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# **STATUS-QUO ANALYSIS OF ENERGY EFFICIENCY POLICIES IN 8 EU COUNTRIES**

**PART OF WORK PACKAGE 1: MAPPING OF ENERGY EFFICIENCY POLICY INSTRUMENTS AND  
AVAILABLE TECHNOLOGIES IN BUILDINGS AND TRANSPORT**

## **NATIONAL REPORT FOR SERBIA**

**30.07.2015.**

**Partner: Centre for Energy, University of Belgrade – Faculty of Mining and Geology**



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## **HERON: Forward – looking socio-economic research on Energy Efficiency in EU countries**

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## ACRONYMS

|       |   |
|-------|---|
| ECTS  | European Credit Transfer System               |
| EEAP  | Energy Efficiency Action Plan                 |
| ESCO  | Energy Service Company                        |
| IEE   | International Energy Agency                   |
| IRAP  | International Road Assessment Programme       |
| MIFF  | Multiannual Indicative Financial Framework    |
| Mtoe  | Million Tons of Oil Equivalent                |
| NPI   | National Plan for Integration with the EU     |
| RSD   | Republic of Serbia Dinar                      |
| SAA   | Stabilization and Association Agreement       |
| SEAP  | Sustainable Energy Action Plan                |
| SEC   | Swedish Export Credit Corporation             |
| UN    | United Nations                                |
| UNECE | United Nations Economic Commission for Europe |

## EXECUTIVE SUMMARY

The Republic of Serbia has adopted the Law on Efficient Use of Energy (Government of the Republic of Serbia, 2013a) and The Second Energy Efficiency Action Plan (Government of the Republic of Serbia, 2013b), and made a significant step towards the transposition of the energy efficiency acquis. However, more needs to be done in the near future for full implementation of the energy efficiency acquis (Energy Community, 2015).

Also, The Republic of Serbia has recently adopted several regulations that promote energy efficiency in the buildings sector. These regulations are in accordance with the Law on Planning and Construction (Government of the Republic of Serbia, 2009, 2014a). This Law was the first legal act that introduced energy efficiency principals in Serbia's buildings sector. Next set of adopted regulations and rulebooks are based on the legal framework provided by the Law on Efficient Use of Energy. Together, these documents make the legal basis for policy instruments related to energy efficiency in buildings.

These policy instruments include regulatory, economic and financial instruments, as well as capacity building and networking. The main policy instruments in the buildings sector are: Minimum energy performance requirements for new or reconstructed buildings, Energy audit (mandatory), Energy management system in buildings, Energy labeling, Subsidy, Education and Training for energy managers, Education and training for energy efficiency in buildings, Model of Energy Service Agreement for Public buildings, Funding for research in energy efficiency.

Compared to the buildings sector, policy instruments for improvement of energy efficiency in the transport sector are less developed. Planning instruments are developed based on the Law on Road Traffic Safety: Improvements of bicycle and pedestrian infrastructure, Traffic calming, and Traffic management systems.

Regulatory policy instruments related to energy efficiency in transport are based on mixture of regulations related to energy sector, but also to trade, market regulation, environment, etc.: Fuel economy standards/vehicle CO<sub>2</sub>-emission standards, Fuel quality standards. Currently, there are no specific financial policy instruments dedicated to support improvement of energy efficiency in the transport sector in Serbia.

As an example for implementation of energy efficiency measures at local level the case of the city of Niš is explained. According to the Ordinance on establishing an unified list of Regions and Local Self-governments per Level of Development for 2014<sup>1</sup> Niš belongs to the first, most developed group of municipalities in Serbia. In terms of dealing with local energy issues the City of Niš is one of the better performing in Serbian context. The City of Niš signed Covenant of Mayors Charter in July 2011 and submitted Sustainable Energy Action Plan (SEAP) in December 2014<sup>2</sup>. SEAP is covering period till year 2020 and sets indicative target for CO<sub>2</sub> emissions to 21% compared to baseline levels of 2010.

According to the SEAP, the buildings sector is the most important in terms of reduction of CO<sub>2</sub> emissions for the upcoming period till 2020. Therefore, majority of measures, 25 of them, belong to the buildings sector. Most of the measures are energy efficiency related, but there are some that promote utilization of renewables. All measures in the buildings sector are divided in five subgroups: general measures, promotional, informational and educational measures and activities, measures in

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<sup>1</sup> [Official Gazette of the Republic of Serbia", No. 104/2014, 2014;](#)

<http://www.regionalnirazvoj.gov.rs/Lat/ShowNARRFolder.aspx?mi=171> (30.07.2015)

<sup>2</sup> [http://www.covenantofmayors.eu/about/signatories\\_en.html?city\\_id=2996&seap](http://www.covenantofmayors.eu/about/signatories_en.html?city_id=2996&seap) (30.07.2015)

residential and public buildings owned by the City, measures in residential sector including collective and individual housing and measures in commercial and service buildings.

SEAP defines 17 measures to reduce CO<sub>2</sub> emissions from the transport sector in the City of Niš, which are divided into 5 categories: legislative and planning measures, promotion, information and education measures and activities, specific measures and activities for private and commercial vehicles, specific measures and activities for the vehicles owned by the City, specific measures and activities for the public transport.

Regarding improvement of energy efficiency of buildings, general measure in the buildings sector - Education and behavioral change of the buildings users in objects owned by the City of Niš is described, while for the transport sector the System for Centralized Management of Traffic on the territory of City of Niš is presented.

# 1. POLICY INSTRUMENTS ON THE NATIONAL LEVEL

The Republic of Serbia has adopted the Law on Efficient Use of Energy (Government of the Republic of Serbia, 2013a) and the Second Energy Efficiency Action Plan (Government of the Republic of Serbia, 2013b), and made a significant step towards the transposition of the energy efficiency acquis. However, more needs be done in the near future for full implementation of the energy efficiency acquis (Energy Community, 2015). Development and adoption of a comprehensive set of secondary legislation based on the Law on Efficient Use of Energy is necessary precondition for implementation of comprehensive set of policy instruments. Therefore, set of current and here presented policy instruments is relatively modest.

## 1.1 POLICY INSTRUMENTS IN THE BUILDINGS SECTOR

The Republic of Serbia has recently adopted several regulations which deal with and promote energy efficiency in the buildings sector. These regulations are in accordance with the Law on Planning and Construction (Government of the Republic of Serbia, 2009, 2014a). This Law was the first legal act which introduced energy efficiency principals in legal framework of Serbia. Another set of regulations and rulebooks follow the Law on Efficient Use of Energy and tackle the issue of energy efficiency in buildings more or less directly. They address the buildings sector in terms of regulation, but also financing and capacity building. While the Law on Planning and Construction is completely covered by secondary legislations, this is still not the case with the Law on Efficient Use of Energy.

Serbia proclaimed several measures, to improve efficiency in buildings, through the EEAPs and back them up as policy instruments with regulations and rulebooks. These policy instruments include regulatory, economic and financial instruments, as well as capacity building and networking. The main policy instruments in the buildings sector are related to:

- Minimum requirements for energy performance in buildings,
- Energy audit (mandatory),
- Energy management system in buildings,
- Energy labeling,
- Subsidy,
- Education and training for energy managers,
- Education and training for energy efficiency in buildings,
- Model of Energy Service Agreement for Public Buildings,
- Funding for research in energy efficiency.

### 1.1.1 REGULATORY POLICY INSTRUMENTS

Three regulatory policy instruments are recognized within this class of existing instruments targeting the buildings sector. The Law on Planning and Construction (Government of the Republic of Serbia, 2013a) has established minimum requirements for energy performance of buildings and it is fully implemented. Energy audit (mandatory) and energy management system in buildings are instruments established by the Law on Efficient Use of Energy, and their implementation is on very beginning.

### **1.1.1.1 Minimum requirements for energy performance for new and reconstructed buildings**

#### **a) General information**

This policy instrument is related to the Serbian transposition of relevant provisions of Directive 2010/31/EU. Legal base are the Law on Construction and Planning, the Law on Efficient Use of Energy, the Rulebook on Energy Efficiency of Buildings (Ministry of Environment, Mining and Spatial Planning, 2011a) and the Rulebook on Conditions, Content and Manner of Issuance of Certificates of Energy Performance of Buildings (Ministry of Environment, Mining and Spatial Planning, 2011b). These regulations that govern energy efficiency in the buildings sector, prescribe the energy performance of buildings, the manner of calculating the thermal properties of buildings, energy requirements for new and existing buildings, as well as conditions, content and manner of issuing certificates for the energy performance of buildings. Furthermore, the rulebooks stipulate obligation of making the study on energy efficiency of a building, which should be enclosed with documentation for issuing of a building permit. Finally they define that energy certificate should be enclosed within the request for occupancy permit.

#### **b) Type of policy instrument**

This policy instrument principally belongs to regulatory policy instruments, but also have awareness raising and informative purpose.

#### **c) Objectives**

Objective of this policy initiative is to ensure improvement of quality of design, used materials and building technology, in order to achieve improvement of energy performance of buildings. Furthermore, it is aimed to guaranty and provide document of certain level of energy performance for all types of buildings. The objective is to save a total of 9.98 PJ of energy by 2018.

#### **d) Target group**

Target groups are owners, users and investors in public, commercial and residential buildings.

Energy certificate is not requested for following buildings:

- 1) Existing buildings for selling, renting, reconstructed or rehabilitated with a net surface area of less than 50 m<sup>2</sup>;
- 2) Buildings with planned life time of two years or less;
- 3) Buildings of a temporary purpose (for example accommodation of people and building materials during construction);
- 4) Workshops, production halls, industrial buildings and other commercial buildings which in accordance with their purpose, must be held open for more than half of working time, if not equipped with air curtain;
- 5) Buildings for religious rites;
- 6) Existing buildings which are sold, or ownership right is transferred in bankruptcy procedure in the case of forced sale or enforcement;
- 7) Buildings that are under a protection and in which fulfillment of energy efficiency requirements would conflict with protection requirements;
- 8) Buildings which are not heated, or are heated to a temperature up to + 12 ° C.

#### **e) Rules and influencing mechanisms**



Minimal requirements in terms of energy performance of the buildings stipulated in two mentioned rulebooks are for newly built buildings class "C" and for renovated existing buildings improvement of at least one energy class.

#### f) Implementation network

The most significant role in implementation of this policy instrument has the Ministry of construction, transport and infrastructure, Department of energy efficiency and construction products<sup>3</sup> that oversees and regulates the processes, and the Chamber of Engineers which is in charge for training energy auditors and organizations licensed for issuing energy certificates for buildings.

Conduct procedures regarding obtaining energy certificate is as follows:

First step is preparation of the Elaborate of energy efficiency of the building (whether existing or in design phase). The Elaborate can be issued only by licensed energy efficiency engineer for buildings. The aforementioned study serves as a mandatory document for obtaining construction permits for objects that are only planned for construction.

After preparing the Study, the authorized legal entity - organizations licensed for issuing energy certificates for buildings (with minimum 3 responsible energy efficiency engineers for buildings with appropriate licenses) prepares and issues the building energy certificate.

#### g) Outcomes

Calculations made during the determination of national typology of residential buildings in Serbia (Jovanović et al., 2012) created in accordance with IEE Tabula project,<sup>4</sup> have shown that the first level of energy recovery (in accordance with this policy instrument) can provide savings of a minimum 25% of the energy needed for heating. The second EEAP quoted potential for energy saving of this particular policy instrument for the period 2012-2018 of 0,0848 Mtoe in residential sector and 0,0535 Mtoe in public and commercial sector.

Forecast of final energy savings according to the second EEAP is presented in Table 1. Data about cost-effectiveness are not available.

**Table 1: Estimation of final energy savings according the second EEAP**

| Policy instrument  | Savings<br>2010-2012 | Savings total<br>2012-2018 |
|--|----------------------|----------------------------|
| Minimum energy performance requirements for new or reconstructed buildings |                      | 9.98 PJ                    |

### 1.1.1.2 Energy audit (mandatory)

#### a) General information

The Law on Efficient Use of Energy introduced energy audit as mandatory information instrument. According to the Law, energy audit has been defined as “systematic procedure for collecting

<sup>3</sup> <http://www.mgsi.gov.rs/cir/odsek/odsek-za-energetsku-efikasnost-i-gradjevinske-proizvode>

<sup>4</sup> [www.building-typology.eu](http://www.building-typology.eu)

necessary information and knowledge about existing level and manner of production, transport, distribution and use of energy in building, manufacturing process, private and public service, with the purpose to define and to quantify possibilities for economically feasible and efficient energy use". The Law prescribes general content of Report on conducted energy audit. This document should contain (in the case of buildings):

- Energy balance of the building;
- Evaluation of the existing level of energy efficiency of the building;
- Proposed measures for increasing energy efficiency of the building that is a subject of examination;
- Assessment of achievable energy savings and reduction of CO<sub>2</sub> emissions for each of the proposed measures, and estimation of total achievable energy savings and overall reduction of CO<sub>2</sub> emissions in the case of simultaneous introduction of energy efficiency measures, including economic and financial analysis;
- The final expert opinion with the proposal of measures for effective energy use to be implemented;
- All other information relevant to evaluation of energy efficiency and proposed measures for efficient use of energy.

Authorized energy advisor shall perform energy audit. Authorized energy advisor is natural or legal person, evidenced in the registry of authorized energy advisors.

This instrument is still not in force, as secondary legislation necessary for its conduction is still not developed. The only document adopted so far is the Rulebook on conditions in terms of personnel, equipment and facilities of the organization that conducted the training for energy managers and authorized energy advisors (Ministry of Mining and Energy, 2015a).

#### **b) Type of policy instrument**

Energy audit according to Law on Efficient Use of Energy is classified as a regulatory policy instrument, as it is mandatory. However, this is the policy instrument that combines obligation with information, motivation and advice.

#### **c) Objectives**

Energy audit should define and quantify possibilities for economically feasible and efficient energy use in buildings. Energy audit shall be used for identification and understanding options for energy savings, and their prioritizing in accordance to conducted economic analysis.

#### **d) Target group**

According to the Law on Efficient Use of Energy, the obligation to perform energy audit refers to:

- 1) Facilities and buildings used by public administration bodies and other bodies of the Republic of Serbia, autonomous provinces, local government authorities with more than 20,000 inhabitants, as well as other public services that use facilities in public ownership, with an usable area of more than 500 m<sup>2</sup>;
- 2) Buildings or parts of buildings which are classified into one of the energy classes (as defined by the Rulebook on Conditions, Content and Manner of Issuance of Certificates of Energy Performance of Buildings (Ministry of Environment, Mining and Spatial Planning, 2011b));
- 3) Buildings and parts of buildings in case of change of purpose, change of the owner, or if they are intended for renting.

Owners of buildings or parts of buildings mentioned above are obliged to perform an energy audit at least once every 10 years.

**e) Rules and influencing mechanisms**

Rules and influencing mechanisms are still not prescribed.

**f) Implementation network**

Ministry of Mining and Energy (Department for energy efficiency and renewable energy)<sup>5</sup> has prescribed conditions in terms of personnel, equipment and facilities for the organizations which conduct the training for energy managers and authorized energy advisors. Department for energy efficiency and renewable energy within Ministry of Mining and Energy is responsible for the register of authorized energy advisors, while responsible Minister issues appropriate licenses. The same Ministry is in charge for the database with conducted energy audits. Ministry should prescribe data that will be collected, methodology and terms and manner for collecting, as well as forms to be filled in with collected data.

**g) Outcomes**

According to the Second EEAP this policy instrument is closely connected to proposed financial instruments (credit lines, subsidies, loans) and introduction of Energy Efficiency Fund. Estimated potential for energy savings according to the second EEAP, as a result of synergy of these instruments for the period 2010-2018 is 0.0436 Mtoe in residential sector and 0.0170 Mtoe in public and commercial sector (Table 2). Data about cost-effectiveness are not available.

**Table 2: Estimation of final energy savings according the second EEAP**

| Policy instrument        | Savings 2010-2012 | Savings total 2012-2018 |
|--------------------------|-------------------|-------------------------|
| Energy audit (mandatory) | -                 | 8.94 PJ                 |

**1.1.1.3 Energy management system in buildings****a) General information**

The Law on Efficient Use of Energy has created a legal base for establishing the system of energy management. Introduction and implementation of energy management system should help the public administration bodies, autonomous province, local self-governments with more than 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 limit (to be determined by the Government through adequate regulation), to reduce energy consumption in accordance with the requirements defined in the same regulation (this regulation is in the process of preparation).

This instrument is still not in force, as secondary legislation necessary for its conduction is still not issued. The only documents are those concerning training of energy managers: the Rulebook on conditions in terms of personnel, equipment and facilities of the organization that conducted the training for energy managers and authorized energy advisors (Ministry of Mining and Energy, 2015a) and the Rulebook on the manner of implementation and content of training program for energy managers, expenditures for attending the training courses, and detailed conditions, curriculum, and taking of the examination for energy managers (Ministry of Mining and Energy, 2015b).

<sup>5</sup> <http://mre.gov.rs/energetska-efikasnost.php>

**b) Type of policy instrument**

Energy management system belongs to regulatory policy instruments, but also has awareness raising and informative purpose. Implementation in municipalities' and government's buildings is especially important, because public sector should be an example of good practice, in implementation energy efficiency policy.

**c) Objectives**

The main objective of introducing energy management system in buildings is reduction of energy consumption in public and commercial buildings. The designated organizations define targets for energy consumption reduction and prepare energy efficiency plans and programs in order achieve proposed targets in the most convenient manner - through organization and investment. The objective is to save a total of 1.87 PJ of energy by 2018.

**d) Target group**

Target groups for energy management system's implementation in buildings are bodies of public administration and other authorities of the Republic of Serbia, authorities of the autonomous province, authorities and bodies of local self-governments with a population exceeding 20,000, and other public services using buildings in public ownership, as well as companies whose core activity is in the sector of trading and services (if they consume more energy than prescribed by the Government) and companies whose core activity is in the manufacturing sector and posses facilities which jointly (in manufacturing and trading and services) consume more energy than prescribed.

**e) Rules and influencing mechanisms**

Designated organizations will be required to appoint an energy manager, with the appropriate license, who will be responsible for monitoring and analyzing energy consumption data, planning and implementing the energy efficiency measures.

The designated organization prepares energy efficiency plans and programs, and informs Ministry of Mining and Energy (Department for energy efficiency and renewable energy) on achieved results of their implementation annually. Designated organizations from public and commercial sectors are required to conduct energy audits at least once every 10 years.

Rules and influencing mechanisms are still not prescribed by appropriate rulebooks.

**f) Implementation network**

Ministry of Mining and Energy (Department for energy efficiency and renewable energy) prescribed conditions in terms of personnel, equipment and facilities of the organization that conducted the training for energy managers and authorized energy advisors. This Ministry is responsible for the register of authorized energy advisors, and responsible Minister issues appropriate licenses. The same Ministry is in charge for the database with conducted energy audits. Ministry should prescribe data that shall be collected, methodology and terms and manner for collecting, as well as forms to be filled in with collected data.

**g) Outcomes**

According to the second EEAP, in order to establish a system of energy management, Ministry of Mining and energy has provided grants from Japan and the UNDP. The Japanese project will help to establish a training program for energy managers, prepare bylaws, establish a training center for energy managers and energy advisors, as well as databases and integrated platform for the collection and analysis of data submitted by designated organizations. UNDP will donate a database for energy management at the local level. The EEAP envisages that the first saving can be achieved in 2015, and gives projection of final energy savings (Table 3). Data about cost-effectiveness are not available.

**Table 3: Projection of final energy savings as a result of introduction of energy management system**

| Policy instrument        | Savings 2010-2012 | Savings total<br>2012-2018 |
|--------------------------|-------------------|----------------------------|
| Energy management system | -                 | 1.87 PJ                    |

## 1.1.2 DISSEMINATION AND AWARENESS INSTRUMENTS/INFORMATIVE POLICY INSTRUMENTS

Energy Labeling is the only policy instrument that is classified in this category. Activities related to energy labeling in Serbia begun in 2005/06 when Energy Efficiency Agency of the Republic of Serbia (ceased to exist in 2012) conducted a promotion and raising awareness campaign for usage of energy-efficient household appliances. The campaign included video on household appliances` energy labeling, and distribution of 996,000 leaflets related to energy labeling of appliances (The Government of the Republic of Serbia, 2013b). The effect of this measure wasn't directly measurable, but it coincides with the period when all major retailers begin to label home appliances, although it was not mandatory at the time.

### 1.1.2.1 Energy Labeling

#### a) General information

With the enforcement of the Law on Efficient Use of Energy in 2013, the energy labeling of household appliances became mandatory. By adoption of the regulation (Government of the Republic of Serbia, 2013c) and rulebooks (Ministry of Energy, Development and Environment, 2014a-g) on the labeling of energy-related products in 2013 and 2014 full transposition of Directive 2010/30/EU and Delegated Acts is achieved.

#### b) Type of policy instrument

Energy labeling belongs to the policy type "Energy information and advice". It combines information, motivation and advice.

#### c) Objectives

The objective of energy labeling is to reduce electricity consumption by introducing more energy-efficient household appliances (refrigerators, stoves, washing machines, dishwashers, air conditioners, electrical lamps and luminaires, etc.). The objective is to save a total of 0.5 PJ of energy by 2018.

#### d) Target group

Target group for energy savings is residential sector, i.e. households. Obligations of labeling have suppliers and vendors of products.

#### e) Rules and influencing mechanisms

The Regulation (Government of the Republic of Serbia, 2013c) prescribes that, based on Rulebooks (Ministry of Energy, Development and Environment, 2014a-g) the following products shall be labeled regarding energy consumption, and/or energy efficiency: household refrigerating devices, TVs,

household washing machines, household dishwashers, electric ovens, air-conditioning devices and electrical lamps and luminaires. The Regulation likewise regulates: the obligations of suppliers and vendors regarding products being labeled, the contents of the energy efficiency label, the energy efficiency classes, obligations regarding the data sheet and technical documentation of the product, methodology for determination of energy efficiency class, obligations during the remote sale of products, as well as inspection supervision.

#### **f) Implementation network**

Ministry of Mining and Energy and market inspection are directly responsible for conducting this policy instrument. Also, the role of NGOs and consumers associations in the cases of regulations violation is very important.

#### **g) Outcomes**

The second EEAP analysed results of implementation energy labelling in period of implementation of the first EEAP when it was voluntary, and found that the energy saving was 0.00228 Mtoe. For the interior lighting, according to the first EEAP, the expected target of savings was almost reached, while for household appliances saving wasn't determined. Table 4 presents projection of final energy savings according to the second EEAP. Data about cost-effectiveness are not available.

**Table 4: Projection of final energy savings (The Second EEAP)**

| Policy instrument | Savings 2010-2012 | Savings total 2012-2018 |
|-------------------|-------------------|-------------------------|
| Energy Labeling   | 0.095 PJ          | 0.5 PJ                  |

## **1.1.3 ECONOMIC POLICY INSTRUMENTS**

The second EEAP envisaged different economic policy instruments for supporting activities and measures related to energy efficiency. However, the only implemented instrument is subsidizing from the Budget Fund for energy efficiency.

### **1.1.3.1 Subsidy**

#### **a) General information**

The Law on Efficient Use of Energy provided the framework for establishment of the Budget Fund for energy efficiency, with an aim to provide funds, to finance or co-finance projects, programs and activities directed to increase efficiency of energy use. The Budget Fund was established in 2013 (Government of the Republic of Serbia, 2013d). Financing or co-financing from the Budget Fund shall be governed in accordance with the annual program for financing activities and measures for improving energy efficiency. Regulation on establishing the program for financing activities and measures for improving energy efficiency in 2014 (Ministry of Energy, Development and Environment 2014h) was the first Program for financing that was adopted.

**b) Type of policy instrument**

Subsidy is an economic policy instrument.

**c) Objectives**

The main objective is financial supporting of measures and mechanisms directed to energy efficiency improvement, envisaged by the Law, the Action Plan and other strategic documents of the energy sector. It shall contribute in achieving following objectives: energy saving and rational use by introduction of modern technologies and products with economically justified implementations and usages; use of renewable energy for own needs; greater employment of business entities; protection of the environment by reduced emissions of greenhouse gases; increasing public awareness of the importance and effects of energy efficiency.

**d) Target group**

One of the major target groups is the buildings sector. Regulation (Ministry of Energy, Development and Environment 2014h) specifies activities that shall be supported: improvement of energy efficiency in buildings (refurbishment, renovation, replacement or installation of new energy efficient equipment in systems for heating and/or cooling, replacement/modernization of interior lighting, introduction of a system for automatic control etc.); connection of new consumers to existing district heating systems; connection of consumers, who use electricity for direct heating or inefficient boilers/stoves for heating to existing gas distribution network; installation of heat pumps with low nominal power and high coefficient of performance; installation of biomass boilers; installation of solar collectors for heating domestic hot water; promotion of energy efficient appliances in households; raising awareness of the importance of energy efficiency.

**e) Rules and influencing mechanisms**

For the realization of the Program, the Budget Fund provided the total amount of 300 million of dinars (approximately 2.5 million of Euro) in 2014. Additional funding should be provided by donations. For the household sector total amount of 100 million of dinars (approximately 825,000 Euro) is allocated. Fund's beneficiaries shall be commercial banks while loan beneficiaries shall be individuals and associations of homeowners.

For the public sector the total amount of 180 million of dinars (approximately 1.48 million of Euro) is allocated. Beneficiaries of the funds shall be local authorities. Financing of projects should be carried out in accordance with the Regulation that defines conditions and manners for allocation and use of funds, as well as methods of monitoring, contractual commitments and obligations.

The Rulebook on the conditions for allocation and use of the Budget Fund for improving energy efficiency of the Republic of Serbia and criteria for exemption from the obligation of performing an energy audit (Ministry of Mining and Energy, 2014h) in more detail regulates necessary documentation that shall be submitted, criteria for the selection and ranking of projects, as well as maximal participation in costs, provided by the Fund.

**f) Implementation network**

Implementation of this policy instrument shall be carried out by Ministry of Energy and Mining, local authorities and commercial banks.

### **g) Outcomes**

The Rulebook on the conditions for allocation and use of the Budget Fund, defines as the first criteria for ranking the expected energy savings in kWh/RSD. Although, for the first open call, projects that shall be financed are selected (Ministry of Energy, Development and Environment, 2014i), (Ministry of Energy, Development, 2014j), expected energy savings are still not presented. So far eleven projects got financing from the Budget Fund.

## **1.1.4. CAPACITY BUILDING AND NETWORKING**

Instruments related to capacity building, are new, adopted in 2015, and can be classified in two sections: education and training for energy managers (under jurisdiction of Ministry in charge for energy) and education and training for engineers to be specialized in area of energy efficiency of buildings (under jurisdiction of Ministry in charge for construction).

### **1.1.4.1 Education and training for energy managers**

#### **a) General information**

In accordance with the Law on Efficient Use of Energy (Government of the Republic of Serbia, (2013a)<sup>6</sup>, The Rulebook on the manner of implementation and content of training program for energy managers, expenditures for attending the training courses, and detailed conditions, curriculum, and taking of the examination for energy managers (Ministry of Mining and Energy, 2015b) prescribes the manner in which training shall be delivered, the content of theoretical and practical training for energy managers, the amount and manner of payment of costs related to energy manager training, and detailed conditions, the curriculum and taking of the examination for energy managers.

#### **b) Type of policy instrument**

This policy instrument is classified as a capacity building policy instrument.

#### **c) Objectives**

Objectives of this policy instrument, in order to contribute to capacity building, are to prescribe curriculums of different trainings for energy managers, depending on target group, the conditions to be met by candidates who shall attend training, training and examination procedure, as well as related costs.

#### **d) Target group**

Person who can attend training shall have: higher education of the first degree academic studies in the field of technical or technological sciences with the extent of 180 ECTS (European Credit Transfer

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<sup>6</sup> [http://www.mre.gov.rs/doc/efikasnost-izvori/efikasnost/A\\_01\\_Zakon\\_o\\_efikasnom\\_koriszenju\\_energije.pdf](http://www.mre.gov.rs/doc/efikasnost-izvori/efikasnost/A_01_Zakon_o_efikasnom_koriszenju_energije.pdf) (28.07.2015)



System) or higher education of the second degree of academic study at master academic studies in educational and scientific fields of mechanical engineering, electrical engineering or technology.

#### **e) Rules and influencing mechanisms**

The curriculums of training programs are different depending on energy management system obligors:

- 1) The training for energy managers for energy management systems with predominant activity in the manufacturing sector, which includes public enterprises, referred to as energy managers in the field of industrial energy;
- 2) The training for energy managers for systems with predominant activity in the sector of trade and services, as well as government authorities and other authorities of the Republic of Serbia, autonomous province, as well as public services and public companies which do not conduct the activity in the manufacturing sector- referred to as energy managers for the buildings sector;
- 3) The training for energy managers for system of local self-governments with more 20,000 inhabitants (energy managers in the field of municipal energy).

The Organization in charge for training appoints mentors who supervise the trainees. The number of participants in the training sessions for the use of specialized software can be up to 20. The number of participants in the classes of practical training cannot be more than ten.

#### **f) Implementation network**

Training for energy managers shall be carried out by the Organization that meets the requirements regarding human resources, equipment and premises for delivering training for energy managers and authorized energy advisors. Rulebook on conditions regarding human resources, equipment and premises of organizations delivering training for energy managers and authorized energy advisors (Ministry of Mining and Energy, 2015a) prescribes relevant details.

#### **g) Outcomes**

The person who attends the training and passes the examination for the appropriate type of energy manager is trained to: collect and analyze data on use of energy provided by energy management obligors, prepare plans and programs of energy efficiency for energy management obligors, prepare annual reports on the program's objectives and plan of energy efficiency, undertake other actions and measures prescribed by the Law regulating the efficient use of energy. Although, there were no appropriate legislative in the time of training, it has been estimated that approximately 1,700 energy advisors have been trained in Serbia so far (GIZ, 2015).

According to the second EEAP, expected savings due to introduction of energy management system are 1.87 PJ until 2018. Education and training for energy managers is a precondition for that achievement. Data about cost-effectiveness are not available.

### 1.1.4.2 Education and training for energy efficiency in buildings

#### a) General information

In accordance with the Law on planning and construction<sup>7</sup>, The Rulebook on licensing exams in the field of spatial and urban planning, design of technical documentation, construction and energy efficiency and on issuing and revocation of licenses for the authorized urban planner, designer, contractor and responsible planner (Ministry of Construction, Transport and Infrastructure, 2015) regulates the conditions, program and manner of taking professional exams in the field of spatial and urban planning, the design documentation, construction and energy efficiency, and the conditions and procedures for granting and revoking licenses of authorized urban planner, designer, contractor and responsible planners.

#### b) Type of policy instrument

This policy instrument is classified as a capacity building policy instrument.

#### c) Objectives

The aim of this policy instrument is to train engineers for implementation of The Rulebook on Energy Efficiency of Buildings (Ministry of Environment, Mining and Spatial Planning, 2011a) and the Rulebook on Conditions, Content and Manner of Issuance of Certificates of Energy Performance of Buildings (Ministry of Environment, Mining and Spatial Planning, 2011b), in order to guaranty and document certain level in energy performance of all types of buildings.

#### d) Target group

Persons with acquired education at the master academic studies or bachelor studies as well as education on vocational studies (basic vocational studies, specialized professional studies) and secondary education in construction, architecture, mechanical engineering, electrical engineering, technology or other appropriate can participate in training.

#### e) Rules and influencing mechanisms

Requirement for taking professional exam for responsible energy efficiency engineer for buildings and for obtaining appropriate license is that a person has at least four years of professional experience and completed training in the field of energy efficiency in buildings, according to the program.

#### f) Implementation network

Serbian Chamber of engineers<sup>8</sup> carries out training and examination for energy efficiency in buildings.

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<sup>7</sup> [http://www.ingkomora.org.rs/zakoni/zakon\\_o\\_planiranju\\_i\\_izgradnji2014.pdf](http://www.ingkomora.org.rs/zakoni/zakon_o_planiranju_i_izgradnji2014.pdf) (28.07.2015)

<sup>8</sup> <http://www.ingkomora.org.rs>

**g) Outcomes**

Person educated for energy efficiency in buildings, according to the program, shall have knowledge about all aspects of energy consumption in buildings, influential parameters, possibilities for energy efficiency improvement, as well as related economic aspects.

According to the Second EEAP, savings due to introduction of Minimum energy performance requirements for new or reconstructed buildings are 9.98 PJ until 2018. Education and training for energy efficiency in buildings is a precondition for that achievement. Data about cost-effectiveness are not available.

## 1.1.5 POLICY INSTRUMENTS FOR THE PROMOTION OF ENERGY SERVICES

### 1.1.5.1 Model of Energy Service Agreement for Public Buildings

**a) General information**

The Law on Efficient Use of Energy for the first time in Serbia introduced and defined terms: energy service and energy service company (ESCO). The law stipulates that the provision of energy services shall be governed by an Energy Services Agreement concluded between ESCO and the relevant energy consumer. The law also, defines mandatory elements of this agreement (efficiency criteria, measures for increasing energy efficiency, manner of financing of the project, energy consumption within the reference period, fees for the provided energy services, etc.). The Rulebook on Model Energy Service Contracts for the Implementation of Energy Efficiency when Users are from Public Sector (Ministry of Energy, Development and Environment, 2015c) was developed to help public entities, as well ECCOs in preparation of an Energy Service Agreement. Two models for contracts are provided, one for public buildings and another for public lighting.

**b) Type of policy instrument**

This policy instrument is created to promote implementation of energy services in buildings sector.

**c) Objectives**

This instrument allows establishment of public-private partnerships between the relevant public partner (e.g. a municipality, a public company, a State) and the relevant private partner (i.e. ESCO company) on a long-term basis wherein the installation and management of the undertaken energy efficiency measures by a private partner shall be financed from the savings achieved. For overall bankability of ESCO projects in Serbia it is important to note that this instrument allows the receivables attributed to a private partner from the savings, to be further transferable to third parties.

**d) Target group**

Relevant public partner (e.g. a municipality, a public company, a State) and the relevant private partner (i.e. ESCO company) are the target groups for this instrument.

### e) Rules and influencing mechanisms

The model agreement set out by this policy instrument envisages three main periods of the ESCO agreement. The Preparatory Period mainly consists of planning and design activities. The second - Implementation Period consists of activities related to the implementation of the respective energy savings measures by a private partner in cooperation with a public partner. The Guarantee Period is the period of utilizing the energy savings potentials of the contracted facility. In this period energy savings, i.e. financial savings are achieved as a result of the implemented measures. The model agreement further contains amply sophisticated provisions related to collateral packages, warranties regarding the performance, the insurance of the project, the force majeure clauses and detailed rules regarding the aforesaid three main contractual periods. It also contains a comprehensive set of appendices where necessary details relevant for a particular project shall be set, such as details of the contracted facility, the instructions for achieving energy savings, as well as the guidelines for verification of the quality of maintenance and performance levels (Petrikić & Partneri AOD, 2015).

### g) Outcomes

This policy instrument has been introduced in 2015, so results and outcomes are expected to be visible in the future. The second EEAP considers implementation of this policy instrument in energy efficiency improvement measures in public and commercial buildings. Total energy saving potential of this measure is 0.0169 Mtoe (0.71 PJ), up to 2018, but the share of ESCO projects in it was not determined. In table 5 projection of final energy savings according to the second EEAP is presented. Data about cost-effectiveness are not available.

**Table 5: Projection of final energy savings according to the second EEAP**

| Policy instrument | Savings 2010-2012 | Savings total 2012-2018 |
|-------------------|-------------------|-------------------------|
| Energy Labeling   | -                 | 0.71 PJ*                |

\* Total saving potential of energy efficiency improvement measures in public and commercial buildings (partly will be financed by ESCO)

## 1.1.6 POLICY INSTRUMENTS FOR RESEARCH AND DEVELOPMENT AND BEST AVAILABLE TECHNOLOGY (BAT) PROMOTION

### 1.1.6.1 Funding for research in energy efficiency

#### a) General information

The Strategy of science and technological development of the Republic of Serbia for the period 2010-2015 (Government of the Republic of Serbia, 2010a) identified “Energy and Energy Efficiency” as one of the top priorities in the domain of science and technology in Serbia. This priority is supported partly through the co-funding of integral and interdisciplinary research in “energy efficiency of production, distribution and use of energy, with a special attention to improvement of energy efficiency in buildings” and partly through funding of projects in the Program of technological

development (Ministry of Education, Science and Technological Development, 2010). Currently, different research projects are financed, and they have been selected through public call from 2010.

#### **b) Type of policy instrument**

This policy instrument is created to support research and development related to energy efficiency.

#### **c) Objectives**

General objectives of this instrument is to improve capacities of Serbian economy by securing energy supply, rationalizing consumption, reducing of dependency on imports and expanding production of energy equipment and equipment for the protection of the environment, contributing to the reduction of unemployment rate (Stojiljkovic et al., 2012). Within topics of energy, mining and energy efficiency, energy efficiency in the buildings sector is emphasized. Objectives are achieved by different research projects that are financing or co-financing by the State budget.

#### **d) Target group**

Relevant scientific institutions (e.g. Universities, research institutes, etc.), and relevant public (e.g. a municipality, a public company, a State) or commercial partners (owner of buildings) are target groups for this instrument.

#### **e) Rules and influencing mechanisms**

The Ministry of Education, Science and Technological Development<sup>9</sup> regularly announces public calls for funding research in the Program of technological development (topic: Energy, mining and energy efficiency) and for co-funding of integral and interdisciplinary research (topic: Energy and energy efficiency, sub-topic: Energy efficiency of production, distribution and use of energy, with a special attention to improvement of energy efficiency in buildings). Researches in Program of technological development are 100% financed from the budget of Ministry of Education and Science, while integral and interdisciplinary researches are partly financed by public or private partners. Funding includes salaries of researchers and research equipment.

#### **f) Implementation network**

The Ministry of Education, Science and Technological Development - Department for Technological Development, Technology Transfer and Innovative Systems<sup>10</sup> and Department for Science<sup>11</sup> announce public calls for funding and co-funding of research and development projects related to energy efficiency in buildings. The same Ministry is responsible for selecting projects to be funded, and monitoring of their implementation, as well as for the supervision of achieved results.

#### **g) Outcomes**

Total budget of the Ministry of Education, Science and Technological Development for project in energy field is approximately 4 million euro per year. However, there is no publicly available data about the outcomes of ongoing and realized projects, and their effects on energy efficiency in buildings.

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<sup>9</sup> <http://www.mpn.gov.rs/?lang=sr-YU>

<sup>10</sup> <http://www.mpn.gov.rs/nauka/tehnoloski-razvoj>

<sup>11</sup> <http://mpn.gov.rs/nauka/integralna-i-interdisciplinarna-istrazivanja>



## 1.1.7 SUMMARY TABLE FOR THE BUILDINGS SECTOR IN SERBIA

| Summary table: Buildings  |   |   |  |   |   |  |
|---|---|---|--|---|---|--|
| Policy instruments  | Short list of implemented policies and measures   | Objective   | Target group and targeted objects  | Rules and influencing mechanism (motivation or punish non-compliance) | Implementation network  |  |
| <b>Regulatory policy instruments</b>  | Minimum energy performance requirements for new or reconstructed buildings<br>Energy audit (mandatory)<br>Energy management system in buildings | Reduction of energy consumption in buildings for heating and cooling                    | Target group: Owners, users and investors in public, commercial and residential buildings.<br>Targeted objects: Residential, commercial and public buildings | Punish non-compliance   | Ministry of Mining and Energy<br>Ministry of Construction, Transport and Infrastructure<br>Chamber of Engineers |  |
| <b>Dissemination and awareness instruments/Informative policy instruments</b> | Energy Labeling   | Reduction of electricity consumption for operation of different appliances in buildings | Target group: Households, suppliers and vendors of products<br>Targeted objects: Households appliances   | Punish non-compliance   | Ministry of Mining and Energy   |  |
| <b>Economic policy instruments</b>  | Subsidy   | Financing of activities and measures directed to improve energy efficiency in buildings | Target group: Owners and investors in public, commercial and residential buildings.<br>Targeted objects: Residential, commercial and public buildings        | Motivation  | Ministry of Mining and Energy   |  |

|   |   |  |   |                   |   |
|---|---|--|---|-------------------|---|
| <p><b>Capacity building and networking</b></p>                                  | <p>Education and training for energy managers<br/>Education and training for energy efficiency in buildings</p> | <p>Training and education for implementation proposed regulatory policy instruments</p>                      | <p>Target group: Persons with acquired education at the master academic studies or bachelor studies as well as education on vocational studies (basic vocational studies, specialized professional studies) and secondary education in construction, architecture, mechanical engineering, electrical engineering, technology or other appropriate.<br/>Targeted objects: Commercial and public buildings</p> | <p>Motivation</p> | <p>Ministry of Mining and Energy</p>                                |
| <p><b>Policy instruments for the promotion of energy services</b></p>           | <p>Model of Energy Service Agreement for Public Buildings</p>   | <p>Financing of activities and measures directed to improve energy efficiency in buildings</p>               | <p>Target group: public institutions (e.g. a municipality, a public company, a State), ESCO companies<br/>Targeted objects: Public buildings</p>  | <p>Motivation</p> | <p>Ministry of Mining and Energy</p>                                |
| <p><b>Policy instruments for Research and Development and BAT promotion</b></p> | <p>Funding for research in energy efficiency</p>  | <p>Scientific research and development of technologies for improvement of energy efficiency in buildings</p> | <p>Target group: Scientific institutions (e.g. Universities, research institutes, etc.), public institutions (e.g. a municipality, a public company, a State), owners of the buildings<br/>Targeted objects: Residential, commercial and public buildings</p>   | <p>Motivation</p> | <p>Ministry of Education, Science and Technological Development</p> |



## 1.2 POLICY INSTRUMENTS IN THE TRANSPORT SECTOR

Compared to the buildings sector, policy instruments for increasing energy efficiency in the transport sector are less developed. Planning instruments are developed based on the Law on Road Traffic Safety (Government of the Republic of Serbia, 2009a)<sup>12</sup> are:

- Improvements of bicycle and pedestrian infrastructure,
- Traffic calming, and
- Traffic management systems.

Regulatory policy instruments related to energy efficiency in transport are based on mixture of regulations related to energy sector, but also to trade, market regulation, environment, etc.:

- Fuel economy standards/vehicle CO<sub>2</sub>-emission standards,
- Fuel quality standards.

Currently, there is no specific financial policy instruments dedicated to energy efficiency in transport sector in Serbia. In previous period (2010-2012) the Government of Republic of Serbia 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, with an idea to encourage the replacement of old vehicles equipped with engines that do not meet even Euro 3 standard, with new domestically produced vehicles equipped with Euro 5 engines (Government of the Republic of Serbia, 2013c). Also, in 2011 the Fund for Environmental Protection had the programs for subsidizing purchasing vehicles with low emissions of CO<sub>2</sub> (in 2011) and adopted the 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 lower than 100 g/km (in 2012). This Fund ceased to operate in 2012.

Dissemination and awareness instruments in transport sector are mostly related to transport safety. Promotion of eco-driving and car sharing scheme are proposed as information measures, but appropriate instruments for supporting are still not developed.

Research and development in the area of energy efficiency in transport sector is not recognized as a priority in relevant strategy (Government of the Republic of Serbia, 2010a) and there are no specific policy instruments which are targeting this sector.

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<sup>12</sup> <http://en.abs.gov.rs/regulations>



## 1.2.1 PLANNING INSTRUMENTS

### 1.2.1.1 Improvements of bicycle and pedestrian infrastructure

#### a) General information

The Law on Road Traffic Safety (Government of the Republic of Serbia, 2009a) regulates issues related to bicycle traffic. Improvements of bicycle and pedestrian infrastructure are under jurisdiction of local self-governments, and shall be regulated in spatial and urban plans (Government of the Republic of Serbia, 2014a). In large cities there are initiatives for improvements of bicycle and pedestrian infrastructure, often financially and organizationally supported by international institutions and organizations<sup>13</sup>.

#### b) Type of policy instrument

Improvements of bicycle and pedestrian infrastructure is planning policy instrument.

#### c) Objectives

Improvements of bicycle and pedestrian infrastructure should increase the share of biking and walking in passenger transport and consequently reduce fuel consumption.

#### d) Target group

Passengers in city transport are the main target group.

#### e) Rules and influencing mechanisms

Introduction of bicycle and pedestrian infrastructure in local spatial and urban plans is the precondition for their construction. Improvements of bicycle and pedestrian infrastructure should motivate people to use these modes of transport. However, in Serbian regulations and practice still there are no sanctions for using non-efficient modes of transport.

#### f) Implementation network

Local administrations are responsible for spatial and urban plans development.

#### g) Outcomes

There is no officially available document about energy savings achieved by this policy instrument.

### 1.2.1.2 Traffic calming

#### a) General information

This policy instrument was developed with an aim to reduce and slow down the intensity of traffic. It is directly related to the relevant international documents, UN Improving Global Road Safety (United Nations Secretary, 2013) and International Road Assessment Programme<sup>14</sup>, which have very

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<sup>13</sup> [http://www.rs.undp.org/content/serbia/en/home/operations/projects/environment\\_and\\_energy/support-to-sustainable-transport-in-the-city-of-belgrade.html](http://www.rs.undp.org/content/serbia/en/home/operations/projects/environment_and_energy/support-to-sustainable-transport-in-the-city-of-belgrade.html) (30.07.2015)

<sup>14</sup> International Road Assessment Programme, iRAP Report Serbia, 2009., available at <http://www.irap.net/about-irap-3/assessment-reports?download=66:irap-serbia-results> (30.07.2015)

important role in creating legal base for application of measures for traffic calming at international level. Legal base for this policy instrument are the Law on road traffic safety (Government of the Republic of Serbia, 2009) and the Rulebook of the technical measures for slowing road traffic (Ministry of Transport, 2013).

#### **b) Type of policy instrument**

This is planning policy instrument.

#### **c) Objectives**

Objective of this policy instrument is to ensure an increase of quality of transport intensity and safety by changes in road geometry and placement of proper traffic equipment, pavement markings and traffic signs. Traffic calming measures are developed to ensure reduction of vehicle speed. This would lead to an increase of energy efficiency and caused by decrease fuel consumption.

#### **d) Target group**

Target groups are users (public and private companies), drivers, pedestrians, public and private companies that maintain the roads and railways, investors, equipment producers etc.

#### **e) Rules and influencing mechanisms**

No rules and influencing mechanisms are defined.

#### **f) Implementation network**

Most important role in terms of application of the policy instrument has primarily the Ministry of Construction, Transport and Infrastructure Department for road transport, roads and safety, Group for road safety<sup>15</sup>. To support this measure Ministry developed the Rulebook on technical tools for slowing road traffic (Ministry of construction, transport and infrastructure, 2014). In the case when roads are under jurisdiction of local authority, each local self-government shall adopt Rulebook on the criteria for the installation of technical traffic calming tools<sup>16</sup> in order to specify locations where road slowing tools shall be introduced. Sector for traffic police with in the Ministry of interior<sup>17</sup> is involved in managing traffic safety and monitoring and improvement of legislation in road safety.

The Road Traffic Safety Agency<sup>18</sup> continuously coordinates and performs different tasks: cooperation and coordination with regional and local road traffic safety bodies, offering professional help to the bodies in order to improve traffic safety, creating professional instructions, manuals and guides for improving the work of the local bodies, following international experiences and accomplishments in the field of road traffic safety.

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<sup>15</sup> <http://www.mgsi.gov.rs/cir/odsek/grupa-za-unapređenje-bezbednosti-saobraćaja-na-putevima>

<sup>16</sup> <http://www.tsgserbia.com/file/SRBIA%20Podzakonski%20akti/Pravilnik%20o%20kriterijumima%20za%20ugradnju%20tehničkih%20sredstava....pdf>

<sup>17</sup> <http://prezentacije.mup.gov.rs/usp/Poslovi/Poslovi.html>

<sup>18</sup> <http://en.abs.gov.rs/>

## **g) Outcomes**

The Rulebook of the technical measures for slowing road traffic has contributed to an increase in infrastructure investments in transport sector (Road Traffic Safety Agency, 2015). Although this instrument affects fuel consumption, data about achieved savings are not available.

### **1.2.1.3 Traffic management system**

#### **a) General information**

This policy instrument is primarily targeting the problem of traffic organization and transport infrastructure. It should contribute in establishing extended, improved and safe transport network. Traffic management system is a complex system that combines infrastructure, traffic regulations and adequate enforcement. Implementation of traffic management system in the Republic of Serbia coincided with initiatives of Introduction and Benefits of Intelligent Transport Systems (Public Enterprise "Roads of Serbia, 2009). The legal base for implementation of traffic management system is the Strategy of the Railway, Road, Inland Waterway, Air and Intermodal Transport Development in the Republic of Serbia (2008-2015) (Government of the Republic of Serbia, 2007)<sup>19</sup>. Traffic management system as policy instrument can be used in traffic control, incident management, travel demand management, operation and maintenance, environmental conditions monitoring, automated dynamic warning and enforcement and non-vehicular road user safety.

#### **b) Type of policy instrument**

Traffic management system represent principally planning policy instrument, but purpose of it is also informative.

#### **c) Objectives**

The main objective of this policy instrument is to increase safety and efficiency of transport (including energy efficiency).

#### **d) Target group**

This instrument is targeting all transport modes. Target groups are owners, users and investors in public, private and commercial companies, Governmental agencies, transport operators and environmental organisation.

#### **e) Rules and influencing mechanisms**

Rules and influencing mechanisms are still not prescribed.

#### **f) Implementation network**

Ministry of construction, transport and infrastructure - Department for transport, Group for intelligent transport systems<sup>20</sup>, promotes and defines the traffic signalization, equipment, devices

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<sup>19</sup> [http://www.putevi-srbije.rs/strategijapdf/Strategijatransport\\_lat.pdf](http://www.putevi-srbije.rs/strategijapdf/Strategijatransport_lat.pdf)

<sup>20</sup> <http://www.mgsi.gov.rs/cir/odsek/grupa-za-intelligentne-transportne-sistemee>

and systems for managing and controlling traffic, as well as intelligent systems for roads and vehicles. Legal base for implementation traffic management systems represents Strategy for planning, development and intelligent transport systems application on roads of the Republic of Serbia<sup>21</sup>

### **g) Outcomes**

The good practice show that, after implementation of different measures of this policy instrument increase of traffic flow is up to 25% and travel time reduction is up to 25%. Reduction of energy consumption achieves almost 30% (Public Enterprise "Roads of Serbia, 2009).

## **1.2.2 REGULATORY POLICY INSTRUMENTS**

### **1.2.2.1 Fuel Quality Standards**

#### **a. General information**

The Rulebook on technical and other requirements for petroleum-derived liquid fuels (Ministry of Energy, Development and Environment, 2013a) prescribes the required quality of petrol and liquid fuels. This Rulebook is adopted on the basis of the Law on Technical Requirements for Products and Conformity Assessment (Government of the Republic of Serbia, 2009b). The Directive 98/70/EC on the quality of petrol and diesel fuels is partially transposed to the Rulebook (European Integration Office, 2014). Implementation of this policy instrument is further support by the Regulation on marking of oil products (Government of the Republic of Serbia, 2013e).

#### **b. Type of policy instrument:**

A fuel standard is regulatory and mandatory policy instrument.

#### **c. Objectives:**

Application of this policy instrument directly affects increasing of liquid fuel quality and reducing consumption. Consequently this leads to improvement of energy efficiency in transport sector.

#### **d. Target groups:**

This policy instrument is related to unleaded petrol, aviation gasoline, jet fuel and diesel. Therefore, higher-quality liquid fuels are targeting energy efficiency in all transport sectors.

#### **e. Rules and influencing mechanisms**

This policy instrument prescribes technical and other requirements to be met by petroleum based liquid fuels that are used in internal combustion engines that are as fuels placed on the market of the Republic of Serbia. It also defines method for assessment of compliance (of selected fuel) with standards. Prescribed method of sampling is in accordance with SRPS EN ISO 3170 and SRPS EN ISO 3171 standards. Penalties for placing fuels with lower quality than specified are prescribed by

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<sup>21</sup> <http://www.putevi-srbije.rs/strategijapdf/itsrezime.pdf>

regulation related to control and monitoring of petroleum fuels on the market (Government of the Republic of Serbia, 2013e).

**f. Implementation network:**

The appointed and accredited institutions are responsible for assessment of specific fuel compliance with standards. Appointed procedure is conducted in accordance with Regulation on method of appointment and authorization of the body for assessment of compliance (Government of the Republic of Serbia, 2009c), while the appropriate accreditation procedure is the responsibility of Accreditation body of Serbia<sup>22</sup>. Inspection and monitoring of fuel quality and fuel marking are the responsibility of the Ministry of Trade, Tourism and Telecommunications – Department for Market Inspection.

**g. Outcomes:**

There are no official data on increasing energy efficiency related to quality of fuels used in transport sector.

### 1.2.2.2 Fuel economy standards/vehicle CO<sub>2</sub> - emission standards

**a. General information**

This policy instrument was introduced by 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 (National Assembly of the Republic of Serbia, 2011). Approval of vehicles according to United Nations Economic Commission for Europe (UNECE) regulations include determination and verification that the vehicle's characteristics meet the requirements related to the active safety, passive safety, environmental protection and energy saving (fuel consumption), control of the conformity of series production, a unique method of application and acceptance by all contracting parties. The Stabilization and Association Agreement of the Republic of Serbia<sup>23</sup> stipulates the obligation of acceptance and implementation of EU legislation in the field of approval of road vehicles. The level of harmonization between UNECE regulations and EU regulations is very high, as they have the same technical requirements and procedures for testing. Hence, the Republic of Serbia performs controls of the conformity of imported vehicles, both on the basis of UNECE regulations, and on the relevant EU regulations (Government of the Republic of Serbia, 2013b).

**b. Type of policy instrument:**

This is regulatory and mandatory policy instrument.

**c. Objectives:**

The key problem in terms of energy efficiency, environmental pollution and safety in Serbian road transport sector is the age of the vehicle fleet (Government of the Republic of Serbia, 2013b). Using newer vehicles, with stricter emission and consumption standards should increase energy efficiency in the transport sector. The objective is to save 2.43 PJ of energy in period 2012-2018 (Government of the Republic of Serbia, 2013b)

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<sup>22</sup> <http://www.ats.rs> (30.07.2015)

<sup>23</sup> [http://ec.europa.eu/enlargement/pdf/serbia/key\\_document/saa\\_en.pdf](http://ec.europa.eu/enlargement/pdf/serbia/key_document/saa_en.pdf) (30.07.2015)

**d. Target groups:**

Importers and car dealers are the target group for this policy instrument.

**e. Rules and influencing mechanisms:**

Currently all new imported vehicles must be equipped with engines that meet at least Euro 5 standard (Government of the Republic of Serbia, 2013b), while for the import of used vehicles minimum Euro 3 standard is required (Government of the Republic of Serbia, 2010b). Customs Administration makes inspection of compliance of imported vehicle with proposed vehicle standards by inspection of vehicle, insight into accompanying documents and comparing of vehicle and accompanying documents with technical specification for selected vehicle type. If Customs Administration is unable to define compliance of vehicle with Euro 3 standard, further inspection is carried out in accordance with conditions provided by Road Traffic Safety Agency.

**f. Implementation network:**

Implementation of this policy instrument is responsibility of Road Traffic Safety Agency and the Ministry of Interior, while institutions in charge of monitoring are Road Traffic Safety Agency, Customs Administration and Ministry of Construction, Transport and Infrastructure.

**g. Outcomes:**

Implementation of this policy instrument and corresponding UNECE regulations and EU legislation is very important for the fleet modernization in the Republic of Serbia, but also for the reduction of fuel consumption in the transport sector. Achieved and expected savings in transport sector related to this policy instrument are elaborated in the second EEAP (Table 6).

**Table 6: Achieved and forecast of final energy savings (The Second EEAP)**

| Policy instrument | Savings 2010-2012 | Savings total<br>2012-2018 |
|-------------------|-------------------|----------------------------|
| Vehicle standards | 0.02 PJ           | 2.43 PJ                    |

### 1.2.3 FINANCIAL POLICY INSTRUMENTS

N/A

### 1.2.4 DISSEMINATION AND AWARENESS INSTRUMENTS

N/A

### 1.2.5 POLICY INSTRUMENTS FOR RESEARCH AND DEVELOPMENT

N/A



## 1.2.6 SUMMARY TABLE FOR THE TRANSPORT SECTOR IN #COUNTRY#

| Summary table: Transport   |   |  |   |   |  |  |
|----------------------------|---|--|---|---|--|--|
|                            | Short list of implemented policies and measures       | Objective <sup>24</sup> (improve system, travel or vehicle efficiency) | Target group and targeted objects   | Rules and influencing mechanism (motivation or punish non-compliance) | Implementation network   |  |
| <b>Planning instrument</b> | Improvements of bicycle and pedestrian infrastructure | System efficiency  | Target groups: Passengers in the city transport<br>Target sector: Road transport  | Motivation  | Local self-governments   |  |
| <b>Planning instrument</b> | Traffic calming                                       | System efficiency  | Target groups: All participants in road transport, public and private companies that maintain the roads and railway, equipment producers<br>Target sector: Road transport | Motivation  | Ministry of Construction, Transport and Infrastructure<br>Ministry of Interior<br>Road traffic safety Agency |  |
| <b>Planning instrument</b> | Traffic management systems                            | System efficiency  | Target groups: All participants in road transport<br>Target sector: Road transport  | Motivation  | Ministry of Construction, Transport and Infrastructure   |  |

<sup>24</sup> Energy efficiency in the transport sector can be divided into system efficiency (reduce or avoid travel or the need to travel), travel efficiency (shift to more energy efficient modes) and vehicle efficiency (improve the efficiency through vehicle technology).

|  |  |                    |                                      |                       |  |
|--|--|--------------------|--------------------------------------|-----------------------|--|
| <b>Regulatory policy instruments</b>                   | Fuel economy standards/vehicle CO <sub>2</sub> -emission standards | Travel efficiency  | Target sector: Road transport        | Punish non-compliance | Road Traffic Safety Agency<br>Ministry of Interior<br>Customs Administration       |
| <b>Regulatory policy instruments</b>                   | Fuel quality standards   | Vehicle efficiency | Target sector: All transport sectors | Punish non-compliance | Accredited and Appointed and institutions for fuel inspection<br>Market Inspection |
| <b>Financial policy instruments</b>                    | N/A  | N/A                | N/A                                  | N/A                   | N/A  |
| <b>Dissemination and awareness instruments</b>         | N/A  | N/A                | N/A                                  | N/A                   | N/A  |
| <b>Policy instruments for Research and Development</b> | N/A  | N/A                | N/A                                  | N/A                   | N/A  |





## 2. POLICY INSTRUMENTS ON THE REGIONAL / LOCAL LEVEL

### 2.1 PRESENTATION OF THE CASE STUDY CITY OF NIŠ

#### City / Region:

The City of Niš is located in the south-eastern part of Serbia and it is the third largest city in the country, with 260,237 inhabitants according to census of 2011 (Statistical Office of the Republic of Serbia, 2011a). It covers area 596 km<sup>2</sup> out of which 63.1% is agricultural land (Statistical Office of the Republic of Serbia, 2011b). According to the Ordinance on establishing an unified list of Regions and Local Self-governments per Level of Development for 2014<sup>25</sup> Niš belongs to the first, most developed group of municipalities in Serbia.

In terms of dealing with local energy issues the City of Niš is one of the better performing in Serbian context. Within local administration it has Directorate for Communal Services, Energy and Transport which again consists of several smaller administrative units. One of them is the Department for Energy with five highly educated staff. Until this department was established energy issues in the City of Niš haven't been tackled in organized and systematic manner. In the very beginning activities of the Department included the preparation and adoption of the documents that shape the legal framework for dealing with energy at the local level with a particular focus on district heating (Tariff System, Decision on conditions and manner of heat supply<sup>26</sup> and accompanying ordinances). Activities also included defining the conditions for development of the gas network infrastructure in the City, the intensification of activities related to the participation of the City in the international association "Energy Cities". Furthermore the City of Niš with the support of the Swedish Export Credit Corporation (SEK) implemented the project of preparing the analysis of the potential for heating the city of Nis (excluding district heating). In the initial period employees of the Department have been trained to prepare the energy balance, upon which regular collection of data regarding energy consumption in the public sector started.

Also, after establishing the Department the City of Niš signed the Covenant of Mayors Charter in July 2011 and submitted Sustainable Energy Action Plan (SEAP) in December of 2014<sup>27</sup>. The SEAP is covering period till year 2020 and sets indicative target for CO<sub>2</sub> emissions to 21% compared to baseline levels of 2010, which is equivalent of 842.093,07 t of CO<sub>2</sub>. This plan suggests and foresees 50 measures and actions in five different sectors: buildings, transport, public lighting, water provision and waste management. Measures include:

- **Energy Efficiency Policy / Action**

Implementation of energy efficiency measures in organized manner started in 2008 when trilateral agreement on the use of KfW Development Bank funds within the programme "Rehabilitation of the District Heating Systems in Serbia - Phase III" was signed between the Republic of Serbia, the City of Niš and local district heating provider (Public Utility Company "Gradska toplana"). With this credit arrangement equipment and services were procured for the rehabilitation and modernization of district heating system. In following period with growing understanding of importance of the energy management system, several projects were implemented including one in sector of the public

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<sup>25</sup> [Official Gazette of the Republic of Serbia", No. 104/2014, 2014;](http://www.regionalnirazvoj.gov.rs/Lat/ShowNARRFolder.aspx?mi=171)

<http://www.regionalnirazvoj.gov.rs/Lat/ShowNARRFolder.aspx?mi=171> (30.07.2015)

<sup>26</sup> [http://www.nitoplana.co.rs/index.php?seo\\_name=downloads&next\\_downloads=1](http://www.nitoplana.co.rs/index.php?seo_name=downloads&next_downloads=1) (30.07.2015)

<sup>27</sup> [http://www.covenantofmayors.eu/about/signatories\\_en.html?city\\_id=2996&seap](http://www.covenantofmayors.eu/about/signatories_en.html?city_id=2996&seap) (30.07.2015)

buildings - restoration and renovation of the envelope of one of city's administrative buildings (24, Nikola Pasic Street).

According to the SEAP, the buildings sector is the most important in terms of CO<sub>2</sub> emissions reduction for the upcoming period, till 2020. Therefore, majority of measures, 25 of them, belong to the buildings sector. Most of the measures are energy efficiency related but there are some that belong to utilization of renewables. All the measures in the buildings sector are divided in five subgroups: (1) General measures; (2) Promotional, informational and educational measures and activities; (3) Measures in residential and public buildings owned by the City; (4) Measures in residential sector including collective and individual housing; and (5) Measures in commercial and service buildings.

The category of General measures includes activities related to entire building stock in the City of Niš and can be divided into two subgroups: measures to remove obstacles to the monitoring and control of energy consumption in the buildings sector and schemes for co-financing implementation of identified energy efficiency measures in all subsectors. Group of general measures is considered to be very important and a bases for all others, because on one hand, without collecting data and relevant energy indicators it is impossible to monitor the actual change in energy consumption and corresponding reduction in CO<sub>2</sub> emissions from the buildings sector, and on the other, experiences show that without co-financing mechanisms action plans remain just a wish lists.

Subcategory promotional, informational and educational measures include following: opening of the info-corner on energy efficiency; implementation of the "Engage" campaign on energy efficiency and putting up posters and billboards; continuous informing consumers about ways of energy savings and current energy issues on the back of the energy bill; implementation of thematic promotional and information campaigns to raise awareness of energy efficiency in buildings; organization of conferences to promote the rational use of energy and reduction of CO<sub>2</sub> emissions; educational campaigns on the design, construction and use of buildings in a sustainable way to target groups like architects, contractors and planners; education and introduction of energy efficient principles in public procurement.

Energy efficiency measures for buildings owned by the City can be divided into three groups: Preparatory activities, Operational projects, and Legislative measures. A set of preparatory activities include the following measures and activities: introduction of the Information system of energy management in buildings owned the City; Introduction of energy passports for public buildings, development of a plan of reconstruction of public facilities based on the currently available data on energy consumption and other information on objects (with the possibility of change the plan annually when information system becomes operational) and Introduction of a scheme 50-50 [%] according to which the achieved energy savings, i.e. avoided energy costs are evenly shared between the city administration as operators and users. Overview of specific projects planned in the City of Nis is very long, and here are presented just most potent ones: reconstruction of heating systems in public buildings, introduction of automation and process control and conversion to more efficient energy sources including renewable; installation of solar systems for hot water preparation in education, cultural, sports and administrative buildings owned by the city; installation of thermostatic valve sets on the radiators in buildings owned by the City in which there are multiple users; introduction of efficient indoor lighting in all public buildings; Thermal insulation of envelopes and roofs of buildings public buildings; Installing a high-efficiency power windows in buildings owned by the city; installation of solar photovoltaic systems on the roofs of all public buildings. Legislative-administrative measures on the city level that can result in considerable reduction in CO<sub>2</sub> emissions are as follows: introduction of energy efficiency criteria in public procurement under the Law on Efficient Use of Energy for all the equipment and services buildings owned City; decision of the City Assembly, according to which all new buildings owned by the City should use at least one renewable energy source (Photovoltaic systems, solar collectors, heat pumps); installation of central cooling

systems for new buildings owned by the City; decisions on local tax reduction for construction of low energy and passive buildings.

Energy efficiency measures in the residential sub-sector can be divided into measures for new and for existing buildings. Measures in new buildings will be most effectively achieved by adopting legislation that will limit consumption. Measures of energy efficiency for existing residential buildings include two categories: preparatory activities; and performing projects. Preparatory activities like in the case of the sub-sector public buildings will not have a direct impact on reduction of energy consumption but they would set the necessary preconditions for the successful implementation of the energy efficiency projects. Residential sector is the largest consumer of energy and thus there is the biggest potentials for savings and reduction of CO<sub>2</sub> emissions. Therefore related preparatory activities are of great importance. In addition to these activities following ones have the potential for reduction in energy consumption: co-financing of the reconstruction of facades and roofs of buildings on the principles of sustainable construction; co-financing installation of solar systems for hot water; replacement of existing windows with high efficiency ones; conversion of boilers to renewables; conversion of electric water heaters to a central water heating system.

Energy efficiency measures for the sub-sector commercial and service buildings can be divided into new and existing buildings. Proposed measures for existing buildings include the following activities: use of renewable energy sources; use of energy efficient electrical appliances; installation of energy saving light bulbs. Proposal of measures for new commercial buildings includes: employment of high energy standards in planning and construction; and Installment of efficient equipment and utilization of renewable energy sources.

The SEAP prescribes altogether 17 measures to reduce CO<sub>2</sub> emissions from the transport sector in the City of Nis which are divided into following 5 categories: legislative and planning measures; promotion, information and education measures and activities; specific measures and activities for private and commercial vehicles; specific measures and activities for the vehicles owned by the City; specific measures and activities for the public transport. Legislative and planning measures include activities that arise from legal obligations as well as those related to projects aiming to improve traffic infrastructure, and regulation. Implementation of the planning measures will create necessary preconditions for improvement of the transport sector but also determine investment costs of specific measures. Preparatory activities also include preparation of following studies: study on the development and implementation of information system for monitoring and route traffic in the city; feasibility study on using a light rail traffic in City; feasibility study of application and use of measures to improve public transport in the City; investment studies for the improvement of bicycle transportation in the City; transport study of the city of Nis; study for parking; study of public transport; study of improving traffic safety; study of improving regulation and traffic management; project for zones of slow traffic; project on rent a bike system; project for introduction of new subsystems transport (minibus, midi bus).

- **Energy Efficiency instruments / measures per sector**

For the purpose of this case study a general measure in buildings sector - education and behavioral change of the buildings users in objects owned by the City of Niš will be described. General measure (by its nature) does not require excessive external funding, implementation can start immediately and it corresponds to the measure PC4 from the second Energy Efficiency Action Plan – Introduction of energy management system in public and commercial sector.

The measure includes a range of educational activities on the regular basis: organization of educational workshops on ways to save energy; preparation and distribution of educational materials (flyers, brochures, posters, and the like.); and Organization of forums for different actors. There is also possibility of reducing the costs for measure implementation if multipliers of knowledge are engaged (employees of the city administration) who would be prepared to conduct trainings for

users of the buildings. Their involvement would be significantly cheaper, with minimal investment in equipment, especially if local center for energy efficiency would be establish. In addition to educational activities under this measure it is necessary to introduce an incentive scheme for savings within which the financial resources of energy savings remains available to the institution in which the savings was achieved. It is recommended that this measure be linked with the training for the representatives of the buildings users on the use of software for data on energy consumption database. Also it is proposed to link this measure with membership in an international network of cities "Euronet 50-50"<sup>28</sup> that are dedicated to mechanism of retaining parts of the revenue generated from savings with the users. Estimating energy savings achieved by implementation of measures aimed at awareness raising and education of buildings users is not easy. According to the experience of other European cities, it was assumed that continuous educational, promotional and informative activities can realize savings of heat and electric power of 9%. For the reference consumption of heat and electricity in year 2010 in buildings owned by the City of Niš was 39,769.80 MWh and 18,799.58 MWh respectively. Following table shows main elements in terms of costs and savings of the measure.

**Table 7: Main elements of the measure: Education and behavioral change of the buildings users in objects owned by the City of Niš (SEAP)**

|   |   |
|---|---|
| Stakeholder carrying out the measure                      | City of Nis   |
| Start / end of realization (years)                        | from 2014 until 2020                                  |
| Estimated costs (unit / total)                            | Yearly 6,500.00 €<br>Total 45,500.00 €                |
| Assessment savings [MWh]                                  | 3,579.28 [MWh] heat<br>1,691.96 [MWh] electricity     |
| Assessment of emission reductions [t CO <sub>2</sub> ]    | Heat 1,353.57<br>Electricity 998.93<br>Total 2,352.50 |
| Costs for reducing the emissions [€ / t CO <sub>2</sub> ] | 19.34   |
| Source of funds for implementation                        | City budget<br>Funds (IPA, IEE, etc.).                |

Example measure in the transport sector is the System for Centralized Management of Traffic on the territory of the City of Niš. The savings in energy consumption by using this measure should occur by ensuring priority of passage for public transport vehicles in the traffic system of the City including optimization of traffic lights, priority lanes, horizontal signalization, junctions, etc. Within this measure the percentage of savings apply to the total daily traffic in all subsectors including public transport, emergency vehicles, private vehicles and commercial vehicles. It is assumed that successful implementation of this measure would result in total savings of 2% of energy consumption. Expected effects of the measure, besides energy saving, are the reduction of time spent in traffic, increased traffic exploitation rate and enabling of priority for public transportation and emergence vehicles at intersections. Table 8 shows main elements in terms of costs and savings of the measure.

<sup>28</sup> <http://www.euronet50-50.eu>

**Table 8: Main elements of the measure: System for Centralized Management of Traffic on the territory of City of Niš (SEAP)**

|   |   |
|---|---|
| Stakeholder carrying out the measure                      | City of Nis   |
| Start / end of realization (years)                        | 2014 – 2015   |
| Estimated costs (unit / total)                            | 1 <sup>st</sup> phase 663,300 €<br>2 <sup>nd</sup> phase 850,000 €<br>3 <sup>rd</sup> Phase 1,167,500 €<br>Total: 2,680,800 € |
| Assessment savings ([MWh],liter fuel)                     | Fuel all together 659,224 liters<br>Petrol 5,193.10 MWh<br>Diesel 6,321.36 MWh<br>TNG 1,503.12 MWh                            |
| Assessment of emission reductions [t CO <sub>2</sub> ]    | 3,320.70  |
| Costs for reducing the emissions [€ / t CO <sub>2</sub> ] | 807.30  |
| Source of funds for implementation                        | City budget<br>Council for safety of the traffic<br>IEE program<br>National EE Fund   |

- **Interaction between national and local policies**

Serbia has recently adopted several regulations and strategic documents that deal with and promote energy efficiency in the buildings and transport sectors. Most important documents in this respect are the Law on Planning and Construction, the Law on Efficient Use of Energy and Energy Law with accompanying by-laws, and the First and the Second Energy Efficiency Action Plan.

When it comes to the policy instruments in the buildings and transport sectors Serbia proclaimed several of them predominantly through National Action Plans for Energy Efficiency and back them up with mentioned laws and accompanying regulations. These policy instruments spread over areas of regulation, and financial instruments, capacity building and networking and are presented in separate section preceding case study.

The SEAP of the City of Niš in its chapter 9 on Energy Management makes references to priorities and measures in both buildings and transport sectors arising from mentioned laws and strategic documents, thus making top down integration of national policies and goals to local policy. Furthermore chapter 10 of the SEAP - Action Plan, by listing, describing and quantifying number of measures in the buildings and transport sectors contributes to reaching of national goals set in the second Energy Efficiency Action Plan. Cumulative contribution of proposed measures in the SEAP for buildings and transport sectors in terms of reduction of energy consumption and related CO<sub>2</sub> emissions showing bottom up integration of policies are given in tables 8 and 9.

**Table 9: Projections of energy consumption and CO<sub>2</sub> emissions till 2020 of the buildings sector per scenarios**

| Scenarios        | Energy Consumption [MWh] |              | Compared to 2010 in % | Emissions [t/CO <sub>2</sub> ] |            | Compared to 2010 in % |
|------------------|--------------------------|--------------|-----------------------|--------------------------------|------------|-----------------------|
|                  | 2010                     | 2020         |                       | 2010                           | 2020       |                       |
| Without Measures | 1,414,734.73             | 1,583,033.22 | 11.90                 | 850,963.91                     | 991,045.39 | 16.46                 |
| With Measures    | 1,414,734.73             | 1,020,445.31 | -27.87                | 850,963.91                     | 645,314.54 | -24.17                |

**Table 10: Projections of energy consumption and CO2 emissions till 2020 of the transport sector per scenarios**

| Scenarios        | Energy Consumption [MWh] |            | Compared to 2010 in % | Emissions [t/CO <sub>2</sub> ] |            | Compared to 2010 in % |
|------------------|--------------------------|------------|-----------------------|--------------------------------|------------|-----------------------|
|                  | 2010                     | 2020       |                       | 2010                           | 2020       |                       |
| Without Measures | 707,148.62               | 905,455.80 | 28.04                 | 180,937.44                     | 231,661.41 | 28.03                 |
| With Measures    | 707,148.62               | 662,389.45 | -6.33                 | 180,937.44                     | 167,329.50 | -7.52                 |

It should be emphasized that in Serbian context the City of Niš is one of better performing local authorities in energy field and their SEAP is one of the best documents of its kind.

- **Discussion / Recommendations**

There are several barriers for successful implementation of the City of Niš SEAP and thus active contribution to realization of national policies and goals. They can be described as the lack of political support, lack of financial or economical instruments and lack of administrative capacities in public sector. Fortunately all of mentioned barriers are tackled in the SEAP which gives different solutions and approaches to financing and realizing foreseen measures.

The data acquisition on public sector energy consumption in the City of Nis is an example of administrative capacity barrier. This activity is being performed since 2009, but still it doesn't produce satisfactory results. The quality of the provided data on energy consumption is not on the satisfactory level because the employees from various public institutions that should submit the data find difficult to understand which information is relevant and data processing takes too long. In this case intensive education and capacity building of users in public buildings and public servants on energy consumption and data collection is needed.

- **Further information**

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