for obtaining a building and / or energy permit.	Not estimated	MEDEP	From the funds foreseen by investors for the construction of new or reconstruction of the existing facility
I5	Mandatory regular control of the combustion process of boilers and other combustion chambers with the capacity over 20 kW, as well as air conditioning systems with the capacity over 12 kW	New measure set forth by the Law on Efficient Use of Energy. Specifically, it is envisaged that regular control of the combustion process of boilers and other combustion chambers with the capacity exceeding 20 kW is mandatory to determine the utility level, as well as air conditioning systems with the capacity exceeding 12 kW.	0.0027	MEDEP, industrial companies, owners of boilers and other combustion plants with the capacity 20kW, as well as air conditioning systems with the capacity over 12 Kw, and persons authorized by MEDEP under the Law on Efficient Use of Energy.	From the funds provided for maintenance of boilers and combustion plants of the boiler owners In the initial phase, it is possible to obtain incentives of the Budget Fund for Energy Efficiency.
<b>Measures in the transport sector</b>					
T1	Introduction of the EU Regulation EC 443/2009 for energy efficiency in the transport sector	4.1 Introduction of the EU legislation on energy efficiency in the transport sector	0.058	Road Traffic Safety Agency, MEDEP, Ministry of Interior	From the RTSA funding
T2	Promotion of eco-driving and car sharing scheme	4.3 Promotion of eco-driving, low-cost energy efficiency measures in transport and car sharing scheme	0.0198	RTSA, local self-governments	From the Road Traffic Safety Agency funding and grants
T3	Introduction of incentive mechanisms for replacement of the existing vehicles	4.5 Introduction of incentive mechanisms for replacement of the existing fleet	0.0340	Ministry in charge of Economy	Budget of the Republic of Serbia

T4	Modernization of fleet in order to meet technical requirements for the performance of domestic and international transportation	Newly introduced measure upon audit's proposal	0.0395	Ministry of Transport, Ministry on Interior	Funding provided by companies engaged in transportation
T5	Determination of energy efficiency as a criterion for fleet modernization and the assignment of public transport service performance	Newly introduced measure upon audit's proposal	0.0593	Local self-government units	Budget of local self-government unit
Horizontal measures					
H1	Billing based on actual (measured) consumption of thermal energy to the consumers connected to district heating system			MEDEP, and other relevant institutions	Companies engaged in providing thermal energy supply, investors / apartment owners
H2	Promotion of ESCO model for EE projects financing			MEDEP, autonomous province institutions, local self-government, public and commercial companies	EBRD, Budget Fund for Energy Efficiency
H3	Obligation to comply with eco-design requirements for products that affect energy consumption			MEDEP, industrial, public and commercial companies	
H4	Raising awareness about the energy efficiency importance			MEDEP, autonomous province institutions, local self-government, and other institutions and organisations	

In order to provide insight into the energy consumption trend, and overall economic trends of the country in the period of implementation of the First EEAP, a starting point should refer to the initial requirements provided in the First EEAP. Table 4 is taken from the First EEAP (Table 3.8) and refers to the expected GDP trend and final energy consumption.

Table 4: Expected FEC after the implementation of plans, according to the First EEAP

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
GDP growth index: forecast	-3	1.5	3.0	5.0	5.2	5.2	5.2	5.2	5.2	5.2
Expected FCE (DEU) according to the normal market development trend, Mtoe	7.958	7.935	8.03	8.287	8.569	8.860	9.161	9.473	9.795	10.128
Indicative target, Mtoe	-	-	0.042	0.125	0.209	0.334	0.46	0.585	0.669	0.752
FCE (DEU) upon implementation of EEI measures, ktoe	7.959	7.935	7.946	8.12	8.276	8.442	8.66	8.888	9.126	9.376

Table 5 shows indicative target savings in the First EEAP (in Table 3.7)

Table 5: Distribution of indicative targets per sectors in the First EEAP

Sectors - final energy consumers	Targets distribution by 2012	Target proportion, index	Notes (examples):
	Mtoe	%	
Residential, commercial and public services	0.0235	19%	Indicative target
Industry	0.0566	45%	Indicative target
Transport	0.0453	36%	Indicative target
Total	0.1254	100	

According to data available, that are more accurate in comparison to 2010, the economic growth throughout the period of implementation of the First EEAP was significantly lower than it was assumed as shown in Table 6. There was also a significant drop in consumption in the industrial sector, of approx. 16% (comparing 2010 with 2008), and a decrease in energy consumption in the transport sector in relation to the base year of 2008, followed by a significant increase in consumption in the household sector, as shown in Table 7.

Table 6: GDP growth rate per year, with projections for 2014 and 2015\*.

	2009/ 2008	2010/ 2009	2011/ 2010	2012/ 2011	2013/ 2012	2014/ 2013	2015/ 2014
Annual real GDP growth rate %	-3.5	1.0	1.6	-1.7	2	3.5	4

\*Sources: SORS for the period 2008-2012, and the Ministry of Finance and Economy for the period 2013-2015

Table 7: Final energy consumption for energy purposes according to the Balances of the Republic of Serbia\*\*

Sector / Consumption Mtoe	2008	2010	2011	2012 forecast
Industry	2.832	2.393	2.708	2.662
Transport	2.310	2.199	1.975	2.288
Households	2.253	3.148	3.248	3.227
PC	0.966	0.934	1.163	1.173
Agriculture	0.08	0.175	0.118	0.137
Total	8.361	8.849	9.212	9.487
Growth rate %		6%	4%	3%

\*\*The consumption in air transport was exempted from transport consumption

A significant drop in consumption in the manufacturing and transport sector can be explained primarily as a result of the economic crisis, while the increase in household consumption emerged as a result of different calculation of the consumption of biomass. In particular, in the Energy Balance sheet for 2008 renewable energy sources were not fully presented, as this part of the energy statistics was still in the establishment procedure in the Statistical Office of the Republic of Serbia. For this reason, a research has been conducted on biomass consumption for all Parties to the Energy Community Treaty for 2009 and 2010. The study established that the final biomass consumption in Serbia in 2010 amounted to 1.025 Mtoe, so this information was used for the preparation of the Energy Balance of the Republic of Serbia for 2012.

Implementation period of the First EEAP was marked by a significant reduction in investment and funding, recession, decline in purchasing power and declining living standards, thus all the planned measures were either cancelled or only partially implemented. For this reason, the indicative savings targets, provided in the First EEAP, had to be revised in the framework of the Second EEAP. In particular, this referred to the ratio of predicted savings in the industrial sector on the one hand, and the households and PC sector on the other hand. In addition, new calculations of potential savings pointed to the conclusion that the potential of some measure is underrated while for others it is overrated.

According to Table 3.8 from the First EEAP, savings of 0.125 Mtoe was to be implemented by the end of 2012, with a positive GDP growth rate index, which was not the case in that particular period, and assuming that the necessary regulatory and incentive framework would have been established by 2010. In the framework of the First EEAP, it was also envisaged that the reduction in final energy consumption in the period from 2014 to 2016 would stand at around 1.5% per year as a result of implementation of the Law on Rational Use of Energy and the activities of the Energy Efficiency Fund, which should have been passed, i.e. established as of 2010. However, since the adoption of the by-laws of the Law on Efficient Use of Energy is expected by 2015, the Second EEAP during the period from 2013 to 2015 envisaged savings at the level of around 3.5% for the entire reporting period, while the major savings are expected in the period 2016-2018, when the Law on Efficient Use of Energy will be fully enforced.

In the framework of the project "Preparation of the Second National Energy Efficiency Action Plan and Development of energy indicators," which will be implemented under the IPA funds for 2012, a detailed analysis will be carried out of the objectives defined, trends of final energy consumption in all sectors and alignment of the goal set at 9% of final energy consumption with the general economic trends in the most efficient and effective manner, upon which the Second EEAP will be audited.

Based on data collected by 14 June 2013, it was established that in the framework of implementation of the First EEAP and early measures, implemented in the period 2004-2009, whose effects can be calculated in line with DEEC, in the period from 2010 to 2012 savings at the level of 81.5% of the anticipated savings for that period were achieved. It should be taken into account that due to the lack of statistical data impact of the First EEAP was assessed exclusively by using bottom-up methodology, which is based on gathering and analysis of data on individual projects / activities, thus the reliability of the results depends on the volume and quality of data collected.

Table 8 provides an overview of the measures from the First EEAP, with the Implementation impact assessment, while in the ANNEX 1 - List of measures and early measures from the First EEAP, which is enclosed to this Action Plan as its integral part, a list of all previous and early measures is provided.

**Verification of Compliance of the First National Energy Efficiency Action Plan**

**Table 8: Overview of measures of the First EEAP with the implementation impact assessment**

No:	Name of EEI measure	Expected duration	MV	Achieved savings in the period 2010-2012 (Mtoe)	Achieved total energy savings in 2012 (Mtoe)	Expected energy savings in 2012 (Mtoe)	Expected energy savings in 2018 (Mtoe)	Status with regard to The First EEAP	Additional comments	Recommendation with respect to inclusion of the measure in the Second EEAP	
1.1	Improvement of the building thermal envelope in terms of increasing energy efficiency to reduce energy consumption for heating and ventilation	2010-2018	Bottom-up 4, Bottom-up 5	/	/	0.00271	0.0314	Not completed	No voluntary agreements were signed in the period 2010-2011.	Measure audit is required. Measure to be linked to some financial instrument rather than voluntary agreements.	
1.2	Improvement of internal lighting in terms of increasing energy efficiency	2004-2009	Bottom-up 2	0.001981	0.00228	0.00172	0.0172	Partially completed	Early measure EM1	Continue implementation as planned.	
		2010-2018		0.000299					M1		
1.3	Promotion of the use of energy-efficient household appliances	2005	Bottom-up 8, Bottom-up 9, Bottom-up 11	/	/	/	0.00404	0.0167	Partially completed	Early measure EM2	Continue implementation as planned.
		2010-2018		/					The Law on Efficient Use of Energy was not enforced. No public campaigns were conducted in the period 2010-2011. Implementation is expected as of 2013.		
1.4	Reduction of electricity use for heating	2010-2018	/	/	/	Not defined	0.00047	Not completed	The Law on Efficient Use of Energy was not enforced. No public campaigns were conducted in the period 2010-2011.	Measure audit is required. Measure to be linked to some financial instrument rather than voluntary agreements.	

1.5	New rules for the design and construction of buildings, the minimum requirements for energy performance and certification of buildings energy performance in accordance with the revised EPBD.	2010-2018	Bottom-up 4, Bottom-up 5	/	/	Not defined	0.00628	Not completed	The Law on Efficient Use of Energy was not enforced. No programmes were implemented in the period 2010-2011. The Rulebook on energy performance of buildings and the Rulebook on the conditions, content and manner of issuance of certificates of energy performance of buildings were adopted in accordance of the Law on Planning and Construction, in August 2011. The Rulebooks came into force in late 2012.	Continue implementation as planned.
1.6	Billing based on actual (measured) consumption of thermal energy to the consumers connected to district heating system	2007-2009	TD	/	/	0.0018	0.01159	Partially completed	Early measure EM3	Continue implementation as planned.
		2011-2018		/	/				The new Energy Law was adopted in 2011. The Law on EUE was adopted in March 2013. Implementation is expected as of the start of heating season 2014/2015.	
1.7	Establishment of the Energy Efficiency Fund	2011-2018	/	/	/	Not estimated	Not estimated	Not completed	The Law on EEU was adopted in March 2013.	Measure to be revoked since it is a mechanism, not a measure.
1.8	Introduction of credit lines for energy efficiency and renewable energy sources for households	2010-2018	/	/	0.00514	Not estimated	Not estimated	Not completed	No subsidized loans were approved in the period 2010-2011. M2 Implementation is expected as of 2014.	Measure to be revoked since it is a mechanism, not a measure.

2.1	Improvement of internal lighting in terms of increasing energy efficiency	2004-2009	Bottom-up 3	0.000083	0.00008	0.0043	0.0301	Partially completed through early measure	Early measure EM4	Measure audit is required. It should be diversified to include all types of interior lighting system improvements and not only bulbs replacement.
		2011-2018		/					No public campaigns were conducted in the period 2010-2011.	
2.2	Agreements with municipalities for the modernization of public lighting system	2004-2009	Bottom-up 1	0.005436	0.00552	0.0014	0.0083	Partially completed	Early measure EM5	Measure audit is required. It should be diversified to include all types of interior lighting system modernization and not only MoUs with municipalities.
		2010-2018		0.000046					M3 No new agreements were signed in the period 2010-2011.	
2.3	Reduction of electricity use for heating	2004-2009	Bottom-up 6, Bottom-up 8, Bottom-up 9, Bottom-up 11	0.000247	0.00044	Not defined	0.00885	Partially completed	Early measure EM6	Measure audit is required. Measure to be linked to some financial instrument rather than voluntary agreements.
		2010-2018		0.000193					M4 The Law on EE was adopted in March 2013. No public campaigns were conducted in the period 2010-2011.	

2.4	New rules for the design and construction of buildings, the minimum requirements for energy performance and certification of buildings energy performance in accordance with the revised EPBD.	2011-2018	Bottom-up 4, Bottom-up 5	/	/	Not defined	0.11940	Not completed	The Law on Efficient Energy Use was not enforced. No programmes were implemented in the period 2010-2011. The Rulebook on energy performance of buildings and the Rulebook on the conditions, content and manner of issuance of certificates of energy performance of buildings were adopted in accordance of the Law on Planning and Construction, in August 2011. The Rulebooks came into force in October 2012.	Continue implementation as planned.
2.5	Introduction of Energy Management Systems in public and commercial buildings	2011-2018	/	/	/	0.00309	0.02472	Not completed	The Law on EE was adopted in March 2013. Implementation is expected as of 2015.	Continue implementation as planned.
2.6	Determination of energy efficiency as one of the criteria for the most economically advantageous tender in public procurement	2011-2018	/	/	/	Not estimated	Not estimated	Not completed	The Law on EE was adopted in March 2013. The new Law on Public Procurement ("Official Gazette of the RS", No. 124/12) was not adopted at the time.	Continue implementation as planned.

2.7	Serbian Energy Efficiency Project (SEEP)	2005–2011	Bottom-up / Methodology approved by the WB	0.002879	0.00523	0.00478	0.00478	Completed	Early measure EM7	Continue implementation as planned.
		2010-2013	Energy audits were conducted by companies approved by the WB	0.002355					M5	
2.8	Establishment of the Energy Efficiency Fund	2011-2018	/	/	/	Not estimated	Not estimated	Not completed	The Law on Efficient Energy Use was not enforced.	Measure to be revoked since it is a mechanism, not a measure.
2.9	Introduction of credit lines for energy efficiency and renewable energy sources for public and commercial buildings	2004-2009	Bottom-up 3, Bottom-up 4, Bottom-up 5, Bottom-up 6, Bottom-up 8, Bottom-up 9	0.000787	0.00082	Not estimated	Not estimated	Partially completed through early measure only	Early measure EM8 EEI demonstration projects funded by donors or from local funds.	Continue implementation as planned.
		2010-2018	/	0.000029					M6 No subsidized loans were approved in the period 2010-2011. Implementation is expected as of 2012.	

2.10	Promotion of energy service companies (ESCOs).	2011-2018	/	/	/	Not estimated	Not estimated	Not completed		Continue implementation as planned.
3.1	Agreements with the industrial sector initiated by the EEARS /SIEEN / REEC	2010-2018	/	/	/	0.0089	0.027257	Not completed	/	Measure to be revoked.
3.2.	Introduction of the Energy Management System for large industrial sector consumers	2010-2018	/	/	/	0.0292	0.15	Not completed	The Law on Efficient Use of Energy was not enforced at that time.	Continue implementation as planned.
3.3	Energy audits in the industry sector	2004–2009	BU	/	/	0.01857	0.0954	Partially completed	Early measure EM9 Energy audits were conducted by companies approved by the EEARS.	Continue implementation as planned.
		2010-2018		/					The Law on Efficient Use of Energy was not enforced at that time.	
3.4	Incentive rates for highly efficient coupled / combined heat and power generation in industrial companies	2010-2018	Bottom-up 12 / Energy audits	0.00237	0.00237	Not estimated	Not estimated	Completed	M7 The Regulation on Incentives for the production of electricity using renewable energy sources and co-generation of electricity and thermal energy ("Official Gazette of the RS", No. 99/09 and 124/12) and the Regulation on Acquiring the status of privileged power producers and the criteria for assessing the fulfillment of these conditions ("Official Gazette of the RS", No. 72/09) were adopted in late 2009. Development of projects of combined electricity and heat generation in the industry sector takes approximately two years.	Continue implementation as planned.

3.5	Establishment of the Energy Efficiency Fund	2010-2018	/	/	/	Not estimated	Not estimated	Not estimated	The Law on Efficient Use of Energy was not enforced at that time.	Measure to be revoked since it is a project, not a measure.
3.6	Introduction of favourable credit lines for the implementation of EEI measures in the industry sector	2010-2018	Bottom-up / Methodology approved by EBRD Energy audits are conducted by companies approved by EBRD	0.07220	0.07220	Not estimated	Not estimated	Completed	M8	Continue implementation as planned.

4.1	Introduction of the EU acquis on energy efficiency in the transport sector	2011-2018	Bottom-up 13 / Energy audits	/	0.00056	0.013	0.058	Partially completed	M9 The Law on Road Traffic Safety ("Official Gazette of the RS", No. 41/09) on the roads was adopted in 2009. The Law on Standardisation ("Official Gazette of the RS", No. 36/09) was adopted in 2009, The Regulation on Imports of motor vehicles ("Official Gazette of the RS", No. 23/10) was adopted in 2010, The Law on Ratification of the Agreement on the adoption of unified technical regulations for wheeled vehicles, equipment and parts which can be fitted and/or used on vehicles with wheels and conditions for reciprocal recognition of approvals awarded in line with these regulations was adopted in 2011.	Continue implementation as planned.
4.2	Creation of the energy-efficient transportation system	2011-2018	/	/	-	0.005	0.0231	Not completed		Measure to be revoked.
4.3	Promotion of eco-driving and low-cost energy efficiency measures in the transport sector.	2011-2018	/	/	-	0.008	0.0347	Not completed		Measure audit is required.
4.4	Introduction of fleet management in road transport	2011-2018	/	/	-	0.008	0.0347	Not completed		Measure to be revoked.
4.5	Introduction of incentive mechanisms for the replacement of	2009	Bottom-up 13 / Energy	0.003971	0.00764	0.0011	0.0462	Partially completed	EM10 Modernization of fleet of the companies engaged in public transport	Continue implementation as planned.

	existing fleet		audits	0.003672					EM11 Modernization of fleet in order to meet technical requirements for the performance of international transportation and obtaining ECMT permits	
		2010-2018							EM12 Introduction of incentive mechanisms for the replacement of existing fleet	
									M10, M11	
Total measures (Bottom-up):					0.102277					
Indicative target in 2012:						0.1254				
Target in 2018:							0.7524			

**Calculated until 14 June 2013 Year**

### **1.1. *Problems related to the implementation of the First EEAP.***

Obstacles that have arisen relating to the implementation of the First EEAP are as follows: 1) lack of adequately established institutional and legal frameworks (during the period of implementation of the First EEAP) for the implementation of EEI measures, 2) lack of established and unsatisfactory financial mechanisms and instruments, 3) general state of the economy.

- The Law on EUE, which enforcement was envisaged by the First EEAP (in the original proposal the Law on Rational use of energy) was not in force during the implementation of the First EEAP, thus the planned legal and institutional frameworks for the implementation of policies aimed at energy efficiency improvement were not established to a necessary extent.

- The Energy Efficiency Fund was not established in the period 2010-2012, as it was planned during the preparation of the First EEAP. A part of the obligations, as regards the financing of EEI measures, which were originally assigned to the envisaged Fund were taken over by the Environmental Protection Fund with a special project aimed at improving energy efficiency, but the Project was implemented only during 2012. The State financial mechanisms for the EE improvement in the given period were not established and developed to the extent necessary.

- As a result of the economic crisis, a decline in GDP occurred, as well as a significant reduction in final energy consumption in the industrial sector. Investments in the development and implementation of efficient techniques and technologies were also reduced. Economic framework for the implementation of energy efficiency policy was not satisfactory.

In addition to these problems that have adversely affected the implementation of the measures of the First EEAP, there are also permanent obstacles in the field of energy efficiency improvement, such as:

- Lack of administrative capacity (in terms of human resources and training) to implement EE policy, especially at the local level;

- Lack of inter-sectoral communication and coordination during the policy implementation;

- Insufficient acknowledgment of energy efficiency as an important mechanism for the improvement of business operations and environmental protection in all business and institutional sectors;

- Energy prices parity insufficiently stimulating for the implementation of energy efficiency measures.

A part of the problems identified will be addressed in the process of implementation of the Second EEAP, through broader vertical and horizontal cooperation which will be carried out according to the provisions of the Law on EUE, and through increased participation of institutions, which are not directly in charge of the EE policy implementation, in the planning and decision-making processes.

### **1.2. *Problems related to the elaboration of the Second EEAP***

The major shortcoming of the First EEAP lies in the fact that it failed to provide for monitoring and verification of the energy savings achieved. Most energy efficiency measures were proposed on the basis of engineering experience, but little was discussed and planned in relation to the method of monitoring of the measures implementation and improving the data collection process. Consequently, the methodology of monitoring and verification of concrete measures were not to be considered under the First EEAP. Methodologies for calculating savings were developed much later, in the last quarter of 2011, as a result of the project "Capacity Building for Monitoring, Verification and Evaluation (MVE system) of the Energy Efficiency Policies in SEE Countries, in terms of the EU accession", which is funded by the GIZ / ORF. Therefore, there was not enough time to establish a system of data collection and reporting on monitoring and evaluation of the achieved energy savings. Currently, in the Republic of Serbia there is not enough quality statistical data necessary for the establishment of a database to determine the adequate energy indicators for specific sectors of final energy consumption.

All the energy savings that are presented in this Report were calculated by using exclusively Bottom-up methodology and ex-ante evaluation of the planned measures. For this reason, great efforts have been invested in a lengthy process of collecting detailed data necessary to evaluate and report on savings achieved by using individual measures, most of which are early measures.

Problems related to the Bottom-up methodology occur due to incompleteness and unavailability of data, and due to a large number of local, regional and national activities / projects that need to be monitored and evaluated in order to display as closely as possible the savings achieved at the national level. MEDEP, having in mind its institutional position, can provide a set of data related to the public sector, whereas the activities and measures undertaken in households, commercial and industrial sector may remain completely uncovered due to the lack of a centralized database of all projects on the territory of the Republic of Serbia. Introduction of adequate tools for savings tracking is expected, the overview of which is provided in Section 3 of this Action Plan, as well as the imposition of mandatory data submission that will be prescribed by by-laws of the Law on EUE. Thus, most of the problems associated with the collection of data will be eliminated, and data collection will be facilitated. In the coming period, it is very important to establish an appropriate monitoring system to avoid errors in the estimated savings, especially regarding the reports submitted by local self-governments, in which errors occur as a result of the lack of training of technical personnel.

### **1.3. *Preconditions for a successful implementation of the Second EEAP***

Basic prerequisites for successful implementation of the Second EEAP derive from overcoming the problems that occurred in the implementation of the First EEAP, and may be grouped in financial, regulatory and institutional factors.

Thus, it is necessary in the first place to establish a continuous and stable funding mechanisms of EEI projects, such as the establishment of a specialized fund to finance savings; adoption of secondary legislation which will define sectoral commitments in planning savings, their implementation and reporting, as well as further capacity building of institutions and the public sector.

In the First EEAP, establishment of the Energy Efficiency Fund was envisaged in 2010, but only the new Law on EUE, adopted in March 2013, provided for the establishment of the Budget Fund which will be used for EEI projects financing as of 2014, in accordance with the approved Annual Program of the Fund. Successful implementation of the Second EEAP will depend in large part on the amount of resources and the manner of their allocation through this Fund, although the implementation of the Second EEAP largely relies upon favourable credit lines placed by IFI, either directly or through commercial banks in the Republic of Serbia. In accordance with the Law on EUE, both the autonomous province and local self-governments are entitled to establishing incentive EEI funds, whereas it is expected that the implementation of ESCO method of financing in the public sector could have significant results, provided that an adequate legal framework is established. In the previous period, special funds intended for financing EEI measures were allocated through the Environmental Protection Fund, in line with the Programme of financing energy efficiency improvement projects in 2012, which was established by the Regulation on the Implementation of the Programme of financing energy efficiency improvement projects in 2012 ("Official Gazette of the RS", No. 20/12).

The Law on EUE sets forth, inter alia, the establishment of designated organisation of the energy management system in the public, commercial and industrial sectors, and the adoption of by-laws that will regulate the following: the list of all EMS designated organisation, specific savings targets, method and form of reporting to MEDEP, periodic energy controls and audits. In this way, not only the monitoring of large energy consumers and data monitoring systems will be established, but also commitments to achieving energy savings will be identified and imposed.

As regards the implementation of EE policy defined in the policy documents and in the Second EEAP, it is necessary to strengthen further the capacity of both local administration in terms

of project implementation, monitoring and reporting on savings, and MEDEP itself and other institutions involved in its implementation and monitoring. It should be taken into account that MEDEP, and its Department for Energy Efficiency Improvement, is the main institution responsible for the preparation of the action plan, proposing EEI measures, their implementation and monitoring of performance, and in this respect it should be strengthened in terms of personnel, their training and funds which will be used primarily for monitoring cost savings, performance evaluation measures and the audit thereof, all aimed at fulfilling its obligations. In addition to MEDEP, it is necessary to take into consideration that the local self-governments will be widely engaged in planning, implementation and reporting on EEI measures, thus it is necessary to strengthen capacities of the local administration.

#### **1.4. Key elements of the Second National Energy Efficiency Action Plan**

The Second EEAP has been prepared in accordance with the requirements of DEEC, and in line with the objectives defined in the Law on EUE, the Energy Law, which defines the country's energy policy, the Energy Development Strategy for the period by 2015, and the Strategy Implementation Programme. The Energy Efficiency Action Plan, its elaboration, implementation monitoring and reporting are defined as mandatory obligations by Articles 8 and 9 of the Law on EUE.

The Second EEAP has multiple significance for the implementation of the energy efficiency improvement policy from the perspective of: a) monitoring and reporting on the targets set by the First EEAP, which provides an insight into the effectiveness of both specific EEI measures and overall indicative targets set; b) harmonization of this EEAP with the latest relevant strategic documents of the Republic of Serbia, laws and standards that are being elaborated or already enforced; c) audit of previous measures and targets and establishment of new measures, which will take into account an overall statistical analysis of energy consumption in all sectors; d) establishment of a system of monitoring and reporting on the measures' objectives achieved; all in accordance with the overall goal defined in the First EEAP, of 9% energy savings in final energy consumption compared to the base year 2008.

The system for monitoring and reporting on cost savings achieved through EEI measures is being established and will be implemented over a number of projects that have kicked-off, or are in the implementation phase, as follows:

- The basis for the establishment of data monitoring system is contained in the results of the project "Capacity Building for Monitoring, Verification and Evaluation (MVE system) of Energy Efficiency Policies in SEE countries, in terms of the European Union (EU) accession" (PN 08.2016.7-005.00) whose implementation was funded by ORF-EE/GIZ, to support the work of the Energy Efficiency Working Group established within the Energy Community Secretariat, due to the fact that this project has defined a methodology for monitoring, verification and evaluation of the First EEAP. This methodology was used in determining the savings achieved in the period of implementation of the First EEAP, which are shown in the Second EEAP.

- Regional project "Establishment of an integrated platform for monitoring and verification of savings achieved through the implementation of action plans (MVP)", implemented and funded by GIZ ORF-EE as part of continuing support to the activities of the Working Group on Energy Efficiency established within the Energy Community Secretariat, will provide for the establishment of an integrated information system for collection and verification of data on actual savings achieved through action plans. The system will be based on the above mentioned MVE methodology, i.e. by-laws which will officially acknowledge the methodology, and it will enable the collection and exchange of data with the Web-based Data Management System (hereinafter referred to as: DMS) and other MEDEP databases, as appropriate. Commitment of the parties to submit data on energy savings will be prescribed by applicable by-law in accordance with the Law on EUE.

- GIZ project “Energy efficiency in the building sector” will partly establish mechanisms for the building sector status monitoring. DMS implementation is planned by the end of 2013, as a platform for the collection of relevant data on buildings, issuance of permits for new buildings and buildings under energy revitalization, surveys and energy performance of buildings. The Ministry of Construction and Urban Planning and MEDEP have been identified as key drivers of the Project, which will define data to be collected, within the scope of their competencies and according to the needs. Besides the above-mentioned ministries, the access to the system and active participation in it will be granted to other interested institutions (public companies, local self-governments, universities, etc.). A part of the data that will be collected in this manner will be related to the energy savings achieved under the new rules of construction and extensive refurbishment of buildings in accordance with the Law on Planning and Construction (“Official Gazette of the RS”, No. 72/09, 81/09 - corrigendum, 64/10-US, 24/11, 121/12, 42/13-US, 50/13-US and 54/13) and relevant by-laws which prescribe the energy performance of buildings and certification of the energy performance of buildings. In the framework of DMS, data collection under the Bottom-up methodology will be conducted, for each energy certificate created for a new building or an existing energy revitalised building. In addition, statistical data analysis will be provided, to serve as a basis for the planning of funding and implementation of new projects. In the next project phase, DMS should be expanded with information gathered on the basis of the Energy Management System implementation and energy audits, which will be collected through special databases. Thus conceived DMS should be able to link horizontally and vertically different subjects: government institutions, local self-government, energy managers and advisors, authorised organisations that meet the requirements for the energy permits issuance, engineers responsible for the energy efficiency of buildings and other subjects relevant for the implementation of EE policy in the building sector.

- Logistics, which should provide for the monitoring system information, inter alia, will partly be conducted through the “Project for Settlement and Enhancement of Energy Management System in Energy Consumption Sector in the Republic of Serbia”, carried out by MEDEP in cooperation with JICA. This project will set up an energy management system with the designated organisations, where the appointed energy managers will have reporting obligations towards MEDEP.

- In the framework of cooperation with UNDP, it has been agreed that UNDP will donate to the Ministry of Energy, Development and Environmental Protection a database for energy and water consumption management in public buildings, which will enable regular monitoring of energy consumption both by the Ministry and by the users themselves, with a tendency to expand this database to the public utility services as well.

For the implementation of the Second EEAP, the implementation of the "Regional Energy Efficiency Programme in the Western Balkans - ESCO and policy dialogue" (EBRD REEP) is equally important, which aims to create conditions for the application of ESCO mechanism.

## 1.5. National importance of the energy efficiency

The legal basis allowing the implementation of the measures foreseen in the Second EEAP is contained in the following documents:

1) The Law on EUE, („Official Gazette of the RS”, No. 25/13),

Among other things, the Law on EUE created a legal basis for the establishment of the:

- Designated organisations,
- Energy Audit System,
- functioning of the Budget Fund for Energy Efficiency,
- prerequisites for the work of ESCOs, i.e. the provision of energy services,
- obligations of the energy labelling of products that affect energy consumption and compliance with the eco-design requirements,
- recommendations for the public sector to implement the energy efficiency criteria in public procurement, etc.

Adoption of by-laws which will enable the Law on EUE enforcement is expected in the next 18 months.

2) The Law on Planning and Construction (“Official Gazette of the RS”, No. 72/09, 81/09 - corrigendum, 64/10-US, 24/11, 121/12, 42/13-US, 50/13-US, and 54/13),

- The Rulebook on the conditions, content and manner of issuance of certificates of energy performance of buildings, (“Official Gazette of the RS”, No. 69/12),
- The Rulebook on energy performance of buildings, (“Official Gazette of the RS”, No. 61/11), has been applied as of 30 September 2012.

3) The Regulation on the Amount of special incentive remuneration in 2013 ("Official Gazette of the RS", No. 8/13),

4) The Regulation on the Method of calculation and allocation of funds collected for the purpose of incentive remunerations for privileged power producers (“Official Gazette of the RS”, No. 8/13).

The Law on Planning and Construction and the adopted regulations dealing with the energy performance of buildings are partly in line with the EPBD.

The Rulebooks governing the energy efficiency in building construction closely regulate the energy performance of buildings, method of calculating thermal properties of multi storey facilities, energy requirements for new and existing buildings, as well as conditions, content and method of issuing certificates of energy performance of buildings. Mandatory elaboration of a elaborate on energy efficiency of building is established, which is attached as part of the project documentation for the construction permit, and the issuance of energy passport along with a request for the issuance of building occupancy permit. In addition, it is stipulated that newly constructed buildings need to meet the minimum requirements defined by the energy class "C", and after extensive refurbishment of an existing building the energy class of such building needs to be upgraded for at least one grade. In order to fulfil the requirements of the Regulations, training and licensing is conducted for engineers responsible for the energy efficiency of buildings. According to data from June 2013, training for engineers in charge of buildings energy efficiency was completed by 1547 persons, out of which 1025 passed the professional exam, while the license (No. 381) was acquired by 793 people; 48 companies or other legal entities received a decision on the fulfilment of requirements for the issuance of energy passport . By June 2013, authorised organisations issued 16 energy passports..

The Law on EUE defines obligations of designated organisations in the public, commercial and industrial sector to establish EMS. In the framework of EMS, the planned savings target defined by the Government will be achieved, appointment of the required number of energy

managers will be carried out, as well as adoption of energy efficiency plans and programs and implementation of EE measures defined in these plans and programs, along with implementation of energy audits. The designated organisations, pursuant to the Law on EUE, comprise companies with predominant activity in the manufacturing, trade and services sector, which consume more energy than the amount that will be prescribed by the Government's regulation, as well as government bodies, autonomous province bodies and local self-governments with over 20,000 inhabitants, and other public services using facilities in the public ownership.

The Law on EUE has for the first time defined a term of providing energy services and ESCOs, thus further improvement of this energy efficiency financing model is yet to be expected.

In addition, the Law stipulates the obligation of energy labelling of products that affect energy consumption, and in that sense the regulations will be harmonized with the Directive 2010/30/EU.

The elaboration of the new Energy Development Strategy of the Republic of Serbia for the period until 2025 is in course, with projections until 2030, where creating conditions for the energy efficiency improvement in all energy sectors, as well as in final consumption, is defined as a strategic objective. The targets that will be set by a new Strategy in the final consumption field will be compliant with the targets set out in the Energy Efficiency Action Plans and commitments relating to the DEEC enforcement.

Impact of the financial crisis on the EEI measures implementation is significant because EE is not recognized only as a way to improve the existing situation (facilities, society, economy), but it is often viewed as a luxury. It could be said with certainty that there is an attitude, in both public and commercial sector, that the acquisition of EE goods and services is often an additional cost for the supplier. Regardless of the LCC analysis, which can prove that the acquisition of EE products and services is profitable in the long run, in developing countries like the Republic of Serbia there is often a lack of basic resources. Our prediction is that the specific and indicative targets of the Action Plans will be implemented sooner if the Republic of Serbia begins to achieve a stable GDP growth of at least 2-3% per year. Otherwise, there will be a decrease in energy consumption, which will not actually result from EEI measures but rather from the economic downturn, unemployment rise, and industrial production decline, as already happened in 2012. In this regard, Bottom-up method for monitoring and verification of savings that connects the savings in relation to a specific measure may provide more accurate data on EEI than the Top-down method that looks at sector spending, and which will fail to show that a drop in spending occurred as a result of economic activity drop, unless energy efficiency indicators are established.

## 1.6. Overview of targets and achievements of the energy savings

The First EEAP set a goal for 2018 to achieve 9% savings of final energy consumption compared to the base year 2008, i.e. 0.7524 Mtoe expressed in energy units.

Table 9: National indicative target and achieved results

Distribution by sectors	Planned energy savings in the period 2010-2012 (Mtoe)	Achieved energy savings in the period 2010-2012 (Mtoe)*	Sectoral target (Mtoe) in 2018	
			according to the First EEAP	according to the Second EEAP
		Measures (BU)		
Household and PC sector	0.0235	0.0195	0.3031	0.2749
Industry sector	0.0566	0.07457	0.2626	0.2668
Transport sector	0.0453	0.0082	0.1867	0.2107
Total (Mtoe):	0.1254	0.1023	0.7524	0.7524
Total (GWh):	1458.4	1189.474	8750.4	8750.4
Share (%) (compared with baseline consumption in accordance with DEEC)	1.5%	1.223%	9%	9%

**\*Calculated until 14 June 2013**

In relation to the indicative target set for 2012, of 0.1254 Mtoe, according to data collected by 14 June 2013, savings of 0.10223 Mtoe of final energy consumption was achieved, which amounts to 81.5% of the final target, i.e. 1.22% savings of final energy consumption in 2008. All data displayed were processed by Bottom-up methodology due to the lack of relevant statistical data for the use of Top-down methodology.

Taking into account all the above mentioned circumstances under which the First EEAP was implemented, the achieved results are satisfactory.

Successful implementation of the Second EEAP, which sets significantly higher targets for energy savings, will depend primarily on the successful overcoming of the problems that were present during the course of the First EEAP. As mentioned above, a new redistribution of savings by measures was announced, which will be discussed in more detail in the part related to these measures. The new distribution takes into account the reduction in industrial consumption and the increase of households final consumption, but the results of previous measures were taken into account as well.

## 2. ENERGY SAVINGS IN THE FINAL ENERGY CONSUMPTION

### 2.1. Overview of the planned and achieved energy savings targets

Picture 1: Share of final energy consumption by sectors in %



Final energy consumption in the Republic of Serbia in 2012, according to the estimates available, due to the fact that data for 2012 are being processed at the moment, amounted to 9.487 Mtoe excluding consumption in air traffic. Picture 1 shows the structure of consumption by sector, excluding the construction sector and non-energy consumption. Major changes in the structure of final consumption were recorded in the household and industrial sector, compared to 2008, as already mentioned above.

Table 10: Overview of targets and achieved savings in direct consumption

Year	2009	2010	2011	2012
Expected FEC according to the normal market development trend, Mtoe	7.958	7.935	8.03	8.287
Achieved FEC, Mtoe		8.849	9.212	9.487
Difference %		11.5%	14.7%	14.5%

In analyzing the final energy consumption trend in Table 10, the trend of deviation from the planned spending, ranging between 10% and 15%, is evident. As already mentioned in the previous section, given a different calculation of biomass as of 2011, in the total Energy Balance, and having in mind a drop in consumption in the transport and industrial sector, it would be difficult to expect that targets defined in the First EEAP are fully compliant with the achieved results. Thus, it could be concluded that the savings follow to some extent the savings plan, as provided in subsection 1.3. of this Action Plan, but for the time being these results are not in a clear correlation with the actually achieved final consumption.

At this point, it is difficult to apply the Top-down methodology due to all above mentioned, and due to problems that still exist in the field of statistical data collection and analysis. Thus, we believe that the application of the Bottom-up methodology more clearly and accurately shows the actually achieved savings.

## 2.2. Overview of strategies related to the energy efficiency

Table 11 provides an overview of strategies aimed at improving energy efficiency.

**Table 11: Overview of strategies for reducing energy consumption**

Name of strategy	Targets	Targeted sectors
Energy Sector Development Strategy of the Republic of Serbia by 2015 ("Official Gazette of the RS", No. 44/05)	Primary focus on the rational use of quality energy sources and increasing energy efficiency in production, distribution and utilization of energy by end-users	All sectors of production, transformation, distribution and final consumption
National Sustainable Development Strategy ("Official Gazette of the RS", No. 57/08)	Ensuring security of energy supply by increasing the efficiency of energy companies and energy efficiency of the economy	All sectors
Industrial Development Strategy and Policy of the Republic of Serbia in the period from 2011 to 2020 ("Official Gazette of the RS", No. 55/11)	Ensuring security of energy supply by increasing the efficiency of energy companies and energy efficiency of the economy	Industry
Strategy of railway, road, water, air, and intermodal transport development in the Republic of Serbia in the period from 2008 to 2015 ("Official Gazette of the RS", No. 4/08)	Reducing the negative impact of transport on the environment in accordance with the principles of sustainable development	Transport

The Energy Development Strategy of the Republic of Serbia by 2015, and the Energy Law ("Official Gazette of the RS", No. 57/11, 80/11-corrigendum, 93/12 and 124/12) are strategic documents, in terms of the objectives defined and the acknowledgement of the importance of energy efficiency improvement. As part of the Energy Development Strategy of the Republic of Serbia by 2015, energy efficiency is considered the second - targeted Priority of the rational use of quality energy sources and energy efficiency improvement in production, distribution and use of energy by end-users of energy services. In addition, the third - special priority of the Strategy refers to the use of new renewable energy sources and new, energy-efficient and environmentally-friendly energy technologies and devices / equipment for energy use.

Regulation on the establishment of the Implementation Programme of the Energy Development Strategy of the Republic of Serbia by 2015, for the period from 2007 to 2012 ("Official Gazette of the RS", No. 17/07, 73/07, 99/09 and 27/10) describes the status in the energy consumption sectors, provides an assessment of energy potentials across sectors (industry, transport, construction), identifies the obstacles to increasing energy efficiency and proposes a set of measures necessary for the elimination of these obstacles.

Draft Energy Development Strategy of the Republic of Serbia for the period until 2025, with projections until 2030, will define a new strategic framework, which will certainly take into account the savings scenario defined in accordance with the commitments of the Republic of Serbia to the Energy Community, as defined within the First EEAP. The energy efficiency improvement was recognized in the Draft Strategy as a strategic objective, but the quantity of the savings will be defined for each period by relevant action plans.

National Strategy for Sustainable Development defines the increase of energy efficiency as one of the priorities for achieving sustainable development of the country.

The Strategy and policy of industrial development of the Republic of Serbia from 2011 to 2020 has identified energy efficiency as an important condition for achieving the goal set - improving competitiveness.

The Law on EUE, which entered into force in March 2013, defines mechanisms and measures aimed at achieving cost savings in the energy production, distribution and consumption sector.

## **2.3. Measures for energy efficiency improvement and energy savings achieved in the final consumption**

### **2.3.1. Savings calculation methodology**

Within the project "Preparation of Bottom-up MV methodology", implemented by GIZ ORF-EE in cooperation with Serbian institutions, a Bottom-up method of monitoring and verification of savings was developed, which allows the evaluation of a large number of measures both within the First EEAP, and in the case of the Second EEAP. The method for calculating savings was developed according to the recommendations set out in the EC document "Recommendations on Measurement and Verification Methods in the Framework of the Directive 2006/32/EC on Energy End-Use Efficiency and Energy Services" and recommendations of the "EMEEES" Project (Wuppertal Institute for Climate, Environment and Energy) - (<http://www.evaluate-energy-savings.eu/>). Data on completed projects and achieved savings were collected from local self-governments, the Autonomous Province of Vojvodina, directly from beneficiaries of grants, incentives and subsidies, and from banks that granted loans for this purpose. In Annex 2 - the Summary of Bottom-up methodologies, which is attached to this Action Plan and forms its integral part, provides an overview of the methodology by the types of measures that are applied to. In accordance with Article 9, paragraph 6, Of the Law on EUE, the methodology for monitoring, verification and evaluation of the Action Plan implementation effects is prescribed by the minister in charge of energy affairs.

In accordance with these instructions, and with technical assistance from GIZ ORF-EE, a Top-down methodology for monitoring savings was developed, with appropriate Top-down tables. However, the savings achieved in the First EEAP are monitored primarily by a Bottom-up methodology, due to the lack of relevant statistical data for the application of Top-down methodology.

### **2.3.2. List of all energy efficiency measures**

Hereby is shown an overview of all measures by sectoral allocations. Final energy consumption sectors have remained the same as in the First EEAP and are aligned with the consumption sectors provided by the Energy Balances. Currently, the PC sectors are not being monitored by the energy balance separately, but their separation is planned in order to verify the energy targets. In addition, measures that are designed for households, public and commercial sector are different in nature and need to be considered separately.

In this Action Plan, it is proposed that a significant number of measures is monitored by the Bottom-up methodology, in adequate Bottom-up tables, that will enable tracking of savings per projects, by summing up their effects. This methodology hardly enables the monitoring of the transport and industrial sectors, which will be mainly monitored by the Top-down methodology, in adequate Top-down tables. The establishment of EMS and energy audits is expected to provide for partially overcoming this problem in the industrial sector.

All measures are classified into the following groups:

- 1) measures in households, public and commercial sectors, with a division in two sub-categories - households as the first sub-category and PC sector as the second sub-category,
- 2) measures in the transport sector,
- 3) measures in the industry sector,
- 4) horizontal measures.

Due to the fact that consumption in the agricultural sector in 2013 amounted to only 0.118 Mtoe (less than 3% of the consumption in the residential and commercial sector) no measures for this sector have been provided within the Second EEAP.

Horizontal measures will be further discussed in Section 3 of this Action Plan, dealing with institutional, regulatory, financial and information mechanisms and measures, which are aimed at improving the implementation and monitoring of results of the Second EEAP.

#### 2.3.2.1. Measures in the household, public and commercial sector

Residential and tertiary sector used 3.219 Mtoe, or approx. 38% of total final energy consumption in the Republic of Serbia in 2008, while this value in 2011 increased to 4.411 Mtoe, or nearly 50% of the final energy consumption, as a result of different calculation of biomass in 2011, compared to 2008, as discussed above. In the preparation of the Second EEAP based on the data available, it was difficult to make a distinction between the consumption achieved within public and commercial services.

Residential, commercial and public services sectors experienced steady growth in recent decades, especially in the construction of all types of facilities: residential, commercial and combined - multi-purpose facilities. Private, domestic and foreign investments in urban centers of the Republic of Serbia resulted in the development of combined multi-purpose facilities - commercial and business, retail and luxury residential areas with built-in heating, ventilation and air conditioning systems of large installed capacity. Some of these facilities are designed in compliance with the highest EU standards of energy efficiency, and in this respect these have become a benchmark in the region (e.g. reconstruction of the SC Usce - although with a full glass surface, the facility has a heat load of less than 50 kWh/m<sup>2</sup>). Such trend is widely present in state-of-the-art facilities, so an average energy consumption in newly built facilities amounts to 100 kWh/m<sup>2</sup>.

Average annual energy consumption in most of the existing facilities in the urban areas of the Republic of Serbia is significantly higher, as much as two to three times higher than in newly built facilities. Residential buildings that were built during the 1970s and 1980s, in the period of most intense growth of the housing stock, are characterized by excessive final energy consumption and increased heat consumption. Due to poor construction and aging, thermal properties of their building thermal envelope are progressively worsening. Having in mind that these buildings were built without any or with inadequate thermal insulation, today they represent the major problem in terms of energy consumption in the Republic of Serbia. These facilities are further characterized by oversized installations of heating systems and boilers or heating substations, if connected to the district heating network. According to the Programme for Implementation of the Energy Development Strategy of the Republic of Serbia, the average specific final energy consumption for heating and hot water in the Republic of Serbia is estimated at about 220 kWh/m<sup>2</sup>, which is much more than the EU average.

In accordance with the Law on Planning and Construction and relevant regulations, all new buildings need to have annual energy consumption for heating within the specified energy class "C", or a maximum of 75 kWh/m<sup>2</sup>, while the energy class for existing buildings, upon reconstruction, renewal, refurbishment, repair and energy rehabilitation need to be upgraded for at least one class. According to data of the Statistical Office of the Republic of Serbia, collected in Q1 2013, the value of construction works carried out by contractors from the Republic of Serbia has decreased by 18.7% compared to Q1 2012, expressed in current prices, while in constant prices such decline amounts to 23.0%. The number of apartments in January and February 2013, compared to the same period in 2012, according to the number of issued building permits, is unchanged, while the size of apartments, according to permits issued, increased by 4.3%.

In the course of 2013, the project "Tabula" was completed, which for the first time in the Republic of Serbia provided the classification of buildings in family and multi-family housing. This project was supported by GIZ, and its implementation engaged professors from the Faculty of Architecture with their associates. The project was implemented in most European countries and it was aimed at defining common principles for the establishment of national typology of residential buildings. The adopted common principles of typology comprise buildings periodization and

classification into four basic types. For the purpose of this project, data of the Statistical Office of the Republic of Serbia was partly used, and extensive field research was conducted which included an inventory of around 6,000 buildings in 2011, and around 13,000 buildings in 2012.

Although the "Tabula" defines four basic types of buildings, based on the principle of recognizing specific features of particular countries, in the Republic of Serbia several types have been defined thereto. Accordingly, the national typology of residential buildings comprises: within the family housing, categories of free-standing houses (type 1) and row houses (type 2), and within the multi-family housing, the category of free-standing building (type 3), lamela (type 4), buildings in a row (type 5) and high-rise (type 6).

Table 12: National typology - representation of types by surface (m<sup>2</sup>)

		породично становање family housing		вишепородично становање multifamily housing				Σ m <sup>2</sup>	%	
		1	2	3	4	5	6			
A	A	< 1919	8 812 918	1 641 759	181 255	128 836	319 202		11 083 970	3.83%
Б	В	1919-1945	14 060 213	871 044	1 056 060	343 833	1 829 417		18 160 567	6.27%
Ц	С	1946-1960	19 797 175	951 208	1 419 450	2 699 971	1 591 895	127 540	26 587 239	9.18%
Д	Д	1961-1970	27 080 821	1 858 685	6 464 054	6 207 704	2 226 913	1 031 502	44 869 679	15.49%
Е	Е	1971-1980	38 021 616	1 921 639	10 176 303	17 481 251	3 154 044	2 418 507	73 173 360	25.26%
Ф	Ф	1981-1990	34 331 187	2 121 357	10 867 713	15 936 685	3 401 177	815 053	67 473 172	23.29%
Г	Г	1991-2011	23 129 363	1 449 853	8 362 188	10 410 747	4 987 582		48 339 733	16.69%
		Σ m <sup>2</sup>	165 233 293	10 815 545	38 527 023	53 209 027	17 510 230	4 392 602	289 687 720	100.00%
		%	57.04%	3.73%	13.30%	18.37%	6.04%	1.52%	100.00%	

For each approved type of buildings, typical elements of the thermal envelope were defined, with the calculated heat transfer ratio, characteristics of the heating and hot water system, incidence of types in the overall national housing fund, and improvement opportunities were identified. In accordance with the Rulebook on energy efficiency in buildings, for each building that is representative of the approved type the following was calculated: energy required for its heating per year per m<sup>2</sup> of heated area, final energy, total energy required for heating the entire heated area of the building, primary energy and carbon dioxide emissions. For each building the energy class was defined. The above data were also provided for potential energy efficiency improvement of buildings.

Table 13: National typology - representation of types according to energy demand for heating (MWh / year)

		породично становање family housing		вишепородично становање multifamily housing				Σ MWh/годишње Σ MWh/year	%	
		1	2	3	4	5	6			
A	A	< 1919	2 317 797	512 229	38 064	21 129	52 988		2 942 206	4.50%
Б	В	1919-1945	3 402 572	284 831	196 427	75 299	272 583		4 231 713	6.48%
Ц	С	1946-1960	4 969 091	232 095	322 215	491 395	348 625	20 151	6 383 572	9.77%
Д	Д	1961-1970	6 824 367	667 268	1 111 817	987 025	420 887	121 717	10 133 081	15.51%
Е	Е	1971-1980	12 433 068	253 656	1 943 674	2 394 931	498 339	324 080	17 847 749	27.32%
Ф	Ф	1981-1990	11 638 272	462 456	1 369 332	2 023 959	397 938	101 882	15 993 838	24.48%
Г	Г	1991-2011	5 551 047	230 527	652 251	884 913	473 820		7 792 558	11.93%
		Σ MWh/годишње Σ MWh/year	47 136 215	2 643 062	5 633 780	6 878 652	2 465 179	567 830	65 324 717	100.00%
		%	72.16%	4.05%	8.62%	10.53%	3.77%	0.87%	100.00%	

Potential energy efficiency improvements in residential buildings included construction measures to intervene on the thermal envelope of building, as well as improvement of the heating system and domestic hot water system. The above measures were discussed on two levels of improvement: the first that achieves improvement of a minimum one energy class of building, and another that represents the maximum range of energy recovery in accordance with the specific characteristics of the building. Conducted calculations show that the first level of energy recovery provides for savings of a minimum 25% of the energy needed for heating, while the second level of energy recovery enables to achieve savings of about 70% of the energy needed for heating. In certain cases, by the application of these rehabilitation measures the energy required for heating was reduced to only 5% of the energy required for heating in the existing condition.

In 2011, households consumed about 52% of the total electricity consumption in the Republic of Serbia, and it is estimated that about 65% of it is used for space heating in the housing stock. Thus, it is evident that there is a great potential for energy savings and a wide range of sustainable energy efficiency measures in the housing stock.

So far, 27% of households is connected to the district heating system in the Republic of Serbia, with the largest percentage in Novi Sad (60%) and Belgrade (50%). The number of residential, commercial and public buildings that are supplied with thermal energy and / or gas is steadily increasing. According to the Programme for achieving the Energy Development Strategy of the Republic of Serbia, another 65,000 residential and 35,000 commercial and public customers should be connected to the DHS.

According to the Study on Energy Efficiency in Buildings in the Republic of Serbia, which was executed with the support of the World Bank, buildings provide an opportunity for significant energy savings. Due to the fact that heating accounts for 61% of energy consumption in buildings, much of the potential savings would be achieved by improving the building thermal envelope, i.e. reducing heat loss. In general, the energy rehabilitation of existing buildings represents potential savings of about 16% of final energy consumption. It is estimated that achieving the full potential for energy savings in buildings would cost 8.8 billion euros, out of which approximately 6.37 billion euros would be invested in housing, and around 2.4 billion euros in the PC sector. Such investment would be paid off in about eight years, since the estimated savings of investors and customers amount to about 1.1 billion euros annually. For the public sector, predicted annual savings could amount to approximately 123.4 million euros, out of which 52 million euros from public buildings, 43.1 million from educational buildings, and 28.3 million from hospitals. It was assessed that, in order to fully implement the Second EEAP and defined savings, significant investments in the field of reconstruction and rehabilitation of existing buildings in the residential and commercial sectors are necessary, while there is a need to carry out the reconstruction and rehabilitation of about six times more m<sup>2</sup>, compared to the current trend. This is particularly important from the point of view of the creation of the Budget Fund for Energy Efficiency Programme and allocation of new credit lines and other financial mechanisms.

Public lighting is one of public services that is provided by municipalities mainly for streets and pedestrian zones lighting, whereas it can also be utilised for decorative purposes alone. Maintenance of public lighting is usually the responsibility of the local electricity distribution company. In the past, one of the important features of the public lighting system development in the Republic of Serbia related to the fact that systems in small towns were built solely through funding provided by the citizens, due to which modest technical solutions were applied. According to data of the Public company "Electric Power Industry of Serbia", the consumption of electricity for public lighting in 2008 amounted to 461 GWh (1.67% of total electricity consumption). The total installed capacity of the lighting system is estimated at about 80 MW. It was estimated that about 70% of bulbs is obsolete, with inadequate light source, so these should be replaced in the coming period during the modernization of the system. Improvement of public lighting should not only be directed towards replacing existing lights, but also towards modernization of the lighting control system. The above measures, although without significant capacity savings compared with other measures, is one of the measures with the quickest return on investment.

As part of the measure relating to the use of energy efficient light bulbs and household appliances, it should be noted that, although so far there was no obligation of the appliances energy labelling, the labelling was carried out in general . Within this measure, priority should be given to the promotion of energy-efficient appliances.

One of the major cost-saving measures in the Second EEAP is the measure related to the EMS introduction in the PC sector. As of 2015, all implemented measures in the PC sector for designated organisations will be monitored through the EMS measure alone.

Proposed measures in the household and PC sector were partially modified with respect to the First EEAP.

#### Measures in the household sector

In the household sector, individual measures are classified according to the type they refer to: technical i.e. construction works - D1, regulations - D2, and mandatory information measures - D3. The first measure D1 includes three previous measures, while at the same time it is covered by the three Bottom-up methods of calculation. The measure is summed up in this way primarily because it is more comprehensive, while old measures can be identified as separate activities under the new measure. Besides, credit lines and funds from the Budget Fund for Energy Efficiency are allocated, among other, for comprehensive technical interventions on buildings, regardless of individual activities within a single measure. The measure D2 is also covered with three calculation methods, as in the case of D1, from Bottom-up methodology. In order to avoid duplicating effects of savings, the first measure will track existing buildings, regardless of the fact that regulations given in D2 are also applicable to it, while new buildings will be observed through the measure D2. The measure D1 will track all savings achieved through dedicated funds, programmes and projects, while the measure D2 will track all newly constructed buildings in line with new regulations. The savings are to be monitored through the above described programming platform DMS.

The measure D3 cannot be monitored by Bottom-up methodology, thus individual data are generally not available. Hereby the Top-down methodology will be applied, as soon as all relevant statistical data are available.

Table 14: Summary of measures in the household sector

No:	Name of measure in the Second EEAP	Name of measure in the First EEAP	Targeted direct consumption	Duration	Achieved savings in 2012 [Mtoe]	Expected savings in 2015 [Mtoe]	Expected savings in 2018 [Mtoe]
H1	Energy efficiency improvement measures in residential buildings	1.1 Improvement of the building thermal envelope in terms of increasing energy efficiency to reduce energy consumption for heating and ventilation  1.4. Reduction of electricity use for heating 1.8. Introduction of credit lines for energy efficiency and renewable energy sources for households	Residential sector, existing buildings	2010–2018	0.00514	0.0218	0.0436
H2	New rules for the design and construction of buildings, the minimum requirements in terms of energy performance of buildings and their certification in accordance with the revised EPBD	1.5. New rules for the design and construction of buildings, the minimum requirements for energy performance and certification of buildings energy performance in accordance with the revised EPBD.	Residential sector, new buildings	2010–2018	/	0.0418	0.0848
H3	Promotion of the use of energy-efficient household appliances	1.3. Promotion of the use of energy-efficient household appliances 1.2. Improvement of internal lighting in terms of increasing energy efficiency	Households	2010–2018  Early measure: EM1 2004-2009 expired,  EM2 2006-2009	0.00228	0.005762	0.01194
Total					0.00742	0.0693	0.1403

### Specific measures in the household sector

Name of measure		Energy efficiency improvement measures in residential buildings
Baseline measure label		H1
Description of measure	Category	- Financial instrument (credit line, subsidy, loan), - Information and mandatory information measures (Energy audit)
	Time frame	Start date: 2010 Completion date: 2018 No early measures were applied
	Target / brief description	Energy savings for heating and cooling through the following activities: improvement or replacement of external windows and doors; installation or improvement of existing thermal insulation of walls, roofs, ceilings over open passages, walls and floors on the ground, and the other walls to unheated spaces (building envelope). Reducing the energy consumption of HVAC system through the use of: efficient HVAC equipment with automatic control, and other; energy-efficient equipment for biomass combustion; thermal solar collectors; effective heating devices, such as heat pumps
	Target end-users (Target direct consumers)	Existing buildings, lighting systems in existing buildings, HVAC systems in existing buildings
	Target group	Residential sector
	Regional implementation	National, regional, local
Information on implementation	List and description of activities for the implementation of measure	This measure will be implemented by means of loans extended by commercial banks at favourable repayment terms provided through the Budget Fund for Energy Efficiency funds or funds of the autonomous province or local self-government, and other favourable credit lines supported by IFIs or the commercial banks. The Fund is expected to provide funding to subsidize interest or means of guarantees or other types of subsidies that would enable the funds to be available on favourable terms, in accordance with the Fund's annual program of financing. The Fund may also finance the preparation of energy audits for large-scale projects. Projects financing is available from the budgets of investors who invest in building reconstruction. The implementation will be conducted by MEDEP, with possible support of local self-governments and the autonomous province, and with accompanying public campaigns and promotions. The basis for the implementation is the Law on EUE and relevant by-laws, and the Law on Planning and Construction.
	Budget and funding sources	Budget Fund for Energy Efficiency, budget and fund for energy efficiency of the autonomous province and local self-government, or favourable credit lines of IFIs and commercial banks, investors' budgets
	Institutions in charge of implementation of activities	MEDEP, Ministry of Construction and Urban Planning, and other relevant institutions at the

	under the measure	level of the autonomous province and local self-government.
	Institution in charge of monitoring	MEDEP
	Method of monitoring / measurement of achieved savings	Bottom-up 4, Bottom-up 5, Bottom-up 6, Bottom-up 8 Bottom-up 9, Bottom-up 11
	Expected savings in 2012, according to the First EEAP	0.00318 Mtoe
	Achieved savings in 2012	0.00514 Mtoe
	Expected savings in 2018	0.0436 Mtoe
	Expected savings in the period 2013-2015	0.0218 Mtoe
	Expected impact on savings in 2020	
	Assumptions	Estimated savings are based on data from the Statistical Office of the Republic of Serbia on average annual number of square meters that are reconstructed in the residential sector (period 2001-2012), and data from the "Tabula" relating to the average consumption in the residential sector and potential percentage of savings achieved by the application of the measure D1. Estimated values are obtained by multiplying the average annual number of squares that are reconstructed in the housing sector and the percentage of potential savings achieved through the measure application. Potential savings are obtained on annual level, and then multiplied for the period by 2015 and by 2018. These savings are then increased fivefold, as for the required target it is necessary to provide through various types of incentives the reconstruction of approx. additional 800,000 m <sup>2</sup> of housing space.
	Overlaps, multiplication effects, synergy	Overlaps were possible with D2 measure since the new regulations apply both to existing buildings in the reconstruction phase, and new buildings. The overlap has been resolved in such a way that savings related to new buildings will be presented within D2 measure, while the savings relating to reconstructed buildings will be shown in D1 measure.

Name of measure	New rules for the design and construction of buildings, the minimum requirements in terms of energy performance of buildings and their certification in accordance with the revised EPBD	
Baseline measure label	H2	
Description of measure	Category	Provisions (standards and norms)
	Time frame	Start date: 2012 Completion date: 2018 No early measures were applied
	Target / brief description	Achieving savings based on the new regulations in the construction industry: New regulations on energy performance of buildings, which prescribe mandatory use of the relevant ISO / EN standards for the energy performance of buildings, standards for thermal performance of buildings and other standards relating to the design of buildings and their HVAC systems; Energy certification of buildings;
	Target end-users	Reconstructed buildings and new buildings
	Target group	Residential sector
Information on implementation	Regional implementation	National, regional, local
	List and description of activities for the implementation of measure	Regulations accompanying the Law on Planning and Construction which are related to energy efficiency are the following: The Rulebook on energy efficiency in buildings ("Official Gazette of the RS", No. 61/11), which prescribes energy performance and methodology for calculating the thermal performance of buildings as well as energy demands for new and existing buildings. The Rulebook on the conditions, content and manner of issuance of certificates of energy performance in buildings ("Official Gazette of the RS", No. 69/12) prescribes the conditions, content and manner of performing energy certification of buildings. These Rulebooks have provided for the transposition of the EPBD provisions relating to the energy efficiency of buildings into the national legislation. According to the requirements prescribed in these regulations, all new buildings and buildings that are reconstructed need to have energy passports and meet the requirements of a minimum "C" class of buildings.
	Budget and funding sources	Funds of the investor which is building a new facility or reconstructing the existing one, Budget of the Republic of Serbia
	Institutions in charge of the implementation of activities under the measure	Ministry of Construction and Urban Planning, Chamber of Engineers, and other relevant institutions
	Institution in charge of monitoring	Ministry of Construction and Urban Planning, MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	Bottom-up 7
	Expected savings in 2012, according to the First EEAP	/
	Achieved savings in 2012	/
	Expected savings in 2018	0.0848 Mtoe

	Expected savings in the period 2013-2015	0.0418 Mtoe
	Expected impact on savings in 2020	
	Assumptions	Estimated savings are based on data from the Statistical Office of the Republic of Serbia, on the average annual number of square meters built in the residential sector (period 2001-2012.), and data from the "Tabula" project that relate to the average consumption in the residential sector and newly prescribed maximum heat energy for the "C" class taken from the Rulebook on energy certification of buildings. Estimated values are obtained by multiplying the average annual number of square meters that are constructed in the housing sector with a difference in energy consumption for heating by using old and new rules. Potential savings are obtained on annual level, and then multiplied for the period by 2015 and by 2018, with the annual increase in the number of constructed square meters by 1%.
	Overlaps, multiplication effects, synergy	Overlaps were possible with D1 measure since the new regulations apply both to existing buildings in the reconstruction phase, and new buildings. The overlap has been resolved in such a way that savings related to new buildings will be presented within D2 measure, while the savings relating to reconstructed buildings will be shown in D1 measure.

Name of measure		Promotion of the use of energy-efficient household appliances
Baseline measure label		H3
Description of measure	Category	Information and mandatory information measures (public information campaigns, energy labelling) - Financial instruments (subsidies, credit lines)
	Time frame	2010-2018 Early measure: EM1 2004-2009 expired, EM1 2006-2009
	Target / brief description	Reducing electricity consumption by introducing energy-efficient household appliances (refrigerators, stoves, washing machines, dishwashers, air conditioners, light bulbs, etc.)
	Target end-users	Households
	Target group	Residential sector
	Regional implementation	National, regional, local
Information on implementation	List and description of activities for the implementation of measure	<p>The Law on EUE has defined the obligation of energy efficiency labelling of products that affect energy consumption, while the by-laws will define which products need to be labelled and in what manner.</p> <p>For successful implementation of the measures, it is necessary to implement public awareness campaigns, to be carried out by MEDEP, the autonomous province and local self-governments, consumer organisations and/or NGOs, along with distribution of free compact fluorescent (CFL) bulbs to regular payers and socially vulnerable electricity customers by EPS.</p> <p>The implementation of measures may be supported through subsidies or favourable loans from the budgetary fund and other funding sources.</p> <p>The Public company Electric Power Industry of Serbia (EPS) has organized different public campaigns for the replacement of incandescent light bulbs with CFL bulbs. During the 2011 campaign, 12,500 free CFL bulbs were distributed to citizens. In 2012, 20,000 free CFL bulbs were distributed free of charge.</p> <p>The total number of bulbs distributed is relatively insignificant. In the period from 2010 to 2012, besides EPS campaigns no other campaigns were organised.</p> <p>The savings assessment in household appliances requires a current status in households, regarding consumption of various appliances, as well as sales data on currently different types of appliances, and also an estimation on the appliances sales improvement upon the introduction of energy labelling (which depends on the the success of the energy labelling campaign). This measure is not measurable by households and consumption, but it rather indicates a change in the market. An in-depth market analysis is necessary, that would include possible assumptions about the presence of certain energy classes of appliances by 2015.</p>

		<p>EEARS conducted a promotion and raising awareness activity in 2006, when distribution of 996,000 leaflets on energy labelling of products was carried out. The effect of this measure is not directly measurable, but it coincides with the period when all major retailers started marking energy labels on home appliances, although it was not mandatory at the time.</p> <p>With the enforcement of the Law on EUE, the energy labelling of household appliances became mandatory. Other activities of the efficient CFL bulbs distribution are expected in the future, as part of promotional activities.</p> <p>This measure is relatively difficult for monitoring. On the one hand, the measure will be monitored by Top-down method regarding an increase in sales of household appliances, while on the other side through EPS promotional activities data are obtained by Bottom-up methods on the savings achieved. As regards interior lighting, according to the First EEAP, the expected level of savings was almost reached, but for household appliances this is difficult to determine.</p>
	Budget and funding sources	Measures can be supported from the budgetary funds and other sources of funding.
	Institutions in charge of the implementation of activities under the measure	MEDEP, autonomous province, local self-government, EPS, market inspection, NGOs, consumers association
Energy savings	Method of monitoring / measurement of achieved savings	Bottom-up 2 for bulbs, Top-down method P4 for household appliances
	Expected savings in 2012, according to the First EEAP	0.005762 Mtoe
	Achieved savings in 2012	0.00228 Mtoe
	Expected savings in 2018	0.011963 Mtoe
	Expected savings in the period 2013-2015	0.005762 Mtoe
	Expected impact on savings in 2020	
	Assumptions	The Law on EUE adopted / achieved. The target was set at the level of average annual savings projected in the First EEAP for the period 2010-2012.
	Overlaps, multiplication effects, synergy	-

## Measures in the public and commercial sector

Hereby, as in the case of households, the new measure, labelled as PC1, included several previous programs and measures that are now recognized as activities within its scope. The measure comprises all technical activities related to increasing the efficiency of buildings in the public and commercial sector, including lighting, and the measure can be monitored over four Bottom-up tables. The World Bank project and KfW credit line are considered in this case only as support mechanisms for the measure implementation, rather than, as it is the case in the First EEAP, as special measures. Through PC1 only the reconstruction and renovation of existing buildings will be monitored, to avoid a duplication effect with PC2

Other measures have been taken from the First EEAP, whereas the measure PC4 will be specifically monitored. All savings achieved within the Energy Management System will be monitored within PC4, regardless of the individual measure in question, to avoid duplication effects. Within the PC sector, where the Energy Management System establishment is not mandatory, savings will be monitored through the remaining measures.

Out of the above mentioned measures, two of them are technical, PC1 and PC3, and these are monitored by Bottom-up methodology, while the remaining measures are normative, where PC2 and PC4 should be monitored by Bottom-up methodology; the effects of PC5 and PC6 measures are hard to track.

In this case, monitoring of the measures' effects should be provided for, at least in part, by the DMS platform established.

Table 15: Summary of measures in the public and commercial sector

No.	Name of measure in the Second EEAP	Name of measure in the First EEAP	Targeted direct consumption	Duration	Achieved savings in 2012 [Mtoe]	Expected savings in 2015 [Mtoe]	Expected savings in 2018 [Mtoe]
PC1	Energy efficiency improvement measures in residential buildings	<p>- Measure of the building thermal envelope improvement in terms of increasing energy efficiency to reduce energy consumption for heating and ventilation in the PC sector was not envisaged by the First EEAP</p> <p>2.1 Improvement of interior lighting in terms of increasing energy efficiency</p> <p>2.3 Reduction of electricity use for heating</p> <p>2.7 Serbian Energy Efficiency Project (SEEP)</p> <p>2.9 Introduction of credit lines for energy efficiency and renewable energy sources for public and commercial buildings</p>	Existing buildings in the PC sector	2010-2018 EM4 2004-2009 EM6 2004-2009 EM7 2005-2011 EM8 2004-2009	0.00656	0.00691	0.0170
PC2	New rules for the design and construction of buildings, the minimum requirements in terms of energy performance of buildings and their certification in accordance with the revised EPBD	2.4. New rules for the design and construction of buildings, the minimum requirements for energy performance and certification of buildings energy performance in accordance with the revised EPBD.	New buildings in the PC sector	2012–2018	/	0.02676	0.05352
PC3	Modernization of public lighting system in towns and municipalities	Modernization of public lighting system in towns and municipalities	Public lighting system	2004-2009  2011–2018	0.00552	0.00139	0.0083

PC4	Introduction of Energy Management Systems in the public and commercial sector	Introduction of Energy Management Systems in public and commercial buildings	Designated organisations in the PC sector	2013–2018	/	0.008141	0.04477	
PC5	Determination of energy efficiency as one of the criteria for the most economically advantageous tender in public procurement	Determination of energy efficiency as one of the criteria for the most economically advantageous tender in public procurement	Public sector	2013-2018	/	Not estimated	Not estimated	
PC6	Incentive rates for highly efficient coupled / combined heat and power generation	New measure In the First EEAP included only the industry sector, even though the incentives were foreseen for all plants for combined heat and power generation, provided they meet the required conditions	PC sector	2010–2018	/	0.00431	0.00862	
PC7	Mandatory regular control of the combustion process of boilers and other combustion chambers with the capacity over 20 kW, as well as air conditioning systems	New measure set forth by the Law on Efficient Use of Energy. Specifically, it is envisaged that regular control of the combustion process of boilers and other combustion chambers with the capacity exceeding 20 kW is mandatory to determine the utility level, as well as air conditioning systems with the capacity exceeding 12 kW.		2015-2018	/	0.00242	0.00242	
Total						0.01208	0.049941	0.134637

### Specific measures in the public and commercial sector

Name of measure		Energy efficiency improvement measures in public and commercial buildings
Baseline measure label		PC1
Description of measure	Category	Financial instrument (credit line, subsidy, loan), information and required information measures - (significant example of the public sector, energy overview)
	Time frame	Start date: 2010 Completion date: 2018 EM4 2004-2009 EM6 2004-2009 EM7 2005-2011 EM8 2004-2009
	Target / brief description	1) Energy savings for heating and cooling through the following activities: - improvement or replacement of external windows and doors; - installation or improvement of existing thermal insulation of walls, roofs, ceilings over open passages, walls and floors on the ground, and the other walls to unheated spaces (building envelope); - reduction of electricity consumption for lighting by promoting and supporting the replacement of incandescent bulbs with energy efficient bulbs, and other measures to improve the lighting system (automatic regulation, dampers, upgraded lighting plan, etc.). 2) Reducing the energy consumption of HVAC system through the use of: - energy-efficient equipment for biomass combustion; - thermal solar collectors; - effective heating devices, such as heat pumps.
	Target end-users	Existing buildings, lighting systems in existing buildings, HVAC systems in existing buildings
	Target group	PC sector
	Regional implementation	National, regional, local

Information on implementation	List and description of activities for the implementation of measure	<p>This measure will be implemented with subsidies, loans, or credit lines with favourable repayment terms provided through IFIs (KfW, WB, EBRD, etc.), Budget Fund for Energy Efficiency and other favourable credit lines and funding sources, or through energy service company (ESCO), with active participation of local self-government units and possible support of the autonomous province.</p> <p>In case the source of funding is the Budget Fund for Energy Efficiency, the requirement for funds allocation is the energy audit of the building; the funds can be allocated for the implementation of the identified measures, unless otherwise prescribed by relevant by-laws. Upon the project implementation, execution of another energy audit is required.</p> <p>The level of subsidies of the Public Sector Fund, as well as method of stimulation of the commercial sector, will be defined by the funding plan of the Fund and its rulebook.</p> <p>Project financing is available from the budgets of investors who invest in building reconstruction.</p> <p>The basis for the implementation is the Law on EUE and relevant by-laws, along with the Law on Planning and Construction and its relevant by-laws.</p> <p>The new Law on Public Procurement and the Law on EUE allow the establishment of energy efficiency criteria in the procedure of public procurement of goods and services.</p> <p>The Minister in charge of Energy prescribes minimum criteria in terms of energy efficiency in the public procurement of goods and services.</p>
	Budget and funding sources	<p>Budgets of buildings users, budgets of investors. Subsidies, loans or credit lines on favourable repayment terms provided through the Budget Fund for Energy Efficiency, in line with the annual financing plan of the Fund, other favourable credit lines and other funding sources.</p> <p>IFIs and Donors ESCO.</p>
	Institutions in charge of the implementation of activities under the measure	MEDEP, Ministry of Construction and Urban Planning, and other relevant institutions at the level of the autonomous province and local self-government, SCTM.
	Institution in charge of monitoring	MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	Bottom-up 2, Bottom-up 3, Bottom-up 4, Bottom-up 5, Bottom-up 6, Bottom-up 8 Bottom-up 9, Bottom-up 11
	Expected savings in 2012, according to the First EEAP	0.0091
	Achieved savings in 2018	0.00656
	Expected savings in 2018	0.0170
	Expected savings in the period 2013-2015	0.00691
Expected impact on savings in 2020		

	Assumptions	Estimated savings are based on data from the Statistical Office of the Republic of Serbia on average annual number of square meters that are reconstructed in the public and commercial sector (period 2001-2012), and acquired data relating to the average consumption in the public and commercial sector, and potential percentage of savings achieved by the application of the measure PC1. Estimated savings are obtained by multiplying the average annual number of square meters that are reconstructed in the public and commercial sectors and the percentage of potential savings achieved by using this measure. Potential savings were obtained annually, and then multiplied for the period by 2015 and 2018. These savings were then enlarged three times, as for the target achievement it is necessary, through various types of incentives, to provide for reconstruction an average of additional 145 000 m <sup>2</sup> Of the PC space.
	Overlaps, multiplication effects, synergy	In order to avoid overlapping with the measure PC4, results of this measure with the designated organisations will be presented as part of the measure PC4. Overlaps were possible with PC2 measure since the new regulations apply both to existing buildings in the reconstruction phase, and new buildings. The overlap has been resolved in such a way that savings related to new buildings will be presented within PC2 measure, while the savings relating to reconstructed buildings, not incurred by the designated organisations, will be shown in PC1 measure.

Name of measure		New rules for the design and construction of buildings, the minimum requirements in terms of energy performance of buildings and their certification in accordance with the revised EPBD
Baseline measure label		PC2
Description of measure	Category	Provisions (standards and norms)
	Time frame	Start date: 2012 Completion date: 2018 No early measures were applied
	Target / brief description	Achieving savings based on the new regulations in the construction sector: 1) New regulations on energy performance of buildings, which prescribe mandatory use of the relevant ISO / EN standards for the energy performance of buildings, standards for thermal performance of buildings and other standards relating to the design of buildings and their HVAC systems; 2) Energy certification of buildings.
	Target end-users	Existing buildings in reconstruction and new buildings
	Target group	PC sector
	Regional implementation	National, regional, local

Information on implementation	List and description of activities for the implementation of measure	Regulations accompanying the Law on Planning and Construction which are related to energy efficiency are the following: The Rulebook on energy efficiency in buildings, which prescribes energy performance and methodology for calculating the thermal performance of buildings as well as energy demands for new and existing buildings, The Rulebook on energy certification of buildings, which prescribes the conditions, content and manner of performing energy certification of buildings. These Rulebooks have provided for the transposition of the EPBD provisions relating to the energy efficiency of buildings into the national legislation. According to the requirements prescribed in these regulations, all new buildings and buildings that are reconstructed need to have energy permits and meet the requirements of a minimum "C" class of buildings.
	Budget and funding sources	Funds of the investor building a new facility or reconstructing the existing one. Budget of the Republic of Serbia.
	Institutions in charge of the implementation of activities under the measure	Ministry of Construction and Urban Planning, Chamber of Engineers, and other relevant institutions
	Institution in charge of monitoring	Ministry of Construction and Urban Planning, and MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	Bottom-up 7
	Expected savings in 2012, according to the First EEAP	/
	Achieved savings in 2012	/
	Expected savings in 2018	0.05352
	Expected savings in the period 2013-2015	0.02676
	Expected impact on savings in 2020	
	Assumptions	Estimated savings are based on data from the Statistical Office of the Republic of Serbia, on the average annual number of square meters built in the PC sector (period 2001-2012), and approved data related to the average consumption in the PC sector prior to the new Rulebook adoption, and newly prescribed maximum heat energy consumption for the "C" class taken from the Rulebook on energy certification of buildings. Estimated values are obtained by multiplying the average annual number of square meters that are constructed in the public and commercial sector with a difference in energy consumption for heating by using old and new rules. Potential savings are obtained on annual level, and then multiplied for the period by 2015 and by 2018.
	Overlaps, multiplication effects, synergy	In order to avoid duplication of savings with the measure PC4 and PC1, hereby the results of construction of all new facilities will be displayed.

Name of measure		Modernization of public lighting system in towns and municipalities
Baseline measure label		PC3
Description of measure	Category	Voluntary agreements and cooperation instruments (technology procurement, public procurement with the implementation of energy efficiency criteria). Mechanisms for energy savings (fund). Information and required information measures - (significant example of the public sector).
	Time frame	2011-2018 2004-2009, early measure EM5
	Target / brief description	Energy savings achieved through the following activities: 1) Replacement of the existing street lights in the public lighting system with modern lamps with energy-efficient light sources and improved optical characteristics that provide greater efficiency of the lamps. 2) Introduction of a regulation mechanism in the public lighting system.
	Target end-users	Public lighting systems in municipalities / towns
	Target group	Companies in charge of public lighting at the local self-government level
	Regional implementation	Regional
Information on implementation	List and description of activities for the implementation of measure	<p>The cost for electricity consumed and maintenance of the system will be beared by the local self-governments. They will also decide on the investments in the expansion and reconstruction of the system. Estimated energy savings upon modernization are very high, on average about 30%.</p> <p>In order to promote energy efficiency and the rational use of energy at the local level, SCTM Committee for Energy Efficiency prepared and recommended for adoption a municipal decision model relating to the energy efficiency improvement of public lighting and interior lighting in public buildings under the jurisdiction of municipalities and cities. By adopting such decision, the municipalities will declare the mandatory use of efficient light sources and bulbs with the required minimum quality in all newly designed systems, as well as in systems conducting regular or investment maintenance. In this way, gradual modernization of the system will be carried out, while increasing energy efficiency, reducing maintenance costs and increasing the quality of interior and public lighting.</p> <p>Two municipalities adopted in late 2009 the municipal decision on energy efficiency of public lighting. In 2012, another one municipality adopted this decision. In order to promote this activity, MEDEP and SCTM sent a joint letter to the local self-governments and held the promotion of the decision at the Energy Efficiency Committee within the SCTM.</p> <p>The new Law on Public Procurement provides for, while the Law on EUE requires the establishment of energy efficiency criteria in the</p>

		<p>procedure of public procurement of goods and services, including procurement of efficient public lighting systems.</p> <p>The measure has shown better results than originally envisaged. The results have mainly derived from the early measures.</p>
	Budget and funding sources	Budget of local self-governments, ECSO Subsidies, loans or credit lines on favourable repayment terms provided through the Budget Fund for Energy Efficiency, and other favourable credit lines
	Institutions in charge of the implementation of activities under the measure	Public company in charge of public lighting; local self-government; MEDEP, SCTM
	Institution in charge of monitoring	MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	Bottom-up 1
	Expected savings in 2012, according to the First EEAP	0.0014 Mtoe
	Achieved savings in 2012	0.00552 Mtoe
	Expected savings in 2018	0.0083 Mtoe
	Expected savings in the period 2013-2015	0.00139 Mtoe
	Assumptions	Expected savings in 2018 are envisaged at the level set in the First EEAP, since the results were mainly achieved as a result of the early measures, whereas the target for 2015 was calculated accordingly, assuming an increase in savings of 0.000463 Mtoe annually.
	Overlaps, multiplication effects, synergy	In order to avoid overlapping with the PC4 measure, results of the measures achieved before the EMS became operational, including early measures, will be shown through this measure. All activities on the improvement of public lighting after the EMS establishment with designated organisations will be shown as part of the measure PC4. Hereby results of the public lighting EE improvement for all non-designated organisations will be displayed.

Name of measure		Introduction of the Energy Management System in the public and commercial sector
Baseline measure label		PC4
Description of measure	Category	Regulations Information and required information measures - (significant example of the public sector)
	Time frame	2014-2018
	Target / brief description	Measure is implemented in accordance with the Law on Efficient Use of Energy, through: 1) Collecting and analysing data on energy consumption, proposing measures and activities aimed at increasing EE, 2) Developing and delivering programmes and plans for efficient energy use to MEDEP, 3) Implementing proposed measures and activities, 4) Preparing and submitting periodic reports to MEDEP (on the energy consumption and the achieved savings), 5) Implementing mandatory periodic energy audits. The activity is carried out by energy manager who possesses the appropriate license in accordance with the Law on EUE.
	Target end-users	Local self-governments with over 20,000 inhabitants, facilities which are the property of public administration bodies, autonomous province and commercial sector, with energy consumption exceeding the prescribed limits
	Target group	PC sector
	Regional implementation	National, local
Information on implementation	List and description of activities for the implementation of measure	The Law on EUE stipulates the obligation of the public administration bodies, autonomous province, local self-government with over 20,000 inhabitants, and other public services using the facilities in the public property, as well as consumers of energy in the service sector, which consume energy above the threshold to be determined by the Government through adequate regulation, to reduce energy consumption in accordance with the requirements defined in the same regulation, by implementing EMS. Designated organisations will be required to appoint an energy manager (EM), with the appropriate license, who will be responsible for monitoring and analysing energy consumption data, planning and implementing the EEI measures. The designated organisation prepares the energy efficiency plans and programmes, and informs MEDEP on the results of their implementation annually. Designated organisations from the two sectors are required to conduct energy audits at least once every 10 years. The system aims at prescribing commitments of energy consumption reduction for EMS, whereas the EMS has the right to fulfill its obligations in the most convenient manner, as appropriate. The EMS is entitled to achieve its targets through organisational and investment measures. As part of the measure, stimulation of the Energy Management System development is

		<p>envisaged with entities that are not included as the designated organisations .</p> <p>In order to establish EMS, MEDEP has provided grants from Japan, Norway and the UNDP. The Japanese project will help to establish a training program for energy managers, prepare bylaws, establish a training center g for energy managers and energy advisors, as well as databases and integrated platform for the collection and analysis of data submitted by designated organisations . The Norwegian grant will help funding the creation of a database and integrated platform for collecting data on conducted energy audits. UNDP will donate a database for energy management at the local level.</p> <p>Due to the fact that the EMS establishment will take some time, the first savings are expected in 2015.</p>
	Budget and funding sources	Funds of designated organisations, Budget Fund for Energy Efficiency, ESCO, loans and favourable credit lines approved by IFIs, other sources of funding.
	Institutions in charge of the implementation of activities under the measure	MEDEP, designated organisations
	Institution in charge of monitoring	MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	
	Expected savings in 2012, according to the First EEAP	0.00309
	Achieved savings in 2012	/
	Expected savings in 2018	0.044757
	Expected savings in the period 2013-2015	0.008141
	Assumptions	The potential is determined based on the assumption that 50% of energy consumption in the sector will be included in EMS, as well as the assumption that designated organisations will have to achieve savings at the level of 1% of final energy consumption per year. It is estimated that savings will start as of 2015.
	Overlaps, multiplication effects, synergy	Avoiding of duplication of savings with the measures PC1, PC2 and PC3 is explained in the framework of these measures.

Name of measure		Determination of energy efficiency as one of the criteria for the most economically advantageous tender in public procurement
Baseline measure label		PC5
Description of measure	Category	Information and mandatory information measures. Regulations
	Time frame	2013-2018
	Target / brief description	Energy savings resulting from the procurement of energy-efficient equipment, appliances and vehicles
	Target end-users	Facilities, equipment and vehicles which are the public sector property
	Target group	Public sector
	Regional implementation	National, regional, local
Information on implementation	List and description of activities for the implementation of measure	In accordance with the Law on EUE and DEEC, the public sector is required to provide an exemplary implementation of the energy efficiency policy by using energy efficiency criteria in the public procurement procedure. During the implementation of the public procurement procedure, when selecting bidders, public institutions should take into account the energy efficiency of products and services that are purchased. It is recommended to purchase only those products that meet the highest performance criteria and belong to the highest energy efficiency class. In addition, when purchasing or renting facilities and/or buildings or parts of buildings, the public sector has to include the energy efficiency criterion of the building/facility or part of a building in the decision-making process. The Ministry in charge of Energy, i.e. the Minister, prescribes by-laws to set forth minimum criteria in terms of energy efficiency in the public procurement of goods and services. In order to improve the measure implementation, it is necessary to prepare relevant guidelines and promote the measure.
	Budget and funding sources	Funds of persons conducting public procurement
	Institutions in charge of the implementation of activities under the measure	MEDEP, PPO, local self-governments, public companies
	Institution in charge of monitoring	MEDEP, PPO
Energy savings	Method of monitoring / measurement of achieved savings	
	Expected savings in 2012, according to the First EEAP	New measure
	Achieved savings in 2012	New measure
	Expected savings in 2018	Non assessable
	Expected savings in the period 2013-2015	-
	Assumptions	-
	Overlaps, multiplication effects, synergy	Results with the designated organisations will be presented as part of the measure PC4 upon the EMS establishment.

Name of measure		Incentive rates for highly efficient coupled / combined heat and power generation in public and commercial buildings
Baseline measure label		PC6
Description of measure	Category	Financial instruments: Regulations: The Regulation on the amount of special fees for incentives in 2013, and the Regulation on the method of calculation and the method of distribution of funds collected from the fees to stimulate privileged power producers.
	Time frame	2013-2018
	Target / brief description	Increasing energy efficiency in public and commercial buildings through the implementation of projects of combined heat and power generation.
	Target end-users	Facilities in the public and commercial sector property
	Target group	PC sector
	Regional implementation	National, regional, local
Information on implementation	List and description of activities for the implementation of measure	Institutions and companies in the PC sector that are engaged in efficient coupled / combined heat and power generation are entitled to acquiring the status of privileged electricity producer and exercising incentive purchase price for electricity delivered. Buildings in the property of PC sector that have significant and continuous need for heat (usually in the form of hot water) have the technical potential for the application of coupled / combined heat and power generation. Such buildings include clinical centres, major hospitals, social care buildings (senior care nursing homes, special hospitals, etc.), sports centres, etc.
	Budget and funding sources	
	Institutions in charge of the implementation of activities under the measure	MEDEP, public sector and commercial companies
	Institution in charge of monitoring	MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	Bottom-up 12
	Expected savings in 2012, according to the First EEAP	New measure
	Achieved savings in 2012	New measure
	Expected savings in 2018	0.00862
	Expected savings in the period 2013-2015	0.00431
	Assumptions	Assessment is made on the basis of the report on savings for the implementation period of the First EEAP, according to the Bottom-up methodology. Taking into account the incentives introduced by the Republic of Serbia, the current trends and analyses show that the combined heat and power generation will have approx. five-fold increase by 2018, compared to 2010.
	Overlaps, multiplication effects, synergy	

Name of measure	Mandatory regular control of the combustion process of boilers and other combustion chambers with the capacity over 20 kW, as well as air conditioning systems with the capacity over 12 kW	
Baseline measure label	PC7	
Description of measure	Category	Information and mandatory information measures. Regulations
	Time frame	Start date: 2015 Permanent activity
	Target / brief description	Energy saving is achieved by applying periodic control of boilers and other combustion plants, regulation of the combustion process, and control of heating and air conditioning systems.
	Target end-users (Target direct consumers)	Boilers and other combustion chambers with the capacity over 20 kW, as well as air conditioning systems with the capacity over 12 kW.
	Target group	Public and commercial companies, owners of boilers and other combustion plants, and air conditioning systems
	Regional implementation	National
Information on implementation	List and description of activities for the implementation of measure	The Law on EUE stipulates the obligation of the owners of boilers and other combustion plants with installed capacity over 20 kW to periodically exercise control of the combustion process, with simultaneous control of the heating systems in accordance with the EPBD requirements. In accordance with the aforementioned Directive, the Law on EUE stipulates the obligation of the owner of an air conditioning system with installed cooling capacity over 12 kW to conduct regular periodic controls of these systems. In order to implement the measure, the Law on EUE prescribes that MEDEP will establish the procedure of authorisation of persons eligible to perform these activities. Terms and dynamics of performing controls will be defined in detail by relevant by-laws. Control of the implementation will be carried out by MEDEP inspection services.
	Budget and funding sources	Owners of boilers and other combustion plants with installed capacity over 20 kW, as well as air conditioning systems of installed cooling capacity over 12 kW within the funds allocated for regular repairs and maintenance of these systems. In the initial phase, it is possible to obtain incentives from the Budget Fund for Energy Efficiency, or other sources.
	Institutions in charge of the implementation of activities under the measure	Public and commercial companies, owners of boilers and other combustion plants with installed capacity over 20 kW, as well as air conditioning systems of installed cooling capacity over 12 kW Authorised persons, pursuant to the Law on EUE and MEDEP.
	Institution in charge of monitoring	MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	Audit reports prepared by authorised persons
	Expected savings in 2012, according to the First EEAP	New measure
	Achieved savings in 2012	New measure
	Expected savings in 2018	0.00242

	Expected savings in the period 2013-2015	0.00242
	Assumptions	It is assumed that through periodic adjustment of the combustion process in boilers outside the designated organisations scheme 2% of annual savings in energy consumption can be achieved.
	Overlaps, multiplication effects, synergy	In order to avoid overlap with the measure PC4, the results achieved in the local self-government units with less than 20,000 inhabitants will be taken into account, i.e. in commercial companies which are not liable to EMS.

### 2.3.2.2. Measures in the industry sector

According to the Industrial Development Strategy and Policy of the Republic of Serbia from 2011 to 2020, in the transition period from 2001 to 2008 significant results in terms of economic growth were achieved. Transitional growth was primarily based on domestic aggregate demand (export demand is four times lower due to the structure of the economy and lack of competitiveness), and foreign loans and significant inflows of foreign direct investment. Dynamic economic growth was interrupted in Q4 2008 and in 2009, when the Republic of Serbia was faced with economic downturn and a sharp decline in economic activity, especially in the sector of tradable goods. Decline in domestic and global demand, slowdown in lending activity and foreign direct investment led to GDP drop in 2009 (-3.5%). The major negative effects of the crisis were reflected in the industry (drop of -11.5%), particularly manufacturing (drop of -15.8%), where growth was completely annulled in the period 2001-2008, followed by trade (-7.5%) and construction (-19.7%). In the second half of 2009 and during 2010 the economic activity in the Republic of Serbia was stabilized under the influence of a number of incentives.

In the period 2001 - 2009, the Republic of Serbia achieved an average GDP growth rate of 4%, due to the fact that for attaining competitiveness of Serbian economy it was necessary to achieve significantly higher GDP growth rates during this period. The achieved GDP growth in the period from 2001 to 2009 was mainly due to the service sector growth, while on the other hand there was a pronounced trend of de-industrialization and land reclamation (mainly manufacturing) in the economy of the Republic of Serbia, formed primarily as a result of inadequate investment structure, partially unsuccessful privatization and the already mentioned expansion of the service sector. Consequently, in the period 2001-2009, the average growth rate of the agricultural sector and the industry accounted for 2.1% and -0.1%, respectively. The construction sector in the same period recorded a growth rate of 6.3%. Summarily, the sector of tradable goods had a very low growth rate of only 0.6% in the transition period, which means that almost the entire growth of gross value added (GVA) of the economy was generated by the service sector GVA.

At the end of 2008 and throughout 2009, economy of the Republic of Serbia was affected by the global economic downturn, which resulted in the interruption of upward GDP trend achieved in the previous years. In 2009, a decline in GDP rate amounted to 3.5%. Sectors that were most affected by the economic depression were actually the ones that had previously recorded the lowest growth rates: industry (especially manufacturing) and construction sector. The rate of decline of these two sectors in 2009 amounted to 11.5% and 19.7%, respectively. In 2010, economy of the Republic of Serbia began recovering from the global economic crisis impact, thus in the Industrial Development Strategy and Policy of the Republic of Serbia in the period 2011-2020 a semi-annual GDP growth rate at the level of 1.8% was estimated. In 2010, there were no significant changes in the sectoral structure. The industry sector, which recorded the major decline in value added in 2008 and 2009 (in absolute terms), is a sector that in 2010 achieved the most significant recovery.

In the new situation created in the period from 2008 to 2011, there was a decline in final energy consumption in the industrial sector. Namely, according to data from the Energy Balance of

the Republic of Serbia for 2009, there was a significant drop in final energy consumption in the industrial sector (approx. 28%) compared to the consumption that in 2008 amounted to 2.832 Mtoe. In 2010 and 2011, growth of final energy consumption was achieved in the industrial sector, thus in 2011 it reached 2.708 Mtoe (about 96% of the consumption in 2008). Detailed overview is given in Table 16.

Table 16: Final energy consumption trend in the industry sector

	2008	2009	2010	2011
FIPO in the industry sector (Mtoe)	2.832	2.039	2.393	2.708
Trend with respect to 2008		0.72	0.845	0.96

The structure of energy consumption in the industrial sector in 2008 was as follows: solid fossil fuels 18.5%, oil and oil derivatives 17.3%, natural gas 21.8%, biomass (wood) 4.8%, heat 13.8% and electricity 23.7%. The program of the Energy Sector Development Strategy implementation identified the following technical measures and assessed their overall potential for energy savings in the industrial sector:

1) Use of waste heat: this measure could result in savings of more than 20% of the current industry needs for thermal energy in production. The main obstacle to this measure is a volatile business environment in almost all industries in the Republic of Serbia, and the lack of a reliable database that could contribute to the realization of the real potentials of this measure.

2) Improvement of the control and regulation: from the experience of countries that have applied this measure, the savings could be around 5-10% of energy consumption in the industry sector. Replacement of the existing electric motors: In the industrial sector, there are built-in electric motors of 4000 MW capacity. In case these would be replaced with motors of higher energy efficiency, class EF1 and EF2, the electricity consumption could be reduced by 188 GWh per year or 0.01617 Mtoe (0.6% of the energy consumption in the industry sector).

3) Energy integration of the production process: this measure is particularly important for the chemical industry and it is a potential that could improve the energy efficiency of heating systems by 5%, with a relatively short return on investment period (typically less than a year, but not exceeding three years).

Table 17: Summary of measures in the industry sector

No.	Name of measure in the Second EEAP	Name of measure in the First EEAP	Targeted direct consumption	Duration	Achieved savings in 2012 [Mtoe]	Expected savings in 2015 [Mtoe]	Expected savings in 2018 [Mtoe]
I1	Introduction of the Energy Management System for large energy consumers in the industrial sector	- Introduction of the Energy Management System for large industrial sector consumers	Industrial companies consuming energy above the limits set out by relevant regulations	2015-2018	/	0.0149	0.0819
I2	Programme of energy efficiency improvement in the industry sector	- Energy audits in the industry sector - Introduction of favourable credit lines for the implementation of EEI measures in the industry sector	Industrial companies	2010-2018	0.0722	0.0562	0.1650
I3	Incentive rates for the use of highly efficient coupled /	- Incentive rates for highly efficient coupled / combined heat and	Overall industrial sector	2010-2018	0.0034	0.00852	0.0172

	combined heat and power generation in the industry sector	power generation in industrial companies					
I4	Minimum energy efficiency requirements for new and revitalized facilities for electricity and heat production, and plants for combined heat and power generation	- New measure, in accordance with the Law on EUE. Specifically, the Law prescribes the obligation that all new and revitalized facilities meet minimum requirements in terms of energy efficiency for obtaining a building and / or energy permit.	Overall industrial sector	2014-2018	Not estimated	Not estimated	Not estimated
I5	Mandatory regular control of the combustion process of boilers and other combustion chambers with the capacity over 20 kW, as well as air conditioning systems with the capacity over 12 kW	- New measure set forth by the Law on Efficient Use of Energy. Specifically, it is envisaged that regular control of the combustion process of boilers and other combustion chambers with the capacity exceeding 20 kW is mandatory to determine the utility level, as well as air conditioning systems with the capacity exceeding 12 kW.	National	2015-2018	/	0.0014	0.0027
Total:					0.0756	0.0810	0.2668

### Specific measures in the industry sector

Name of measure		Introduction of the Energy Management System for large energy consumers in the industry sector
Baseline measure label		II
Description of measure	Category	Information and mandatory information measures
	Time frame	Start date: 2014 Permanent activity
	Target / brief description	Measure is implemented in accordance with the Law on EUE and it involves the achievement of energy savings through EEI measures, in accordance with the target savings set forth by the state bodies. 1) Collecting and analysing data on energy consumption, proposing measures and activities aimed at increasing EE, 2) Developing and delivering programmes and plans for efficient energy use to MEDEP, 3) Implementing proposed measures and activities, 4) Preparing and submitting periodic reports to MEDEP (on the energy consumption and the achieved savings), 5) Implementing mandatory periodic energy audits. The activity is carried out by energy manager who possesses the appropriate license in accordance with the Law on EUE.
	Target end-users (Target direct consumers)	Industrial companies consuming energy above the limits set out by relevant regulations
	Target group	Industrial companies
	Regional implementation	National
Information on implementation	List and description of activities for the implementation of measure	The Law on EUE stipulates the obligation of energy consumers which consume energy above the threshold to be determined by the Government through adequate regulation, to reduce energy consumption in accordance with the requirements defined in the same regulation, by implementing EMS. Designated organisations will be required to appoint an energy manager (EM), with the appropriate license, who will be responsible for monitoring and analysing energy consumption data, planning and implementing the EEI measures, as well as regular annual reporting on behalf of EMS to MEDEP. The designated organisation is required to conduct energy audits at least once every 5 years. The system aims at prescribing commitments of energy consumption reduction for EMS, whereas the EMS has the right to fulfil its obligations in the most convenient manner, as deems appropriate. EMS is entitled to achieve its targets through organisational and investment measures. Due to the fact that EMS establishment will take some time, the first savings are expected in 2015.
	Budget and funding sources	Funds for the implementation of investment measures are provide by an designated organisation from its own funds, from the favourable credits disbursed by IFIs and the Budget Fund for Energy Efficiency, and from loans extended by commercial banks or other

		sources. The implementation of measures may also include ESCO.
	Institutions in charge of the implementation of activities under the measure	Designated organisations MEDEP
	Institution in charge of monitoring	MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	Reports of designated organisation, reports on energy audits in accordance with the methodology which will be determined in accordance with the Law on EUE.
	Expected savings in 2012, according to the First EEAP	0.029 Mtoe
	Achieved savings in 2012	Energy savings were not achieved due to the fact that the Law on EUE was adopted in March 2013.
	Expected savings in 2018	0.0819 Mtoe
	Expected savings in the period 2013-2015	0.0149 Mtoe
	Assumptions	The savings were calculated under the assumption that EMS would encompass 55% of final energy consumption in the industrial sector (as of 2015), and that the prescribed mandatory savings for EMS in the period 2013-2015 would amount to 1% with respect to the consumption in 2011, i.e. 1.5% in the period 2016-2018.
	Overlaps, multiplication effects, synergy	All measures implemented by designated organisations, regardless of the funding sources, will be displayed through this measure.

Name of measure		Energy efficiency improvement programme in the industry sector
Baseline measure label		I2
Description of measure	Category	Information and mandatory information measures. Financial measures.
	Time frame	Start date: 2014 Completion date: 2018
	Target / brief description	Energy saving is achieved by applying the EE measures in accordance with the recommendations of energy audits: 1) Collecting and analysing data on energy consumption, proposing measures and activities aimed at increasing EE, through implemented energy audits, 2) Implementing proposed measures and activities.
	Target end-users (Target direct consumers)	Industrial companies
	Target group	Industrial companies that are not designated organisations
	Regional implementation	National
Information on implementation	List and description of activities for the implementation of measure	The Law on EUE prescribes the requirements for performing energy audits, while the methodology will be regulated by a relevant Rulebook. Budget Fund for Energy Efficiency will provide incentives to implement energy audits, aimed at raising awareness of opportunities to save energy and stimulating industry to invest in the energy efficiency improvement measures. The Fund will provide favourable credit lines or

		<p>other incentives for the implementation of the measures established by energy audits, funded from any source of funding, provided that the audits were conducted by authorised energy advisors in accordance with the Law on EUE and prescribed procedures.</p> <p>IFIs and/or commercial banks will provide affordable credit terms for the financing of EEI measures that are determined by energy audits conducted in accordance with the Law on EUE. Measures conducted in accordance with the audits performed may be financed from other sources of funding and through the implementation of ESCO principle.</p> <p>The Fund can provide funding for incentives related to the implementation of individual measures that do not require energy audits (e.g. replacement of electric motors, etc.)</p> <p>Key technical measures that could provide significant energy savings are as follows:</p> <ul style="list-style-type: none"> <li>- EE measures in industrial furnaces (optimization of the combustion process, use of waste heat, insulation improvement),</li> <li>- EE measures in the steam and condensate recovery system,</li> <li>- EE in electric facilities,</li> <li>- EE in the waste heat energy recovery,</li> <li>- EE in space heating,</li> <li>- introduction of the integrated management system of energy consumption.</li> </ul> <p>The implementation of the above-mentioned measures in industrial companies could reduce the final energy consumption in the industrial sector by 8% on average.</p> <p>IFIs will provide favourable loans for energy efficiency improvement, and within these their procedures for the energy savings assessment will be applied.</p> <p>The savings in the period 2010-2012 were largely generated by means of EBRD credit line.</p>
	Budget and funding sources	<p>The manner and amount of incentives provided by the Budget Fund for Energy Efficiency for each year are set forth by the Government, through the funding programme of the Fund.</p> <p>Regional EBRD credit line which monitors the implementation of the project EBRD-REPP.</p> <p>Credit lines of IFIs, commercial banks and other sources of funding, i.e. ESCO.</p> <p>Funding of industrial companies</p>
	Institutions in charge of the implementation of activities under the measure	MEDEP
	Institution in charge of monitoring	MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	Reports on energy audits in accordance with the methodology which will be determined in accordance with the Law on EUE.
	Expected savings in 2012, according to the First EEAP	0.01857 Mtoe
	Achieved savings in 2012	0.0722 Mtoe
	Expected savings in 2018	0.165 Mtoe

	Expected savings in the period 2013-2015	0.1268 Mtoe
	Assumptions	The assessment was made on the basis of the results achieved in the period 2010-2012, assuming that in the period 2013-2014 (before the EMS kick-off) on the annual level 1/3 of the savings would be achieved compared to the savings achieved in the period 2010-2012. As of 2015, it is expected that further savings will be at a level of 30% of the assumed annual savings of the industrial sector, provided that the latter would be at a level of 1% (in 2015), i.e. 1.5% (in the period 2016-2018).
	Overlaps, multiplication effects, synergy	Results of the overall investments in the industry sector up to the EMS establishment will be shown under this measure. Upon EMS establishment, only results of the industry that is not liable to EMS will be shown here.

Name of measure		Incentive rates for the use of highly efficient coupled / combined heat and power generation in the industrial facilities.
Baseline measure label		I3
Description of measure	Category	Financial instruments Provisions
	Time frame	2010-2018
	Target / brief description	Increasing energy efficiency in industrial facilities through the implementation of projects of combined heat and power generation.
	Target end-users	Energy facilities in the industrial sector
	Target group	Overall industrial sector
	Regional implementation	National, regional, local
Information on implementation	List and description of activities for the implementation of measure	Industrial companies that are engaged in efficient coupled / combined heat and power generation are entitled to acquiring the status of privileged electricity producer and exercising incentive purchase price for electricity delivered. Industry has a continuous need for thermal energy throughout the year (usually as steam for energy and technology processes). Thus, there is a great potential for the application of combined heat and power generation all industrial areas. Measure was also envisaged in the First EEAP.
	Budget and funding sources	2,000,000,000.00 RSD The Regulation on the amount of special fees for incentives in 2013 and the Regulation on the method of calculation and the method of distribution of funds collected from the fees to stimulate privileged power producers
	Institutions in charge of the implementation of activities under the measure	MEDEP
	Institution in charge of monitoring	MEDEP

Energy savings	Method of monitoring / measurement of achieved savings	Bottom-up 12
	Expected savings in 2012, according to the First EEAP	Not estimated
	Achieved savings in 2012	0.003408 Mtoe
	Expected savings in 2018	0.0172 Mtoe
	Expected savings in the period 2013-2015	0.00852 Mtoe
	Assumptions	Assessment is based on the results of the measure implementation in the First EEAP and the expected increase in the combined heat and power generation by 2018, projected in the existing strategic documents. An annual increase of 50% of the capacities for the combined heat and power generation is projected.
	Overlaps, multiplication effects, synergy	

Name of measure		Minimum energy efficiency requirements for new and revitalized facilities for electricity and heat production, and plants for combined heat and power generation
Baseline measure label		I4
Description of measure	Category	Provisions
	Time frame	Start date: 2014 Permanent
	Target / brief description	Increasing the energy efficiency of new and revitalized facilities for the production of heat and electricity or for combined heat and power generation will be achieved by applying the minimum requirements in terms of energy efficiency, which will be a condition for obtaining energy and/or building permit.
	Target end-users (Target direct consumers)	Energy facilities in industrial companies
	Target group	Overall industrial sector
	Regional implementation	National
Information on implementation	List and description of activities for the implementation of measure	The Law on EUE introduced a requirement that during the construction of new and reconstruction of existing facilities for the production of heat and electricity, and plants for combined heat and power generation, the minimum energy efficiency criteria need to be met which will be defined by a relevant by-law. The requirement for obtaining the energy and/or construction permit will comprise the elaboration of a study on the plant's energy efficiency, to demonstrate compliance with the minimum energy efficiency criteria. The implementation is expected as of 2014, upon the enactment of relevant by-laws.

	Budget and funding sources	Investors that are building new or reconstructing existing facilities for the production of heat and electricity and heat, and plants for combined heat and power generation, will provide funds for the planned investments from the available sources of funding.
	Institutions in charge of the implementation of activities under the measure	Investors, MEDEP
	Institution in charge of monitoring	MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	
	Expected savings in 2012, according to the First EEAP	Measure was not provided within the First EEAP
	Achieved savings in 2012	
	Expected savings in 2018	Not estimated
	Expected savings in the period 2013-2015	Not estimated
	Assumptions	
	Overlaps, multiplication effects, synergy	

Name of measure		Mandatory regular control of the combustion process of boilers and other combustion chambers with the capacity over 20 kW, as well as air conditioning systems with the capacity over 12 kW
Baseline measure label		I5
Description of measure	Category	Information and mandatory information measures. Provisions
	Time frame	Start date: 2015 Permanent activity
	Target / brief description	Energy saving is achieved by applying periodic control of boilers and other combustion plants, regulation of the combustion process, and control of heating and air conditioning systems
	Target end-users (Target direct consumers)	Boilers and other combustion chambers with the capacity over 20 kW, as well as air conditioning systems with the capacity over 12 kW
	Target group	Industrial companies, owners of boilers and other combustion plants, and air conditioning systems
	Regional implementation	National
Information on implementation	List and description of activities for the implementation of measure	<p>The Law on EUE stipulates the obligation of the owners of boilers and other combustion plants with installed capacity over 20 kW to periodically exercise control of the combustion process, with simultaneous control of the heating systems in accordance with the EPBD requirements.</p> <p>In accordance with the aforementioned Directive, the Law on EUE stipulates the obligation of the owners of air conditioning systems with installed cooling capacity over 12 kW to conduct regular periodic controls of these systems.</p> <p>In order to implement the measure, the Law on EUE prescribes that MEDEP will establish the procedure of authorisation of persons eligible to perform these activities. Terms and dynamics of performing controls will be defined in detail by relevant by-laws.</p> <p>Control of the implementation will be carried out by MEDEP inspection services.</p>
	Budget and funding sources	<p>Industrial facilities, owners of boilers and other combustion plants with the installed capacity over 20 kW, as well as air conditioning systems of the installed cooling capacity over 12 kW within the funds allocated for regular repairs and maintenance of these boilers.</p> <p>In the initial phase, it is possible to obtain incentives from the Budget Fund for Energy Efficiency.</p>
	Institutions in charge of the implementation of activities under the measure	<p>Industrial companies, owners of boilers and other combustion plants, and air conditioning systems.</p> <p>Authorised persons, pursuant to the Law on EUE.</p> <p>MEDEP.</p>

	Institution in charge of monitoring	MEDEP
Energy savings	Method of monitoring / measurement of achieved savings	Audit reports prepared by authorised persons
	Expected savings in 2012, according to the First EEAP	This is a new measure
	Achieved savings in 2012	Energy savings were not achieved since the measure will be implemented only as of 2015.
	Expected savings in 2018	0.00278 Mtoe
	Expected savings in the period 2013-2015	0.00135 Mtoe
	Assumptions	The savings are calculated based on the recommendations of the Implementation Programme of the Energy Development Strategy of the Republic of Serbia by 2015, for the period from 2007 to 2012. According to this programme, by applying this measure savings at the level of 5-10% of the total consumption can be achieved, assuming that in 2015 the first results will be achieved at the level of 5%, while in 2018 the savings will amount to 10%.
	Overlaps, multiplication effects, synergy	Results of this measure with designated organisations will be presented in the part relating to the designated organisations.

### 2.3.2.3. Measures in the transport sector

Transport sector is a significant consumer of energy in the Republic of Serbia. The share of transport in total final energy consumption in the Republic of Serbia is around 22% (in 2011), whereas in terms of oil and oil derivatives consumption the share of transport is as much as 74%, while the share in electricity consumption amounts to 1.9%, and in natural gas consumption it amounts to 1.2%. Approximately 68% of the final consumption of oil and oil derivatives in the transport sector is related to the consumption in road transport.

With respect to the base year, consumption in the transport sector fell by approx. 15% in 2011, and it was primarily caused by the economic downturn.

In the Republic of Serbia, as well as in other European countries, the most common type is road transport, both in passenger and in freight transport. In the structure of freight transport in 2012, road transport accounted for a share on the transport market of approx. 72% (23% rail, 5% water way). Development of rail transport has been neglected for many years, and there has been neither any visible progress of modernization of the railway infrastructure nor any renewal of traction and rolling stock.

The number of the first-time registered passenger vehicles in the Republic of Serbia in 2012, compared to the previous year, increased by 5.4%, and of truck vehicles by 22.9%, while a decrease of approximately 20% was recorded with regard to buses, commercial vehicles and trailers.

The share of freight and towing vehicles of Euro 5 category in the total number of freight and towing vehicles registered for international transport amounts to approx. 45% in 2013, and tends to increase compared to 2012 (33%) and 2011 (28%).

The key problem in terms of energy efficiency, environmental pollution and safety is the age of the vehicle fleet. At the end of 2005, the average age of the road fleet was 15.3 years, and 20% of vehicles (over 400,000) was older than 20 years. At the end of 2004, the age of the rolling stock was 31.1 years, while the age of the vessels was 37 years. More recent data can be expected after the establishment of the relevant database. Data will be collected on the basis of mandatory technical

inspection of motor vehicles and will enable the identification and monitoring of energy consumption indicators in road transport. In accordance with the Law on EUE, the database will be the responsibility of the Road Traffic Safety Agency.

The measures provided herein, related to transport, are primarily standard measures which are also applied in the region, but they need to be followed by further development of transport infrastructure and renewal of the fleet. The largest number of proposed measures for energy savings is focused on road transport, due to its dominant share of over 70% in energy consumption in the transport sector, with the expected further increase in consumption.

The main problem in the preparation and evaluation of the measures was the lack of data from the transport sector. In this regard, the Republic of Serbia must improve the existing system of data collection in all sectors of consumption, including the transport sector. For the transport sector, it is important to collect data relating to the number of vehicles, types of vehicles, age of the vehicle, the mileage, fuel consumption, number of passengers, the amount of goods transported, etc.

The collected data will allow more accurate calculation of the EE indicators. The future EE indicators should include the following: traffic intensity (total and by transport types), the index of energy efficiency, unit consumption (by type and fuel), specific CO<sub>2</sub> emissions by type of transport (passenger cars - the average of the fleet and of new cars - trucks, buses, air, rail and river transport), etc.

Top-down approach will be based on the calculation model using relevant EE indicators. Top-down monitoring is not envisaged in the first three years. Bottom-up monitoring is envisaged for the measure T3.

Table 18: Summary of measures in the transport sector

No.	Name of measure in the Second EEAP	Name of measure in the First EEAP	Targeted direct consumption	Duration	Achieved savings in 2012 [Mtoe]	Expected savings in 2015 [Mtoe]	Expected savings in 2018 [Mtoe]
T1	Introduction of the EU Regulation EC 443/2009 for energy efficiency in the transport sector	- Introduction of the EU acquis on energy efficiency in the transport sector	Road transport	2010–2018	0.00056	0.0225	0.058
T2	Promotion of eco-driving and car sharing scheme	Promotion of eco-driving and low-cost energy efficiency measures in the transport sector	Road transport	2013–2018		0.0099	0.0198
T3	Introduction of incentive mechanisms for replacement of the existing vehicles	Introduction of incentive mechanisms for the replacement of existing fleet	Road transport	2010–2018	0.00765	0.0132	0.0340
T4	Modernization of the fleet in order to meet technical requirements for the performance of domestic and international transportation	Newly introduced measure upon audit's proposal	Road transport	2013–2018		0.0198	0.0396
T5	Determination of energy efficiency as a criterion for fleet modernization and the assignment of public transport service performance	Newly introduced measure upon audit's proposal	Road transport	2013–2018		0.0296	0.0593
Total					0.00821	0.0949	0.2107

### Individual measures in transport sector

Name of measure		Introduction of the EU Regulation EC 443/2009 for energy efficiency in the transport sector
Baseline measure label		T1
Description of measure	Category	Provisions: standards and norms
	Time frame	2010-2018
	Target / brief description	Further implementation of the Law on Ratification of the Agreement on the adoption of unified technical regulations for wheeled vehicles, equipment and parts which can be fitted and/or used on vehicles with wheels and conditions for reciprocal recognition of approvals awarded in line with these regulations (“Official Gazette of the RS - International agreements”, No. 11/11);
	Target end-users	Road transport
	Target group	Importers and car dealers
Regional implementation		National
Information on implementation	List and description of activities for the implementation of measure	<p>The Republic of Serbia determined the procedure of approval of motor vehicles in accordance with the Law on Ratification of the Agreement on the adoption of unified technical regulations for wheeled vehicles, equipment and parts which can be fitted and/or used on vehicles with wheels and conditions for reciprocal recognition of approvals awarded in line with these regulations and ESE regulations as an integral part of the Agreement. Pursuant to the Law on Road Transport Safety (“Official Gazette of the RS”, No. 41/09, 53/10, 101/11 and 32/13-contracting party) RTSA is in charge of the implementation of the Agreement. Approval of vehicles according to UN / ECE regulations include determination and verification that the vehicle characteristics meet the requirements relating to the active safety, passive safety, environmental protection and energy saving (fuel consumption), the control of the conformity of series production, a unique method of application and acceptance by all contracting parties.</p> <p>The Stabilisation and Association Agreement of the Republic of Serbia stipulates the obligation of acceptance and implementation of EU legislation in the field of approval of road vehicles. Having in mind the high level of harmonisation between UNECE regulations and EU regulations (the same technical requirements and procedures for testing), the Republic of Serbia performs controls of the conformity of imported vehicles, except on the basis of UNECE regulations and also based on the relevant EU regulations.</p> <p>Implementation of the UNECE regulations and of corresponding EU legislation is of huge importance for the modernization of the fleet in the Republic of Serbia and the reduction of fuel consumption in the transport sector. Currently all new vehicles must be equipped with engines that meet at least Euro 5 standard.</p>
	Budget and funding sources	From the funding of the Road Traffic Safety Agency, and the Budget of the Republic of

		Serbia, share of the Ministry of Transport
	Institutions in charge of the implementation of activities under the measure	RTSA, MEDEP, and the Ministry of Interior
	Institution in charge of monitoring	RTSA Customs Administration Ministry of Transport
Energy savings	Method of monitoring / measurement of achieved savings	
	Expected savings in 2012, according to the First EEAP	0.013 Mtoe
	Achieved savings in 2012	0.00056 Mtoe
	Expected savings in 2018	0.058 Mtoe
	Expected savings in the period 2013-2015	0.0225 Mtoe
	Expected impact on savings in 2020	
	Assumptions	The savings have not been changed in this measure in respect of the First EEAP
	Overlaps, multiplication effects, synergy	/

Name of measure		Promotion of eco-driving and car sharing scheme
Baseline measure label		T2
Description of measure	Category	Information and mandatory information measures (Targeted public information campaigns; Training and Education)
	Time frame	2013-2018
	Target / brief description	Changing driving habits and vehicle maintenance, and the use of alternative modes of transportation.
	Target end-users	Road transport
	Target group	Drivers of passenger vehicles, bus drivers and commercial vehicles drivers; driving instructors, intermediary organisations (fleet managers, driving schools, sectoral organisations, etc.); general public
	Regional implementation	National
Information on implementation	List and description of activities for the implementation of measure	Eco-driving is one of the most effective measures, not only in terms of reducing fuel consumption, exhaust emissions and the number of traffic accidents, but also in terms of raising awareness of the socially responsible behaviour of all citizens and drivers with regard to the benefits of this modern, intelligent and environmentally friendly driving style and the manner of vehicle maintenance. Car sharing scheme is a measure of organisational character which is aimed, primarily by increasing the efficiency of vehicles in urban areas, at reducing bottlenecks in cities and increasing the efficiency of vehicles. The measure is implemented through the implementation of trainings and awareness-raising campaigns aimed at: Promoting techniques of eco-friendly (or saving) driving; Promoting manners of vehicle maintenance (e.g. the use of tires with low rolling resistance tires, check of tire pressure, etc.); Promoting car-sharing scheme.
	Budget and funding sources	Road Traffic Safety Agency funds, donations
	Institutions in charge of the implementation of activities under the measure	RTSA Local self-governments
	Institution in charge of monitoring	RTSA Ministry of Transport Ministry of Interior Local self-governments
Energy savings	Method of monitoring / measurement of achieved savings	
	Expected savings in 2012, according to the First EEAP	0.008 Mtoe

	Achieved savings in 2012	
	Expected savings in 2018	0.0198 Mtoe
	Expected savings in the period 2013-2015	0.0099 Mtoe
	Expected impact on savings in 2020	
	Assumptions	The potential of this measure has been reduced with respect to the First EEAP, whereas cost savings values have been obtained based on the consideration that it is possible to achieve 1.5% savings in 9 years of the measure implementation, compared to the final energy consumption in the transport sector in 2008.
	Overlaps, multiplication effects, synergy	/

Name of measure		Introduction of incentive mechanisms for replacement of the existing vehicles
Baseline measure label		T3
Description of measure	Category	Financial instruments Subsidies (grants) - Loans
	Time frame	2010–2018
	Target / brief description	Reducing CO <sub>2</sub> emissions and energy consumption through procurement of vehicles that meet the latest regulations and standards.
	Target end-users	Road transport
	Target group	Users and/or purchasers of vehicles (both legal and natural persons), importers and dealers of vehicles
	Regional implementation	National
Information on implementation	List and description of activities for the implementation of measure	<p>Promoting vehicles with high environmental quality through: annual check-up and subsidizing vehicles with lower emissions of carbon dioxide; mechanisms of incentives for switching to fuels with lower carbon content (LPG, CNG); switching to biofuels and promoting this type of vehicles/fuel.</p> <p>In 2010, 2011, and 2012 the Government passed regulations on the conditions and manner of subsidized acquisition of vehicles manufactured in the Republic of Serbia in accordance with the old-for-new policy. The purpose of this measure was to encourage the replacement of old vehicles equipped with engines that do not meet even Euro 3 standard, with new domestic vehicles equipped with Euro 5 engines. The subsidy per vehicle varied in the range from 600 to 1,000 Euro.</p> <p>In 2011, the Fund for Environmental Protection subsidized the purchase of vehicles with low emissions of CO<sub>2</sub>. In 2012, the Fund for Environmental Protection adopted a Decision on the awarding of grants to automotive companies aimed at encouraging the purchase of environmentally friendly vehicles, i.e. vehicles with CO<sub>2</sub> emissions below 100 g/km. The total value of funds available for this purpose amounted to 20,000,000 dinars, or 100,000 RSD per vehicle.</p>
	Budget and funding sources	Budget of the Republic of Serbia
	Institutions in charge of the implementation of activities under the measure	Ministry in charge of Economy
	Institution in charge of monitoring	Ministry in charge of Economy Customs Administration
Energy savings	Method of monitoring / measurement of achieved savings	Bottom-up 13 / Energy audits
	Expected savings in 2012, according to the First EEAP	0.0115 Mtoe
	Achieved savings in 2012	0.00765 Mtoe
	Expected savings in 2018	0.0340 Mtoe
	Expected savings in the period 2013-2015	0.0132 Mtoe
	Expected impact on savings	

	in 2020	
	Assumptions	For further implementation of the measure, the Government and the Ministry in charge of Economy need to continue with this type of subsidization. Savings values have been obtained based on the consideration that it is possible to achieve 2% savings in 9 years of the measure implementation, compared to the final energy consumption in the transport sector in 2008.
	Overlaps, multiplication effects, synergy	/

Name of measure		Modernization of the fleet in order to meet technical requirements for the performance of domestic and international transportation
Baseline measure label		T4
Description of measure	Category	Regulations
	Time frame	2013-2018
	Target / brief description	Purchase of new vehicles that meet the latest exhaust emissions standards, or that have low fuel consumption and low CO <sub>2</sub> emissions: new buses; new commercial vehicles.
	Target end-users	Road transport
	Target group	Companies engaged in international road passenger and freight transport.
	Regional implementation	National
Information on implementation	List and description of activities for the implementation of measure	<p>One of the criteria for performing international road transport that Serbian operators have to meet is the quality of the fleet. Requirements that commercial vehicles in international transport have to meet (in accordance with EU regulations) apply, besides security, to the requirements on exhaust emissions and particulate emissions from vehicles (such vehicles have lower fuel consumption and lower CO<sub>2</sub> emission).</p> <p>The international road transport, i.e. the access to the international transport market of the EU is carried out mostly in the permits regime (single-bilateral or multilateral) and it has been increasingly conditioned by the use of vehicles that meet the regulations on emissions and safety of vehicles (Euro 3, Euro 4, Euro 5 vehicles, etc.).</p> <p>It is expected that upon the adoption of a new Law on the Carriage of Goods by Road and the Law on the Carriage of Passengers by Road, this measure will also be applied to domestic transport of passengers and goods.</p>
	Budget and funding sources	Individual funding provided by companies engaged in transportation.
	Institutions in charge of the implementation of activities under the measure	Ministry of Transport, Ministry of Interior
	Institution in charge of monitoring	Ministry of Transport
Energy savings	Method of monitoring / measurement of achieved savings	
	Expected savings in 2012, according to the First EEAP	New measure
	Achieved savings in 2012	New measure

	Expected savings in 2018	0.0396 Mtoe
	Expected savings in the period 2013-2015	0.0198 Mtoe
	Expected impact on savings in 2020	
	Assumptions	Savings values have been obtained based on the consideration that it is possible to achieve 2% savings in 6 years of the measure implementation, compared to the final energy consumption in the transport sector in 2008.
	Overlaps, multiplication effects, synergy	/

Name of measure		Determination of energy efficiency as a criterion for fleet modernization and the assignment of public transport service performance
Baseline measure label		T5
Description of measure	Category	Voluntary agreements and cooperation instruments (procurement, energy-efficient public procurement technology, commercial and institutional voluntary agreement)
	Time frame	2013-2018
	Target / brief description	Reducing CO <sub>2</sub> emissions and energy savings. - Through the introduction of environmental protection and energy efficiency criteria, by setting requirements for private companies which are entrusted with the performance of utilities of public transport to use vehicles that meet the latest regulations on exhaust emissions and have low power consumption/CO <sub>2</sub> emissions (taxis, buses, vans, etc.). - Through purchasing of new vehicles that meet the latest exhaust emissions standards, or that have low fuel (energy) consumption and low CO <sub>2</sub> emissions.
	Target end-users	Road transport
	Target group	government bodies, the autonomous province and local self-government
	Regional implementation	National
Information on implementation	List and description of activities for the implementation of measure	Some of the cities and municipalities entrust the performance of utilities of public transport to private companies. Usually, it refers to services of taxi transportation, but in large cities such services also include transportation in buses and vans. Some cities, such as Belgrade, for example, adopted decisions on the quality of such services, including requirements on the quality of exhaust emissions of vehicles. As a result, the public transportation includes vehicles that meet stringent requirements in terms of exhaust emissions. Such vehicles are also energy

		efficient. In recent years, significant efforts have been made in major cities to modernize the fleet of public transport. A number of new city buses was purchased. In addition, a huge modernization of electric vehicle fleet has started in Belgrade, by purchasing new trolley buses and trams.
	Budget and funding sources	Local self-governments funding
	Institutions in charge of the implementation of activities under the measure	Public sector
	Institution in charge of monitoring	Local self-government PPO
Energy savings	Method of monitoring / measurement of achieved savings	
	Expected savings in 2012, according to the First EEAP	New measure
	Achieved savings in 2012	New measure
	Expected savings in 2018	0.0593 Mtoe
	Expected savings in the period 2013-2015	0.0296 Mtoe
	Expected impact on savings in 2020	
	Assumptions	Savings values have been obtained based on the consideration that it is possible to achieve 3% savings in 6 years of the measure implementation, compared to the final energy consumption in the transport sector in 2008.
	Overlaps, multiplication effects, synergy	/

### **3. HORIZONTAL MEASURES AND INSTITUTIONAL AND FINANCIAL FRAMEWORKS FOR THE IMPLEMENTATION OF EEI MEASURES**

In this section, mechanisms and tools set up to facilitate the monitoring and verification of savings are listed as horizontal measures, and these are applied in most cases to all vertical sectors.

#### **3.1. Financial framework for the implementation of EEI measures**

Pursuant to the Law on EUE, the funds for financing activities aimed at improvement of efficient energy use shall be provided from the Budget of the Republic of Serbia, budgets of the autonomous province and local self-government; funds of the European Union and other international funds; donations, gifts, contributions, assistance; loans from international financial institutions; other sources in accordance with the law.

The same law also stipulates the establishment of the Budget Fund for Energy Efficiency, and stipulates that the autonomous province or local self-government units are entitled to determine by their legal acts special financial and other incentives, the establishment of budgetary funds and the use of funds from existing treasury funds, for the implementation of projects and other activities aimed at effective energy use in their territory.

The Budget Fund for Energy Efficiency shall encourage: improvement of energy efficiency in private, public, commercial, and other facilities through the use of technical measures for efficient use of energy; development of energy management system for entities that are not designated organisations; promotion and implementation of energy audits of facilities, production processes and services; construction of a system for combined heat and power generation for investors that use thermal and electrical energy exclusively for their own use; development of energy services market on the market of the Republic of Serbia; use of renewable energy sources for electricity and heat generation for individual use; other activities aimed at the improvement of efficient energy use.

The use of funds from the Budget Fund for Energy Efficiency shall be carried out in accordance with the annual programme funding adopted by the Government, while the amount of funds allocated to the Fund shall be set out within the Budget of the Republic of Serbia for each year in accordance with the current state. Funds from the Energy Efficiency Budget Fund will be made available to natural and legal persons established in the territory of the Republic of Serbia who are eligible for grants on the basis of open competition. Minister in charge of Energy shall prescribe the requirements for the allocation and use of funds from Energy Efficiency Budget Fund, the method of allocation of these funds, as well as the method of monitoring the appropriate use of funds and contractual rights and obligations.

The Law on EUE shall also introduce the concept of energy services and ESCO concept that allows the implementation of EEI measures by third parties, which may in particular contribute to the implementation of the EEI measures in the public sector, since this mechanism does not create any additional burden on the budget due to the fact that the third parties investing in the public sector are paid from savings made in energy costs, and energy sources.

In the Republic of Serbia and the region, there is a large number of favourable credit lines placed by IFIs and various funds and donors, either through direct funding or through commercial banks, which are aimed at improving energy efficiency, and the Republic of Serbia is seriously counting on these funds in order to implement the Second EEAP, primarily in the private sector. In Annex 3 - the Summary of funds available for the funding of energy efficiency measures, which is attached to this Action Plan and forms its integral part, presents data on the funds available for EEI measures on the territory of the Republic of Serbia.

In accordance with the above mentioned, for each of the measures the expected sources of funding are envisaged, whereas in the Budget of the Republic of Serbia in 2013 no special funds are provided for this purpose, with the exception of funds that were allocated by the authorised

institutions within their budgets for the promotion of regulatory framework, i.e. for their operations, as well as investments that were already planned at the local level.

For the implementation of measures prescribed in the Second EEAP, it is not necessary to provide additional funding in the Budget of the Republic of Serbia, i.e. in the local self-government budget in 2013. In 2014 and 2015, funding for these purposes shall be projected in the budget allocation procedure, i.e. in the procedure of budget preparation and adoption in 2014, and 2015, acting in accordance with the balance potential of the Budget of the Republic of Serbia, or the budget of the local self-government.

### **3.2. Tools required for the EEAP implementation and monitoring of its implementation**

#### **3.2.1. MVP - platform for monitoring energy savings achieved through the implementation of the Action Plan**

Regional project "Establishment of an integrated platform for monitoring and verification of savings achieved through the implementation of action plans (MVP)", implemented and funded by GIZ ORF-EE shall provide for the establishment of an integrated information system for collection and verification of data on actual savings achieved through the Action Plan. The system shall be based on the above-mentioned MVP methodology, i.e. the by-law that shall enable the formalisation of the methodology and collection and exchange of data with the DMS system and other MEDEP databases, as needed. Commitment of the parties to submit data on energy savings shall be prescribed by relevant by-law in accordance with the Law on EUE. Logistics, which should provide for the monitoring system information, inter alia, shall partly be conducted through the "Project for Settlement and Enhancement of Energy Management System in Energy Consumption Sector in the Republic of Serbia", carried out by MEDEP in cooperation with Japanese agency JICA. This project shall set up the Energy Management System with the designated organisations, where the appointed energy managers shall have reporting obligations towards MEDEP.

#### **3.2.2. Creation of a database on energy consumption and the savings achieved for the designated organisations and a database on the conducted energy audits**

In the framework of implementation of the second phase of assistance of JICA for the introduction of energy management in the Republic of Serbia, in accordance with the Law on EUE, adoption of all relevant by-laws is expected, which will create the preconditions for the functioning of the designated organisations. As part of this project, a database should be established for tracking designated organisations reports and monitoring of the savings achieved by this system. In addition, in the framework of the project "Assistance in implementing the requirements of the Treaty establishing the Energy Community in connection with the EU acquis on energy efficiency" (donation of the Kingdom of Norway) should develop a complementary database of energy audits. In the framework of cooperation with UNDP, it has been agreed that UNDP will donate to the Ministry of Energy, Development and Environmental Protection a database for energy and water consumption management in public buildings, which will enable regular monitoring of energy consumption.

#### **3.2.3. DMS - a platform for monitoring the status in the building sector**

GIZ project "Energy efficiency in the building sector" will partly provide for the establishment of mechanisms for the building sector status monitoring. DMS implementation is planned by the end of 2013, as a platform for the collection of relevant data on buildings, issuance of permits for buildings, surveys and energy performance of buildings. The Ministry of Construction and Urban Planning and MEDEP are the key drivers of the Project, which shall define data to be collected, within the scope of their competencies and according to the needs. A part of the data that will be collected in this way is related to the energy savings achieved through normative measures. In the framework of DMS, data collection under the Bottom-up methodology shall be

conducted, for each study carried out for a new building or an existing reconstructed building. In addition, statistical data analysis shall be provided, to serve as a basis for the planning of funding and implementation of new projects. In the next DMS project phase, next year, DMS should be expanded with information gathered on the basis of the Energy Management System implementation and energy audits, which will be collected through special databases to allow monitoring of EEI measures in all sectors covered by this system. Thus conceived DMS should be able to link horizontally and vertically different entities: government institutions, local self-government, energy managers and advisors, authorised organisations that meet the requirements for the energy permits issuance, engineers responsible for the energy efficiency of buildings and other entities relevant for the implementation of EE policy in the building sector.

**3.3. Horizontal measures**

Table 19: Overview of horizontal measures

No.	Description of measure	Category	Sectors
H1	Billing based on actual (measured) consumption of thermal energy to the consumers connected to district heating system	Financial instruments	All sectors
H2	Promotion of ESCO model for EE projects financing		All sectors
H3	Obligation to comply with eco-design requirements for products that affect energy consumption		Industrial, public and commercial companies
H4	Raising awareness about the energy efficiency importance		All sectors

**H1 - Billing based on actual (measured) consumption of thermal energy for the consumers connected to district heating system**

The Law on EUE shall provide for the adoption of a tariff system which shall comprise as one of its elements the actual consumed and measured thermal energy. The Energy Law stipulates that the thermal energy market shall be under the jurisdiction of local self-governments. It is therefore necessary to adopt municipal decision-making in each individual municipality or city that has a district heating system, related to the introduction of a new tariff system for the collection of district heating services fees.

A precondition for the introduction of payment by actual consumption is the installation of individual consumption meters wherever technically feasible, or the installation of meters at substations and heat cost allocators in individual homes and in individual radiators. In addition to the individual meter installation, it is necessary to provide the technical requirements for controlling the amount of heat supplied.

**H2 - Promotion of ESCO model for EE projects financing**

The Law on EUE shall govern the field of providing energy services and energy performance contracting. This measure shall be achieved through the implementation of energy performance contracting projects. The meaning of the provision of energy services, which would be performed by a legal entity and entrepreneur (ESCO), is to solve and regulate by relevant contracts, in the best way possible for both the employer and the executor of energy services, issues concerning the application of technology or some other energy services that will lead to evident and measurable improvement in energy efficiency, provision of funds for the energy services supply and payment of funds for the provided energy services.

In cooperation with the EC Secretariat, EBRD prepared a project proposal "Regional Energy Efficiency Programme in the Western Balkans - ESCO and policy dialogue" (EBRD REEP), approved for funding by the WBIF, which aims to create the conditions for the implementation of ESCO mechanism. The implementation involves parties to the Energy Community Treaty, including the Republic of Serbia. For the financing of technical assistance activities related to the preparation of the legal framework, identification, preparation of project documentation and monitoring of the project, grants of WBIF, EWBIF and other donors have been provided, and for all participants in the project these funds totalled 26.5 million euros, of which 12 million euros are allocated for the public sector. A part of these funds is intended as an incentive for companies / institutions that will implement projects through this programme, namely 15% of the loan amount for the public sector, and 10% for the private sector, while a part of the funds shall be allocated for covering bank risks of those banks that would be involved in the project. In addition, EBRD has provided a credit line in the amount of 160 million euros, of which 80 million euros is intended for the public sector, while for the implementation through the ESCO mechanism funds up to 50 million euros are allocated (long-term). In order to improve working conditions for ESCOs and eliminate any possible barriers, MEDEP shall establish an inter-ministerial working group to monitor the activities of consultants engaged on the project.

### H3 - Obligation to comply with eco-design requirements for products that affect energy consumption

The Law on EUE envisages that the products affecting energy consumption can be placed on the market only if they comply with the requirements of eco-design, which shall be defined by specific technical regulations. This provision of the Law on EUE transfers the requests of the Directive 2009/125/ES on establishing a framework for defining requirements for eco-design of products that affect energy consumption.

### H4 - Raising awareness about the energy efficiency importance and education

Raising awareness about energy efficiency is an essential prerequisite for reducing the consumption of all forms of energy. It is necessary to develop awareness of the importance of energy, and the need to implement energy efficiency measures and effects that are achieved in this manner. Raising awareness of energy efficiency is realized through various information campaigns, training at various levels (including the introduction of relevant subjects in the system of compulsory education, especially in specialized schools), organisation of seminars, workshops and lectures. It is essential to cover all target groups, particularly holders of responsible positions who are in charge of energy consumption at all levels, as well as various social groups.

The City of Belgrade, in its Development Strategy of the City of Belgrade, has recognized the need to develop awareness of energy efficiency, especially in youth and children, and accordingly it has developed projects for education and promotion of energy efficiency in kindergartens and schools. In the course of 2013, an educational and information campaign "My eco-kindergarten - eco education from an early age" is planned. Similar projects have been implemented in other municipalities in Serbia.

In the period from 2002 to 2012, promotional activities were conducted by the Energy Efficiency Agency, and in the next period these activities shall be conducted by MEDEP who took over the competencies of the Agency. For the implementation of these activities, donors' support is expected.

### H5 - Mandatory dissemination of information to energy consumers on the monthly consumption of electricity and heat, or natural gas

In accordance with the Law on EUE, public companies and other companies engaged in the distribution and supply of electricity and heat are obliged to inform the customer, once a month, on the energy bill or along with it, inter alia, on the amount of energy consumed by the customer during the previous month, the average price of energy for the customer in that month, as well as the ways of providing information to the customers about available energy efficiency improvement measures that may be taken, and other data relevant for the rational use of energy. Information dissemination to the heat customers is applied only during the heating season. The same obligations apply to the delivery and supply of natural gas.

### 3.4. Public sector

#### 3.4.1. Activities of the public sector as an example of good practice

In accordance with the requirements stipulated in the directives DEEC and EPBD, the Law on EUE envisages a number of public sector activities aimed at energy efficiency improvement.

In addition to large energy consumers in the manufacturing and services sector, the public sector is also obliged to introduce the Energy Management System in order to establish energy consumption monitoring, planning and implementing of measures aimed at reducing energy consumption and improving energy efficiency. Designated organisations are public administration bodies and other governmental bodies of the Republic of Serbia, bodies of the autonomous province and local self-governments with over 20,000 inhabitants, and other public services using facilities in the public ownership.

The Law on EUE also stipulates that the designated organisations shall conduct periodical energy audits to control the status in terms of energy efficiency and the identification of cost-effective energy efficiency measures. This obligation shall apply to buildings with a total surface area exceeding 500m<sup>2</sup> used by the public sector, where energy audits are conducted at least once every ten years.

In order to encourage and promote activities related to energy efficiency improvement, the Law on EUE stipulates the establishment of the Budget Fund for Energy Efficiency. The funds of the Budget Fund for Energy Efficiency are awarded to beneficiaries (natural and legal entities) through public tender, while the requirement for the application, except in special cases, shall comprise a report on the conducted energy audit.

Pursuant to Article 63 Of the Law on EUE, the competent authority of the autonomous province or local self-government unit is entitled to determine by its legal acts special financial and other incentives, the establishment of budgetary funds and the use of funds from existing treasury funds, for the implementation of projects and other activities aimed at efficient energy use on its territory.

The Law on Public Procurement stipulates the possibility of the procurement of energy audit services and energy services, while the Law on EUE has introduced the concept of energy services and ESCOs and stipulated the main elements of the Energy Services Agreement, while the Minister in charge of Energy shall prescribe the form and structure of the model contract for specific types of energy services when such services are financed from the Budget Fund for Energy Efficiency or when users are in the public sector.

According to Article 68 Of the Law on EUE, it is envisaged that all the organs and institutions of the public sector, including public companies, are required to take measures aimed at improving energy efficiency in the facilities they utilise, and in the performance of their activities, by conducting primarily economically justified measures that generate the maximum energy savings in the shortest period of time. These authorities shall also implement measures aimed at introducing employees with measures of efficient energy use and ways of their implementation, as well as the establishment and implementation of energy efficiency criteria in the procurement of goods and services.

Article 69 Of the Law on EUE stipulates that the contracting authority in the public procurement of goods, services and works, shall take into account energy efficiency aspects through technical specification of goods, services and works and / or through the criteria for selection of the most successful bidder of goods, services and works, and during the preparation of tender documents. The Minister in charge of Energy prescribes the minimum criteria in terms of energy efficiency in the public procurement of goods, services and works.

Article 70 Of the Law on EUE stipulates that in the process of purchase or lease of the property or parts of the facility for the needs of state authorities, public sector organisations including public companies, the customer has to take into account the energy efficiency of the facility or part of the facility as one of the criteria for making the relevant decision.

In addition to the above mentioned, the Law on EUE stipulates that local self-governments with more than 20,000 inhabitants shall develop a Programme aimed at improving energy efficiency in transportation for a period of three years.

EPBD requirements on the energy performance of buildings are applied through regulations that follow the Law on Planning and Construction, and the Rulebook on energy efficiency in buildings, and the Rulebook on the conditions, content and manner of issuance of certificates of energy performance of buildings.

The public sector, from its own funds and donations, funds of the Environmental Protection Fund and loans under favourable conditions, implemented in the previous period a number of projects which aimed at improving the working and living conditions while reducing energy consumption. Previous results were achieved through the implementation of energy recovery of facilities used in this sector, especially in schools and hospitals. These projects are very important from the point of view of raising awareness about the improvement of energy efficiency, and are a good example to demonstrate the EEI measures effects.

#### 3.4.2. Specific measures in the public procurement procedure

According to the list of adequate measures for the implementation of energy efficiency in public procurement, provided in DEEC, Annex VI, the Law on EUE defines energy efficiency as one of the criteria in the process of the best bid selection. Namely, the contracting authority in the public procurement procedure is required, in the process of tender documentation preparation, to take into account the energy efficiency of goods, services and works to be procured. The Law on EUE also stipulates that the Minister in charge of Energy shall define through a relevant by-law the minimum energy efficiency criteria in the public procurement procedure. In the period of implementation of the early measures (2002-2009), local self-governments conducted the procurement of energy-efficient vehicles in public transport. Modernization of the vehicle fleet of public carriers was carried out in Belgrade, Niš and Novi Sad. New vehicles were procured that meet the latest exhaust emissions standards, or that have low fuel (energy) consumption and low CO<sub>2</sub> emissions. One of the measures adequate for the energy efficiency application, which was also implemented through the First EEAP, is the Agreement with municipalities for the modernization of public lighting system. The measure provided for the replacement of the existing street lights in the public lighting system with modern lamps with energy-efficient light sources and improved optical characteristics that provide greater efficiency of the lamps, as well as the introduction of the street lighting regulation system. The measure was implemented in several municipalities and the savings of 0.003508 Mtoe were achieved.

Improvement of the situation in this field is also expected through the execution and implementation of two other projects. In the project "EFFECT", which is implemented in the framework of the South East Europe Transnational Cooperation Programme, MEDEP participates as an associate partner with 10% share, and the project is focused on the improvement of energy efficiency criteria in public procurement in the SEE region. Through cooperation with a number of partners from the region, the necessary experience is gained for the establishment and implementation of EE criteria in the public procurement procedure. In the framework of the project "Raising awareness of energy efficiency of decision makers at the local level in Serbia" that was implemented by SCTM with technical support from UNDP, a "Guide for local self-government on the inclusion of energy efficiency criteria in public procurement" was implemented.

### **3.5. Availability of advice and information**

Pursuant to Article 53, Of the Law on EUE, public companies and other companies engaged in the distribution and supply of electricity and heat are obliged to inform the customer, once a month, on the energy bill or along with it, inter alia, on the following: the amount of energy consumed by the customer during the previous month, the average price of energy for the customer in that month, the prices by elements of calculation of the energy consumed, the total energy consumed and monthly energy consumption during the previous 12 months, ratio of the energy consumed in the previous month and the same month of the previous year, ratio of the amount of energy consumed and the average amount of energy consumed by customers of the same category, the ways of providing information to the customers about available energy efficiency improvement measures that may be taken, the list of measures that may be taken by customers to save energy, as well as other data relevant for the rational use of energy. The same applies to public companies and other companies that perform delivery and supply of natural gas.

In order to inform the public about the relevant legislation and activities in terms of energy efficiency improvements, texts of the Law on EUE, the First EEAP and the Report on the implementation of this plan in the period 2010-2011 are posted on the MEDEP website, [www.merz.gov.rs](http://www.merz.gov.rs) It is envisaged that all by-laws, and the following action plan, as soon as they are adopted, will also be posted on the above mentioned web site, as well as all relevant documents, reports, tools, overview of authorised energy advisors, etc. In addition, public calls of the Budget Fund for Energy Efficiency will also be placed on this website.

In the previous period, MEDEP took part in several meetings which were aimed at the energy efficiency promotion and the presentation of the Law on EUE, in cooperation with the IFI Coordination Office. On 27 May 2013, in Belgrade, a workshop entitled “Financing mechanisms for measures aimed at improving energy efficiency in the Second Energy Efficiency Action Plan” was held, which was attended by representatives of relevant government bodies and other public institutions, local authorities and commercial banks.

Having in mind that in the period from 2013 to 2014, development of the necessary regulatory framework and organisational activities will be the focus, more promotional activities and measures can be expected at the end of 2014 and during 2015.

### **3.6. Liabilities of companies in the sector of generation, transmission and distribution of energy to promote energy efficiency in the energy consumption sector**

The Law on EUE stipulates the obligation of companies from the sector of transport, distribution and transmission of energy not to encourage unnecessary increase of amounts of distributed, or transmitted energy. In particular, pursuant to the Law on EUE, the competent authority in charge of pricing for transmission, distribution and transportation of energy shall take the necessary measures to prevent undue encouragement of increasing the amounts of distributed, or transmitted energy.

Companies engaged in the heat distribution, pursuant to the Law on EUE, are obliged, if it is economically viable and technically feasible, to provide their bid at economically acceptable price of the control equipment for energy consumed in a building or part of a building that is already connected to the district heating system. During the preparation of the technical documentation for design, installation and reconstruction of heat and gas pipelines, one of the important requirements is to provide for the installation of a device for regulating heat delivery for the building and for the regulation of controlled delivery of heat at each heating body.

### **3.7. Energy services market**

The Law on Public Procurement stipulates the possibility of procurement of energy audits services and energy services, while the Law on EUE introduces the concept of energy services and ESCOs, and stipulates the main elements of the Energy Services Agreement. The Minister in charge of Energy shall prescribe the form and structure of the model contract for specific types of energy services when such services are financed from the Budget Fund for Energy Efficiency, or when users are from the public sector.

In order to promote energy services and provide for the conditions for the creation of markets of such services, the Republic of Serbia took part in the “Regional energy efficiency programme in the Western Balkans - ESCO and policy dialogue”, conducted by EBRD under the auspices of the Energy Community Secretariat (detailed project description is given within the Measure H2). Due to the fact that an important component of this Project foresees an analysis of the existing legal framework for the implementation of energy services, with suggestions for its improvement, MEDEP has formed a task force that will take an active part in this part of the Project.

### **3.8. Strategy aimed at increasing the number of buildings with nearly zero energy consumption**

Buildings with nearly zero energy consumption, as defined in the Rulebook on energy efficiency in buildings, are the buildings in which the annual energy consumption for heating per unit of floor area does not exceed 15 kWh/m<sup>2</sup> and these fall into energy class A+. Calculation and expression of the energy class, by the time the national software is adopted, shall be performed in accordance with the methodology set forth in the Rulebook on energy efficiency in buildings, based on the characteristics of the building thermal envelope, with the exception of HVAC systems in the building. By excluding the HVAC systems in the calculation, the use of renewable energy sources in the HVAC systems of the building is not taken into account, which represents one of the key characteristics of the nearly zero-energy buildings. Having in mind the above fact, and the methodology of calculation and classification of the energy class, it is very difficult to achieve the annual energy consumption below 15 kWh/m<sup>2</sup> and thus the classification of a building as the nearly zero-energy building. In accordance with the above, the amendment of the Rulebook on energy efficiency in buildings is necessary.

The Republic of Serbia, at present, has no defined strategy to encourage the construction of buildings with nearly zero energy consumption, but such projects are implemented as case studies. Thus, for example, the construction of five new combined children's institutions in Belgrade is in the pipeline, and these will be designed as very low-energy buildings. During the construction of these kindergartens, all measures aimed at increasing energy efficiency of buildings were applied, i.e. the use of energy efficient materials and technologies, such as the use of renewable energy sources for heating and cooling of the kindergartens, as well as designing of the building thermal envelope with a very low coefficient of thermal conductivity.

### **3.9. Measures to support the implementation of the Directive 2010/31/EU on the energy performance of buildings**

The role of the public sector in the implementation of the EPBD is reflected through the implementation of various projects in collaboration with foreign partners (for example, The World Bank and KfW), which are related to the energy recovery of public facilities such as educational institutions and hospitals, where the requirements defined in the Law on Planning and Construction and the accompanying regulations are applied.

The goal of the project "Energy Efficiency in Serbia", funded by the World Bank, is to improve energy efficiency in buildings heating system. The project was implemented in the period from June 2004 to June 2012.

In the first phase, which was conducted in the period from 2005 to 2009, from the initial fund of USD 25 million, 28 buildings (16 schools and 12 hospitals) were provided with adequate energy equipment, and CCS energy system revitalization was carried out. Upon the implementation of energy saving measures in buildings, the savings of 13,630 MWh per year were achieved (around 40% of savings compared to the original energy consumption prior to the implementation of measures), along with a reduction in CO<sub>2</sub> emissions by 4,223 t (around 42% of reduction compared with the previous level of emissions).

In the second phase, which was conducted in 2011 and 2012, a group of 62 buildings underwent energy revitalization (28 schools, 10 hospitals and 19 buildings of the Clinical Centre in Niš - a total of 29 hospital buildings, and 5 social care building), while in the Clinical Center in Niš a new system of energy supply was built, from the additional funding in the amount of 28 million USD. In these buildings, savings of 29,496 MWh per year were achieved (approx. 50% savings compared to the estimated energy consumption), along with 9,388 tons of carbon dioxide emissions reductions (approx. 47% reduction compared to the estimated emissions).

The project "Energy Efficiency in Public Buildings", funded by KfW, aims to improve the energy performance in buildings of schools and other educational institutions, with the aim to reduce their energy consumption and improve the conditions for work and study. The Project will include the energy performance improvement in approximately 25-35 schools. Furthermore, the Project may comprise additional works in order to create better comfort of students and teachers (painting, toilets refurbishment, etc.), up to the value of 15% of the total investment. Moreover, there is a possibility to conduct a demonstration project aimed to demonstrate results of the implementation of measures to improve energy efficiency and the use of renewable energy sources. To support the implementation of the project, technical assistance shall be provided.

The project implementation is foreseen from a development loan of the German development bank KfW, in the amount of 15 million euros. Local contribution of the municipalities, on the territory of which are situated the schools involved in the project for additional works, is planned at the level of 1.5 million euros, while the contribution from WBIF (grant) for technical assistance is provided at the level of 1.3 million euros. The funds for the loan guarantee, in the amount of 15 million euros, are projected in the Budget of the Republic of Serbia for 2013.

In the coming period, significant results are expected in terms of improving energy efficiency in public buildings through the use of ESCO mechanism. The application of this mechanism shall be supported through the implementation of the aforementioned regional EBRD / REEP project, which in addition to technical assistance for the improvement of the legal framework for the implementation of this mechanism includes technical assistance for the implementation of specific projects, by the implementation of this mechanism through the identification, preparation of design and tender documentation and monitoring of the project implementation. In addition to grants provided by WBIF, EWBJF, for the implementation of investment projects, EBRD has provided a credit line in the amount of 160 million euros, of which 80 million euros is intended for the public sector (110 million euros is allocated immediately), while for the implementation through the ESCO mechanism funds up to 50 million euros are allocated (long-term).

The establishment of the Budget Fund for Energy Efficiency will enable the Republic of Serbia to financially support energy efficiency in buildings, by providing funds to subsidize the

interest or warranty or any other type of subsidy, and thus provide for the availability of funds under more favourable conditions.

## ANNEX 1 - LIST OF MEASURES AND EARLY MEASURES FROM THE FIRST EEAP

Table 20: List of early measures implemented in the period 2004-2009

No.	Id.	No. in National EEAP of the Republic of Serbia	Name of Energy Efficiency Project measure	Scheme	Targeted activities	Implementation period
1	EM1	1.2	Improvement of interior lighting in terms of increasing energy efficiency	Public campaigns of the Electric Power Industry of Serbia (EPS)	EPS distributed 120,000 CFL bulbs of 100 W free of charge.	2007-2008
2	EM2	1.3	Promotion of the use of energy-efficient household appliances	Campaign of the Energy Efficiency Agency with respect to energy labelling of household appliances	Video on household appliances energy labelling	2005
3	EM3	1.6	Billing based on actual (measured) consumption of thermal energy to the consumers connected to the district heating system.	The new billing system was introduced in the towns of Subotica, Bačka Palanka and Šabac	Subotica: heated area of 809,072 m <sup>2</sup> Bačka Palanka: heated area of 56,272 m <sup>2</sup> Šabac: heated area of 465,893 m <sup>2</sup>	2009-2010
4	EM4	2.1	Improvement of internal lighting of public buildings in terms of energy efficiency increase	Small-scale municipal projects co-financed by the municipalities and the GTZ Project "Modernization of Municipal Services"	Project of increasing energy efficiency of interior lighting in public buildings in the municipality of Žagubica.	2005-2008
				EEI measures financed by the Provincial Fund for Capital Investments	Project of increasing energy efficiency of interior lighting in public buildings in the municipalities of Beočin, Nova Crnja and Senta.	2007-2009
5	EM5	2.2	Agreements with municipalities for the modernization of public lighting system	Small-scale municipal projects co-financed by the municipalities and the GTZ Project "Modernization of Municipal Services"	Project of increasing energy efficiency of interior lighting in public buildings in the municipalities (Arlje, Ražanj, Dimitrovgrad, Opovo, Čoka, Varvarin, Vrnjačka Banja, Ivanjica, Bačka Topola)	2005-2008
				Pilot projects of energy efficiency in municipal services implemented by EEARS and co-financed by the EU through EAR	Modernization of public lighting system in five municipalities (Zrenjanin, Novi Kneževac, Varvarin, Bor, Belgrade)	2005-2007
				Energy efficiency measures in the public lighting system financed by the Provincial Secretariat for Energy and Mineral Resources	Modernization of public lighting system in sixteen municipalities of AP Vojvodina (Irig, Bač, Opovo, Kanjiža, Senta, Zrenjanin, Titel, Alibunar, Bački Petrovac, Bačka Topola, Indija, Kovin, Novi Bečej, Novi Kneževac, Plandište, Sremski Karlovci).	2007-2008

				Energy efficiency measures in the public lighting system financed by the Provincial Secretariat for Energy and Mineral Resources	Modernization of public lighting system in five municipalities (Ada, Alibunar, Beočin, Irig, Stara Pazova).	2007-2009
				Energy efficiency measures in the public lighting system financed by the municipalities	Modernization of public lighting system.	2004-2009
				Agreements with the municipalities of Varvarin and Čičevac on Public lighting energy efficiency	Decision on the assembling of energy efficient bulbs in all newly designed, reconstructed or maintained parts of the installation of the public lighting system.	2009
6	EM6	2.3	Reduction of electricity use for heating	Small-scale municipal projects co-financed by the municipalities and the GTZ Project "Modernization of Municipal Services"	Energy efficiency projects in the municipalities of Varvarin (heat pump assembling in a school) and Nova Varoš (biomass boiler assembling in a school)	2005-2008
				EEI pilot projects in public buildings implemented by EEARS and co-financed by the EU through EAR	Projects of renewable energy sources implementation in the municipality of Ivanjica (biomass boilers assembling in public buildings). Assembling of thermal solar collectors in a Special psychiatric hospital Toponica	2006-2008
				EEI measures in public buildings financed by the municipalities		2006-2009
				EEI measures in public buildings financed by the Government	National Investment Plan, etc.	2006-2009
7	EM7	2.7	Serbian Energy Efficiency Project (SEEP)	WB/IDA Loan	SEEP projects in public buildings (building thermal envelope, heating system, interior lighting) in 90 public buildings (schools, hospitals, social care buildings) and reconstruction of power systems in the Clinical Center of Serbia, and the Clinical Center Niš	2004-2009
8	EM8	2.9	Introduction of subsidies and credit lines for energy efficiency and renewable energy sources for public and commercial buildings	EEI demonstration projects in public buildings implemented by EEARS and co-financed by the EU through EAR	EEI projects in public buildings (building thermal envelope, heating system, interior lighting) in 16 municipalities (Belgrade, Niš, Sremska Mitrovica, Koceljeva, Čoka, Nova Varoš, Malo Crniće, Žabalj, Dimitrovgrad, Negotin, Smederevo, Svilajnac, Žagubica, Kladovo, Zrenjanin).	2004 - 2007

				EEI projects in public buildings financed by the Provincial Secretariat for Energy and Mineral Resources	EEI projects (building thermal envelope, heating system, interior lighting) in 32 public buildings in 20 municipalities in Vojvodina (Zrenjanin, Kikinda, Beočin, Novi Bečej, Odžaci, Apatin, Šid, Senta, Bačka Topola, Bačka Palanka, Bački Petrovac, Temerin, Titel, Čoka, Kovačica, Žabalj, Irig, Opovo, Plandište and Sremska Mitrovica).	2007-2008
				Small-scale municipal projects co-financed by the municipalities and the GTZ Project "Modernization of Municipal Services"	EEI projects in public buildings (building thermal envelope, heating system, interior lighting) in 6 municipalities (Malo Crniće, Žagubica, Arilje, Majdanpek, Veliko Gradište, Pećinci).	2005-2008
				EEI projects in public buildings financed by the Provincial Fund for Capital Investments	EEI projects (building thermal envelope, heating system, interior lighting) in 32 public buildings in 16 municipalities	2007-2009
				EEI projects in public buildings financed by the National Investment Plan	EEI projects (building thermal envelope, heating system, interior lighting).	2006-2009
8	EM9	3.3	Energy audits in the industry sector	EEI demonstration projects in the industry sector implemented by EEARS and co-financed by the EU through EAR	21 energy audit in the industry sector and three pre-feasibility studies on the introduction of energy management.	2004-2007
				Norwegian assistance to Serbia in the implementation of the new energy policy	Demonstration of energy audits in the industry sector and Energy Management System in industry.	2004-2005
10	EM10		Modernization of fleet of the companies engaged in public city transport	Business policy of the companies engaged in public city transport Procurement of technology	Procurement of new vehicles that meet the latest exhaust emissions standards, or that have low fuel (energy) consumption and low CO <sub>2</sub> emissions: New buses; New trolleybuses; New trams.  Large cities (Belgrade, Niš, Novi Sad) started the modernization of their fleets.	2002-2009

11	EM1 1		Modernization of the fleet in order to meet the technical requirements for the performance of domestic and international transportation [57] for obtaining ECMT permits [58]	The application of the Rulebook on technological and technical- operating conditions to be met by commercial vehicles and buses that operate in the international public road transport [57], and the Regulation on the manner of distribution and criteria for awarding foreign licenses for international transport of goods to domestic carriers [58]	Procurement of new vehicles that meet the latest exhaust emissions standards, or that have low fuel consumption and low CO <sub>2</sub> emissions: 1) New buses; The Second New commercial vehicles. Companies engaged in international passenger and freight transport started purchasing new vehicles in order to perform such activities outside Serbia.	2006-2009
12	EM1 2		Introduction of incentive mechanisms for replacement of the existing fleet	Implementation of the Regulation on the conditions and manner of subsidies implementation for the procurement of new vehicles manufactured in the Republic of Serbia in accordance with the old- for-new policy.	The aim of the introduction of incentive mechanisms to replace the existing fleet is to replace old vehicles with engines below the EURO 3 standard with new vehicles of domestic manufacturers which are equipped with EURO 5 engines. The subsidy per vehicle ranges from 600 to 1000 Euro.	2009

Table 21: List of energy efficiency measures from the First EEAP implemented in the period 2010-2012

No.	Id.	No. in National EEAP of the	Name of Energy Efficiency Project measure	Scheme	Targeted activities	Implementation period
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		Republic of Serbia				
1	M1	1.2	Improvement of interior lighting in terms of increasing energy efficiency	Public campaigns of the Electric Power Industry of Serbia (EPS)	In 2010, EPS distributed free of charge 2500 CFL light bulbs of 100 W, 2000 CFL light bulbs of 60 W, 8000 CFL bulbs of 40 W. In 2012, EPS distributed 20,000 CFL bulbs of 100 W free of charge.	2010-2012
2	M2	1.8	Introduction of credit lines for energy efficiency and renewable energy sources for households	Implementation of the Regulation on the financing of energy efficiency projects in 2012 [41]	EI measures in residential buildings (building thermal envelope, heating system, interior lighting).	2012
3	M3	2.2	Agreements with municipalities for the modernization of public lighting system	Public campaign	Modernization of public lighting.	2010-2012
4	M4	2.3	Reduction of electricity use for heating	EEI projects in public buildings financed by the Provincial Secretariat for Energy and Mineral Resources	Installation of combined plants including heat pump and thermal solar collectors in public and commercial buildings in 10 municipalities.	2010
					Assembling of thermal solar collectors on public and commercial buildings: five specialized hospitals, nine student dormitories, three psychiatric hospitals, six sports centres.	2011-2012
					Assembling of heat pumps in seven public and commercial buildings in five municipalities.	2011
					Assembling of biomass boilers in secondary schools in five municipalities (Sombor, Futog, Bačka Topola, Zrenjanin)	2011
				EEI projects in public buildings financed by the municipalities		2010-2012
EEI projects in public buildings financed by the Government of the Republic of Serbia	National Investment Plan, etc.	2010				
5	M5	2.7	Serbian Energy Efficiency Project (SEEP)	WB/IDA Loan	SEEP projects (building thermal envelope, heating system, interior lighting) in public buildings (schools, hospitals, social welfare buildings).	2010-2012
6	M6	2.9	Introduction of credit lines for energy efficiency and renewable energy sources credit lines for public and commercial buildings.	Implementation of the Regulation on the financing of energy efficiency projects in 2012 [41].	EI measures in residential buildings (building thermal envelope, HVAC systems, interior lighting).	2012
7	M7	3.4	Incentive rates for highly efficient coupled / combined heat and power generation in industrial companies	Application of the Energy Law [3] and the Regulation on the incentives for the production of electricity using renewable energy sources and combined generation of electricity and heat [45] and the	Implementation of projects of combined electricity and heat generation in the industry sector.	2010-2012

				Regulation on eligibility of privileged power producers [46] which were adopted in 2009.		
8	M8	3.6	Introduction of favourable credit lines for the implementation of EE measures in the industry sector	Western Balkans Sustainable Energy Financing Facility – WeBSEDF. EBRD credit line for the Western Balkans countries	Implementation of EEI projects and use of renewable energy sources in the industry sector.	2010-2012
9	M9	4.1	Introduction of the EU acquis on energy efficiency in the transport sector	Implementation of the Regulation on the import of motor vehicles, which was adopted in 2010 [50]	The Regulation requires that all imported used vehicles are to be equipped with an engine that meets the minimum standard Euro 3.	2010-2012
10	M10	4.5	Introduction of incentive mechanisms for replacement of the existing fleet.	Implementation of the Regulation on the conditions and manner of subsidized acquisition of vehicles manufactured in the Republic of Serbia in accordance with the old- for-new policy [51]	Introduction of incentive mechanisms for replacement of the existing fleet. The purpose of this measure was to encourage the replacement of old vehicles equipped with engines that fail to meet Euro 3 standard, with new domestic vehicles with Euro 5 engines. The subsidy per vehicle varied in the range from 600 to 1000 Euro.	2010-2011
	M11			Implementation of the Regulation on the programme of financing energy efficiency projects in 2012 [41] and  The Decision on the awarding of the Fund's grants to automotive companies aimed at encouraging the purchase of environmentally friendly vehicles [52].	Stimulation of the purchase of vehicles with low CO <sub>2</sub> emissions. The total value of funds available for this purpose amounts to 20,000,000 dinars or 100,000 RSD per vehicle.	2012

## ANNEX 2 – SUMMARY OF “BOTTOM-UP” METHODOLOGY

The method for calculating savings has been developed by the EC recommendations given in the document "Recommendations on measurement and verification methods in the framework of the Directive 2006/32/EC on energy end-use efficiency and energy services" and recommendations of the EMEEES Project (Wuppertal Institute for Climate, Environment and Energy) - (<http://www.evaluate-energy-savings.eu/>), as set out in paragraph 2.3.1. this Action Plan. Hereby is provided a list of methods applied in the Bottom-up methodology, depending on the type of specific measure.

Bottom-up 1 - Reconstruction or renovation of the public lighting system

Bottom-up 2 - Installation, renovation, repair or maintenance of the existing interior lighting system

Bottom-up 3 - Replacement or improvement of the system or installation of new system or parts of lighting components in new or existing commercial buildings and public-commercial sector buildings

Bottom-up 4 - Reconstruction of thermal insulation of certain parts of the building thermal envelope (e.g. walls, roofs, ceilings, foundations) and/or replacement of windows in existing residential and commercial buildings, and public-commercial buildings

Bottom-up 5 - Reconstruction of building thermal envelope and heating systems in existing residential, commercial and public-commercial buildings

Bottom-up 6 - Replacement of heating equipment in existing residential, commercial and public-commercial buildings

Bottom-up 7 - Enforcement of new building regulations for newly built residential, commercial and public-commercial buildings

Bottom-up 8 - Replacement or installation of new equipment for the heating of domestic hot water in existing residential, commercial and public-commercial buildings

Bottom-up 9 - Connection of new or existing residential, commercial and public-commercial buildings to district heating system

Bottom-up 10 - Installation or replacement of a split system with a nominal capacity of less than 12 kW in new and existing residential, commercial and public-commercial buildings

Bottom-up 11 - Installation of a solar system for heating domestic hot water in existing residential, commercial and public-commercial buildings

Bottom-up 12 - Methodology for determining primary energy savings from the combined heat and power plants (CHP)

Bottom-up 13 - Fleet replacement

**ANNEX 3 - Summary of available sources of funding  
OF THE ENERGY EFFICIENCY MEASURE**

Table 22: Overview of potential sources of funding

Name	Availability of amount (millions of EUR)			End-users	Funding entities
	Loans	Interest	Investment incentives		
REEP	110+125	9.5+10.35	21.5+23.3	SME and Households	EBRD
Green for Growth Fund	194.5	7.5	Included in the loan component	SME and Households	Different international financial institutions / donors
Financial institutions - banking sector (Department of EE)	142	9	3	SME and households	KfW
CEB/KfW/EC Facility	30.8	N/A	7.70	SME and municipalities	KfW
UNECE E4F/EE21	30	6.15	N/A	SME	UNECE
EIB/EC Credit lines	14	0.7	2.8	SME	EIB

Name of bank	Fund	Structure	Value of fund	Value of loan in EUR	Name of entity receiving loan - borrowers
Banca Intesa	KfW	Interest is separately funded	90,000,000 Euro	Up to 1,200,000 Euro	Public local self-governments and public utility companies
Banca Intesa	Green for Growth Fund	100% loan	7,000,000 Euro	Up to 8,000 Euro	Private Households
Banca Intesa	Individual funding	100% loan	Not identified	Up to 25,000 Euro	SME
Banca Intesa	Italian Credit Line	Technical assistance grant	Not identified	Starting at 50,000 Euro up to 100,000 Euro	SME, public sector and municipalities
Banca Intesa	EBRD WeBSEFF	Technical assistance grant as grant (15%-EUR 13 m 20% of the loan amount financing by the EC)	13,000,000 Euro	Starting at 100,000 Euro up to 2,000,000 Euro in foreign currency or in dinars, in average equivalent	SME
Sberbank	From individual funding	100% loan	Not identified	Starting at 300 Euro up to 100,000 Euro	Households, SME
Čačanska Bank	KfW	Technical assistance loan	10,000,000 Euro	Up to 500,000 Euro	Households SME, ESCO
Čačanska Bank	Italian Credit Line	Technical assistance grant	Not identified	Starting at 50,000 Euro up to 1,000,000 Euro	SME
KBC Bank	EIP Apex II	100% loan	Not identified	Starting at 1,000,000 Euro up to 2,000,000 Euro Starting at 2,000,000 Euro up to 12,500,000 Euro	SME Municipalities
Komercijalna/Co	GGF	100% loan	23,000,000 Euro	In the value of	Households, SME

Commercial Bank				investments - mortgage	
Komercijalna/Commercial Bank	EIP Apex II	100% loan	Not identified	Up to 12,500,000 Euro	SME, municipalities, shareholders, economy
Komercijalna/Commercial Bank	Italian Credit Line	Technical assistance grant	Not identified	Starting at 50,000 Euro up to 100,000 Euro	SME
OTP Bank	EIP Apex II	100% loan	Not identified	Up to 12,500,000 Euro	SME, municipalities, shareholders, economy
Privredna Bank Belgrade	Italian Credit Line	Technical assistance grant	Not identified	Starting at 50,000 Euro up to 100,000 Euro	SME
Privredna Bank Belgrade	EIP Apex II	100% loan	Not identified	Min 40,000 Euro	SME, municipalities, shareholders, economy
ProCredit Bank	KfW	Technical assistance loan	30,000,000 Euro	Households up to 150,000 Euro, SME up to 1,000,000 Euro	Private: households, SME
ProCredit Bank	KfW	Technical assistance loan	15,000,000 Euro	Up to 2,000 Euro	Private: households, SME, energy service companies, renewable energy sources
Raiffeisen Bank	EIP Apex II	100% loan	Not identified	Starting at 30,000 Euro up to 12,500,000 Euro	Private: SME
Societe Generale Bank	EBRD WeBSEFF	Technical assistance grant and grant 15% - 20% of the loan amount funding from the EC	10,000,000 Euro	Starting at 100,000 Euro up to 2,000,000 Euro In foreign currency or in dinars, on average Equivalent	Private: SME
UniCredit Bank	Italian Credit Line	Technical assistance grant	Not identified	Starting at 50,000 Euro up to 100,000 Euro	Private: SME
UniCredit Bank	EIP Apex II	100% loan	Not identified	Up to 12,500,000 Euro	Private: SME
Sberbank	KfW Banking for energy facilities Renewable energy sources funding	Technical assistance loan	10,000,000 Euro	Starting at 5,000 Euro	Private: households, SME, energy service companies, renewable energy sources
Directly	EBRD WeBSEDF	78% loan with 17% grant and technical assistance grant	Not identified	Starting at 2,000,000 Euro up to 6,000,000 Euro	Private: SME

Source: European Commission project “Support to EC and IFI Coordination in the Western Balkans and Turkey”