MINISTRY OF ECONOMY

# Energy Efficiency Action Plan of Montenegro for 2013-2015

**November 2013**

# Content

## LIST OF ABREVIATIONS

| | |
|---|---|
| EEAP | Energy Efficiency Action Plan |
| GDP | Gross Domestic Product |
| BU | Bottom-up |
| Directive | Directive ESD adapted to its implementation in countries signatories of the Energy Community Treaty |
| EC | European Commission |
| EE | Energy Efficiency |
| EMEEES | Project "Evaluation and Monitoring for the EU Directive on Energy End-Use Efficiency and Energy Services" |
| EI | Energy intensity |
| EnC | Energy Community |
| EnCT | Energy Community Treaty |
| EPBD | Energy Performance Building Directive |
| ESCO | Energy Service Company |
| ESD | Energy Service Directive |
| EU | European Union |
| FPE | Final energy consumption |
| KAP | Aluminum Plant Podgorica |
| KfW | German Development Bank |
| MoE | Ministry of Economy |
| MS | Ministry of Science |
| MSDT | Ministry of Sustainable Development and Tourism |
| ME | Ministry of Education |
| SME | Small and Medium-sized enterprises |
| MTMA | Ministry of Transport and Maritime Affairs |
| MIA | Ministry of Internal Affairs |
| NGO | Non-governmental Organization |
| WB | World Bank |
| SEE | Sector for energy efficiency (Ministry of Economy) |
| TA-EnCT | Technical Assistance for Implementation of Energy Community Treaty |
| TD | Top-down |
| LoE | Law on Energy |
| LoEE | Law on Energy Efficiency |

## SUMMARY

The second Energy Efficiency Action Plan for 2013-2015 (hereinafter: 2nd EEAP) is prepared based on requirements of the Law on Energy Efficiency and EU Directive 2006/32/EC on energy end-use efficiency and energy services adapted for the purpose of its implementation in signatory countries of the Energy Community Treaty, by decision of the Ministerial Council, 2009/05/MC-EC (hereinafter: Directive).

The second EEAP is mainly a continuation of implementation of activities from the first Energy Efficiency Action Plan for 2010-2012 (hereinafter: 1st EEAP) adopted by the Government of Montenegro in December 2010. However, the 2nd EEAP amends significantly the 1st EEAP based on new and stringent requirements of EU presented through adoption of updated directives in the field of energy efficiency.

The EEAP was prepared according to the template prepared by the Energy Community and which entirely meets the requirements of the Directive.

According to the Energy Community Treaty, obligation of Montenegro is to achieve the indicative energy savings target which represents saving in the amount of 9% of average final consumption of energy in the country in a five-year period in the ninth year of implementation of the Directive. According to the Directive, the established period of time for meeting the indicative energy savings target is from 2010 until 2018.

Obligation of the Aluminum Plant Podgorica to participate in achieving the indicative energy savings target is also excluded in the 2nd EEAP, primarily due to technological limits of the production of aluminum and therefore significant savings cannot be achieved. Taking into consideration the fact that in the previous period the Aluminum Plant Podgorica has contributed to the total final consumption of energy in the amount of 40%, its obligations based on the participation in achieving the indicative energy savings target should be taken over by other energy consumers. However, this is unrealistic to expect in the present circumstances. This approach was accepted by the Energy Community.

However, exclusion of the Aluminum Plant Podgorica from the indicative energy savings target does not mean that it will be excluded from the obligation to achieve energy savings, because the Law on Energy Efficiency provides for all big consumers, including the Aluminum Plant Podgorica, certain obligations related to implementation of energy efficiency measures and achieving energy savings on that basis.

This plan covers the period from 2013 to 2015 and it provides for an intermediate indicative energy savings target for this period of time in the amount of approximately 3% of the average annual final consumption of energy according to the Directive, for the period of time from 2002 until 2006.

Second EEAP has a double significance and it represents the following:

1. a comprehensive document for implementation of the energy efficiency policy on the side of final consumption of energy for the next three-year period;
2. a report with detailed review of activities implemented in the previous period and an evaluation related to achieved energy savings compared to the objectives set in the first EEAP.

Main objectives of the second EEAP are based on the priorities of the Law on Energy Efficiency, as follows:

- Implementation of the Law on Energy Efficiency by completing and improving the regulatory framework and a significant improvement of the institutional framework;
- Raising public awareness and improving understanding, knowledge and capacities in terms of new legal requirements and good practice in the field of energy efficiency in institutions of the public sector, local self-governments, big consumers, professional organizations and other stakeholders;
- Significant improvement of statistical and monitoring system in the field of energy efficiency;
- Implementation of energy saving measures with noticeable results.

During the implementation of the 2nd EEAP, Montenegro should introduce additional significant normative, tax, financial and organizational measures for complete implementation of the Directive.

In order to achieve the indicative energy savings target, significant financial resources should be mobilized, which means that the country, ministries, municipalities and other interested parties have to determine necessary human and financial resources. The energy market should be further liberalized, especially in terms of provision of energy services. In this regard, it is necessary to further develop the public and private partnership in the field of energy efficiency.

Therefore, it should be emphasized that successful implementation of EEAP represents an important step towards a quality, well-coordinated, systematic and gradual activities related to the development of energy efficiency in Montenegro, in general, which is a very complex and long-term process. However, the requirements of Montenegro demand much faster and efficient action using positive experience of other countries.

An overview of planed energy efficiency measures in the second EEAP is given in the next table, with a review of required financial resources as well as estimation of energy savings and a review of entities responsible for implementation of the Plan.

| OVERVIEW OF PLANNED EE MEASURES WITH ESTIMATION OF SAVINGS AND REQUIRED FINANCIAL RESOURCES | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Source of financing | | | Planned energy savings (ktoe) | | Responsible entities |
| Index | Energy Efficiency measure | Budget | Donation | Loan | in 2015 | in 2018 | |
| B.1 | Development and preparation of a regulatory framework for energy efficiency of buildings | 12.000 | 500.000 | | 12,6 | 15,6 | *Ministry of Economy, Ministry of Sustainable Development and Tourism, local self-government units, participants in construction works* |
| B.2 | Implementation of regular energy audits of heating systems and air conditioning systems | 5.000 | 15.000 | | N/D | N/D | *Ministry of Economy, owners of buildings /heating and air conditioning system and persons authorized for performing regular energy audits* |
| B.3 | Energy performance certification of buildings | 20.000 | | | N/D | N/D | *Ministry of Economy, owners of buildings, participants in construction works, persons authorized for performing energy audits* |
| R.1 | Information campaigns and network of EE info centers | 30.000 | | | N/D | N/D | *Ministry of Economy, local self-government units, Ministry of Education, Ministry of Science* |
| R.2 | Energy labelling of household appliances | 10.000 | | | N/D | N/D | *Ministry of Economy, suppliers and distributers of household appliances* |
| R.3 | Financial support for citizens for investments in renewable energy sources on the consumption side | 70.000 | 570.000 | | 0,28 | 0,28 | *Ministry of Economy, local self-government units* |
| P.1 | Development of energy management in the public sector | 25.000 | | | N/D | N/D | *Ministry of Economy, entities of the public sector (state authorities, organizations, regulatory bodies, institutions, bodies of local self-government units and public companies)* |
| P.2 | Establishment and implementation of EE criteria in public procurement of goods and services, as well as in purchase and rental of buildings | 10.000 | | | N/D | N/D | *Ministry of Economy, Ministry of Finance, authorities responsible for implementation of public procurement* |
| P.3 | Improvement of energy performance of buildings in the public sector | 30.000 | 1.500.000 | 16.500.000 | 0,54 | 1,7 | *Ministry of Economy; Ministry of Finance; state authorities, bodies of local self-government units and public companies responsible for management of public buildings* |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| P.4 | Implementation of energy efficiency improvement measures in public utility companies of local self-governments and other public companies (demand side) | 25.000 | | | 0,74 | 0,92 | *Ministry of Economy, Ministry of Finance, self-government units, public companies, ESCO companies* |
| C.1 | Establishment of energy management system in the commercial services | 15.000 | | | N/D | N/D | *Ministry of Economy, owners and users of buildings related to commercial services* |
| C.2 | Incentive program related to the use of solar energy in the tourism sector | 5.000 | | | 0,55 | 0,55 | *Ministry of Economy, Ministry of Sustainable Development and Tourism, owners of hotels and other tourism facilities* |
| C.3 | Development of mechanisms for improvement of energy performance of commercial non-residential buildings | 15.000 | | | N/D | N/D | *Ministry of Economy, owners of non-residential buildings for commercial purpose* |
| I.1 | Establishment of energy management system in the industry sector | 10.000 | | | N/D | N/D | *Ministry of Economy, owners and users of industrial facilities and plants* |
| T.1 | Establishment and implementation of EE criteria in public procurement of vehicles and transport services in the wider public sector | 10.000 | | | N/D | N/D | *Ministry of Economy, Ministry of Finance, authorities responsible for implementation of public procurement* |
| T.2 | Introduction of the chapter "Energy efficiency in transport" in EE improvement programs and plans | 10.000 | | | N/D | N/D | *Ministry of Economy, small and medium sized companies, Ministry of Sustainable Development and Tourism, local self-government units* |
| T.3 | Information campaign on EE behavior in transport and demonstration (pilot) activities | 15.000 | | | N/D | N/D | *Ministry of Economy, small and medium-sized enterprises, local self-government units* |
| T.4 | Study - Action Plan on energy efficiency in transport | 6.000 | 80.000 | | N/D | N/D | *Ministry of Economy, small and medium-sized enterprises , Ministry of Internal Affairs, Ministry of Sustainable Development and Tourism, local self-government units and other relevant entities* |
| T.5 | Infrastructural measures in the transport sector with the energy savings effects | 0 | | | N/D | N/D | *Ministry of Economy, Ministry of Sustainable Development and Tourism, small and medium-sized enterprises, local self-government units* |
| E.1 | Individual metering and informative billing | 0 | | | N/D | N/D | *Electric Power Company of Montenegro (EPCG), Ministry of Economy* |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| H.1 | Development of basic legislative, regulatory and institutional framework for energy efficiency in Montenegro | 10.000 | | | / | / | *Ministry of Economy* |
| H.2 | Adoption of strategic and planning documents for energy efficiency | 5.000 | | | / | / | *Ministry of Economy* |
| H.3 | Establishment of statistical and monitoring systems for energy efficiency | 12.000 | | | / | / | *Ministry of Economy, entities of the public sector (state authorities, organizations, regulatory bodies, institutions, bodies of local self-government units and public companies)* |
| H.4 | Promotion of financial mechanisms for sustainable energy and alternative mechanisms of financing | 10.000 | | | / | / | *Ministry of Economy* |
| H.5 | Strengthening education on energy efficiency | 5.000 | | | / | / | *Ministry of Economy, Ministry of Education, Ministry of Science, University of Montenegro, Centre for vocational education* |
| H.6 | Introduction of a regulatory framework for eco-design of energy related products | 5.000 | | | / | / | *Ministry of Economy, Administration for inspection affairs (market inspection)* |
| H.7 | Introduction of requirements and criteria for energy efficiency in spatial planning and the development of infrastructural investments | 0 | | | / | / | *Ministry of Economy, Ministry of Sustainable Development and Tourism* |
| **Total** | | **370.000** | **2.665.000** | **16.500.000** | **14,71** | **19,05** | |

# 1 INTRODUCTION

Second Energy Efficiency Action Plan is prepared in accordance with requirements of the Directive on Energy Efficiency 2006/23/EU, Energy Efficiency Strategy, Energy Development Strategy of Montenegro and Law on Energy Efficiency (Official Gazette of Montenegro 29/10).

2 The Second EEAP has a double significance:

1. EEAP is a comprehensive document for implementation of the energy efficiency policy on the side of final consumption of energy for the next three-year period;
2. EEAP is a report with detailed review of activities implemented in the previous period and an evaluation related to achieved energy savings compared to the objectives set in the first EEAP.

## 1.1 Evaluation of implementation of 1st EEAP

1st EEAP, which also covered final energy consumption, contained EE measures for sectors of households, services industry and transport, as well as a number of horizontal measures, as described in Table 1. In the 2nd EEAP a number of measures was revised compared to the 1st EEAP, mainly due to introduction of new EU requirements and intention to specify in a detailed manner activities required for efficient use of available potentials for energy savings.

**Table 1 – Overview of measures from 1st EEAP with a qualitative evaluation of implementation and status of the measure in 2nd EEAP**

| No. | Title of EE measure | Evaluation of implementation | Status in 2nd EEAP |
|---|---|---|---|
| **Households** | | | |
| D1 (U1) | Development and preparation of a new regulatory framework for buildings in accordance with LoEE and Energy Performance Building (phase I) | Measure was implemented as intended with relatively minor delay | Revised |
| D2 (U2) | Training and certification of persons for performing energy audits (auditors), certification of buildings and performing audits of boilers/air conditioning systems, as well as training of officials | Measure was implemented as intended | Revised |
| D3 | Energy labeling of household appliances | Measure is partially implemented | Revised |
| D4 (U3) | Information campaigns for wider public and other end users - Info centers | Measure was implemented as intended | Continuation of measure |
| D5 | Financial incentives for utilization of solar thermal systems, small biomass heating systems, saving luminaries and other energy efficiency improvement measures and utilization of RES intended for citizens through press releases or through donors programs | Measure is partially implemented | Revised |
| **Services** | | | |
| U1 (D1) | Development and preparation of a new regulatory framework for buildings in accordance with LoEE and Energy Performance Building Directive (EPBD) (phase 1) | Measure was implemented as intended with relatively minor delay | Revised |
| U2 (D2) | Training and certification of persons for performing energy audits (auditors), certification of buildings and performing audits of boilers/air conditioning systems, as well as training of officials | Measure was implemented as intended | Revised |
| U3 (D4) | Information campaigns for the public and other end users - Info centers | Measure was implemented as intended | Continuation of measure |
| U4 | Program of implementation of energy audits of buildings in the public sector | Measure was implemented as intended with relatively minor delay | Revised |
| U5 | Implementation of investments for EE improvement and | Measure was | Continuation |

| No. | Title of EE measure | Evaluation of implementation | Status in 2nd EEAP |
|---|---|---|---|
| | introduction of schemes of grants for buildings in the wider public sector | implemented as intended with relatively minor delay | of measure |
| U6 | Energy performance certification of public buildings and visibility of certificates | Measure was not implemented as intended | Revised |
| U7 | Implementation of EE improvement measures and EE investments in public and utility companies of local self-governments and other public companies (demand side) | Measure was not implemented as intended | Revised |
| U8 (T1) | Establishment and implementation of EE criteria in procurement of goods, buildings and lease of buildings in a wider public sector | Measure was not implemented as intended | Revised |
| U9 | Elimination of barriers for alternative EE financial mechanisms in the public sector and for other end users | Measure was not implemented as intended | Revised |
| U10 | Plan related to strengthening the capacities for the sector of services (public and private sector) and its implementation | Measure is partially implemented | Revised |
| U11 | Financing of EE projects in the sector of Small and medium-sized enterprises (SME) and introduction of additional incentive measures | Measure is partially implemented | Revised |
| U12 | Voluntary agreements with construction companies | Measure was not implemented | Measure was abandoned |
| **Industry** | | | |
| I1 | Regulatory requirements for big consumers | Measure was not implemented as intended | Revised |
| I2 | Voluntary agreements with the industry | Measure was not implemented | Measure was abandoned |
| I3 | Strengthening the capacities in order to implement industrial energy audits and establishment of energy management | Measure was not implemented as intended | Revised |
| **Transport** | | | |
| T1 (U8) | Establishment and implementation of EE criteria in public procurement of vehicles and transport services in a wider public sector | Measure was not implemented as intended | Revised |
| T2 | Introduction of chapter “Energy efficiency in transport” in EE improvement programs and plans | Measure was not implemented | Revised |
| T3 | Information campaign on energy efficient behavior in transport and demonstrative (pilot) activities | Measure is partially implemented | Revised |
| T4 | Study - Energy Efficiency Action Plan in transport | Measure is partially implemented | Revised |
| T5 | Infrastructural measures in transport sector with effects of energy savings | Measure is partially implemented | Revised |
| **Horizontal** | | | |
| HZ1 | Development of basic legislative, regulatory and institutional framework for energy efficiency in Montenegro | Measure was implemented as intended with relatively minor delay | Continuation of measure |
| HZ2 | Adoption of strategic and planning documents for energy efficiency | Measure was implemented as intended with relatively minor delay | Continuation of measure |
| HZ3 | Establishment of statistical and monitoring system for energy efficiency | Measure is partially implemented | Continuation of measure |
| HZ4 | Individual/smart metering and informative billing | Measure was implemented as intended | Continuation of measure |
| HZ5 | Promotion of financial mechanisms for sustainable energy and alternative financing mechanisms | Measure is partially implemented | Continuation of measure |

| No. | Title of EE measure | Evaluation of implementation | Status in 2nd EEAP |
|---|---|---|---|
| HZ6 | Strengthening education on energy efficiency | Measure was implemented as intended | Continuation of measure |
| HZ7 | Promotion of highly efficient cogeneration | Measure was not implemented as intended | Measure was abandoned |
| HZ8 | Introduction of regulatory framework for eco design of products that use energy | Measure is partially implemented | Continuation of measure |
| HZ9 | Introduction of EE requirements and criteria in spatial planning and development of infrastructural investments | Measure is partially implemented | Continuation of measure |

The 1st EEAP was most successfully implemented in the following: establishment of a legislative and regulatory framework for energy efficiency; preparations and implementation of promotional earmarked projects for energy efficiency improvement, as well raising public awareness about importance and effects of implementation of energy efficiency measures.

Progress related to the establishment of legislative and regulatory framework for energy efficiency was achieved by adoption of the Law on Energy Efficiency and its secondary legislation (11 rulebooks were adopted out of 14 rulebooks that were envisaged), as well as by implementing interventions when amendment of certain laws (Law on Spatial Planning and Construction of Structures, Law on Concessions, Law on Public Procurement, Law on Market Inspection etc.). Development of regulations in the field of energy efficiency of buildings is particularly important. Implementation of the abovementioned regulations will significantly contribute to energy savings in the future, as well as other benefits that follow implementation of energy efficiency measures (decrease in demand for energy, positive impact on the environment, improvement of comfort, development of entrepreneurship, introduction of new materials and technologies etc.).

Implementation of promotional earmarked projects for energy efficiency improvement has demonstrated in practice all the aforementioned positive effects of implementation of energy efficiency measures and most significant are projects related to reconstruction of buildings of educational and healthcare institutions that are implemented based on the loans from the World Bank and KfW.

In addition, significant success was achieved in the field of raising the public awareness about energy efficiency, both among the professionals and in the wider public, through an intensive overall information campaign and implemented educational activity focused on experts, students and pupils. The most significant activities relate to training of professionals for performing energy audits of buildings and their introduction in implementation of earmarked projects in this field.

In addition to the above mentioned it is very important to establish and develop a cooperation with renowned international institutions/organizations in the energy efficiency field that are mainly responsible for implementation of aforementioned projects and activities (EU through IPA, Government of the Federal Republic of Germany and the Government of Kingdom of Norway through GIZ and ENSI, KfW bank, World Bank, UNDP, Government of the Republic of Italy through UNEP and IMELS, EBRD etc.).

## 1.2 Problems related to implementation of 1st EEAP

Major problems in Montenegro in implementing the energy efficiency policy are, as follows:

1. insufficient administrative and professional capacities on national and local level;
2. insufficient cooperation of competent bodies and coordination of activities;
3. obvious lack of integration and understanding of energy efficiency in certain areas under the competence of other ministries;
4. insufficient financial support from the state for implementation of the EEAP.

It is important to emphasize that the removal of the aforementioned current problems is of particular importance for a successful implementation of 2nd EEAP, especially bearing in mind that this plan provides for the initiation and implementation of a number of complex programs, which cannot be implemented without adequately equipped and supported institution, which will coordinate the planned activities and to verify the results obtained.

### 1.3 Problems related to the preparation of 2nd EEAP

Preparation of the 2nd EEAP was followed by a number of problems resulting from the barriers that were previously mentioned, as well as incoherent implementation of the Law on Energy Efficiency on every level (lack of energy management, lack of programs and energy efficiency plans, the fact that entities did not report on planned and implemented EE measures even though they were obliged by Law, lack of data required for the analysis of the situation and conducting policy in the energy efficiency field, lack of framework for inspection control etc.).

In addition, preparation of this plan indicated the fact that implementation of the energy efficiency policy is impossible to plan adequately, nor evaluate the achieved results without the established system for monitoring of all activities that are implemented on the national as well as local level. This systemic monitoring did not exist in Montenegro in the previous period, therefore collecting data and evaluation of achieved savings was extremely difficult and it was based mainly on assessments.

Preparation of a platform based on the web technology for monitoring of all energy efficiency activities and evaluation of energy savings is a priority that should be implemented as soon as possible. Work on 2nd EEAP has confirmed that it is impossible to review report and evaluate energy savings based on implementation of activities without this platform.

### 1.4 Key preconditions for successful implementation of 2nd EEAP

Key assumptions for successful implementation of 2nd EEAP:

1. creation and continuous improvement of legal and regulatory framework for energy efficiency;
2. ensuring continuous financial support for implementation of measures provided for in EEAP;
3. ensuring professional and administrative capacities for implementation of EEAP;
4. ensuring systemic and continuous monitoring of implementation of EE measures and evaluation of achieved results;
5. strengthening the cooperation of all relevant participants and coordination of activities.

# 2 OVERVIEW OF INDICATIVE TARGETS AND ACHIEVED ENERGY SAVINGS

## 2.1 Overall indicative energy savings target

In accordance with the Law on EE, Montenegro has adopted the indicative target for energy savings in the amount of 9% of final consumption of energy, that has to be achieved by the end of 2018 (increase in savings by 1% in average on an annual level). This means that Montenegro should provide energy savings in the amount of 58,9 ktoe of final consumption of energy expressed in equivalent primary energy (hereinafter: final consumption of primary energy). Overall indicative target that the country should achieve and prove as a sum of energy savings in following 9 years, is established based on data on final consumption of energy for five year period 2002-2006.

Final consumption of energy for establishing indicative target is calculated according to the methodology that was adopted by the Ministry of Economy, respecting the recommendations provided for in Directive 2006/32/EC (Official Gazette of Montenegro, 18/2011).

## 2.2 Intermediate indicative target for 1st EEAP

In 1st EEAP, Montenegro has decided that the intermediate indicative target is 13,4 ktoe (final consumption of primary energy) - energy that heeds to be saved by the end of 2012 and which represents around 2% of average amount of final consumption according to the Directive[1]. This target is set, based on analysis of expected results related to improvement of EE in the period from 2010 to 2012, taking into account significant potential for implementation of free and low cost EE measures that can be implemented in first 3 years, having in mind the priority to establishment of basic regulatory and institutional framework for EE that are produced by energy savings that cannot be seen directly.

## 2.3 Intermediate indicative target for 2nd EEAP

The 2nd EEAP provides for that the intermediate indicative target is 19.6 ktoe (final consumption of primary energy) - energy that needs to be saved by the end of 2015, which represents around 3% of average amount of final consumption of energy according to the Directive. This objective is set based on the analysis of expected results of EE improvements in the period from 2013-2015. In this way, the major load in terms of realization of indicative saving target is planned for 2015-2018 and it is 4% of average amount of final consumption of energy according to the Directive. Justification for such planning lies in the fact that in the period of implementation of the 3rd EEAP, the legal and regulatory framework will be complete and better mechanisms will be established for implementation of specific EE programs and projects and access to earmarked funds, especially having in mind the upcoming obligations in the EU accession process.

Determining indicative targets based on final consumption of energy (2002-2006) is shown in Table 2.

**Table 2 - Calculation of energy savings indicative targets**

| | | **Average 2002-2006** | | |
|---|---|---|---|---|
| | **(used unit - ktoe)** | **Electricity** | **Other fuels/energy** | **Total consumption** |
| 1 | **Final consumption of energy** | **322.1** | **398.2** | **720.3** |
| 2 | **Excluded final consumption of energy** | **163.0** | **141.3** | **304.3** |
| *Out of which:* | | | | |
| 2.1 | - Covered by the ETD | 0.0 | 0.0 | 0.0 |
| 2.2 | - Aviation fuel | *0.0* | 12.7 | 12.7 |
| 2.3 | - Maritime bunker fuels | *0.0* | 1.9 | 1.9 |
| 2.4 | - Aluminum Plant Podgorica (KAP) | *163.0* | 126.7 | 289.7 |

[1] **Final energy consumption according to the Directive** is final energy consumption in the country reduced by final energy consumption in certain sectors in accordance with the Directive 2006/32/EC

| | | | | |
|---|---|---|---|---|
| 3 | **Final consumption of energy according to the Directive** | **159.1** | **256.9** | **416.0** |

*Out of which:*

| | | | | |
|---|---|---|---|---|
| 3.1 | - Households | 91.5 | 57.3 | 148.8 |
| 3.2 | - Services | 45.5 | 24.4 | 69.9 |
| 3.3 | - Industry | 19.3 | 38.8 | 58.2 |
| 3.4 | - Transport | 1.8 | 129.9 | 131.7 |
| 3.5 | - Agriculture | 0.9 | 6.5 | 7.3 |

**Calculation of equivalent primary energy (final energy consumption - primary)**

| | **SUMMARY** | **Electricity** | **Other fuels and energy** | **Total consumption** |
|---|---|---|---|---|
| 4 | - Final energy consumption in scope of the Directive (ktoe) | 159.1 | 256.9 | 416.0 |
| 5 | - Conversion factor to primary equivalent | 2.5 | 1.0 | |
| 6 | **Final energy consumption - primary** | **397.7** | **256.9** | **654.6** |
| | | **Final energy consumption - primary ( GWh)** | | **7,612.6** |

**TARGETS expressed in primary energy equivalent (final energy consumption - primary)**

| | **TARGETS (primary energy equivalent)** | **in percentages %** | **in ktoe** | **in GWh** |
|---|---|---|---|---|
| 7 | Intermediate indicative energy savings target indicative energy savings target by the end of 2012 | 2 % | **13.4** | **155.8** |
| 8 | Intermediate indicative energy savings target by the end of 2015 | 2+3=5 % | 13.4+19.6=**33.0** | 155.8+228=**383.8** |
| 9 | Overall indicative energy efficiency target indicative energy savings target by the end of 2018 | 5+4=9 % | 33.0+25.9=**58.9** | 383.8+301.3=**685.1** |

## 2.4 Review of distribution of intermediate indicative target for 2nd EEAP by sectors of consumptions

Distribution of indicative energy savings target by sectors of consumptions was carried out according to the following:

- Participation of certain sectors in final consumption of energy,
- Possibilities for EE improvement and
- Possibilities related to the implementation of EE policy in sectors.

It is important to emphasize that distribution of indicative target was not carried out only on the basis of participation of different sectors in final consumption of energy. In addition, examples and multiple effects of implementation of measures and programs that were financed form the state budget and budgets of local governments were taken into account.

Sectors of households, services (especially public sector) and transport will be treated as a priority.

It can be expected that the largest part of savings during the 2nd EEAP will be achieved mainly in households and in public sector. Achieving savings in the sector of transport are a new concept; therefore significant effects in this respect can be expected in a later stage.

In terms of form of energy, savings related to electricity as well as fuel can be expected.

Distribution of indicative target by sectors for 2nd EEAP is presented in Table 3 based on the above mentioned and real possibilities for implementation of EE improvement measures in different sectors.

**Table 3 – Distribution of intermediate indicative target for 2nd EEAP by sectors of consumption**

| **Intermediate indicative target 2013-2015 [ktoe]** | | |
|---|---|---|
| **Sectorial distribution of target** | **Sectorial target 2015 [ktoe]** | **Share in total target for 2015[%]** |
| Households | 8.8 | 45 |
| Services | 7.3 | 37 |
| Industry | 1.9 | 10 |
| Transport | 1.6 | 8 |
| **Total:** | **19.6** | **100%** |

## 2.5 Achieved/estimated energy savings based on implementation of 1st EEAP and measures provided for in 2nd EEAP

Implementation of EE measures defined in 1st EEAP and achieved technological progress has led to energy savings in the last three year period. Overview of EE measures that were planned in 1st EEAP with a review of its status in 2nd EEAP is given in Table 1. Achieved decrease of final consumption of energy cannot be fully attributed to measures planned in 1st EEAP due to the fact that it is impossible to observe separately the effects of each individual measure, as well as the fact that measures were not implemented as a whole in the prescribed manner. Nevertheless, qualitative and, if possible, quantitative evaluation of implementation of each individual measure indicate the fact that additional efforts and additional measures are required in order to achieve additional energy savings. This was the reason why existing measures in 2nd EEAP were revised in such a way to specify the required activities more precisely and new measures were added and achievement of significant energy savings is expected by implementing these measures.

By combining the implementation of TD indicators and BU methods for individual measures, achieved energy savings in 2012 were evaluated. Details about the manner of calculation of energy savings are presented in chapter 2.6 and results are presented in Table 4.

**Table 4 – Overview of targets and achieved energy savings in final consumption**

| Year | Indicative target [ktoe] | Achieved/estimated total energy savings [ktoe] | Achieved/estimated energy savings based on implementation of measures [PJ][2] |
|---|---|---|---|
| 2012. | 13.4 | 25 | 0.58 |
| 2015. | 33.0 | N/D | 14.71 |
| 2018. | 58.9 | N/D | 19.05 [3] |

Table 5 presents achievement of objectives (in terms of energy savings) by sectors by using the TD indicators for evaluation of total savings and BU methods for evaluation of effects of certain measures. Based on presented data, it is obvious that discrepancies in terms of estimated savings, by using one and the other method, are extremely high. This is a consequence of lack of quality of input data required for implementation of the methods, therefore this problem should be solved in the following period, i.e. provide adequate statistical data and improve mechanisms for collecting data about implemented activities in the energy efficiency field by relevant entities.

[2] Energy savings based on implementation of measures are the savings that are a result of incentive policy of energy efficiency

[3] This value represents energy savings based on EE measures of 2nd EEAP by the end of 2018

**Table 5 – Overview of energy savings in 2012 by sectors**

| *Sector* | *Target end use savings in 2012. (as per 1st EEAP) [ktoe]* | *Total energy savings evaluated with TD indicators [ktoe]* | *Energy savings from measures evaluated with BU methods [ktoe]* |
|---|---|---|---|
| Households | 6.1 | 20 | 0.02 |
| Services | 5.0 | 0 | 0.56 |
| Industry | 1.3 | 0 | N/D |
| Transport | 1.0 | 5 | N/D |
| ***TOTAL*** | ***13.4*** | ***25*** | ***0.58*** |

Table 6 presents a sectorial overview of achieved energy savings in 2012 as well as estimated energy savings for 2015 and 2018.

**Table 6 – Overview of targets and achieved energy savings in final consumption by sectors**

| | Achieved energy savings [ktoe] **2012.** | | Estimated energy savings [ktoe] **2015.** | | Estimated energy savings [ktoe] **2018.** | |
|---|---|---|---|---|---|---|
| | Total | From measures | Total | From measures | Total | From measures |
| Buildings | - | - | N/D | 12.6 | N/D | 15.6 |
| Households | 20 | 0,02 | N/D | 0.28 | N/D | 0.28 |
| Services | 0 | 0,56 | N/D | 1.83 | N/D | 3.17 |
| Industry | 0 | N/D | N/D | N/D | N/D | N/D |
| Transport | 5 | N/D | N/D | N/D | N/D | N/D |
| **TOTAL** | ***25*** | ***0.58*** | **N/D** | **14.71** | **N/D** | **19.05** [4] |

## 2.6 Methodology for calculation of energy savings

For calculating energy savings achieved in 2012, TD indicators were used according to the recommendations of EC provided in the document „Recommendations on Measurement and Verification Methods in the Framework of the Directive 2006/32/EC on Energy End-Use Efficiency and Energy Services". Data of the Statistical office of Montenegro (MONSTAT), the state Hydro-meteorological Office, data from the energy balance of Montenegro and data obtained by modeling were used as data sources. In accordance with the recommended methodology 2009 was used as the initial (reference) year and 2011 was the last year with known energy balance, while the energy balance for 2012 was assumed on the basis of current trends in energy consumption and the data collected for preparation of the energy balance. In the household sector and transport sector calculation related to savings and indicators was made using the minimum (M) and preferred (P) indicators. In the services sector due to lack of data, calculation of the preferred indicators was not available and only M indicators were used , while it was not possible to calculate neither P nor M indicators for the industrial sector because there is no differentiation in energy consumption by industrial branches. Therefore, alternative indicators are calculated for the entire industrial sector, which therefore take into account energy consumption in branches excluded from the framework objective and thus EEAP. For this reason, these indicators are not relevant to EEAP and are not used for reporting about achieved savings. Relevant energy savings are energy savings determined in the calculation of P indices, except in the service sector. In addition, due to lack of data it was not possible to calculate the change in P4 indicators P4 for household appliances in the household sector. Overview of utilization of TD parameters is given in Table 7.

[4] This value represents energy savings based on EE measures of 2nd EEAP by the end of 2018

**Table 7 – Overview of TD indicators used for calculation and reporting on achieved energy savings in 2012**

| TD indicator | Sector | Possibility of calculation | Reporting on achieved savings |
|---|---|---|---|
| P1 | Households | ✓ | P1, P2, P3, P5 |
| P2 | | ✓ | |
| P3 | | ✓ | |
| P4 | | - | |
| P5 | | ✓ | |
| M1 | | ✓ | - |
| M2 | | ✓ | |
| P6 | Services | - | - |
| P7 | | - | |
| M3 | | ✓ | M3, M4 |
| M4 | | ✓ | |
| P8 | Transport | ✓ | P8, P9, P10, P11, P12, P13 |
| A1 for P8 | | ✓ | |
| P9 | | ✓ | |
| A2 for P9 | | ✓ | |
| P10 | | ✓ | |
| P11 | | ✓ | |
| P12 | | ✓ | |
| P13 | | ✓ | |
| M5 | | ✓ | - |
| M6 | | ✓ | |
| M7 | | ✓ | |
| P14 | Industry | - | - |
| A3 for P14 | | ✓ | - |
| M8 | | ✓ | - |
| A4 for M8 | | ✓ | - |

In the ex-post evaluation of the effects of individual measures ( and where possible, during the ex - ante estimations of future savings ) recommended BU methods of the European Commission (EC) were used and they are given in the document "Recommendations on Measurement and Verification Methods in the Framework of the Directive in 2006 / 32/EC on Energy End -Use Efficiency and Energy Services " , in addition to determining reference values corresponding to the situation in the building stock and systems as well as to the state of the market in Montenegro. In developing national BU methods recommendations of the EMEEES project are used[5]. In addition, in evaluation of the effects of the measures the principle of "measured" savings was used , i.e. savings are determined based on the measured energy consumption before and after implementation of energy efficiency improvement measures, if necessary and appropriate, by correction according to factors of impacts (e.g. climate conditions, i.e. heating degree days , industrial production, etc.) .

Overview of BU methods with the links to the measures that have been evaluated using these methods is given in Table 8.

**Table 8 – Overview of BU methods used for calculation and reporting on achieved energy savings in 2012 and estimation of savings in 2015 and 2018**

| BU method | EC recommended method / National method | No. of energy saving measure evaluated using BU method |
|---|---|---|
| Improvement of thermal insulation and heating systems in existing residential buildings and buildings in the service sector | EK (2.1) | U5 |
| Installation of systems for solar water heating in residential and non-residential buildings | EK (2.7) | D5 |

[5] http://www.evaluate-energy-savings.eu/emeees/en/evaluation_tools/bottom-up.php

# 3 ENERGY SAVINGS IN FINAL CONSUMPTION

## 3.1 Structure of final consumption of energy in Montenegro

Total consumption of final energy presented in Figure 1, from 1997-2008, indicates a constant growth (average 3,74 % per year, from 562,3 ktoe in 1997 to 864,7 ktoe in 2008). In structure of consumption in 2009 there was a decrease in the consumption in KAP and Steel factory Niksic.

According to Figure 2, consumption of final energy in industry (40-46%) was predominant in the structure of final consumption of energy, depending on the year, other consumption - households and services (29-36%), while energy consumption in transport was 18-28%. In conditions with reduced consumption of ferrous-metal industry and nonferrous metals industry in 2009 and 2010, it is obvious that transport becomes a dominant sector (39%) compared to other consumption (37%) and industry (24%), also, a constant growth of consumption was recorded in this sector, indicating that transport has a significant role in final energy consumption in the future.

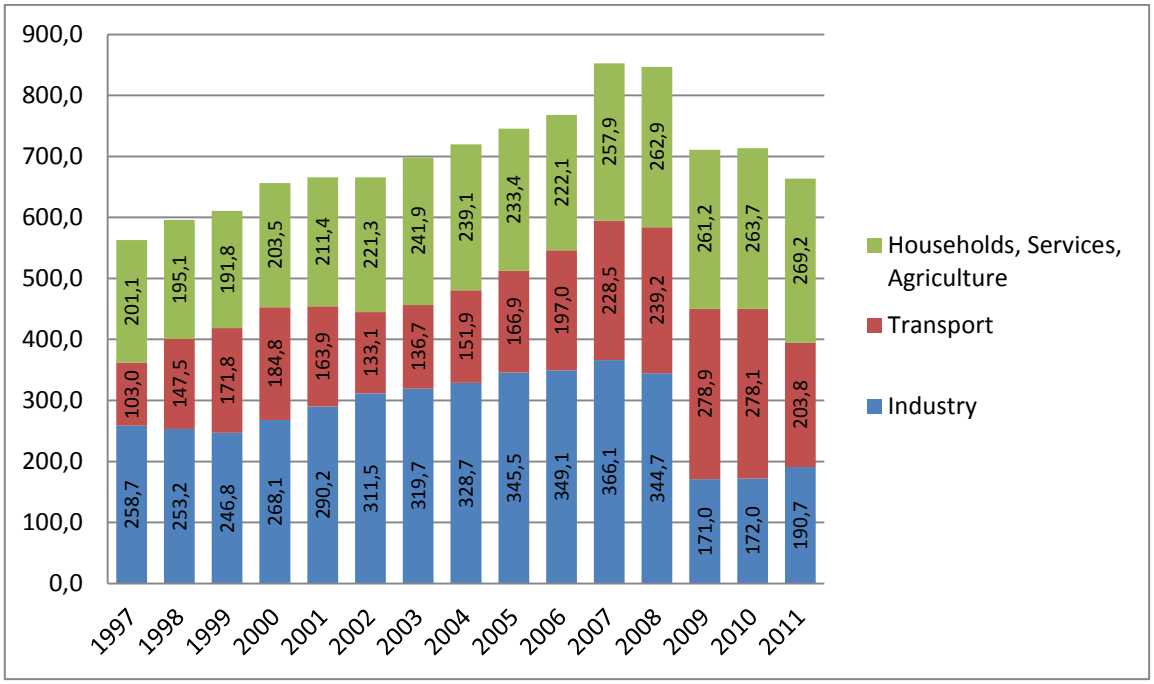


*Figure 1: Final energy consumption by sectors, 1997-2011 (ktoe)*

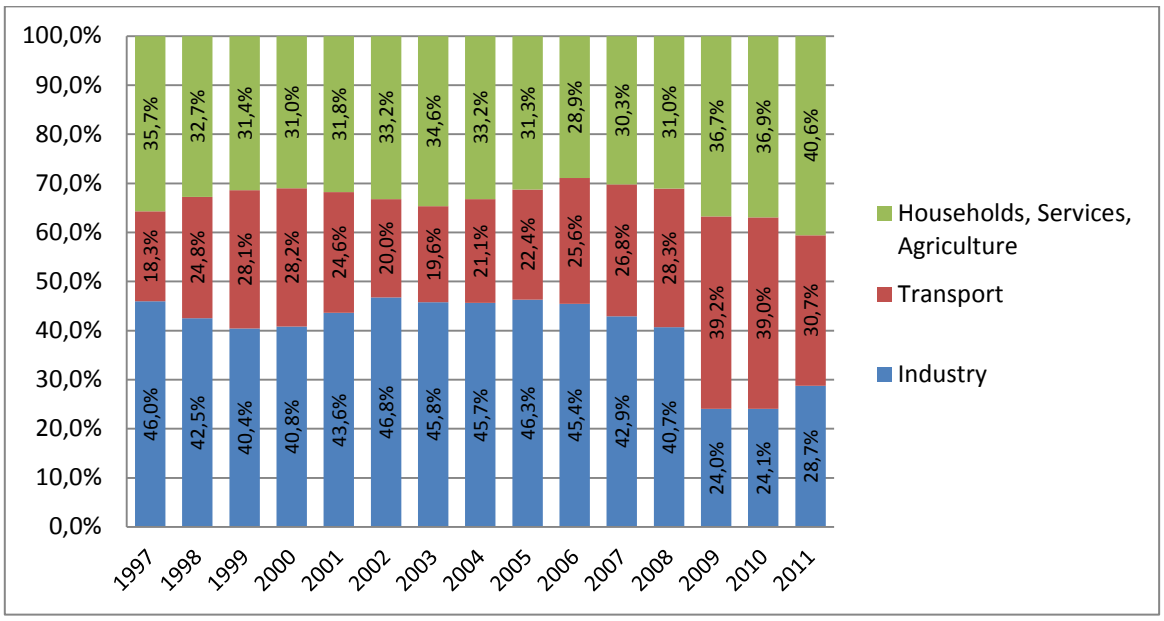


*Figure 2: Final energy consumption by sectors, 1997-2011 (%)*

Energy sector in Montenegro is characterized by high-energy intensity compared to the EU and more developed countries, which is a consequence of high level of consumption of the industry of aluminum and steel. Energy intensity of final consumption of energy was at a maximum level in 2000 and it was 24.387,7 *MJ/000 EUR-2000, which is from 5 up to 8 times higher than the value in EU*-15 and higher than almost all countries in the region. All of this indicates that there is a considerable room for rationalization in terms of energy. High value of energy intensity is concerning, especially if we take into account a relatively small consumption of final energy per inhabitant in Montenegro that is 5 times below the average of more developed countries (Figure 4).

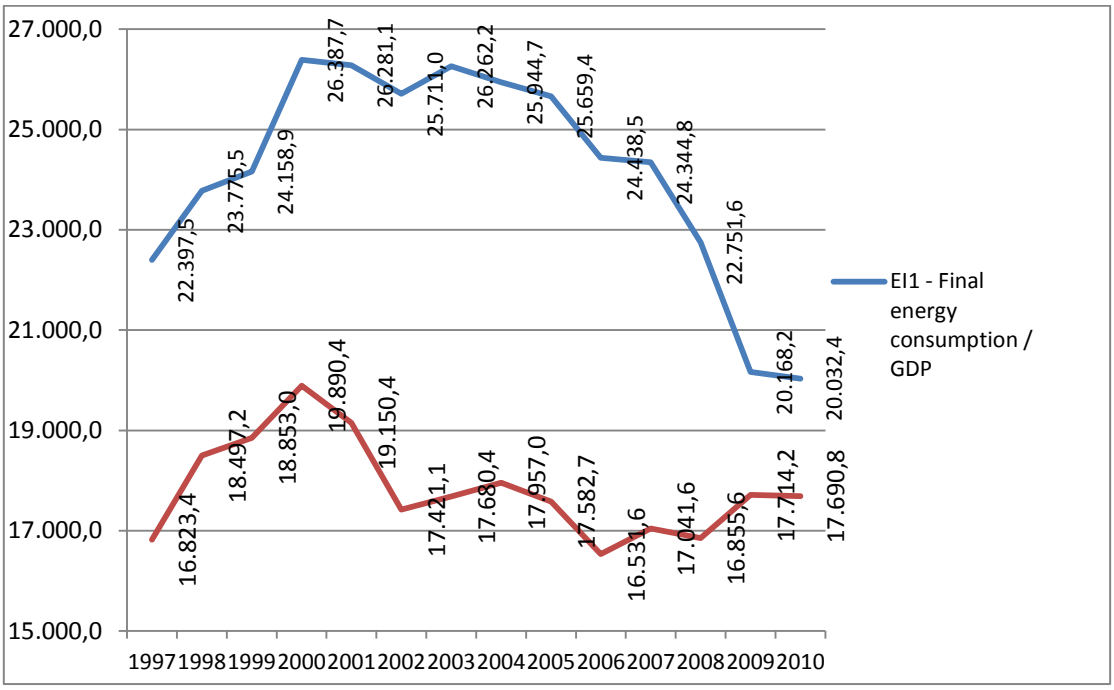


*Figure 3: Energy intensity with and without energy consumption of KAP, 1997-2010 (MJ/000 EUR-2000)*

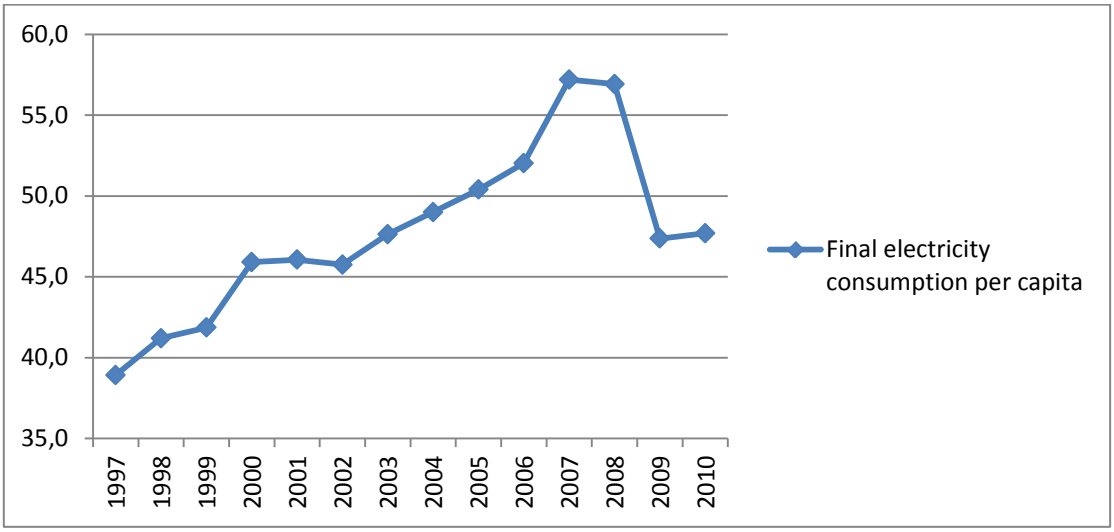


*Figure 4: Final energy consumption per capita in Montenegro, 1997-2010 (GJ/capita)*

### 3.2 Energy efficiency improvement measures and energy savings in final consumption

Individual energy efficiency measures are presented in this chapter and effects of measures defined in 1st EEAP are evaluated. In addition, new EE measures are defined in order to ensure achievement of indicative target in 2015. Measures are divided by sectors, as follows:

1. General measures in buildings – these measures related to the sector of households and sectors of public and commercial services,
2. Measures for households,

3. Measures in the sector of services,
   - Measures for the public sector,
   - Measures for the sector of commercial services,
4. Measures in industry,
5. Measures in transport,
6. Measures for energy entities,
7. Horizontal measures.

### *3.2.1 General measures in buildings*

Sector of buildings is one of 3 biggest energy consumers and it represent a great potential for achieving energy and economic savings, as well as positive effects on the environment. Energy consumption on the sector of buildings represents a dominant part of the consumption in sector of general consumption (households and services) and this is obvious on Figures 1 and 2.

The 1st EEAP has defined with several EE measures related to the building sector and that were an integral part of the package of measures for sectors of households and services. Having in mind their intersectoral character, measures related to building sector were elaborated separately in the 2nd EEAP.

These measures have regulatory character and they primarily relate to transposition of the requirements of the Energy Performance Buildings Directive 2010/31/EU (EPBD) in the national legislation. Process related to the implementation of the EPBD in Montenegro has formally started in 2010 by adopting the Law on Energy Efficiency and it was continued by adopting bylaws related to the energy efficiency of buildings. In cooperation with the Ministry of Sustainable Development and Tourism, the Ministry of Economy has adopted a set of 5 rulebooks that regulate this field in a detailed manner, as follows:

- Rulebook on minimum energy efficiency requirements in buildings (Official Gazette of Montenegro, 23/2013 as of 27 May 2013) determining minimum requirements in terms of energy efficiency of buildings, types of buildings that according to its purpose do not have to meet minimum energy performance and methodology of calculation energy performance of buildings;
- Rulebook on energy performance certification of buildings (Official Gazette of Montenegro 23/2013 as of 27 May 2013) determining detailed manner of certification buildings, manner of determining energy class of buildings, content of table with basic energy performance for public buildings, content of certificates and registry of issued energy performance certificates of building and types of buildings that do not need to be certified in accordance with the purpose;
- Rulebook on methodology for performing energy audits of buildings (Official Gazette 23/2013 as of 27 May 2013) determining methodology for performing energy audits of buildings;
- Rulebook on training program for energy audits, content of requests for issuing authorization and registry of authorized persons (Official Gazette of Montenegro 24/2013 as of 31 May 2013) determining the training program for energy audits of buildings and regular energy audits of heating systems and air conditioning systems, content of requests for issuing authorization for performing energy audits and detailed content of registry of authorized persons for performing energy audits;
- Rulebook on regular energy audits of air-conditioning and heating systems (Official Gazette of Montenegro 24/2013 as of 31 May 2013) determining manner and deadlines for performing regular energy audits of air-conditioning systems with a rated power of 12 kW or more and systems for heating on gas, liquid or solid fuels with a rated power of 20 kW or more.

With the aim of creating conditions for implementation of the described regulatory framework for energy efficiency in field of buildings, in the previous period the Ministry of Economy of Montenegro with the assistance of partner organizations, German International Cooperation (GIZ) and Norwegian company *Energy Saving International* (ENSI) and in cooperation with Mechanical and Architectural Faculty of the University of Montenegro has organized a training for 41 authorized persons for performing energy audits (auditors). Two manuals were developed in order to support the implementation of energy audits. Certain number of auditors is actively involved in implementation of projects related to reconstruction of buildings under the competence of the Ministry of Education and the Ministry of Health and which are implemented based on loans of the World Bank and KfW bank. Auditors have formed association of professionals, NGO Center for Energy Efficiency in order to organize their activities in a better way and in order to ensure their status and interests.

Activities related to creation of conditions for certification of energy performance of buildings have not yet been finalized in Montenegro. Main reason is the fact that there is no national software for evaluation and energy performance certification, as well as the fact that there are no relevant data about the building stock in Montenegro (number, structure, ownership, period of construction, construction and technical characteristics etc.). Special attention is dedicated to this problem in the 2nd EEAP and certain activities have been defined accordingly.

Summary of general measures for improvement of energy efficiency of buildings is given in Table 9 and detailed review of activities in separate tables for each measure separately.

**Table 9 – Overview of individual measures general measures for buildings**

| No. | Title for energy saving measure | Targeted final consumption | Duration | Achieved energy savings in 2012 [ktoe] | Share in the sectoral target for 2012. [%] | Energy savings expected in 2015/2018. [ktoe] | Status in relation to 1st NEEAP | Additional remarks |
|---|---|---|---|---|---|---|---|---|
| B.1. | Development and implementation of the regulatory framework for energy efficiency of buildings | New and existing buildings | 2010-2018 | 0 | 0 | 12.6/15.6 | Measure is revised having in mind the planned activities for harmonization with the updated EPBD | According to the 1st EEAP this measure related to sectors of households and sector of services (public and commercial).<br>Rulebook on minimum energy efficiency requirements of buildings was adopted in 2013. |
| B.2. | Implementation of regular energy audits of heating systems and air conditioning systems | Systems for heating and air conditioning in existing buildings | 2013-2018 | N/D | N/D | N/D | Implementation of measure started in 2nd EEAP | This measure relates to residential and non-residential buildings. |
| B.3. | Energy performance certification of buildings | New and existing buildings | 2010-2018 | N/D | N/D | N/D | Measure revised having in mind planned activities for harmonization with the updated EPBD | Certification relates to residential and non-residential buildings. |
| **TOTAL:** | | | | **0** | **0** | **12.6/15.6** | | |

| ***Title of the measure*** | | ***Development and implementation of the regulatory framework for energy efficiency of buildings*** |
|---|---|---|
| ***Index of the measure*** | | *B.1* |
| **Description** | **Category** | *Regulation* |
| | **Timeframe** | *Start:* ***2010.***<br>*End:* ***2018.***<br>*Foreseen major changes, amendments, improvements:*<br>***The measure has been revised in accordance with envisaged future activities on harmonization with the requirements of innovated EPBD*** |
| | **Aim / brief description** | *Development and implementation of regulatory framework for energy efficiency of buildings is a measure which provides compliance with the standards that are relevant in terms of energy efficiency of buildings. Development of regulation for energy efficiency of buildings is closely related to meeting the requirements of the EPBD. Therefore, activities based on the requirements of updated EPBD will be implemented in the future period. Mechanisms of implementation include inspection, control related to the obligation of certification of new buildings and existing buildings that are reconstructed, as well as control of validity of energy performance certificates.* |
| | **Target end-use** | *New and existing buildings (during reconstruction)* |
| | **Target group** | *Participants in construction, owners of buildings that are being reconstructed* |
| | **Regional application** | *National level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Implemented activities and achieved results:</u>*<br>*Establishment of a regulatory framework in order to meet the requirements in terms of energy performance of buildings:*<br>- *Law on spatial planning and construction of structures (Official Gazette of Montenegro. 51/2008, 34/2011 and 47/2011),*<br>- *Law on Energy Efficiency (Official Gazette of Montenegro 29/2010),*<br>- *Rulebook on minimum requirements of energy efficiency of buildings (Official Gazette of Montenegro 23/2013),*<br>- *Rulebook on energy performance certification of buildings (Official Gazette of Montenegro 23/2013),*<br>- *Rulebook on methodology for performing energy audits of buildings (Official Gazette of Montenegro 23/2013),*<br>- *Rulebook on regular energy audits of system for air conditioning and heating (Official Gazette of Montenegro 24/2013),*<br>- *Rulebook on training program for energy audits, content of requests for issuing authorizations and registry of authorized persons (Official Gazette of Montenegro 24/2013).*<br>*The Law on Energy Efficiency has provided a basis for adoption and implementation of abovementioned regulations.*<br>*The rulebook on minimum requirements of energy efficiency of buildings determines minimum requirements in terms of energy efficiency of buildings, types of buildings that according to the purpose do not have to meet the minimum energy performance and methodology of calculating energy performance of buildings.*<br>*Rulebook on energy performance certification of buildings determines in a detailed way the manner of building certification, manner of determining the energy class of a building, design and content of a table with basic energy performance of public buildings, content of certificates and registry of issued energy performance certificates of buildings and type of buildings that do not need to bet certified according to the purpose.*<br>*Rulebook on methodology of performing energy audits of buildings determines the methodology for performing energy audits of buildings.*<br>*Rulebook on training program for energy audits, content of requests for issuing authorization and registry of authorized persons determines the training program for energy audits of buildings and regular energy audits of heating systems and air conditioning systems, content of requests for issuing authorization for performing energy audits and detailed content of the registry of authorized persons for performing energy audits.*<br>*Rulebook on regular energy audits of air conditioning and heating systems determines the* |

| | | |
|---|---|---|
| | | *manner and deadlines for performing regular energy audits of air conditioning systems with rated power 12 kW or more and systems for heating on gas, liquid or solid fuels with rated power of 20 kW or more.*<br>*Future activities:*<br>1. *Amendments to the Law on Energy Efficiency in terms of introducing and implementing the requirements of new EPBD that relate to: mechanisms of implementation, fines, as well as controls of quality of issued energy performance certificates of buildings.*<br>2. *Amendments to the Law on spatial planning and construction of buildings in terms of creating conditions for a better implementation of rulebooks in the field of energy efficiency of buildings (regulation of the manner of introduction, implementation and control of reqirements related to energy performance of buildings), as well as introducing the energy efficiency component in spatial planning and which for the most part relates to the buildings sector (settlement planning) as well.*<br>3. *Update of the bylaws of the Law on Energy Efficiency in order to harmonize the by-laws with the requirements of updated EPBD.*<br>4. *Adoption of rulebooks based on the Law on spatial planning and construction of buildings, that defines the content and manner of preparing energy efficiency elaborate for buildings.*<br>5. *Preparation and putting into operation the national software for calculation of energy performance of buildings and its certification.*<br>6. *Strengthening the capacities of authorized professionals for performing energy audits of buildings.*<br>7. *Strengthening the capacities of authorized professionals for performing regular energy audits of heating systems and air conditioning systems.*<br>8. *Education and strengthening the capacities of entities competent for performing monitoring and control related to implementation of regulations in the process of constructing buildings, as well as the procedure of issuing permits for their construction and use.* |
| | **Budget and financial source** | *Funds planned by the end of 2015:*<br>- *10.000,00 € from the state budget;*<br>- *500.000,00 € from the support of the Kingdom of Norway for development of a national software for energy performance certification of buildings.* |
| | **Implementing body** | *MoE, MSDT, local self-government units, participants in construction* |
| | **Monitoring authority** | *MoE, MSDT (monitoring over the implementation of regulations)* |
| **Energy savings** | **Monitoring method / measurements of energy savings** | *Monitoring of the effects of this measure is achieved by using the recommended BU method of the EC "Introduction of EE technical regulations for new residential and non-residential buildings and promotion of buildings that meet the required technical regulations" which is adapted to Montenegro.* |
| | **Savings expected in 2012 according to the 1st EEAP** | *3.2 ktoe (1.8 ktoe for residential building and 1.4 for services)* |
| | **Savings achieved in 2012** | *0 ktoe (rulebook on minimum energy efficiency requirements of buildings adopted in 2013)* |
| | **Expected energy savings in 2015.** | *12.6 ktoe* |
| | **Expected effect on energy savings for 2018. (2020.)** | *15.6 ktoe* |
| | **Assumptions** | *For calculation of savings in consumption of thermal energy for heating, 2013 will be taken as a reference year when the new Rulebook on minimum energy efficiency requirements of buildings is being implemented and when the maximum allowed specific consumption of thermal energy for heating is defined, as follows: from 66 to 76 kWh/m2 annually, for residential buildings, i.e. 72 kWh/m2 annually for nonresidential buildings.*<br>*Savings projection is based on the estimation of constructed useful area of new buildings in 2013-2015 and 2016-2018. Assumptions related to newly built area are based on data on construction in last 5 years. Linear increase of the newly built area was not assumed, instead, the calculation was made with the average annual value, in order to get a conservative* |

| | | |
|---|---|---|
| | | *estimation. This estimation takes into account the effects of financial crisis that also affected the construction sector. It is estimated that around 255.000 m2 of residential area (200.000 m2 in family houses and 55.000 m2 in residential buildings) will be built in average, on an annual level. Data on construction of nonresidential area are not available; therefore the estimation is based on the growth of newly built area in the residential sector.*<br>*It is estimated that regulation will be stricter in the second three-year period 2016-2018, when minimum requirements will be 30% stricter.*<br>*In relation to an average consumption of existing buildings, i.e. buildings that were built without regulation, it is estimated that 190 kWh/m2 is for family houses, 165 kWh/m2 for residential buildings, while 180 kWh/m2 is for nonresidential buildings.*<br>*Unit savings calculated according to the established BU methodology are: 198 kWh/m2 for family houses, 172 kWh/m2 for residential buildings and 188 kWh/m2 for nonresidential buildings.*<br>*Annually, 49 GWh of energy can be saved or around 147 GWh (12.6 ktoe) of savings in 2015.*<br>*Having in mind the assumption that from 2015 regulation will be more strict (minimum requirements more strict by 30%) additional savings of around 12 GWh (3 ktoe) will be generated.* |
| | **Overlaps, multiplication effect, synergy** | *This measure will have a great impact on the reconstruction of existing buildings; due to the fact that all reconstructed buildings will have to meet minimum requirements. Consequently, the effect estimated only for reconstruction of new buildings will surely be multiplied. Nevertheless, due to the fact that it is not possible to estimate the area of buildings that will be reconstructed, as well as due to overlap with some other measures (especially, P.2 – Improvement of energy performance in public buildings), such savings could not be calculated.* |

| ***Title of the measure*** | | ***Implementation of regular energy audits of heating systems and air conditioning systems*** |
|---|---|---|
| ***Index of the measure*** | | *B.2* |
| **Description** | **Category** | *Regulation* |
| | **Timeframe** | *Start:* ***2013.***<br>*End:* ***2018.***<br>*Foreseen major changes, amendments, improvements:*<br>***The measure was not implemented in a systematic way, except under the requirement related to implementation of energy audits of buildings. Relevant regulation was adopted in May 2013, therefore, significant implementation and results are expected in the following period.*** |
| | **Aim / brief description** | *Large percentage of heating and air conditioning systems is worn out, it does not function properly and therefore it uses significant amounts of energy, without any reason. Based on the requirements of EPBD a regulation was adopted that provides for the obligation related to control audits of heating and air conditioning systems. Audits will provide to the users precise guidelines for improving energy efficiency of such systems.* |
| | **Target end-use** | *Systems of heating and air conditioning in existing buildings* |
| | **Target group** | *Users of buildings* |
| | **Regional application** | *National level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Implemented activities and achieved results:</u>*<br>*Regulatory framework was established for performing regular energy audits of systems for heating and air conditioning in building:*<br>*1. Rulebook on regular energy audits of systems for air conditioning and heating (Official Gazette of Montenegro 24/2013),*<br>*2. Rulebook on training program for energy audits, content of requests for issuing authorizations and registry of authorized persons (Official Gazette of Montenegro 24/2013).*<br>*Above mentioned rulebooks were adopted based on the Law on Energy Efficiency. The Rulebook on regular energy audits of systems for air-conditioning and heating defines the manner and deadlines for performing regular energy audits of air conditioning systems with rated power of 12 kW or more and systems for heating on gas, liquid or solid fuels with rated power of 20 kW or more. Energy efficiency of systems in real conditions of work is estimated by regular energy audits of heating systems and air conditioning systems, compared to the efficiency that is* |

| | | |
|---|---|---|
| | | *defined in the technical documentation and specification of the producer for designed operation modes, taking into account real and project conditions and the manner in which the building is being used and measures for improving energy efficiency of systems are proposed. Professionals who are authorized by competent state authority can perform regular energy audits. Authorized persons acquire the authorization based on the training program stipulated in the Rulebook on training program for energy audits, content of requests for issuing authorizations and registry of authorized persons.*<br>*Training for first group of professionals for such type of audits was conducted in 2013 and 7 trainees have finished the training successfully. In addition, 11 persons with a degree of Mechanical faculty have acquired the necessary qualification for such type of activity, as part of conducted trainings for performing energy audits of buildings.*<br>*<u>Future activities:</u>*<br>*1. Further strengthening of capacities of professionals for performing regular energy audits of systems for heating and air conditioning*<br>*2. Strengthening capacities of competent inspections in order to provide conditions for successful implementation of this measure*<br>*3. Establishment and development of database on systems for heating and air conditioning that are subject of the requirement of performing regular control audits* |
| | **Budget and financial source** | *Planned funds by the end of 2015:*<br>*- 5.000,00 € from the state budget;*<br>*- 15.000,00 from the support of the GIZ-ORF project for supporting the training of authorized persons for performing energy audits of systems.* |
| | **Implementing body** | *MoE, owners of building/systems for heating and air conditioning and authorized persons for performing regular energy audits.* |
| | **Monitoring authority** | *MoE (monitoring over the implementation of provisions of the subject rulebooks, keeping the database of systems that are subject to the requirement related to audits)*<br>*Administration for inspection affairs (inspection over implementation of provisions of the subject rulebooks)* |
| **Energy savings** | **Method for monitoring/ measuring the resulting savings** | *Methodology for BU monitoring of effects of energy audits as used as a measure of informing about the potentials for energy savings according to the EU recommendations stated in the document „Methodology for monitoring and verification of energy savings – bottom up approach". It is based on the understanding of energy consumption of a system and plants before energy audit and/or results of the energy audit in terms of estimated possible savings. It is necessary to improve the method continually, based on established database on systems of heating and air conditioning, as well as based on monitoring the measures implemented after the performed audit.* |
| | **Expected savings in 2012 as per 1st EEAP** | *Included in the estimation for measure B.1* |
| | **Savings achieved in 2012** | *0 ktoe (Rulebook on regular energy audits of systems for air conditioning and heating adopted in 2013)* |
| | **Expected energy savings in 2015** | *It is not possible to estimate* |
| | **Expected impact on energy savings in 2018** | *It is not possible to estimate* |
| | **Assumptions** | *Having in mind the fact that there is no database for systems for heating and air-conditioning that are subject to the requirement of performing regular control audits, it was not possible to estimate how much such systems will be audited on an annual basis and how much savings could be achieved based on recommendations that are a result of such audits. In the period of the 2nd EEAP it is assumed that this base will be established and that methodology related to evaluation of savings achieved after the energy audits will be improved.* |
| | **Overlaps, multiplication effect, synergy** | *Measure could overlap with measures related to energy management (P.1 and C.1), because audits are a usual part of the energy management system. In order to avoid double estimation of savings, effect of the audit will be included in estimation of savings under such measures. In addition, certain overlap may occur with measure B.3 - Energy performance certification of buildings, because the energy audit can be performed under the certification as well and savings will be estimated under that measure. Stating energy savings related to this measure should be related only to audits of systems that are not included in measures B.3, P.1 and C.1.* |

| *Title of the measure* | | *Energy performance certification of buildings* |
|---|---|---|
| ***Index of the measure*** | | *B.3* |
| **Description** | **Category** | *Information and mandatory information measure* |
| | **Timeframe** | *Start:* ***2010.***<br>*End:* ***2018.***<br>*Foreseen major changes, amedments, improvements:*<br>***The measure was revised according to the foreseen future activities on harmonization of the requirements of EPBD II.*** |
| | **Aim / brief description** | *This measure intends to increase the awareness of users of buildings and transform the market toward more efficient buildings. In order to achieve a full effect of this measure, it is necessary to design and implement an information program of citizens about the meaning and significance of certificates, as well as to provide control mechanisms related to implementation and control of quality of work of persons who are authorized for energy performance certification of buildings. Certificate contains information about the calculated annual primary energy that has to be delivered to the building for heating, cooling, air conditioning, sanitary hot water, lighting, auxiliary equipment and appliances. Certificate for a new building is issued based on implemented technical documentation, while it is necessary to perform a detailed energy audit for the existing building.* |
| | **Target end-use** | *New and existing buildings* |
| | **Target group** | *Owners of buildings, participants in the construction, authorized persons for performing energy audits* |
| | **Regional application** | *National level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Implemented activities and achieved results:</u>*<br>*Establishment of a regulatory framework for energy performance certification of buildings:*<br>- *Rulebook on certification of energy performance of buildings (Official gazette of Montenegro 23/2013),*<br>- *Rulebook on minimum requirements of energy efficiency of buildings (Official gazette of Montenegro 23/2013),*<br>- *Rulebook on methodology for performing energy audits of buildings (Official gazette of Montenegro 23/2013).*<br>*Law on Energy Efficiency provides the basis for adoption and implementation of the given regulations.*<br>*Rulebook on energy performance certification of buildings defines a detailed way of certification of buildings, manner of defining an energy class of a building, design and content of a table with basic energy performance of public buildings, content of certificates and registry of issued energy performance certificates of buildings and types of buildings that are not certified in accordance with the purpose.*<br>*Calculation of energy performance of buildings is performed based on the methodology provided for in the Rulebook on minimum requirements of energy performance of buildings.*<br>*Certificate on energy performance is issued based on energy audit that is performed in accordance with the methodology stipulated in the Rulebook on methodology for performing energy audits.*<br>*According to the Law on Energy Efficiency, the investor shall submit a certificate on energy performance of buildings in addition to a request for issuing certificates of occupancy. Also, owners of buildings which are being sold or rented shall submit the certificate to the buyer, or to make it available to the tenant.*<br>*Public buildings shall publicly display the certificate in a prominent place.*<br>*During the implementation of 1st EEAP this measure was not implemented in practice (no building was certified).*<br>*<u>Future activities:</u>*<br>1. *Update of bylaws of the Law on Energy Efficiency in order to harmonize the bylaws with the requirements of innovated EPBD;*<br>2. *Determining energy class of buildings;*<br>3. *Preparation and bringing into function national software for calculation of energy* |

| | | |
|---|---|---|
| | | *performance of buildings and energy performance certification of buildings;*<br>4. *Strengthening the capacities of competent entities for controlling the quality of implementation of this measure;*<br>5. *Establishing a registry of issued energy performance certificates of buildings;*<br>6. *Implementation of information campaign or special programs on meaning and significance of energy performance certificates of buildings for different target groups (bodies competent for issuing approvals for construction works and use of buildings, designers, supervisory bodies, users etc.).* |
| | **Budget and financial source** | *Planned funds by the end of 2015:*<br>- *20.000,00 € from state budget.*<br>*Note: The measure will be supported from assistance funds of the Kingdom of Norway from measure B.1.* |
| | **Implementing body** | *MoE, owners of buildings and authorized persons for performing energy audits (amendments in the regulation, initiating a campaign or program of certification, implementation of certification)* |
| | **Monitoring authority** | - *MoE (administrative monitoring over implementation of provisions of the Law on Energy Efficiency and subject rulebooks, keeping the registry of issued certificates etc.)*<br>- *Entities competent for control of the quality of issued certificates on energy performance* |
| **Energy savings** | **Method for monitoring/ measuring the resulting savings** | *Methodology for BU monitoring of effects of energy audits was used as a measure of informing about the potentials for energy savings according to the EU recommendations stated in the document „Methodology for monitoring and verification of energy savings – bottom up approach". It is based on understanding the energy consumption in buildings prior to the energy audit and/or results of an energy audit in terms of estimated possible savings. Based on estimated potentials related to savings that are an integral part of the certification process, it can be roughly estimated how much savings will be achieved by implementing only 'soft' measures meaning a change in behavior, better procedures related to management and maintenance of buildings.* |
| | **Expected savings in 2012 as per 1st EEAP** | *Included in the estimation for measure B.1* |
| | **Savings achieved in 2012** | *0 ktoe (Rulebook on energy performance certification of buildings adopted in 2013)* |
| | **Expected energy savings in 2015** | *It is not possible to estimate* |
| | **Expected impact on energy savings in 2018** | *It is not possible to estimate* |
| | **Assumptions** | *In order to monitor the effects of this measure, it is necessary to establish a database of issued certificates and reports on performed energy audits, in order to obtain data about the potentials for energy savings. It is estimated that this database will be established during the period of implementation of 2nd EEAP and that quantification of savings will be possible during the period of implementation of 3. EEAP.* |
| | **Overlaps, multiplication effect, synergy** | *Certification of existing buildings is connected to energy audits and therefore this measure overlaps measures related to energy management (P.1 and C.1) as well as for previous measure B.2.* |

### *3.2.2 Measures in the household sector*

The household sector is one of the most significant energy consumers (especially electricity) in Montenegro. According to Figures 5 and 6, households with a rather constant share of 60-65% dominate in consumption of final energy in the general consumption sector in whole period 1997-2011. In addition to the importance for the energy balance of Montenegro, EE improvement in the household sector is important factor for progress and family economy.

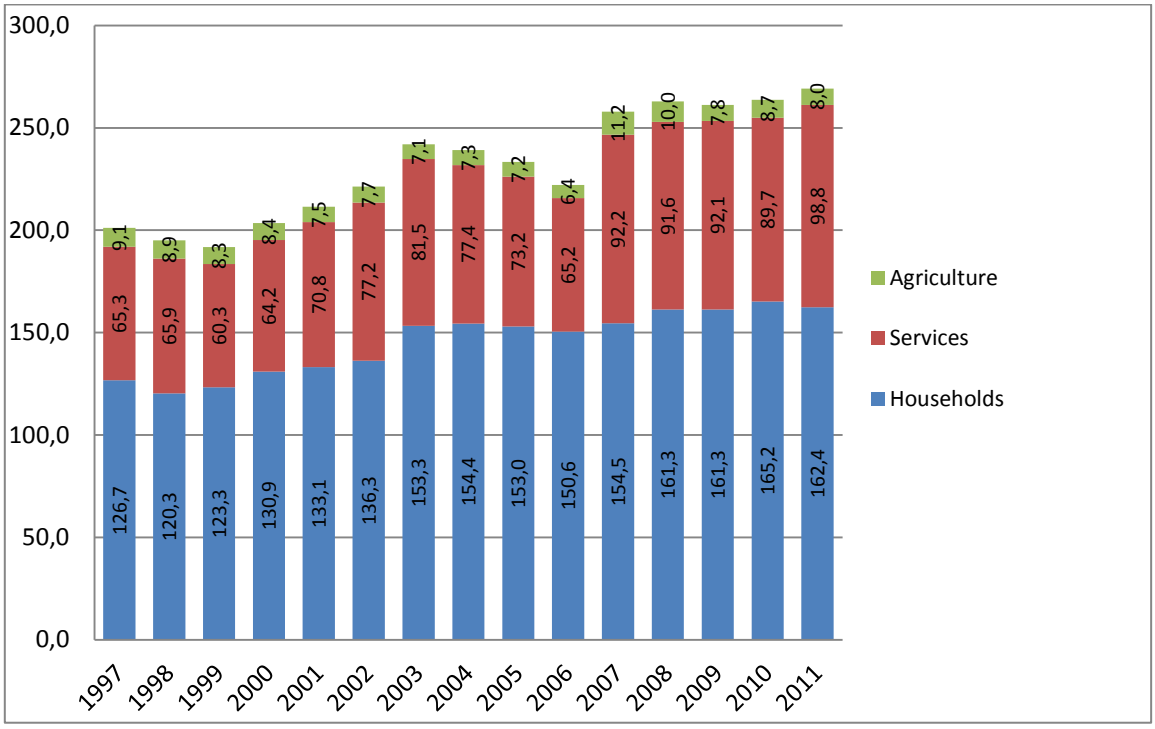


*Figure 5: Consumption of final energy by subsectors of Miscellaneous consumption, 1997-2011 (ktoe)*

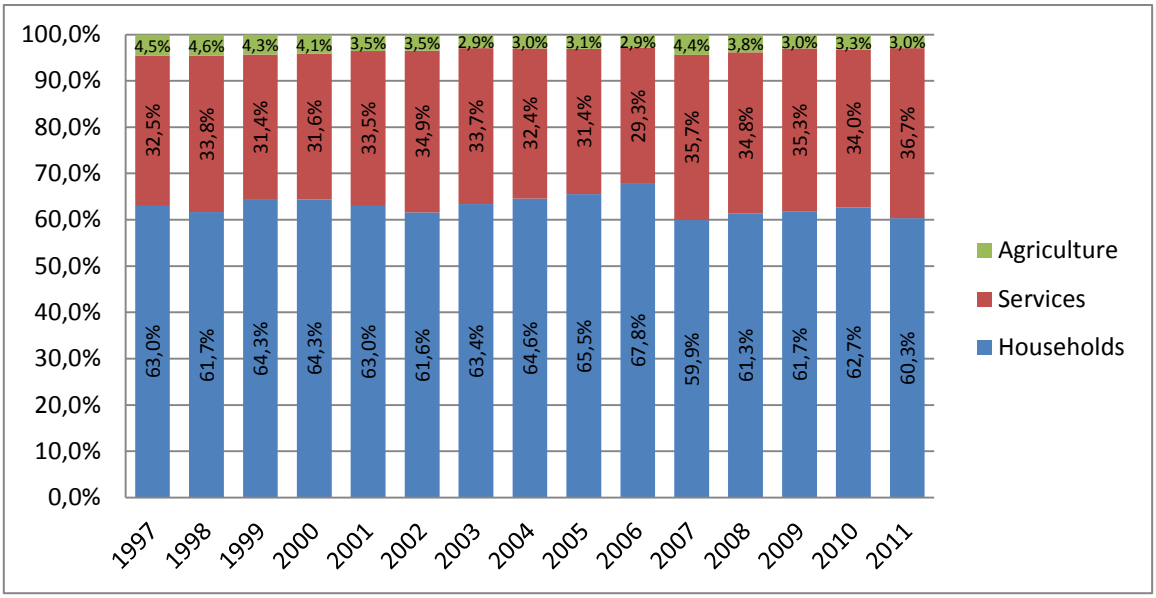


*Figure 6: Consumption of final energy by subsectors of Miscellaneous consumption, 1997-2011 (%)*

According to the census in 2011 there are 194.795 households in Montenegro with an average family with 3,2 members per household. Total number of apartments (including cottages etc.) was around 247.000 with an average surface of 71 m2/per apartment.

After 2004 the activity related to construction works in Montenegro was intensified, especially in the central and southern part of the country. According to available statistical data, 273.000 m² in average of new residential buildings were built in Montenegro from 2004 to 2011 on an annual basis.

Buildings before 1990 were built in accordance with the standards of former SFRY and they have relatively low quality. Even though some of such buildings had thermal insulation at the beginning, this insulation is not functional due to the fact that buildings are old and due to external influences. This is confirmed after preparing several studies as well as tests with the help of thermal cameras.

Many new apartments are still constructed without thermal insulation or with a very poor thermal insulation. However, due to improved awareness of investors, as well as buyers/tenants, number of new buildings that are being built with better standards in term of EE is increasing. This is a result of different activities for increasing the public awareness and which are implemented by the MoE with the support of donors and NGO sector, as well as promotional activities of construction companies and suppliers of construction products.

Low price of electricity in the past in the residential sector, as well as benefits related to the use of electric appliances for space heating, lead to a dominant use of electricity for space heating in residential buildings, especially in urban area. Heat pumps/air conditioners ("split systems") that are usually used for heating have low performance, primarily due to their poor quality, inadequate installations and poor maintenance. Direct electric heating (heat accumulators, electric thermal boilers, electric heaters) are often used for room heating, sometimes even as the only heating source. In addition, electricity is used for preparation of hot water in households, especially in urban areas. Thermal solar systems are rarely used. Use of incandescent bulbs is common in Montenegrin households. Increase of electricity consumption is obvious in the summer due to widespread use of air conditioners in order to cool the rooms.

Biomass (wood) is frequently used for room heating in rural areas, especially in the northern part of Montenegro. Natural gas is not available and district heating is not developed.

Legislative and regulatory framework in terms of EE of buildings is finalized and it is harmonized with the requirements of EPBD. EE measures for buildings are defined and described in Chapter 3.2.1.

Regulatory framework for labelling energy consumption of appliances in households is in the development stage. The Law on Energy Efficiency stipulates the obligation of energy efficiency labelling of household appliances and during the implementation period of 1st EEAP a draft of relevant bylaw (rulebook) was prepared. The rulebook shall regulate this area. It is obvious that household appliances mostly labelled with energy efficiency labels are available on the market and labels often differ, depending on the producer.

In the previous period great attention was dedicated to public awareness raising about the importance and effects of implementation of energy efficiency measures, a strong, ongoing and overall campaign was conducted under the project "Energy efficiency year" (2008). Most important target group of this campaign were the households. In this regard, several public events took place and various promotional materials were prepared and it was intended for a wider public. In addition, through public media (daily newspapers, TV, radio, internet etc.) a large volume of promotional material was distributed in various forms (brochures, TV promotional films and video, advertisements, articles, promotional exhibitions etc.). More information about the conducted activities is given under the description of EE measure R1.

During the period of implementation of 1st EEAP, the Ministry of Economy has launched several significant activities in cooperation with partners in order to provide financial incentives for implementation of EE measures intended for citizens. More information on conducted activities are given under the description of EE measure R.3.

Brief overview of current and new EE measures for the household sector is given in Table 10 and detailed descriptions of activities are given in separate tables for each measure.

**Table 10 – Overview of individual measures for the household sector**

| No. | Title for energy saving measure | Targeted final consumption | Duration | Achieved energy savings in 2012 [ktoe] | Share in the sectoral target for 2012. [%] | Energy savings expected in 2015/2018. [ktoe] | Status in relation to 1st NEEAP | Additional remarks |
|---|---|---|---|---|---|---|---|---|
| R.1. | Info campaigns and network of EE info centers | Existing residential buildings | 2010-2018 | N/D | N/D | N/D | Info campaign shall be continued | According to the 1st EEAP:<br>- measure for the household sector<br>- measure for the sector of services (public and commercial)<br>There is a correlation with measure P.1. |
| R.2. | Energy labelling of household appliances | Household appliances | 2010-2018 | N/D | N/D | N/D | Measure is revised due to amendments of EU directives | It is necessary to provide monitoring of the market (establishing the quantity of appliances depending on the efficiency class) in order to determine the effects of this measure. |
| R.3. | Financial support to citizens for investments in renewable energy sources on the consumption side | New and existing residential buildings | 2010-2018 | 0.02 | 3.3 | 0.28 | Measure is revised | It is necessary to provide further development of relevant mechanisms of support at national and local level (credit lines, earmarked funds, subsidies etc.); Use of solar energy should be primarily encouraged for water heating and use of modern forms of biomass (pellet, briquette, wood chips). |
| **TOTAL:** | | | | **0.02** | | **0.28** | | |

| ***Title of measure*** | | ***Info campaigns and network of EE info centers*** |
|---|---|---|
| ***Index of the measure*** | | *R.1* |
| **Description** | **Category** | *Information and mandatory information measure* |
| | **Timeframe** | *Start:* ***2010.***<br>*End:* ***2018.***<br>*Foreseen major changes, amendments, improvements:*<br>***In the following period info campaign shall be conducted mostly through targeted campaigns in combination with financial incentives for certain measures.*** |
| | **Aim / brief description** | *Objective of the info campaign is raising awareness of targeted groups about the benefits and possibilities of energy efficiency improvement. Most effective are campaigns conducted in a limited period of time, focused on specific activities, for example, the issue of thermal insulation of buildings, efficient lightning, use of RES on consumption side etc. This measure provides for strengthening of the capacities of EE info centers, in local self-government units, where energy advisors distribute free advice to the citizens regarding opportunities for achieving energy and financial savings.* |
| | **Target end-use** | Existing residential buildings |
| | **Target group** | *Citizens* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *Implemented activities and achieved results:*<br>*In the previous period, great attention was dedicated to the process of raising the public awareness about the importance and effects of implementation of energy efficiency measures. Strong, ongoing and overall public campaign was conducted. The campaign initiated under the project "Energy Efficiency Year" (2008). In this regard, several public and expert events took place and different promotional material was prepared intended for wider public, as well as certain target groups (ministries, local self-governments, donors, professional associations etc.). In addition, through public media (daily newspapers, TV, radio, internet etc.) a large volume of promotional material was distributed in various forms (brochures, TV promotional films and video, advertisements, articles, promotional exhibitions etc.)*.<br>*This campaign was accompanied with regular annual public poll (2008-2013) and special reports were prepared in this regard. Public polls showed that more people are familiar with the energy efficiency concept in 2013 compared to 2008. The awareness was improved by 24,8% (from 23,6% to 48,4%).*<br>*It is important to emphasize following activities that were carried out under the campaign:*<br>- *Educational TV series "Smart energy" was broadcasted (12 episodes);*<br>- *In the period 2010-2012, info centers for energy efficiency were opened in the Capital Podgorica and Bijelo Polje, as well as 7 info offices under the existing Regional business centers in Niksic, Berane, Cetinje, Bijelo Polje, Zabljak, Plav and in Rozaje. An info telephone line (080 081 660) is available under the info centre in Podgorica;*<br>- *The Government of Montenegro in cooperation with EPCG and media partners has launched the initiative „Join in!“ in 2011 with the aim of raising public awareness of all consumers in relation to rational and efficient usage of energy;*<br>- *During 2011. and 2012. promotional activities were organized in 21 Montenegrin municipalities, around 7000 saving bulbs were distributed to citizens, as well as brochures with advice for households regarding energy efficiency;*<br>- *Web site www.energetska-efikasnost.me, was opened in 2009 and it was redesigned in 2011;*<br>- *The project „Energy tour“ was implemented during 2011 and 2012 with the aim of introducing the pupils of final years of elementary schools with energy efficiency and expanding their knowledge in the area climate change and renewable energy sources;*<br>- *Promotion of energy efficiency at Construction fairs held in Budva in 2010, 2011, and 2012 and which were mostly dedicated to this topic.*<br>*Future activities:*<br>*The campaign will be continued in the period of implementation of the 2nd EEAP with certain amendments, depending on financial possibilities and earmarked support. Coordinated involvement of entities relevant for promotion of energy efficiency (MoE, local self-government* |

| | | |
|---|---|---|
| | | *unit, NGO sector, donators, market actors etc.) will still be still extremely important for implementation of the campaign. Special role in promotion of energy efficiency have info centers because they have the possibility of having a direct contact with citizens, as well as connections with producers of energy efficient equipment, materials and appliances and service providers in this field.*<br>*In addition, promotional role of producers of energy efficient products and their representatives and distributers is also very significant, especially through media that are available to a wider population (TV, radio, daily newspapers, promotional material etc.).*<br>*In the following period further work should be done in strengthening the role and capacities of educational institutions (schools, faculties etc.) in order to include topics related to energy efficiency in school programs at all levels, as well as carrying out certain promotional activities (seminars, roundtables, quizzes etc.).*<br>*For implementation of the mentioned activities MoE has a very significant role, having in mind competences for implementation of energy efficiency policy that were provided for in the law. Central role of the ministry is, above all, the implementation of effective measures and which are, amongst other, related mostly to the promotion of energy efficiency (preparation and coordination of activities, motivating relevant entities for assistance, reviewing achieved effects etc.).*<br>*For promotion of energy efficiency in terms of improvement of energy performance of buildings results of promotional projects should still be used and the Ministry has a leading/coordinating role and promotional projects provide the opportunity for informing and educating a wider population* |
| | **Budget and financial source** | *Planned funds by the end of 2015:*<br>- *30.000,00 €from the state budget.* |
| | **Implementing body** | *MoE, local self-government unit, Ministry of Education, Ministry of Science* |
| | **Monitoring authority** | *Ministry of Economy* |
| **Energy savings** | **Method for monitoring/ measuring the resulting savings** | *Monitoring the results of this measure is achieved by using recommended TD indicators of the European Commission for the household sector (P1-P5). The measure shall have effects in other sectors as well, especially in the service sector and therefore such effects will be evaluated based on TD indicators (M3 and M4). It is important to carry out a market research before implementing any info campaign and to show the results by repeating the same research after conducting a campaign.* |
| | **Expected savings in 2012 as per 1st EEAP** | *1.4 ktoe* |
| | **Savings achieved in 2012** | *It is not possible to estimate* |
| | **Expected energy savings in 2015** | *It is not possible to estimate* |
| | **Expected impact on energy savings in 2018.** | *It is not possible to estimate* |
| | **Assumptions** | *Even though 1st EEAP provides framework estimations for achieving energy savings related to this measure, practice shows that it is impossible to isolate effects of a measure and that it is better to monitor the measure by using TD indicators. Therefore an estimation of effect of this measure is not given.* |
| | **Overlaps, multiplication effect, synergy** | *This measure is complementing energy management measures and promotion of energy efficiency in other consumption sectors.* |

| *Title of measure* | | *Energy labelling of household appliances* |
|---|---|---|
| ***Index of the measure*** | | *R.2* |
| **Description** | **Category** | *Information and mandatory information measure; Financial instruments* |
| | **Timeframe** | *Start:* ***2010.***<br>*End:* ***2018.***<br>*Foreseen major changes, amendments, improvements:*<br>***The measure is revised in accordance with envisaged future activities in harmonization of relevant innovated EU directive.*** |
| | **Aim / brief description** | *Energy labelling of appliances in the household provide information to buyers related to energy consumption of appliances and it has an influence on their selection depending on energy efficiency of appliances that are available in the market.*<br>*In order to provide conditions and practice for labelling the appliances, it is necessary to establish appropriate legal framework and introduce mechanisms that would oblige market actors (supplier and distributors) to implement this activity.* |
| | **Target end-use** | *Household appliances* |
| | **Target group** | *Citizens, suppliers and distributers of household appliances* |
| | **Regional application** | *National level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Implemented activities and achieved results:</u>*<br>*The Law on Energy Efficiency stipulates the obligation of labelling the energy efficiency of household appliances. However, during 1st EEAP draft of appropriate bylaw (rulebook) is prepared and the rulebook will regulate this field in a more detailed manner.*<br>*Despite the above, it is obvious that household appliances with energy efficiency labels are available on the market and that they often differ depending on the producer.*<br>*<u>Future activities:</u>*<br>*1. Finalization and adoption of the rulebook for energy labelling of energy related products, harmonized with the Directive 2010/30/EU as well as with its implementing measures by the end of 2013;*<br>*2. Establishment of monitoring bodies and a control scheme (inspection) for successful implementation of regulations in the market, monitoring of the situation and reporting from the relevant market (in a manner which is defined in relevant regulations).*<br>*Note: This measure shall be supported with an EE improvement measure R.1 (info campaign and network of EE info centers)* |
| | **Budget and financial source** | *Planned funds by the end of 2015:*<br>*- 10.000,00 € from the state budget.* |
| | **Implementing body** | *MoE, suppliers and distributers of household appliances* |
| | **Monitoring authority** | *MoE, Administration for inspection affairs* |
| **Energy savings** | **Method for monitoring/ measuring the resulting savings** | *Monitoring the effects of this measure is achieved by using recommended TD indicators of the European Commission for the household sector (P4). In this regard, it is necessary to establish a scheme related to monitoring of situation on the market and reporting by relevant market actors.* |
| | **Expected savings in 2012 as per 1st EEAP** | *2.2 ktoe* |
| | **Savings achieved in 2012** | *It is not possible to estimate* |
| | **Expected energy savings in 2015** | *It is not possible to estimate* |
| | **Expected impact on energy savings in 2018.** | *It is not possible to estimate* |

| | | |
|---|---|---|
| | **Assumptions** | *It is assumed that during the period of implementation of 2nd EEAP, a scheme for monitoring the situation in the market will be established and that statistical data on usage of household appliances will be improved (for example. conducting a survey). Improvement of statistical data is necessary for calculation of the TD indicators.* |
| | **Overlaps, multiplication effect, synergy** | *This measure is also important for implementation of measure P.2 – Establishment and implementation of EE criteria in public procurement. Energy class of an appliance should be a relevant criterion in public procurement.* |

| ***Title of measure*** | | ***Financial support to citizens for investments in renewable energy sources on the consumption side*** |
|---|---|---|
| ***Index of the measure*** | | *R.3* |
| **Description** | **Category** | *Financial instruments* |
| | **Timeframe** | *Start:* ***2010.***<br>*End:* ***2018.***<br>*Foreseen major changes, amedments, improvements:*<br>***It is necessary to provide further development of adequate mechanisms of support at the national and local level (credit lines, earmarked funds, subsidies etc.).*** |
| | **Aim / brief description** | *Objective of this measure is to provide the availability of financial mechanisms of support to citizens for investing in energy efficiency and RES.*<br>*Introduction of earmarked programs for support at the national level and local self-government units' level for using available OIE. The use of solar energy for water heating and use of modern forms of biomass (pellet, briquette, wood chips) should primarily be encouraged* |
| | **Target end-use** | *New and existing residential buildings* |
| | **Target group** | *Citizens* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Implemented activities and achieved results:</u>*<br>1. *Ministry of Economy of Montenegro, in cooperation with partners -United Nations Environment Programme (UNEP) and Italian Ministry for Environment, Land and Sea (IMELS), implements the project MONTESOL, launched the MONTESOL project in July 2011, aimed at offering an attractive and sustainable financial mechanism for obtaining a retail loan for households to install Solar Water Heating (SWH) systems. For the MONTESOL project, funds in the amount of 1 million USD were envisaged for project implementation and management and to subsidize the interest rate of commercial banks. Possible individual loans range up to 5000€, with a repayment period of 7 years, with a 0% interest rate. By the end of 2012, 72 systems were installed under the project..*<br>2. *The Ministry of Economy and the Ministry of Agriculture and Rural Development in cooperation with local self-government units (Berane, Kolasin,Mojkovac, Plav, Bijelo Polje, Rožaje and Danilovgrad ) implement the project "Solarni katuni" with the aim of installing solar systems for production of electricity on buildings situated in summer pasture lands which are not connected to the electric grid. By the end of 2012, 87 photovoltaic systems were installed In Montenegrin summer pasturelands under this project and funds were provided and a contract was signed for installation of 115 systems in May-July 2013.*<br>3. *In the previous period, the Capital Podgorica and Budva initiated a program related to subsidies for installation of solar systems in new buildings, by reducing utility fee (fee for utility land) in the amount of 100-150 € per square meter of installed solar panel.*<br>*<u>Future activities:</u>*<br>1. *Continuation of the MONTESOL project in the following period;*<br>2. *Continuation of the project Solarni katuni in 2013. The Ministry of Economy has planned for this purpose 20000 € and total value of the project in 2013 will depend on the interest of interested partners and its participation;*<br>3. *Ministry of Economy of Montenegro, in cooperation with its partners FODEMO project (Forestry Development in Montenegro - phase II) and the Ministry of Agriculture and Rural Development plans to initiate a project aimed at establishment of a financial mechanism for providing loans for households for installation of a system on modern biomass fuels (briquette, pellet). For the purpose of this project funds in the amount of 130.000€ will be provided. Funds are envisaged for implementation and interest rate subsidy in commercial banks;*<br>4. *Promote programs related to subsidies of using renewable energy sources in other Montenegrin* |

| | | |
|---|---|---|
| | | *local self-government units as well according to models that are implemented in Podgorica and Budva.* |
| | **Budget and financial source** | *Planned funds by the end of 2015:*<br>- *70.000,00 € from the state budget,*<br>- *440.000,00 € for implementation of the MONTESOL project - interest free loans for installation of solar hot water heating systems (assistance from the Italian ministry of Environment, Land and Sea and UNEP),*<br>- *130.000,00 for implementation of the program for interest free loans for installation of systems on modern biomass fuels (assistance of the Government of Grand Duchy of Luxemburg).* |
| | **Implementing body** | *MoE, Local Self-government units* |
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/ measuring the resulting savings** | *Monitoring of the effects of this measure is achieved by using the recommended BU method of the EC with the establishment of national reference value. The method is the following - Installation of a system for solar water heating in residential and non-residential buildings and according to recommendations stated in the document „Methodology for monitoring and verification of energy savings– bottom-up approach".* |
| | **Expected savings in 2012 as per 1st EEAP** | *0.6 ktoe* |
| | **Savings achieved in 2012** | *0.02 ktoe* |
| | **Expected energy savings in 2015** | *0.28 ktoe* |
| | **Expected impact on energy savings in 2018. (2020.)** | *0.28 ktoe* |
| | **Assumptions** | *According to the above mentioned methodology, assumed energy savings units per m2 of installed solar collectors are 640 kWh/m2. According to the collected data, by the end of 2012, 330.5 m2 of solar collectors were installed.*<br>*It is predicted that 5000 m2 of solar collectors will be installed by the end of the project.*<br>*Having in mind the fact that lifespan of this system is around 20 years, all savings will be valid in 2020.*<br>*It is not possible to estimate energy savings in relation to the project of installation of systems on modern biomass fuels, because there are no data about systems that will be replaced under this project* |
| | **Overlaps, multiplication effect, synergy** | */* |

### 3.2.3. Measures in service sector

Service sector includes commercial services and public sector. According to Figures 5 and 6, service sector participates with a share of 30-35% in consumption of final energy in sector of general consumption in the period 1997-2011.

Electricity is primarily used in the service sector in buildings. In addition, to usual domains of using the electricity, such as lighting or cooling, electricity is also used for space heating and preparation of hot water, as well as for other needs related to heat. Oil products and coal are mainly used for space heating and preparation of hot water. However, for large number of buildings, electricity is the only energy source.

Relevant studies and energy audits that were performed by now show that there is a significant potential for EE improvement in many areas, including heating/cooling systems, inner lighting and public lighting, water supply system (with great water losses) etc. In many cases measures related to introduction of energy management do not require special form of financing and it can lead to significant energy savings. However, employees often have a rather low level of public awareness in relation to EE, therefore the trend of wasting energy is almost a normal behavior. In addition, another problem is the fact that there is not sufficient capacity for implementation of energy management. This is noticeable in the public sector, especially because of centralized payments for energy costs and not directly by the end user.

#### 3.2.3.1 Measures in public sector

Most important energy consumers in public sector (without transport) are, as follows: water supply, public lighting, facilities under the competence of the Ministry of Education (elementary and high schools, universities, student dormitories etc.) and the Ministry of Health (buildings of healthcare and educational institutions).

In the public sector sufficient attention is not given to the energy consumption, nor to the monitoring of consumption. Until now there was no systemic approach related to the EE improvement in public sector, with the exception of implementation of projects for EE improvement in public buildings (schools, hospitals).

Implementation of EE measures requires a completely developed regulatory framework, guidelines for implementation, increasing awareness and strengthening capacities and, most importantly, providing necessary and political will both on the national and local level. It is necessary to mobilize entities of the public sector and provide necessary human and financial capacities, while MoE/SEE will provide adequate support and training, as the initiator for implementation of monitoring.

During the implementation of 1st EEAP most important activities that were implemented relate to improvement of energy performance of certain public buildings (buildings of healthcare and educational institutions) and which were financed based on the loan of from the World Bank and KfW bank (described under EE measure P.3). In addition, activities were noticed and implemented with a focus on strengthening capacities of public sector entities for a continued and sustainable energy management, as well as ti the implementation of low-cost measures and his is described in a detailed way under EE measure P.1.

In addition, there is a significant interest of the donor community for financing the investments of EE improvements in public buildings (World Bank, KfW, EBRD, UNDP etc.). However, implementation of EE improvement measures in service sector cannot be based only on the support of donors. Participation of state budget and budgets of local self-government units is mandatory, while private capital can be mobilized separately through the participation of ESCO companies.

In the following period it is necessary to increase efforts on integration of energy efficiency requirements in public procurement procedure. In this regard, it is necessary to provide a legal and technical knowledge and skills of officials who are responsible for public procurement for evaluating energy efficiency in procedures related to preparation of tenders and evaluation of bids by implementing criterion of economically most advantageous offer.

Brief summary of existing and new EE measures for the public sector is given in Table 11 and detailed description of activities is given in separate tables for each measure.

**Table 11 – Overview of individual measures in the public sector**

| No. | Title for energy saving measure | Targeted final consumption | Duration | Achieved energy savings in 2012 [ktoe] | Share in the sectoral target for 2012. [%] | Energy savings expected in 2015/2018. [ktoe] | Status in relation to 1st NEEAP | Additional remarks |
|---|---|---|---|---|---|---|---|---|
| P.1. | Development of energy management in public sector | Existing buildings/facilities (energy consumers) under the competence of the state and local self-government units | 2010-2018 | N/D | N/D | N/D | Continuation of activities; | During the implementation period of the 2nd EEAP, special attention should be dedicated to implementation of specific activities with measurable results. |
| P.2. | Establishment and implementation of EE criteria in public procurement of goods and services, as well as for purchase and rental of buildings | Goods, services, buildings | 2010-2018 | 0 | 0 | N/D | Measure was partially implemented; Measure was revised | Provide monitoring of effects of the measure by reporting of the entities that are implementing the measure. |
| P.3 | Improvement of energy performance of buildings in public sector | Existing buildings of the public sector | 2010-2018 | 0.54 | 11 | 1.7/2.2 | Continuation of activities; measure was revised | Measure envisages implementation of technical measures of energy efficiency, especially improvement of energy performance of the building envelope and technical systems |
| P.4 | Implementation of EE improvement measures in public utility companies of local self-governments and other public companies (demand side) | Street lighting systems, water supply and sewage | 2010-2018 | N/D | N/D | 0.74/0.92 | Continuation of activities; measure was revised | |
| **TOTAL:** | | | | **0.54** | **11** | **2.44/3.12** | | |

| ***Title of the measure*** | | ***Development of energy management in public sector*** |
|---|---|---|
| ***Index of the measure*** | | *P.1* |
| **Description** | **Category** | *Informational and mandatory informational measures* |
| | **Timeframe** | *Start:* ***2010.***<br>*End:* ***2018.***<br>*Foreseen major changes, amendments, improvements:*<br>***Implementation of measures is continued. During the period of implementation of 2nd EEAP dedicate special attention to implementation of specific activities with measurable results, especially in terms of achieved energy and economic savings*** |
| | **Aim / brief description** | *Aim of this measure is development of a model of continued and systemic energy management, i.e sustainable management of energy resources on all levels, which contributes to the reduction of energy consumption, as well as decrease of harmful environmental effects. The measure is based on establishing an organizational structure for energy management, education of employees and implementation of IT tools for ongoing monitoring and analysis of energy consumption and water in facilities of the public sector* |
| | **Target end-use** | *Existing buildings/facilities (energy consumers) in competence of the state and local self-government units.* |
| | **Target group** | *Employees in the public sector* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Implemented activities and achieved results:</u>*<br>1. *Law on Energy Efficiency provides for the obligation related to preparation od EE improvement programs and plans, introduction of energy management schemes, establishing alternative financial mechanisms for implementation of EE measures, collecting data, elaboration of methods for reporting etc. for entities of the public sector (state authorities, organizations, regulatory bodies, institutions, local self-government bodies and public companies).*<br>2. *Plan related to strengthening capacities regarding obligations of institutions from a wider public sector, as well as big consumers in public and private sector with the aim of preparation for implementation of the Law on Energy Efficiency was prepared in 2011. In this regard, workshops regarding energy efficiency in the public sector were organized in Budva (May 2011) and Bar(November 2011). Primary topics of workshops included: overview of obligations of state authorities and local self-government under the Law on Energy Efficiency; harmonization with 1st EEAP and clarification of the energy management concept and energy efficiency information systems; planning the development of the training module and strengthening capacities on energy efficiency, energy management, financial mechanisms etc. as well as activities related to implementation of pilot training. Workshops were organized in coordination with SEE and with support of the European Commission.*<br>3. *In 2011/2012 a central information system was also development in order to monitor energy consumption in buildings/facilities under the competence of previously mentioned entities of the public sector. The system was tested and certain minor activities should be done in order to put it into operation. It is also necessary to provide support to entities of the public sector, primarily state authorities and local government bodies with the aim of raising their capacities for using the mentioned information system and for introduction of adequate data.*<br>4. *During 2012 Rulebook defining a detailed content and functional performance of energy efficiency informational system in Montenegro was adopted. The rulebook defines a detailed content and manner of collecting data on annual energy consumption, as well as factors that have an influence on that consumption.*<br>5. *Instruction on energy efficiency measures and guidelines for their implementation for entities of the public sector was adopted during 2012.*<br>6. *Certain local self-governments have prepared the Energy efficiency improvement programs during 2012.*<br>7. *More than 70 energy audits of buildings under the competence of public sector entities were performed during the implementation period of 1st EEAP, which represents significant assistance to the implementation of energy management. In addition to activities related to performing of energy audits of buildings, certain local self-governments have undertaken significant activities in analyzing the situation in terms of energy consumption and in this regard preliminary audits were performed on a large number of facilities under their* |

| | | |
|---|---|---|
| | | *competence (public lightning, water supply systems and sewage etc.) .*<br>*Future activities:*<br>*Activities related to development of energy management will be continued in the following period as well and in this regard, it will be worked on strengthening the capacities of all relevant entities of public sector for implementation of activities stipulated in the Law on energy Efficiency (energy management, preparation of plan documents, submission of data, regular reporting on achieved progress, promotion of EE, implementation of EE measures etc.).* |
| | **Budget and financial source** | *Planned funds by the end of 2015:*<br>- *25.000,00 € from state budget.* |
| | **Implementing body** | *MoE, entities of the public sector (state authorities, organizations, regulatory bodies, institutions, local self-governments bodies and public companies).* |
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/ measuring the resulting savings** | *Savings from this measure should be monitored with the help of energy efficiency information system in public buildings/facilities. Achieved savings are based on measured data on consumption of all forms of energy before and after implementation of activities related to energy management. In addition, 2012 should be taken as a reference year, because activities that are a precondition for energy management in the public sector were implemented during this year. Achieved energy savings on annual level should be calculated as a difference between referent and achieved energy consumption with a correction depending on climate conditions (for example, by using heating degree days).* |
| | **Expected savings in 2012 as per 1st EEAP** | *1.1 ktoe (result of info campaign and promotional activities in the public sector)* |
| | **Savings achieved in 2012** | *It is not possible to estimate* |
| | **Expected energy savings in 2015** | *It is not possible to estimate* |
| | **Expected impact on energy savings in 2018.** | *It is not possible to estimate* |
| | **Assumptions** | *During the implementation of 1st EEAP preparatory activities were carried out in relation to establishment of energy management in the public sector. Effect in terms of achieved savings is not possible to estimate. Future savings is also very difficult to evaluate because they depend on a number of buildings/facilities that will be included, as well as their energy consumption which is currently unknown.* |
| | **Overlaps, multiplication effect, synergy** | *Overlaps are possible with measures B.2 and B.3, as well as with measures P.3 and P.4 that included implementation of specific technical solutions for energy efficiency improvement. Effects of these measures should be monitored separately with the help of developed BU methods.* |

| ***Title of the measure*** | | ***Establishment and implementation of EE criteria in public procurement of goods and services, as well as for purchase and rental of buildings*** |
|---|---|---|
| ***Index of the measure*** | | *P.2* |
| **Description** | **Category** | *Voluntary agreements and instruments of cooperation* |
| | **Timeframe** | *Start:* ***2010.***<br>*End:* ***2018.***<br>*Foreseen major changes, amendments, improvements:*<br>***The measure was implemented partially. It is necessary to intensify the activities that will provide establishment of a legal framework and strengthening of the capacities of officials responsible for public procurement for implementation of this measure*** |

| | | |
|---|---|---|
| | **Aim / brief description** | *Basic aim of this measure is establishment of systemic mechanisms for introducing energy efficiency criteria in public procurement procedure in order to achieve significant energy savings and in order to achieve economic and other benefits*<br>*Having in mind the fact that public sector is a very significant contracting authority of goods and services relevant in terms of energy consumption, successful implementation of this measure may significantly influence the transformation of the market towards more energy efficient solutions, reducing prices of new technologies and their wider use.*<br>*Implementation of this measure is one of important preconditions for meeting requirements for preservation of environment.* |
| | **Target end-use** | *Goods and services relevant in terms of energy consumption* |
| | **Target group** | *Officials responsible for public procurement* |
| | **Regional application** | *National level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Implemented activities and achieved results:</u>*<br>*Law on Energy Efficiency provides for the introduction of EE criteria in public procurement procedure of gods and services, as well as for purchasing vehicles and renting the apartment. During the implementation period of 1st EEAP draft of methodology for establishing the energy efficiency level in public procurement procedure was prepared.*<br>*According to the new Law on Public Procurement which has entered into force from 1 January 2013, energy efficiency was introduced as one of possible sub criteria under the criteria related to economically most advantageous offer.*<br>*<u>Future activities:</u>*<br>*1. Finalization and adoption of methodology for determination of the energy efficiency level in the public procurement procedure;*<br>*2. Training of officials responsible for public procurement for implementation of methodology for determination of the energy efficiency level;*<br>*3. Establish functional mechanisms for monitoring achieved effects through reporting of entities responsible for public procurement.* |
| | **Budget and financial source** | *Estimated funds by the end of2015:*<br>*- 10.000,00 € from state budget* |
| | **Implementing body** | *MoE, Ministry of Finance, users of public procurement* |
| | **Monitoring authority** | *MoE, Ministry of Finance, Public Procurement Administration* |
| **Energy savings** | **Method for monitoring/ measuring the resulting savings** | *Monitoring of achieved energy savings in future will be conducted by implementing the BU method for each group of appliances that was procured taking into account the energy efficiency criteria. It is expected that most procurements will relate to office equipment. The BU method recommended by the European Commission will be used for household and office equipment. The BU method is based on the difference between consumption of the existing appliance and new appliance that will replace the previous appliance or difference between consumption of an average appliance in the market and a new, efficient appliance that will be procured. The BU method will be implemented for buildings as well, by taking into account the difference between energy performance of existing or recently purchased building or rented building. Methods are described in the document „Methodology for monitoring and verification of energy savings – bottom up approach".* |
| | **Expected savings in 2012 as per 1st EEAP** | *0 (implementation is planned only after 2012)* |
| | **Savings achieved in 2012** | *0* |
| | **Expected energy savings in 2015** | *It is not possible to estimate* |
| | **Expected impact on energy savings in 2018.** | *It is not possible to estimate* |

| | | |
|---|---|---|
| | **Assumptions** | *Due to the fact that plans from entities competent for public procurement in terms of quantities of certain types of appliances and buildings are not available, it is not possible to foresee effects of this measure by 2015, i.e. 2018. Precondition for measuring savings based on implementation of this measure is systemic monitoring of quantity and types of procured energy efficient appliances as well as knowing the performance of buildings that are being purchased or rented.* |
| | **Overlaps, multiplication effect, synergy** | */* |

| ***Title of the measure*** | | ***Improvement of energy performance of buildings in public sector*** |
|---|---|---|
| ***Index of the measure*** | | *P.3* |
| **Description** | **Category** | *Financial instruments* |
| | **Timeframe** | *Start:* ***2010.***<br>*End:* ***2018.***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities. Measure complements new activities.*** |
| | **Aim / brief description** | *Aim of this measure is improvement of energy efficiency and comfort conditions in selected buildings in the public sector. It is expected that implementation of the measure will initiate development of the market related to services in the construction sector and it will have a positive effect on the overall social and economic environment. It is also expected that significant results will be achieved in relation to preservation of environment.*<br>*Experience of developed countries show that energy efficiency programs in public buildings represent and effective driving mechanism for motivating the authorities on national and local level to implement their energy efficiency programs.* |
| | **Target end-use** | *Existing buildings in the public sector* |
| | **Target group** | *State administration, local self-governments* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Conducted activities and achieved results:</u>*<br>*Aim of the Montenegrin Energy Efficiency Project is to improve energy efficiency in public buildings. The project has started in December 2008. Under the project energy efficiency measures are being implemented in 9 educational and 6 healthcare institutions. Financing of the project is provided from a loan from the World Bank in the amount of 6,5 million €. The Ministry of Economy, Ministry of Health and the Ministry of Education implement the project. Eight educational and 5 healthcare buildings were reconstructed under this project, during the implementation period of 1st EEAP.*<br>*Project Energy Efficiency Program In Public Buildings (EEPPB) is financed from the resources of the German Development Bank (KfW) in the amount of 13 million euros, of which 1.5 million euros are grant funds. The project has started in January 2012. The project is planned to be finished by June 2014. Implementation of energy efficiency measures in education buildings will be financed from the project. The project is implemented in coordination of the Ministry of Economy and Ministry of Education. This project provides for energy recovery of around 30 buildings. Significant activities were implemented during 2012 in preparation of the project: consultant team for implementation of the project was formed, evaluation of 40 buildings was performed in terms of the possibility of implementation of energy efficiency measures, detailed energy audits of 20 buildings were performed, project documentation was prepared for 10 buildings, tender documentation was prepared for 5 buildings an tender for performing work was announced.*<br>*Project "Beautiful Cetinje" is very important at the local self-government level. The project was initiated by the historical capital Cetinje in cooperation with international organization UNDP in July 2011. Aim of the project is revitalization of buildings of historical center of Cetinje.*<br>*Significant part of activities planned under the Project relates to improvement of energy performance of certain public buildings. First phase of the project envisages revitalization of buildings of former embassies of England and Russia, as well as building of the old hospital Danilo I.*<br>*Recovery of the English embassy was successfully finished during 2012.* |

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| | | *Future activities:*<br>1. *Finalization of the Montenegrin Energy Efficiency Project by 30 March 2014. Continuation of the Project (second phase) was planned and it envisages the recovery of 13 healthcare buildings (hospitals and health centres). The continuation of the Project will be arranged by the end of 2013/beginning of 2014.*<br>2. *Implementation of the project „Energy Efficiency Program In Public Buildings".*<br>3. *Continuation and expansion of the project "Beautiful Cetinje"*<br>4. *Strengthening institutional capacities and development of financial assistance at national and local level in order to prepare, implement and monitor the effects of such and similar projects.* |
| | **Budget and financial source** | *Estimated funds by the end of 2015:*<br>- *30.000,00 € from the state budget;*<br>- *13.000.000,00 € (out of 11.5 mil. € loan + 1.5 mil € grant) for implementation of the project „Energy Efficiency Program In Public Buildings", based on the loan of KfW bank;*<br>- *5.000.000,00 € for implementation of the second phase of the project „ Montenegrin Energy Efficiency Project " (estimation).* |
| | **Implementing body** | *MoE; Ministry of Finance; state authorities, organizations, local self-governments bodies and public companies responsible for the management of public buildings* |
| | **Monitoring authority** | *MoE, Ministry of Finance* |
| **Energy savings** | **Method for monitoring/ measuring the resulting savings** | *Monitoring of the effects of this measure is conducted by using recommended BU methods of the European Commission with established national reference values. Methods are the following – Improvement of thermal insulation of certain parts of buildings; Replacement of appliances (systems) for heating; Replacement or installation of solar water heating system; Replacement or installation of air conditioners in residential and non-residential buildings.*<br>*In the case of integral reconstruction of a building, the following method is also used - Improvement of thermal insulation and heating system and according to recommendations stated in the document „Methodology for monitoring and verification of energy savings - bottom up approach".* |
| | **Expected savings in 2012 as per 1st EEAP** | *1.7 ktoe* |
| | **Savings achieved in 2012** | *0.54 ktoe* |
| | **Expected energy savings in 2015** | *1.7 ktoe* |
| | **Expected impact on energy savings in 2018. (2020.)** | *2.2 ktoe* |
| | **Assumptions** | *Achieved savings are estimated based on the data from projects implemented in hospitals and schools. Data on total area of thermal insulation of walls (26.394 m2), roofs (15.398 m2) and windows (13.311). Heating systems were replaced in 5 buildings with a total area of 25.820 m2 (calculation was performed by using referent values), system related to preparation of hot water was replaced in one object, with a total area of 4.420 m2 and "split" air conditioners were replaced in another object. Total useful area included with these measures is around 50.000 m2.*<br>*Having in mind existing projects it is assumed that by 2015, the energy efficiency improvement projects will be implemented on twice as many buildings – around 30 buildings, with the total estimated area of around 100.000 m2. The following method is used for estimation "Improvement of thermal insulation and heating systems " that assumes an integral reconstruction of the building and changing its performance to the performance required by regulations. It is assumed that existing buildings have thermal needs 180 kWh/m2, and that thermal needs will 117 kWh/m2 after the reconstruction, while efficiency of the system will be improved from 0.66 to 0.848. This means that unit savings will be 135 kWh/m2 after the reconstruction.*<br>*It is assumed that 20 buildings will be reconstructed by 2018, with an area of 50.000 m2.* |

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| | **Overlaps, multiplication effect, synergy** | *This measure complements the measure P.1 related to introduction of energy management.* |
| ***Title of the measure*** | | ***Implementation of EE improvement measures in public utility companies of local self-governments and other public companies (demand side)*** |
| ***Index of the measure*** | | *P.4* |
| **Description** | **Category** | *Energy services for energy savings/ Financial instruments/Informative and mandatory informative measures* |
| | **Timeframe** | *Start:* ***2010.***<br>*End:* ***2018.***<br>*Foreseen major changes, amedments, improvements:*<br>***The measure is a continuation of activities from 1st EEAP.*** |
| | **Aim / brief description** | *Improvement of the monitoring of the state and maintenance, as well as investment in order to improve EE in systems, as follows:*<br>- *street lighting,*<br>- *water supply and sewage,*<br>- *other utility activities.*<br>*This measure does not relate neither to transport services (see EE improvement measures in transport sector) nor to the companies on the supply side (production, transport and distribution etc.)*<br>*Participation of ESCO company will be intensively promoted.* |
| | **Target end-use** | *Public lighting, water supply and sewage systems* |
| | **Target group** | *Public utility companies of local self-governments and public companies* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Implemented activities and achieved results:</u>*<br>*Significant activities were noticed during the implementation of 1st EEAP. These activities were implemented by competent public companies at national and local level. The above mentioned activities mostly relate to improvement of street lighting system and water supply system through investment maintenance and through implementation of an earmarked project which are financed through loan arrangements and donor support. However, implemented activities are not a product of centralized, programmatic approach in terms of EE projects and a monitoring mechanism of achieved effects related to EE improvement was not established (energy and economic savings) and this should be a subject in the 2nd EEAP.*<br>*<u>Future activities:</u>*<br>1. *Continue with improvement of utility systems that use energy. Special attention should be dedicated to systematic and gradual action in order to conceptualize the projects for construction, reconstruction and maintenance of such systems as EE projects, with the possibility of planning and evaluating achieved effects and reporting about planned and implemented EE measures.*<br>2. *Local self-governments shall include EE improvement measures in water supply systems, street lighting systems etc. in three-year programs and annual EE improvement plans, in accordance with the Law on Energy Efficiency.*<br>3. *MoE, in cooperation with Union of Municipalities will make joint efforts in order to identify necessary identification of necessary financial and technical assistance, as well as to coordinate/manage the programs of cooperation between municipalities.*<br>4. *It is necessary to work on establishing a legal framework and mechanism for financing project that relate to improvement of utility systems by ESCO companies or other entities dealing with provision of energy services* |
| | **Budget and financial source** | *Estimated funds by the end of 2015:*<br>- *25.000 € from the state budget.* |
| | **Implementing body** | *MoE, Ministry of Finance, local self-government units, public companies, ESCO companies* |
| | **Monitoring** | *MoE* |

| | | |
|---|---|---|
| | **authority** | |
| **Energy savings** | **Method for monitoring/ measuring the resulting savings** | *It is assumed that under this measure most projects will be focused on street lighting. Savings can be evaluated by using the BU method based on installed power and number of luminaries before and after implementing the measure, taking into account number of working hours of street lighting systems and the fact that there is a control strategy (according to recommendations of the European Commission). Another way of evaluating the savings is based on real measurable data before and after implementation of the measure. Therefore, it is necessary to establish cooperation with EPCG which can submit the data to the MoE.* |
| | **Expected savings in 2012 as per 1st EEAP** | *0.8 ktoe* |
| | **Savings achieved in 2012** | *It is not possible to estimate (due to lack of data on implemented measures)* |
| | **Expected energy savings in 2015** | *0.74 ktoe* |
| | **Expected impact on energy savings in 2018 (2020.)** | *0.92 ktoe* |
| | **Assumptions** | *Street lighting in Montenegro has spent around 42,3 GWh of electricity in 2009. In total, 7,8 MW of power was installed on 45.107 luminaries in municipalities and 63% of luminaries is located in five municipalities (Podgorica, Bar, Herceg Novi, Niksic i Ulcinj).*<br>*By replacing the luminaries of street lighting, installed power is usually decreased by 100-150 W per lighting fixture producing 380 kWh of annual savings per lighting fixture, assuming that annual number of working hours is 3.800.*<br>*This EEAP sets a goal indicating that all street lighting will be replaced in 50% of existing lighting fixtures until 2015..*<br>*Street lighting should be replaced on 63% of lighting fixture until 2018 (corresponding to the number of lighting fixtures in five largest municipalities).* |
| | **Overlaps, multiplication effect, synergy** | */* |

#### *3.2.3.2 Measures in commercial sectors*

In the sector of commercial services, hotels and commercial buildings are major energy consumers.

Energy statistics in Montenegro does not distinguish between consumption in public and commercial services, so it is not possible to determine the exact share of consumption in this sector in the overall energy balance.

In the previous three-year period there was a lack of systematic measures to encourage energy efficiency in this sector. Nevertheless, noticeable initial activities in terms of establishing a credit line for financing energy efficiency and renewable energy sources for the small and medium enterprises, which have not yet made recognizable results. As system for monitoring of achieved effects have not been established, it is not possible to comment on the results of these activities.

In the 2nd EEAP special attention was given in implementing EE measures in three directions:

- Establishing an energy management (described in the framework of EE measures C.1);
- Introducing incentives to fund the use of solar energy in the tourism sector (described in the framework of EE measures C.2);
- Development of mechanisms for improving the energy performance of commercial non-residential buildings (as described in the framework of EE measures C.3).

Summary of the existing and new EE measures for the commercial service sector is given in Table 12, and the detailed descriptions of activities are presented in separate tables for each measure individually.

**Table 12 - Overview of individual measures for the commercial services sector**

| No. | Title for energy saving measure | Targeted final consumption | Duration | Achieved energy savings in 2012 [ktoe] | Share in the sectoral target for 2012. [%] | Energy savings expected in 2015/2018. [ktoe] | Status in relation to 1st NEEAP |
|---|---|---|---|---|---|---|---|
| C.1. | Establishment of energy management system in the commercial services | Building for commercial services | 2013- 2015 | 0 | 0 | N/D | Revised measure |
| C.2 | Incentive program related to the use of solar energy in the tourism sector | Hot water in the tourism sector | 2013- 2015 | / | / | 0.55 | New measure |
| C.3 | Development of mechanisms for the improvement of energy performance for commercial non-residential buildings | Existing non-residential buildings for commercial purposes | 2013- 2015 | / | / | N/D | New measure |
| **Total:** | | | | **0** | **0** | **0.55** | |

| ***Title of the measure*** | | ***Establishment of energy management system in the commercial services*** |
|---|---|---|
| ***Index of the measure*** | | *C.1* |
| **Description** | **Category** | *Informational and mandatory informational measures* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***New measure.*** |
| | **Aim/brief description** | *The aim of this measure is to ensure the application of legal obligations stipulated for large consumers of the services sector (consumers with annual consumption over 10,000 MWh), in terms of: establishing a system for energy management (monitoring and analysis of energy consumption, energy management, energy audits, promotion of EE and others.) implementation of EE measures and reporting on the results.* |
| | **Target end-use** | *Buildings for commercial services* |
| | **Target group** | *Owners and users of commercial service buildings* |
| | **Regional application** | *National level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Future activities :</u>*<br>*1. MoE will develop mechanisms to control the application of the provisions of the Law on EE, which relate to large energy consumers.*<br>*2. MoE will try , within their regular activities to promote energy efficiency policy's, provide support to the development and implementation of energy management systems in commercial service sector, primarily through international cooperation and donor support ( performing energy audits , knowledge transfer and organize trainings, etc. ) .*<br>*3. For other entities in the commercial service sector that do not have the status of a major energy consumer, the MoE within the activities of an information campaign will continue to promote the importance of energy management and the realization of adequate benefits in this area.*<br>*4. Large energy consumers, according to the Law on energy efficiency, are required to establish and develop an energy management system and plan EE measures through their annual plans for EE improvement, and shall report to the MoE.* |
| | **Budget and financial source** | *Funds planned for 2015:*<br>- *15,000 € from the state budget.* |
| | **Implementing body** | *MoE, Owners and users of commercial service buildings* |
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | *The savings from these measures should be monitored by a central information system for energy consumption. Total savings are based on the measured data on the consumption of all forms of energy, before and after the implementation of energy management activities. Energy savings on an annual basis should be calculated as the difference between the reference and actual energy consumption, adjusted depending on the climatic conditions (e.g. using heating degree-days).* |
| | **Expected savings in 2012 as per 1st NEEAP** | */* |
| | **Savings achieved in 2012** | */* |
| | **Expected energy savings in 2015** | *It is not possible to estimate.* |
| | **Expected impact on energy savings in 2018** | *It is not possible to estimate.* |
| | **Assumptions** | *Future savings are very difficult to assess because they are depending on the number of facilities that will be included, as well as their energy consumption, which is currently unknown.* |
| | **Overlaps, multiplication effect, synergy** | *Overlaps are possible with measures B.2 and B.3, which are an integral part of energy management.* |

| *Title of the measure* | | *Incentive program related to the use of solar energy in the tourism sector* |
|---|---|---|
| ***Index of the measure*** | | *C.2* |
| **Description** | **Category** | *Financial instruments* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***New measure.*** |
| | **Aim/brief description** | *The objective of this measure is to ensure a greater use of solar systems for hot water heating in buildings in the tourist sector, which will significantly contribute in reducing the use of electricity and fossil fuels for this purpose.* |
| | **Target end-use** | *Hot water in the facilities of the tourism sector.* |
| | **Target group** | *Hotel owners and owners of other touristic facilities* |
| | **Regional application** | *National and local level (especially the coastal region)* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *Future activities:*<br>*1. Expansion of the Montesol project in the tourism sector (for information on the project see measure R.3);*<br>*2. The introduction of specific support programs at the state and local level for the use of solar energy in the tourism sector;*<br>*3. Strengthening cooperation and establishing an appropriate level of coordination between entities relevant to the development of the tourism industry (MoE, Ministry of Sustainable Development and Tourism, the Central Tourism Organization, etc.);*<br>*4. Organizing support to subjects available for financing these measures (donors, banks, equipment suppliers, ESCO companies, etc.) and the establishment of appropriate mechanisms (credit lines, dedicated funds, market inducement mechanisms, contracting on the basis of energy input, etc.).* |
| | **Budget and financial source** | *Funds planned for 2015.*<br>- *5,000 € from the state budget.*<br>*Note: The funds provided under the project Montesol are covered by measure R.3.* |
| | **Implementing body** | *MoE, Ministry of Sustainable Development and Tourism, hotel owners and owners of other touristic facilities* |
| | **Monitoring authority** | *MoE, Ministry of Sustainable Development and Tourism* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | *Monitoring the effects of these measures is achieved using the BU methods recommended by the European Commission with established national benchmarks. It is a method – Installation of system for solar water heating in residential and non-residential buildings, according to the recommendations given in the document "Methodology for monitoring and verification of energy savings - bottom-up approach."* |
| | **Expected savings in 2012 as per 1st NEEAP** | */* |
| | **Savings achieved in 2012** | */* |
| | **Expected energy savings in 2015** | *0.55 ktoe* |
| | **Expected impact on energy savings in 2018. (2020.)** | *0.55 ktoe* |
| | **Assumptions** | *According to the above methodology, the assumed unit of energy savings per m2 of installed solar collectors amounts 640 kWh/$m^2$. The plan is to install a total of 10,000 $m^2$ of solar collector by the end of 2015.*<br>*Given that the lifetime of this system is about 20 years, the savings will also be valid in 2018$^t$* |
| | **Overlaps, multiplication effect, synergy** | */* |

| ***Title of the measure*** | | ***Development of mechanisms for the improvement of energy performance for commercial non-residential buildings*** |
|---|---|---|
| ***Index of the measure*** | | *C.3* |
| **Description** | **Category** | *Financial instruments* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***New measure.*** |
| | **Aim/brief description** | *The objective of this measure is to provide support to the establishment of sustainable mechanisms for improving energy performance of buildings in the commercial service sector, in order to significantly reduce their demands for energy and achieve appropriate benefits in that area (economic and energy savings, reduction of adverse environmental impacts and etc.).* |
| | **Target end-use** | *Existing non-residential buildings for commercial purposes* |
| | **Target group** | *Owners of non-residential buildings for commercial purposes* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *Future activities:*<br>*1. The introduction of specific support programs at the state and local level to improve the energy performance of buildings in the commercial service sector;*<br>*2. Organizing support to subjects available for financing these measures (donors, banks, equipment suppliers, ESCO companies, etc.) and the establishment of appropriate mechanisms (credit lines, dedicated funds, market inducement mechanisms, contracting based on energy performance, etc.);*<br>*3. Consistent implementation of the legal obligation related to the energy efficiency for the buildings that are being constructed, reconstructed and adapted (meeting the minimum energy performance requirements, performing of energy audits, energy performance certification and visibility of certificates, etc.);*<br>*4. Support the development of market mechanisms to provide the conditions for assessment of the value of the building in relation to its energy performance.* |
| | **Budget and financial source** | *Funds planned for 2015.*<br>- *15,000 € from the state budget.* |
| | **Implementing body** | *MoE, owners of non-residential buildings for commercial purposes* |
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | *The savings from these measures will be monitored based on reports from achieved investments in the field of EE by entities that provide incentives. Total savings are based on the estimated / measured data on consumption of all forms of energy, before and after the realization of the investment.* |
| | **Expected savings in 2012 as per 1st NEEAP** | */* |
| | **Savings achieved in 2012** | */* |
| | **Expected energy savings in 2015** | *It is not possible to estimate.* |
| | **Expected impact on energy savings in 2018. (2020.)** | *It is not possible to estimate.* |
| | **Assumptions** | *Future savings are very difficult to assess because they are depending on the number of buildings/facilities that will be included, as well as their energy consumption, which is currently unknown.* |
| | **Overlaps, multiplication effect, synergy** | *Overlaps are possible with measures B.2* |

### *3.2.4. Measures in the industry sector*

The final energy consumption in the industrial sector has been increasing in the period 1997-2008 especially due to the consumption of non-ferrous metals industry, which represented 74-88% of the total final energy consumption in the industrial sector (Figures 7 and 8). In the period from 2009 to 2011 energy consumption in the industrial sector decreased by about 50% (344.7 ktoe in the 2009. 172 ktoe in 2010) due to reduced production in KAP and the Niksic Steelworks. The consumption in the ferrous metallurgy is represented by 6-14% of total final energy consumption in the industrial sector in the period 1997-2010. In the period from 1997 to 2011 the ferrous metallurgy and non-ferrous metals spent from 157.9 ktoe (2010) to 334 ktoe (2007) or constituted 87-94% of total final energy consumption in the industry.

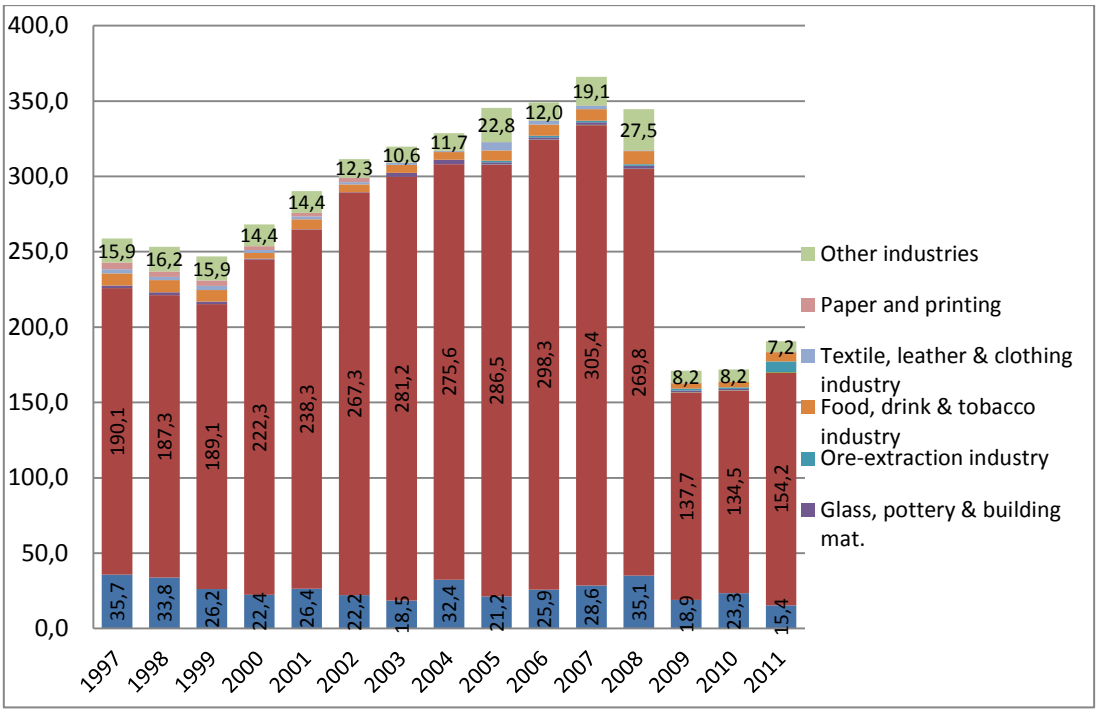


*Figure 7: The final energy consumption by the industrial area, 1997-2011 (ktoe)*

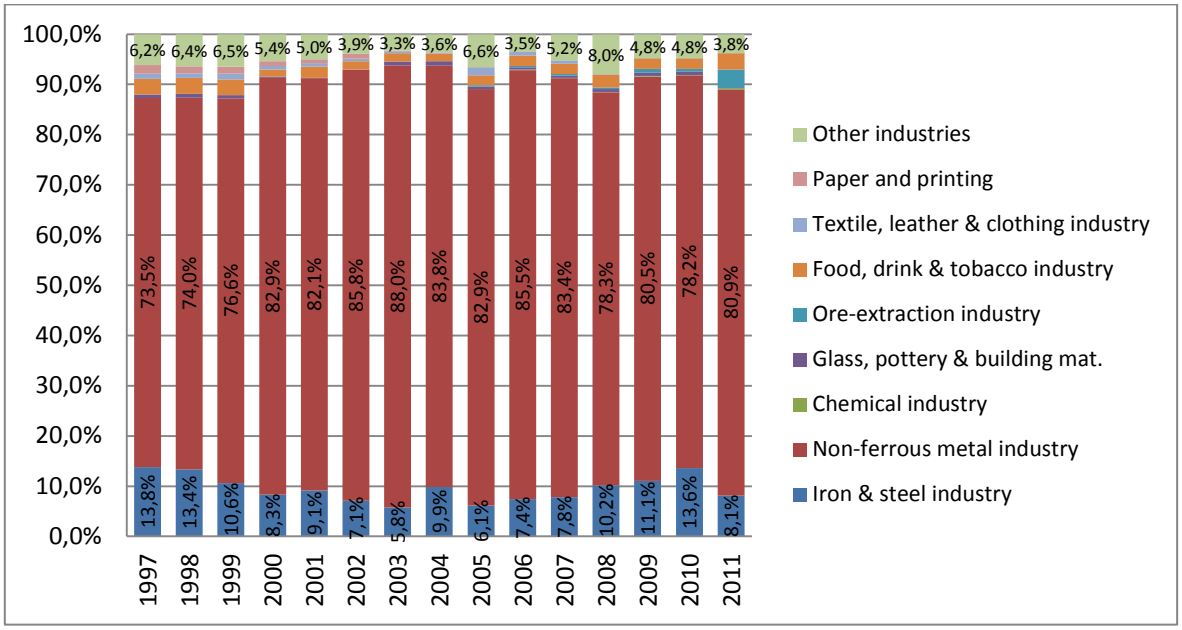


*Figure 8: The final energy consumption by the industrial area, 1997-2011 (%)*

During the period of implementation of the first EEAP special attention has been paid to the implementation of the planned measures in the industrial sector, mainly due to the considerable long-standing financial problems in this sector. The concrete results achieved in terms of realization of the first EEAP cannot be seen, primarily due to

inconsistent application of the Law on EE in terms of reporting of industrial companies on the planned activities in the field of EE as well as on achieved effects. Also, the lack of support mechanisms for the industrial sector entities for the implementation of EE measures prevented the implementation of the activities envisaged by the first EEAP.

Bearing in mind the long-term financial problems of KAP and Steelworks Niksic, as well as other current negative trends, is not expected that during the period of implementation of the second EEAP significant results would be achieved in the implementation of EE measures. Besides that, other consumers in the industrial sector have relatively small share in the total energy balance (see Figures 7 and 8), so the second EEAP planned measures only in terms of establishing and developing energy management system (Table 13), which represents only a first step toward the logical, systematic and progressive action for improvement of energy efficiency at all levels.

**Table 13 - Overview of individual measures for the industry sector**

| No. | Title for energy saving measure | Targeted final consumption | Duration | Achieved energy savings in 2012 [ktoe] | Share in the sectoral target for 2012. [%] | Energy savings expected in 2015/2018. [ktoe] | Status in relation to 1st NEEAP |
|---|---|---|---|---|---|---|---|
| I.1. | Establishment of energy management system in industry sector | Consumption of all forms of energy in the industry | 2010-2018 | 0 | 0 | N/D | In the previous period the measure has not been implemented as intended;<br>Measure is revised |
| **TOTAL:** | | | | 0 | 0 | | |

| ***Title of the measure*** | | ***Establishment of energy management system in industry sector*** |
|---|---|---|
| ***Index of the measure*** | | ***I.1*** |
| **Description** | **Category** | *Information and mandatory information measures* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Revised measure.*** |
| | **Aim/brief description** | *The aim of this measure is to ensure the application of legal obligations stipulated for large customers from the industrial sector (consumers with annual consumption over 10,000 MWh), in terms of: establishing a system for energy management (monitoring and analysis of energy consumption, energy managers, energy audits, promotion of EE and others.) implementation of EE measures and reporting on the results.* |
| | **Target end-use** | *Industrial facilities and equipment* |
| | **Target group** | *Owners and users of industrial plants and facilities* |
| | **Regional application** | *National level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Conducted activities:</u>*<br>*During the implementation period of the 1st EEAP, special attention has not been paid to the implementation of the planned measures in the industrial sector, primarily due to the considerable long-standing financial problems in this sector.*<br>*The concrete results achieved in terms of realization of the first EEAP cannot be seen, primarily due to the inconsistent implementation of the EE legislation, in terms of reporting of industrial companies on the planned activities in the field of EE as well as on achieved effects.*<br>*Also, the lack of support mechanisms for the implementation of EE measures in the industrial sector prevented the realization of the planned activities of the first EEAP.*<br>*<u>Future activities :</u>*<br>*1. MoE will work to develop mechanisms to control the application of the provisions of the Law on EE, which relate to large energy consumers;*<br>*2. MoE will try, within its regular activities for promotion of energy efficiency policies, to provide some level of support for the introduction and development of the energy management system in the industrial sector, primarily through international cooperation and donor support (energy audits performing , knowledge transfer and organization of trainings , etc. ) ;*<br>*3. For other entities within the sectors of industry , who do not have status of large energy consumer, MoE will, through the information campaign, continue to promote the importance of energy management and the achievement of adequate benefits on this basis;*<br>*4. Large energy consumers, according to the Law on EE , are required to establish and develop an energy management system and to implement measures for EE improvement in their facilities. This actions has to be included in the annual EE improvement plans which they have to submit to the MoE.* |
| | **Budget and financial source** | *Funds planned for 2015:*<br>- *10,000 € from the state budget.* |
| | **Implementing body** | *MoE, Owners and users of industrial plants and facilities* |
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | *For the purposes of the second EEAP, it was only possible to evaluate the entire level of savings achieved in the industrial sector (including the aluminum industry, which is excluded from the national indicative target) using the TD indicators.*<br>*With the establishment of the energy management, conditions for continuous monitoring (measurement) of consumed energy will be set, which should be the basis for calculation of the energy savings. Measured data should be corrected by the factors that influence energy consumption (e.g. production volume, etc).* |
| | **Expected savings in 2012 as per 1st NEEAP** | *1.3 ktoe.* |
| | **Savings achieved in 2012** | *It is not possible to determine.* |

| | | |
|---|---|---|
| | **Expected energy savings in 2015** | *It is not possible to determine.* |
| | **Expected impact on energy savings in 2018. (2020.)** | *It is not possible to determine.* |
| | **Assumptions** | / |
| | **Overlaps, multiplication effect, synergy** | / |

### 3.2.5. Measures in the transport sector

Bearing in mind the decline in energy consumption in the industrial sector in recent years, the transport sector has become the dominant sector in energy consumption, and it is expected that this trend will stay during the period of the implementation of the second EEAP (see Figures 1 and 2).

Final energy consumption in the transport sector is shown in Figures 9 and 10. Road transport has by far the largest share in the consumption of all fuels used in the transport sector (about 85%). Air transport follows, whose share in consumption since 2000 amounts to about 10% of the energy consumption, while the share of rail transport is below 1%. In the period from 2002 to 2009 the energy consumption (petroleum products) in road transport has more than doubled (from 112.6 ktoe to 247.6 ktoe).

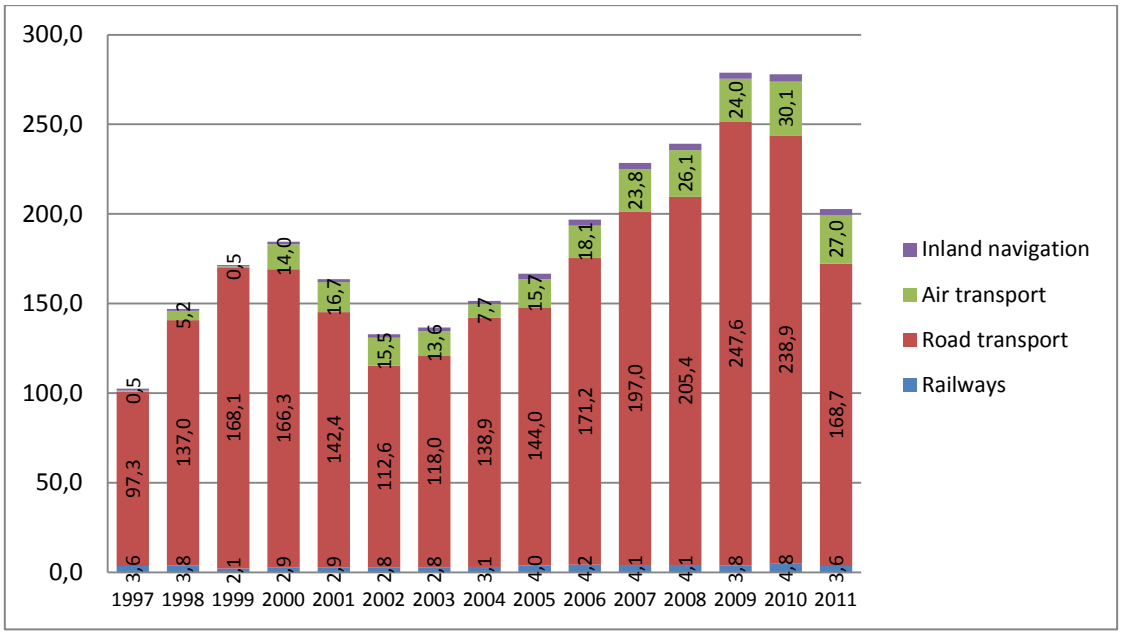


*Figure 9: Consumption of final energy in transport categories, 1997-2011 (ktoe)*

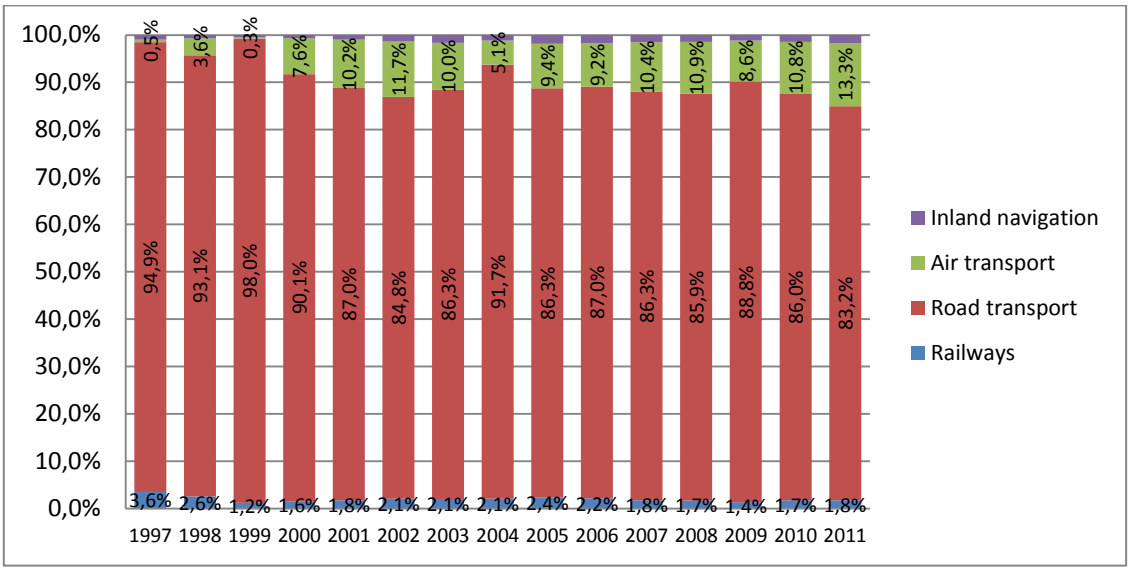


*Figure 9: Consumption of final energy in transport categories, 1997-2011 (%)*

The Table 14 of this EEAP shows EE measures that are inherited from the first EEAP, which in the previous three-year period are generally not implemented or were partially implemented.

The first step towards a more active systematic action in this sector is the creation of adequate study, which would provide a detailed overview of the existing situation and determine courses of action as well as recognize all relevant entities responsible for carrying out measures defined by the study.

Implementation of EE measures in the transport sector requires a fully developed regulatory framework, guidelines for the implementation of activities, awareness raising and capacity building, as well as provided necessary resources and political will, both at the national and at the local level. It is necessary to mobilize all relevant entities and provide the necessary human and financial capacities, while the MoE/SEE will provide adequate support through the role of the initiator for the implementation of the monitoring. It is also important to recognize the direct connection between the requirements for environmental protection and the implementation of EE measures in this sector, in order to ensure synergy and establish a common platform for planning and implementation of measures and monitoring of the achieved results. This requires coordinated action by all relevant parties.

**Table 14 – Overview of individual measures in the transport sector**

| No. | Title of the energy saving measure | Targeted final consumption | Duration | Achieved energy savings in 2012 [ktoe] | Share in the sectoral target for 2012. [%] | Energy savings expected in 2015/2018. [ktoe] | Status in relation to 1st NEEAP | Additional comments | |
|---|---|---|---|---|---|---|---|---|---|
| T.1. | Establishment and implementation of EE criteria in public procurement of vehicles and transport services in the wider public sector | Transport means | 2010 – 2018 | 0 | 0 | N/D | The measure has not been implemented | The savings arising from the realization of specified measures in the transport sector cannot be individually assessed, but the results will be examined using TD indicators. | |
| T.2. | Introduction of the chapter "Energy efficiency in transport " in EE improvement Programs and Plans | Means of public transport | 2010 – 2018 | 0 | 0 | N/D | The measure has not been implemented | | |
| T.3. | Information campaign on EE behavior in transport and demonstration (pilot) activities | Transport means | 2010 – 2018 | N/D | N/D | N/D | The measure has been partially implemented but the effects of the measures have not been assessed | | |
| T.4. | Study /Action Plan on Energy Efficiency in transport | Transport means | 2010 – 2018 | N/D | N/D | N/D | The measure has been partially implemented | | |
| T.5. | Infrastructural measures in the transport sector with the energy savings effects | Transport infrastructure impacting energy consumption | 2010 – 2018 | N/D | N/D | N/D | The measure has been partially implemented but the effects of the measures have not been assessed. | | |
| **Total:** | | | | | | | | | N/D |

| ***Title of the measure*** | | ***Establishment and implementation of EE criteria in public procurement of vehicles and transport services in the wider public sector*** |
|---|---|---|
| ***Index of the measure*** | | *T.1* |
| **Description** | **Category** | *Information and mandatory information measures; Voluntary agreements and instruments of cooperation* |
| | **Timeframe** | *Start: 2012*<br>*End: 2018*<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *As part of the introduction of the EE criteria in public procurement procedures (see EE measure P.2) a specific criteria will be introduced when purchasing vehicles or public transport services.*<br>*Dissemination of relevant information and capacity building activities are included in the EE measure T.3* |
| | **Target end-use** | *Motorized means of transport* |
| | **Target group** | *Vehicle under the authority of the state administration and local self-government, public transport (with the taxi transportation service) and municipal services.* |
| | **Regional application** | *National level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *Conducted activities and the results achieved:*<br>*Law on Energy Efficiency stipulates the introduction of EE criteria in public procurement of goods and services (the subject for procurement includes vehicles and transport services). During the implementation period of the 1st EEAP a draft methodology for determining the level of energy efficiency in public procurement was prepared.*<br>*iN the new Law on Public Procurement, which applies from 1 January 2013, energy efficiency has been introduced as one of the possible criteria in selecting the most favorable bid.*<br>*Future activities:*<br>1. *The finalization and adoption of the methodology for determining the level of energy efficiency in public procurement procedures will be prepared by the end of 2013;*<br>2. *Training of officials, in charge of public procurement, for the application of the methodology for determining the level of energy efficiency of transport vehicles;*<br>3. *Establish functional mechanisms for monitoring the effects achieved through the reporting of entities in charge of procurement.* |
| | **Budget and financial source** | *Funds planned until the end of 2015.*<br>*- 10,000 € from the state budget.* |
| | **Implementing body** | *MoE, Ministry of Finance, entities conducting public procurement* |
| | **Monitoring authority** | *MoE, Ministry of Finance, Administration for public procurement* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | *The savings in the transport sector will followed by TD indicators* |
| | **Expected savings in 2012 as per 1st NEEAP** | */* |
| | **Savings achieved in 2012** | *It is not possible to determine.* |
| | **Expected energy savings in 2015** | *It is not possible to determine.* |
| | **Expected impact on energy savings in 2018.** | *It is not possible to determine.* |
| | **Assumptions** | */* |
| | **Overlaps, multiplication effect,** | *It is expected that the implementation of these measures will have an impact on other consumer sectors, because the public sector will by example encourage other sectors to* |

| | | |
|---|---|---|
| | **synergy** | *purchase more efficient vehicles.* |

| ***Title of the measure*** | | ***Introduction of the chapter "Energy efficiency transport" in EE improvement Programs and Plans*** |
|---|---|---|
| ***Index of the measure*** | | *T.2* |
| **Description** | **Category** | *Regulation* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *The introduction of a separate chapter containing EE improvement measures in the transport in programs and plans for EE improvement of local self-governments, based on the guidelines issued by the ME / SEE.* |
| | **Target end-use** | *Means of public transport* |
| | **Target group** | *Public transport (with the taxi transportation service included)* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Realized activities and the results achieved:</u>*<br>*Due to the inadequate implementation of the Law on EE and the lack of reporting by local self-governments on planned and conducted EE measures, which are partly related to the transport sector, it is not possible to comment on the implementation of these activities during the implementation period of the first EEAP.*<br>*<u>Future activities :</u>*<br>*Since the MoE took over the responsible for making the list of measures and proposing EE guidelines for all sectors of final energy consumption, including the transport sector, it will, in cooperation with the ministry responsible for the transport sector, provide a specialized study of EE in the transport sector (see EE measure T.4 ) .*<br>*Based on the recommendations, the local self-governments are required to improve the EE programs and plans and include concrete measures that will be implemented in their municipalities.*<br>*It is necessary that the local self-government develop a special study on transport and urban mobility that would, inter alia, include the assessment of energy savings and the reduction of CO2 and other emissions.*<br>*Also, local self-governments that have a greater number of vehicles need to provide special studies for the introduction of an effective fleet management system.*<br>*Particular attention should be paid by the local self-governments on the development of capacities for the implementation of the recommendations and guidelines given in the relevant studies.* |
| | **Budget and financial source** | *Funds planned until the end of 2015.*<br>- *10,000 € from the state budget.* |
| | **Implementing body** | *MoE, Ministry of Transport and Maritime, Ministry of Sustainable Development and Tourism, units of local self-governments* |
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | *The savings in the transport sector will followed by TD indicators* |
| | **Expected savings in 2012 as per 1st NEEAP** | */* |
| | **Savings achieved in 2012** | *It is not possible to determine.* |
| | **Expected energy savings in 2015** | *It is not possible to determine.* |
| | **Expected impact on energy savings in** | *It is not possible to determine.* |

| | | |
|---|---|---|
| | **2018.** | |
| | **Assumptions** | / |
| | **Overlaps, multiplication effect, synergy** | *The local plans should define the promotional activities - in this respect the measure will overlap with the measure T.3. In addition, the action plan defined in the measure T.5 will be the basis for local EE programs and plans.* |

| ***Title of the measure*** | | ***Information campaign on EE behavior in transport and demonstration (pilot) activities*** |
|---|---|---|
| ***Index of the measure*** | | *T.3* |
| **Description** | **Category** | *Information and mandatory information measures* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *The objective of this measure is to promote energy-efficient driving style, the use of alternative modes of transportation, as well as the use of more efficient vehicles by drivers.* |
| | **Target end-use** | *Transportation means* |
| | **Target group** | *Citizens* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Conducted activities and the results achieved:</u>*<br>*During the implementation period of the 1st EEAP, some local self-governments, realized some demonstration activities, such as: "Car Free Day", "Day for cyclists", etc., as well as a series of actions for the development of hiking and biking trails in certain parts of Montenegro. However, these and similar activities cannot be considered as implementation of the measure from the first EEAP, but the product of certain actions and global trends, held in order to promote environmental protection, healthy lifestyle, etc.*<br>*<u>Future activities :</u>*<br>*During the period of the Implementation of the 2nd EEAP , the MoE , in cooperation with the Ministry of Transport and Maritime and certain units of local self-governments will design and implement promotional campaigns, which include activities to increase general awareness of :*<br>*- Benefit from purchasing/using of EE vehicles/vehicles that use alternative fuels (energy saving , environmental protection , etc. ) ;*<br>*- The crucial importance of effective preventive maintenance of vehicles in order to increase their lifespan and reduce maintenance costs, improve safety, reduce fuel costs and reduce environmental pollution;*<br>*- Conscientious driving in terms of fuel consumption and environmental protection.*<br>*Also, the campaign needs to include a number of specific promotional activities, primarily:*<br>*- Promotion of "cleaner" modes of transport such as public transport, walking, cycling, etc.;*<br>*- Promotion of EE measures in the field of urban public transport and freight transport;*<br>*- The promotion of sustainable transport systems;*<br>*- The promotion of "clean" vehicles;*<br>*- Days without a car , etc.* |
| | **Budget and financial source** | *Funds planned until the end of 2015.*<br>*- 15,000 € from the state budget.* |
| | **Implementing body** | *MoE, Ministry of Transport and Maritime, units of local self-governments* |
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | *The savings in the transport sector will followed by TD indicators* |
| | **Expected savings in** | *0.5 ktoe* |

| | | |
|---|---|---|
| | **2012 as per 1st NEEAP** | |
| | **Savings achieved in 2012** | *It is not possible to determine.* |
| | **Expected energy savings in 2015** | *It is not possible to determine.* |
| | **Expected impact on energy savings in 2018.** | *It is not possible to determine.* |
| | **Assumptions** | / |
| | **Overlaps, multiplication effect, synergy** | / |

| ***Title of the measure*** | | ***Study/Action Plan on energy efficiency in transport*** |
|---|---|---|
| ***Index of the measure*** | | *T.4* |
| **Description** | **Category** | *Regulation* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *Development of EE study on transport with an action plan, which will define specific measures for EE improvement, applicable in Montenegro, and to be adopted by the Government of Montenegro.*<br>*The Study/Action Plan should define: the specific regulatory and institutional measures (including amendments to certain laws or the introduction of new regulations), the introduction of EU standards, strengthening mechanisms of vehicle control, as well as a number of other EE measures. In addition Study/Action Plan will determine priorities, elaborate each measure in details, as well as estimate energy savings and financing.* |
| | **Target end-use** | *Transport means* |
| | **Target group** | *All participants in transport* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *Conducted activities and the results achieved:*<br>*During the implementation period of the 1st EEAP preparatory activities for the implementation of this measures were conducted. Specifically, within the framework of the EU support through IPA2011 funds the project "Sustainable energy in transport" was approved, which includes the creation of the document: Study/Action Plan on energy efficiency in transport. In 2012 terms of reference have been prepared for a consultant who would work on the preparation of this document, and the selection procedure has began.*<br>*Future activities:*<br>*Finalization of activities:*<br>*- The selection of a consultant for the Study/Action Plan, energy efficiency in transport,*<br>*- Development of the Study and organizing public hearings as part of an information campaign (EE measures T.3)*<br>*- Revision of the Study and its submission to the Government for approval,*<br>*- Promotion of the findings and recommendations to stakeholders relevant for its implementation.* |
| | **Budget and financial source** | *Funds planned until the end of 2015.*<br>- *6,000 € from the state budget.*<br>- *88,000 € IPA funds 2011.* |
| | **Implementing body** | *MoE, Ministry of Transport and Maritime, Ministry of Sustainable Development and Tourism, Ministry of Interior Affairs, units of local self-governments and other relevant bodies* |

| | | |
|---|---|---|
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | *The savings in the transport sector will be monitored by TD indicators* |
| | **Expected savings in 2012 as per 1st NEEAP** | */* |
| | **Savings achieved in 2012** | *It is not possible to determine.* |
| | **Expected energy savings in 2015** | *It is not possible to determine.* |
| | **Expected impact on energy savings in 2018.** | *It is not possible to determine.* |
| | **Assumptions** | */* |
| | **Overlaps, multiplication effect, synergy** | *Study/Action Plan is the basis for the introduction of the EE component in the transport sector in EE programs and plans of local self-governments, and therefore achieves synergies with the measure T.2.* |

| ***Title of the measure*** | | ***Infrastructural measures in the transport sector with the energy savings effects*** |
|---|---|---|
| ***Index of the measure*** | | *T.5* |
| **Description** | **Category** | *Regulation; Voluntary agreements and instruments of cooperation* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *This measure of EE improvement has the aim to demonstrate the effects of fuel savings and emission reductions, through the implementation of infrastructural projects in the transport sector, as well as to encourage future investments in this area, which primarily includes:*<br>*- Development of regulations, which will more precisely determine the implementation of the Law on spatial planning and construction of structures, through the development of the EE studies as an integral element of the technical documentation for all types of construction, including transport (see EE measure HZ 9);*<br>*- Development of the study on system for the assessment of EE effects and reduction of emissions in certain infrastructure projects in transport sector;*<br>*- The construction of bypasses and similar transport infrastructure;*<br>*- Investment in infrastructural projects, such as urban transport, including cycling zones, parking spaces, improved system for management of traffic lights, public transport, bus stops, etc.;*<br>*- Improving the quality of existing infrastructure in transport sector.*<br>*The development of transport infrastructure mainly serves the economic development of the country and safety improvement. However, it also significantly affects the energy efficiency and environmental protection.* |
| | **Target end-use** | *Transport infrastructure that has impact on energy consumption* |
| | **Target group** | *Drivers and owners of private and official vehicles* |
| | **Regional application** | *National* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Measures implemented and the results achieved:</u>*<br>*During the implementation period of the 1st EEAP, Montenegro has implemented a number of important infrastructure projects in the transport sector, which have led to a significant reduction of distance between cities, and improved local transport conditions (e.g. by-pass roads around different cities, tunnels, setting up a third lane on highways, circuits, etc.). The realization of the above mentioned investments have led to relatively large energy savings (fuel) that could not be assessed because investment projects are not designed in a way that would allow the planning and assessment of energy savings. In other words, the EE component is not at all treated in projects of this kind.*<br>*As the Law on spatial planning and construction of structures requires that every construction project (including transport infrastructure) contains, as a compulsory part of the technical documentation, an EE Elaborate, which among other should contain evaluation of adopted solutions and possible alternatives, in the future period it will be necessary to provide adequate application of the Law in this regard, as well as to adopt necessary bylaws and methodologies for planning and evaluation of achieved energy savings. In connection with that the MoE has launched an initiative with the World Bank for the development of the regulatory framework and guidelines for the introduction of the EE component in spatial planning documents, which have been accepted as part of the LAMP project, which implementation is coordinated by the Ministry of Sustainable Development and Tourism. In 2012, the tender was published and a consultant for the realization of the work was selected. However, the contract with the consultant was canceled and the re-tendering process needs to be prepared.*<br>*<u>Future activities:</u>*<br>*Ministry of Sustainable Development and Tourism will, in cooperation with the MoE, repeat the procedure for the consultant selection for the development of the regulatory framework and guidelines for the introduction of the EE component in spatial planning documents.*<br>*The MoE will, in cooperation with the Ministry of Sustainable Development and Tourism and the Ministry of Transport and Maritime, undertake the necessary actions for the development of a methodology for assessment of energy savings and environmental impact during the construction of transport infrastructure (methodology will be the subject of the* |

| | | |
|---|---|---|
| | | *Study under EE measures T.4) .*<br>*The two ministries, in cooperation with local self-governments will promote infrastructural projects in the transport sector which will provide significant energy savings.* |
| | **Budget and financial source** | *Funds planned until the end of 2015.*<br>*Note: Funding for the implementation of this measures will be provided through the LAMP project and IPA 2011 funds, according to the measure H.7* |
| | **Implementing body** | *MoE, Ministry of Transport and Maritime, Ministry of Sustainable Development and Tourism, units of local self-governments* |
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | *Until the methodology for estimation of energy savings and environmental impact on the construction of transport infrastructure (methodology will be subject of the Study/Action Plan under EE measures T.4) has been developed, savings in the transport sector will calculated by using the TD indicators.* |
| | **Expected savings in 2012 as per 1st NEEAP** | *0.5 ktoe* |
| | **Savings achieved in 2012** | *It is not possible to determine.* |
| | **Expected energy savings in 2015** | *It is not possible to determine.* |
| | **Expected impact on energy savings in 2018.** | *It is not possible to determine.* |
| | **Assumptions** | */* |
| | **Overlaps, multiplication effect, synergy** | *Infrastructural measures will be an integral part of the Study/Action Plan (measure T.4) and EE programs and plans of local self-governments (measure T.2)* |

### 3.2.6. Measures for energy entities

Obligations of the distribution system operators and energy suppliers are regulated by the EE law, they relate to the provision of individual measuring and informative billing to its final customer.

In the second EEAP one measure was selected, which relates to the provision of individual measuring and informative billing, that is a continuation of the activities from the first EEAP and which was successfully enforced in the previous three-year period.

**Table 15 – Overview of individual measures for energy entities**

| No. | Title for energy saving measure | Targeted final consumption | Duration | Achieved energy savings in 2012 [ktoe] | Share in the sectoral target for 2012. [%] | Energy savings expected in 2015/2018. [ktoe] | Status in relation to 1st NEEAP |
|---|---|---|---|---|---|---|---|
| E.1. | Individual metering and informative billing | Electricity consumers | 2010-2018 | N/D | N/D | N/D | Continuation of activities |
| **Total:** | | | | | | | |

| ***Title of the measure*** | | ***Individual metering and informative billing*** |
|---|---|---|
| ***Index of the measure*** | | *E.1* |
| **Description** | **Category** | *Information and mandatory information measures; Financial instruments* |
| | **Timeframe** | *Start:* ***2010***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *The aim of these measures is to provide the calculation based on the actual energy use, as well as to increase consumer awareness about power consumption. In addition, the goal is to provide the consumers with the bill for the energy supplied along with the information about: current costs for energy consumption, cost and the actual energy consumption, energy consumption in relation to energy consumption in the same period of the previous year (preferably in graphic form); consumption of energy compared to the energy consumption of the same user group and method of obtaining information on the availability of EE measures, as well as equipment and devices which ensure a higher level of EE.*<br>*According to the Law on EE, the distribution system operators and energy suppliers need to provide clear and understandable energy bills and individual metering.* |
| | **Target end-use** | *Electricity consumers* |
| | **Target group** | *Distribution system operators and suppliers of energy* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Conducted activities and the results achieved:</u>*<br>*Individual metering of electricity in Montenegro represents established practice for many years. During the implementation period of the first EEAP, EPCG has started a program "smart metering" (remote reading of electricity consumption) within which the EPCG embedded approximately 155,000 "smart" meters so far, which represents approximately 40% of available measurement points.*<br>*EPCG introduced a new accounting system and new form of bills for the supplied electricity, which largely complies with the statutory obligations in terms of informing the consumers about their consumption and energy efficiency measures.*<br>*MoE is responsible for supervising the implementation.*<br>*<u>Future activities:</u>*<br>*EPCG will proceed with the implementation of the "smart metering".*<br>*MoE will, within the framework of cooperation with EPCG, monitor the implementation of these activities and examine the effects achieved in terms of energy savings.* |

| | | |
|---|---|---|
| | **Budget and financial source** | *Funds planned until the end of 2015.*<br>*Note: Funding for this measure will be provided by the EPCG.* |
| | **Implementing body** | *EPCG, MoE* |
| | **Monitoring authority** | *MoE* |
| **Energy savings** | **Method for monitoring/measuring the resulting savings** | / |
| | **Expected savings in 2012 as per 1st NEEAP** | / |
| | **Savings achieved in 2012** | *It is not possible to determine.* |
| | **Expected energy savings in 2015** | *It is not possible to determine.* |
| | **Expected impact on energy savings in 2018.** | *It is not possible to determine.* |
| | **Assumptions** | / |
| | **Overlaps, multiplication effect, synergy** | / |

### 3.2.7. Horizontal Measures

The implementation of specific EE measures in the first and in the second EEAP, will effect in the final energy consumption in several sectors. Some of these cross-sectoral measures were "assigned" to certain sectors of final energy consumption in the previous chapters, it is expected that this way they will have the greatest effect. These measures will be re-described in this chapter, but due to a better overview they are specified in Table 16. The most important cross-sectoral and horizontal measures are briefly described in this chapter, and their table overview is given below, without displaying the estimated savings.

**Table 16 - Horizontal and cross-sectoral measures and their application in sectors**

| Measure mark | Title of measure | Households | Services - Public | Services - Commercial | Industry | Transportation | Energy sector |
|---|---|---|---|---|---|---|---|
| B.1 | Development and preparation of a regulatory framework for energy efficiency of buildings | X | X | X | X | | |
| B.2 | Implementation of regular energy audits of heating systems and air conditioning systems | X | X | X | X | | |
| B.3 | Energy performance certification of buildings | X | X | X | X | | |
| R.1 | Information campaigns and network of EE info centers | X | X | X | | | |
| R.2 | Energy labelling of household appliances | X | X | X | X | | |
| E.1 | Individual metering and informative billing | X | X | X | X | | * |
| H.1 | Development of a basic legislative, regulatory and institutional framework for EE in Montenegro | X | X | X | X | X | X |
| H.2 | Adoption of strategic and planning documents for EE | X | X | X | X | X | X |
| H.3 | Establishment of statistical and monitoring system for EE | X | X | X | X | X | X |
| H.4 | Promotion of financial mechanisms for sustainable energy and alternative mechanisms of financing | X | X | X | X | X | X |
| H.5 | Strengthening education on EE | X | X | X | X | X | X |
| H.6 | Introduction of a regulatory framework for eco-design of energy related products | X | X | X | X | X | X |
| H.7 | Introduction of requirements and criteria for EE in spatial planning and the development of infrastructural investments | X | X | X | X | X | X |

* Measure E.1 is implemented by energy operators (suppliers). The measure affects other sectors of consumption, mainly households.

Horizontal and cross-sectoral measures that are not described as part of one of the sectors of final consumption are described below:

| ***Title of the measure*** | | ***H.1: Development of a basic legislative, regulatory and institutional framework for energy efficiency in Montenegro*** |
|---|---|---|
| ***Index of the measure*** | | *H.1* |
| **Description** | **Category** | *Regulation* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *The aim of these measures is a further development of the EE Act and related to the regulations, in accordance with the requirements of the EU directive and innovative needs for the second EEAP, as well as strengthening institutional capacities and providing the necessary support for* |

| | | |
|---|---|---|
| | | *the implementation of the Act.* |
| | **Target end-use** | *Final energy consumption u all final consumption sectors* |
| | **Target group** | *All sectors of the final consumption* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *Conducted activities and the results achieved:*<br>*During the implementation period of the 1st EEAP the Law on EE was passed ("Official Gazette of Montenegro" 29/10).*<br>*Based on the Law, during this period 14 by-laws have been prepared, 11 of them came into force (6 by the end of 2012.), while the remaining three regulations are in the drafting stage. Overview of the policies with their status is given in Annex 1.*<br>*In terms of institutional development foreseen by the first EEAP, in 2010, the Ministry of Economy has created a special sector for energy efficiency, with a prediction of 15 jobs openings, and the Deputy Minister was appointed. The new act on organization and systematization of the position openings the number of openings was reduced to 8. Currently the EE Sector counts 5 employees, and two consultants are engaged under a service contract (coordinator for projects for the reconstruction of buildings under the jurisdiction of the Ministry of Education and Ministry of Health, which is implemented on the basis of loans from the World Bank and KfW).*<br>*In units of local self-government certain activities are evident concerning the establishment of energy management, which is still at an early stage, so that the structure of power management have not been formally recognized.*<br>*Following the adoption of the EE law, the legal framework in the field of energy efficiency, on the EU level, and the adoption of its innovative directives, was significantly strengthened. As Montenegro, through the membership in the Energy Community, took the obligation to accept the request of transposition of updated directives, it was necessary for the further development of the legal framework in the field of energy efficiency, making the novel law - Law on efficient use of energy. The Ministry of Economy prepared a draft on the Law on efficient use of energy in August 2013 which is sent to relevant parties for comments. After a hearing, the law is in the form of a proposal that has been put in further procedure with the Government of Montenegro for adoption.*<br>*Future activities:*<br>*1. Continue the procedure for adoption of the law on efficient use of energy;*<br>*2. After the adoption of the Law on efficient use of energy amend the existing by-laws, in order to bring them in line with the requirements of the Acts and updated directives;*<br>*3. Further capacity strengthening of law enforcement agencies (Ministry of Economy / Sector for Energy Efficiency, units of local self-governments, relevant inspection, authorized persons to carry out energy audits, etc.).* |
| | **Budget and financial source** | *Planned fund until the end of 2015.*<br>- *10.000 € from the state budget.*<br>*Note: The funds for the implementation of this measure are additional in relation to the funds earmarked under the measure: B.1, B.2, B.3, R.2, p.2, H6.* |
| | **Implementing body** | *MoE* |
| | **Monitoring authority** | *MoE* |

| ***Title of the measure*** | | ***H.2: Adoption of strategic and planning documents for energy efficiency*** |
|---|---|---|
| ***Index of the measure*** | | *H.2* |
| **Description** | **Category** | *Regulation* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief** | *The objective of this measure is to develop new and update existing strategic and planning* |

| | | |
|---|---|---|
| | **description** | *documents for energy efficiency.* |
| | **Target end-use** | *Final energy consumption u all final consumption sectors* |
| | **Target group** | *All sectors of the final consumption* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Conducted activities and the results achieved:</u>*<br>*The new Energy Policy of Montenegro that was adopted in 2011 defines the objectives for the development of the energy sector in Montenegro until 2030, as well as major priorities and key strategic directions.*<br>*The Montenegrin government is currently working on the finalization of the draft and the adopting of the Energy Development Strategy until 2030. This process is at the same time developing a strategic assessment of the environmental impact. The adoption of the innovated strategy is planned by the end of 2013.*<br>*How innovated strategy specifically addresses the area of energy efficiency, it is not necessary to develop a strategy of energy efficiency as a separate document, which is provided in the draft law on the efficient use of energy.*<br>*During the implementation period of the 1st EEAP, the Government of Montenegro adopted two annual operating plans for improving the energy efficiency of the state administration for 2012 and 2013.*<br>*It is also evident that some developments have been made in the preparation of the planning documents in the field of energy efficiency at the local level, but that still does not indicate the effective implementation of the Law on Energy Efficiency.*<br>*<u>Future activities:</u>*<br>1. *Adoption of the Energy Development Strategy of Montenegro until the year 2030 including the strategic framework in the field of energy efficiency;*<br>2. *Adoption of the 2nd EEAP and preparation of the 3rd EEAP for the period 2016-2018;*<br>3. *The adoption and implementation of annual operating plans for improving the energy efficiency of the state administration;*<br>4. *The adoption of plans and programs to improve energy efficiency by local self-governments.* |
| | **Budget and financial source** | *Planned fund until the end of 2015.*<br>- *5.000 € from the state budget.* |
| | **Implementing body** | *MoE* |
| | **Monitoring authority** | *MoE* |

| ***Title of the measure*** | | ***H.3: Establishment of statistical and monitoring systems for energy efficiency*** |
|---|---|---|
| ***Index of the measure*** | | *H.3* |
| **Description** | **Category** | *Regulation* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *The objective of this measure is to establish an effective mechanism for the delivery of data, the relevant aspects of energy use, as well as providing conditions for performing analysis and providing guidelines in the field of energy efficiency.* |
| | **Target end-use** | *Final energy consumption u all final consumption sectors* |
| | **Target group** | *All sectors of the final consumption* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Conducted activities and the results achieved:</u>*<br>*Within the TA-EnCT Project, which is funded by the EU (IPA), a central information system for energy consumption was developed. Preparatory activities for establishing this system started in October 2010. The first version of the software is finalized and tested by the end of 2011.*<br>*The project for establishing a central information system for power consumption is supported by the project "Development of IT infrastructure system for Montenegrin energy sector" (ODA Project) which was implemented on the basis of a development assistance project funded by the Government of Slovenia. Specifically, the ODA Project provided necessary IT infrastructure (hardware and system software) to operate a central information system.*<br>*Along with these activities, supporting activities for public sector entities was carried out, especially for government bodies and bodies of local self-governments, with the aim of their capacity raising and software usage for appropriate data.*<br>*The Ministry of Economy has issued regulations on the information system for energy consumption and how to provide data on annual energy consumption (Official Gazette of Montenegro, no. 6/2012).*<br>*Despite the expectations that the information system would be put into operation in 2012, this did not happen due to certain technical and financial issues.*<br>*During the implementation period of the 1st EEAP, it is evident that certain activities are being implemented related to the establishing of the information systems for energy consumption at the local level, but that in this part do not yet point to the effective implementation of the Law on Energy Efficiency.*<br>*<u>Future activities:</u>*<br>1. *Putting the central information system into operation and further development of the energy consumption system;*<br>2. *Strengthening the capacity of entities, in accordance with the Law on Energy Efficiency, dealing with the information systems of energy consumption and supply data;*<br>3. *Strengthening the capacity of the Ministry of Economy / Sector for Energy Efficiency in order to receive and control data, and perform appropriate analysis.* |
| | **Budget and financial source** | *Planned fund until the end of 2015.*<br>*- 12.000 € from the state budget.* |
| | **Implementing body** | *MoE, entities of the public sector (state bodies, organizations, regulatory bodies, institutions, local self-governments and public enterprises)* |
| | **Monitoring authority** | *MoE* |

| ***Title of the measure*** | | ***H.4: Promotion of financial mechanisms for sustainable energy and alternative mechanisms of financing*** |
|---|---|---|
| ***Index of the measure*** | | *H.4* |
| **Description** | **Category** | *Regulation / Financial instruments* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *The aim of this measure is to establish and develop mechanisms for financing programs and energy efficiency projects.* |
| | **Target end-use** | *Final energy consumption u all final consumption sectors* |
| | **Target group** | *All sectors of the final consumption* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Conducted activities and the results achieved:</u>*<br>*During the implementation period of the 1st EEAP, through the implementation of activities and the implementation of specific projects to improve energy efficiency, significant efforts were made to promote financial mechanisms, aimed at:*<br>- *the public sector (the project for the reconstruction of buildings under the jurisdiction of the Ministry of Education and Ministry of Health, which is implemented on the basis of loans from the World Bank and KfW);*<br>- *the citizens (Montesol - a program providing interest-free loans for the installation of solar systems for water heating; ENERGY WOOD - a program providing interest-free loans for the installation of heating systems on biomass; SOLAR KATUNI - subsidizing the costs for the purchase and installation of photovoltaic systems in summer pastures households);*<br>*These projects are implemented with the active participation / coordination of the Ministry of Economy / Sector for Energy Efficiency.*<br>*In addition, some initial activities of individual banks were made, in terms of establishing a line of credit for financing energy efficiency and renewable energy sources, which have not yet made recognizable results.*<br>*In 2013, the EBRD launched a regional project to support the development of a framework for the establishment of ESCO financing models, which was joined by Montenegro.*<br>*<u>Future activities:</u>*<br>1. *Continued implementation of the above mentioned projects and ensuring conditions for launching new ones;*<br>2. *Providing conditions for financing programs and projects based on ESCO energy efficiency models.* |
| | **Budget and financial source** | *Planned fund until the end of 2015.*<br>- *10.000 € from the state budget.*<br>*Note: The implementation of these measures will be supported by the EBRD.* |
| | **Implementing body** | *MoE* |
| | **Monitoring authority** | *MoE* |

| ***Title of the measure*** | | ***H.5: Strengthening education on energy efficiency*** |
|---|---|---|
| ***Index of the measure*** | | *H.5* |
| **Description** | **Category** | *Information and mandatory information measures* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *The goal of this measure is to strengthen the knowledge and professional skills in the field of energy efficiency for different target groups.* |
| | **Target end-use** | *Final energy consumption u all final consumption sectors* |
| | **Target group** | *All sectors of the final consumption* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *<u>Conducted activities and the results achieved:</u>*<br>*During the implementation period of the 1st EEAP, a number of training activities have been noticed in the field of energy efficiency, which are mainly targeted towards the professional circles and students.*<br>*In the previous period the Ministry of Economy, with the support of partner organizations German Society for International Cooperation (GIZ) and the Norwegian company Energy Saving International (ENSI), and in cooperation with the Mechanical and the Faculty of Architecture of the University of Montenegro, trainings have been conducted for 41 Engineers who will get the license to conduct energy audits (auditors). In order to support the implementation of energy audits three ordinances and two manuals were developed and adopted. A certain number of auditors have been actively involved in the implementation of the project, reconstruction of buildings under the jurisdiction of the Ministry of Education and Ministry of Health, which is implemented on the basis of loans from the World Bank and KfW. In order to organize their work better as well as the security of their status and interests, auditors in Montenegro formed a professional organization - NGO Center for energy efficiency.*<br>*In order to educate students in the field of energy efficiency, significant activities were carried out, such as: the formation of a special post-graduate orientation on energy efficiency studies in the Mechanical Engineering Faculty and the Faculty of Architecture, as well as the implementation of the "Energy Tour" organized by the Centre for Professional education of Montenegro and GIZ, which is dedicated to educating 9$^{th}$ grade elementary schools students in Montenegro on the topic of energy efficiency.*<br>*In addition, within the organization of SEE and other actors (NGOs, Mechanical Faculty, National Academy, specialized companies, etc.), there was a number of conferences held at which they promoted the principles of energy efficiency, as well as the latest technology and knowledge in this field. Other public events were held as well (workshops, presentations, etc.) which partially implemented the concept of knowledge transfer, but which by its nature have a public awareness raising character on energy efficiency.*<br>*<u>Future activities:</u>*<br>*1. Continued training activities for auditors, especially auditors that are conducting regular energy audits of heating and air conditioning systems;*<br>*2. The introduction of energy efficiency topics in curricula at all levels of education;*<br>*3. The establishment and development of specialized occupations that deal with energy efficiency, in cooperation with relevant institutions and the Center for Professional Education (e.g. solar equipment installers which already launched an initiative).* |
| | **Budget and financial source** | *Planned fund until the end of 2015.*<br>- *5.000 € from the state budget.*<br>*Note: Planned findings are additional to the funds provided for the implementation of activities for training of persons dealing with energy audits in relation to measures B.1 and B.2* |
| | **Implementing body** | *MoE, Ministry of Education, Ministry of Science, University of Montenegro, Center for Professional Education* |
| | **Monitoring authority** | *MoE* |

| *Title of the measure* | | ***H.6: Introduction of a regulatory framework for eco-design of energy related products*** |
|---|---|---|
| ***Index of the measure*** | | *H.6* |
| **Description** | **Category** | *Regulations* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *The aim of this measure is the introduction of legal obligations for energy related products, so that they meet the requirements in terms of the eco-design.* |
| | **Target end-use** | *Final energy consumption u all final consumption sectors* |
| | **Target group** | *All sectors of the final consumption* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the measure** | *Conducted activities and the results achieved:*<br>*Although the establishment of a framework for eco-design of energy related products is not the obligation of Montenegro, on the basis of the Energy Community Treaty, the law on energy efficiency calls for the introduction of requirements in this section.*<br>*During the implementation period of 1st EEAP, the Ministry of Economy has prepared draft regulation on the eco-design of energy related products, which includes three groups of products. Adoption of the regulations is scheduled for the 2014.*<br>*Future activities:*<br>*1. Finalization and adoption of regulations on eco-design of energy related;*<br>*2. Strengthening the capacity of relevant inspections in order to monitor the application of the Regulations.* |
| | **Budget and financial source** | *Planned fund until the end of 2015.*<br>- *5.000 € from the state budget.* |
| | **Implementing body** | *MoE, Inspection Directorate (market inspectors)* |
| | **Monitoring authority** | *MoE, Inspection Directorate (market inspectors)* |

| *Title of the measure* | | ***H.7: Introduction of requirements and criteria of energy efficiency in spatial planning and development of infrastructural investment*** |
|---|---|---|
| ***Index of the measure*** | | *H.7* |
| **Description** | **Category** | *Regulations* |
| | **Timeframe** | *Start:* ***2012***<br>*End:* ***2018***<br>*Foreseen major changes, amendments, improvements:*<br>***Continuation of activities from the 1st EEAP.*** |
| | **Aim/brief description** | *The aim of this measure is the development of a regulatory framework and guidelines for EE components introduced in spatial planning document.* |
| | **Target end-use** | *Final energy consumption u all final consumption sectors* |
| | **Target group** | *All sectors of the final consumption* |
| | **Regional application** | *National and local level* |
| **Information on implementation** | **List and description of energy saving actions substantiating the** | *Conducted activities and the results achieved:*<br>*MoE has launched an initiative with the World Bank for the development of the regulatory framework and guidelines for the incorporation of the energy efficiency component in the spatial planning document, which has been accepted as part of the LAMP project and implemented by the Ministry of Sustainable Development and Tourism. During 2012, a tender* |

| | | |
|---|---|---|
| | **measure** | *was prepared and consultant a selected for the realization of the work. However, the contract with the consultant is terminated so the tendering has to be repeated.*<br>*Future activities:*<br>*MoE will, in cooperation with the Ministry of Sustainable Development and Tourism, repeat the selection procedure for the consultants that will develop the regulatory framework and guidelines for the installation of the energy efficiency components into the spatial planning document.* |
| | **Budget and financial source** | *Planned fund until the end of 2015.*<br>*Note: Funding for the implementation of these measures will provided by the LAMP project and IPA 2011 funds.* |
| | **Implementing body** | *ME, Ministry of Sustainable Development and Tourism* |
| | **Monitoring authority** | *ME, Ministry of Sustainable Development and Tourism* |

## 3.3 Public sector

### *3.3.1. The leading role of the public sector*

The focus for the implementation of the national policy of energy efficiency in Montenegro has been placed on the public sector. This approach is not only a consequence due to the request of ESD, but also a fact that through encouragement of policy and regulatory measures it is easiest to just start activities in this sector. In addition, this approach further justifies the still underdeveloped market of energy efficiency in Montenegro. Namely, with their actions the public sector can have a positive impact on citizens and entities from other sectors, in terms of taking actions to reduce energy consumption, and because of their buying power can affect the profiling of the market towards more energy efficient products and services.

However, the current barriers are relatively high that slow down and prevent the implementation of energy efficiency in the public sector, primarily due to: inadequate attitude towards energy consumption and energy costs; the lack of motivation of employees for the achievement of energy savings; inability of opting budget funds in energy efficiency projects without complex procedures; the lack of energy management systems, the lack of systematic buildings status overview; as well as the lack of the total energy consumption overview for buildings in the jurisdiction of the state, etc.

In order to remove the above mentioned barriers for some time now significant systemic activities have been implemented Montenegro, focused on several courses of action, and in particular to:

- Finding legal and regulatory solutions,
- Preparation, implementation and monitoring of promotional energy efficiency projects,
- Awareness raising on the importance and effects of the application of energy efficiency measures,
- Strengthening inter-sectoral cooperation in the public sector, aimed at joint action.

***Legal and regulatory solutions to promote energy efficiency in the public sector***

The law on energy efficiency for public sector entities (state bodies, organizations, regulatory bodies, institutions, organs of local self-government and public enterprises) sets significant standards to improve energy efficiency, which primarily include:

- Adoption of energy efficiency planning documents,
- Energy Management,
- Implementation of energy efficiency measures,
- Establishment of an information system for monitoring energy consumption.
- Reporting on the conducted activities.

Local self-governments are required to adopt a three-year programs and one-year plans for EE improvement in order to plan EE measures for buildings which they occupy as well as to report annually to the Ministry of Economy of the achieved results.

On the other hand the state administration bodies are obliged, through the annual operating plan for improving the energy efficiency of the state administration, which is adopted by the Government, to specify the EE measures that will be implemented in the forthcoming year.

In reporting, the public sector entities also have an obligation to submit data to the Ministry on their annual energy consumption in buildings and facilities that they use, as well as on the factors that influence the spending of energy. In order to monitor energy consumption and other relevant data in their facilities, mentioned entities are required to establish an information system on energy consumption.

In order to implement above mentioned obligation specified by the Law on EE, several bylaws are adopted which closely regulate requirement of the public sector (see Annex 1).

In an effort to improve the legal framework in the field of energy efficiency Ministry of Economy has prepared a draft law on the efficient use of energy, whose adoption and entry into force will further enhance the application of legal solutions in this area.

***Promotional energy efficiency projects***

The Ministry of Economy coordinates several projects in the field of energy efficiency, the most important are:

Energy Efficiency Project in Montenegro (MEEP)

The project aims to increase energy efficiency in public sector buildings. This project started in Dec 2008. Within this Project energy efficiency measures have been implemented in 15 institutions and 8 schools, one dorm and 6 hospitals. Project financing is secured through the World Bank loan in the amount of € 6.5 million. The project is being implemented in coordination with the Ministry of Economy, Ministry of Health and Ministry of Education. The planned duration of the project is until March 30$^{th}$, 2014.

Energy efficiency in public buildings (EEPPB)

Ministry of Economy, in cooperation with the German Development Bank (KfW), implements the "Program of energy efficiency in public buildings" with funds amounting 13 million €. It is planned that the program runs until June of 2014. The goal of the program is to improve energy efficiency and comfort conditions in targeted buildings, which are under the jurisdiction of the Ministry of Education and Sports (primary, secondary and special schools, kindergartens and student dormitories). Within the project it is planned for the rehabilitation and modernization of about 30 educational facilities in order to improve the level of energy efficiency.

Interest-free loans project for solar panels in households (Montesol)

Ministry of Economy in cooperation with its partners within the framework for environmental protection at the United Nations (UNEP), and the Italian Ministry of Environment, Land and Sea (IMELS), is implementing a project “Montesol” which aims to establish an attractive and sustainable financial mechanism, or the provision of intrest-free credits to households for the installment of solar panels. For the realization of the Montesol project 1 million $US are allocated, which are intended to implement and subsidize interest rates at commercial banks. Possible individual loans amounting up to € 5,000, with a repayment period of up to seven years, with an interest rate of 0%. In the previous period (until September 2013.) 105 solar systems have been installed.

In the future, it is planned to extend the project to individual legal entities in the tourism sector, for that sector the loan amount would be increased (up to € 50,000), with a repayment period of up to seven years and a 0% interest rate.

Interest-free loans project for the installation of the systems on modern forms of biomass for households (ENERGY WOOD)

Ministry of Economy, in cooperation with the Luxembourg Agency for Development and Cooperation (Lux-Development), implements a program ENERGY WOOD, which aims to establish an attractive and sustainable financial mechanism for providing loans to households for the installation of heating systems (boilers and furnaces) on modern forms of biomass (pellets, briquettes). Funding for the implementation of the ENERGY WOOD program, in the amount of € 130,000, are provided within the FODEMO project (Forestry Development in Montenegro), which is funded by the Government of the Grand Duchy of Luxembourg.

***Awareness rising on the importance and effects of the implementation of energy efficiency***

In the past, awareness raising on energy efficiency in the public sector, was mainly conducted through intensive public campaigns, as well as organizing several conferences and workshops on the topic of energy management, performing energy audits, monitoring and verification of energy savings, etc., which is elaborated in detail in Section 3.2

***Strengthening cross-sectoral cooperation in the public sector***

The Ministry of Economy, as a competent state authority for the implementation of the energy efficiency policy, in the previous period included other state bodies and institutions in their activities, as well as some relevant subjects, which significantly strengthened cross-sectoral cooperation and confirmed their role in promoting energy efficiency. We have to emphasize the importance of coordinating activities on the implementation of the requirement of the EBPD between the Ministry responsible for spatial planning and construction and the Ministry responsible for energy efficiency.

### *3.3.2. The leading role of the public sector in the implementation of EBPD*

The public sector in Montenegro has the leading role in the implementation of activities for energy efficiency improvement, in particular through the implementation of measures P.3 and P.4. The new legal framework (Draft Law on Efficient Use of Energy), by transposing the requirements of the Directive 2012/27/EU on energy efficiency regarding the mandatory reconstruction of the public buildings, introduces additional obligations regarding the implementation of the EPBD.

### *3.3.3. Special measures for public procurement*

Law on Energy Efficiency prescribes the assessment of energy efficiency level for goods and services, as well as buildings in the public procurement procedures. During the implementation period of the first EEAP a draft methodology for determining the level of energy efficiency in public procurement was initiated, its finalization is in progress.

In the new Law on Public Procurement, which applies from January 1$^{st}$, 2013, energy efficiency has been introduced as one of the possible criteria in selecting the most favorable bid.

Also, there are upcoming activities and trainings for government officials in charge of public procurement, on the application of methodologies for determining the level of energy efficiency, as well as the establishment of functional mechanisms for monitoring of the achieved results.

## 3.4 Providing access to advice and information

As part of the information campaign, in the previous period, Info Centers for Energy Efficiency were opened in Podgorica and Bijelo Polje. Information Centre for Energy Efficiency in Podgorica was opened in collaboration with the capital Podgorica and GIZ, through the implementation of the regional project "Capacity building for energy management in cities." Within the Info Centre in Podgorica a free telephone info line is opened.

In addition to the established Info Centers, Info Offices of Energy Efficiency are opened in municipalities of Niksic, Berane, Cetinje, Bijelo Polje, Zabljak, Rozaje, Plav. The opening of these offices is realized in cooperation with the Directorate for Development of Small and Medium Enterprises and GIZ. The idea of this project is to promote energy efficiency in Montenegrin municipalities, through the existing network of business centers, at the disposal of the Directorate for the development of small and medium enterprises.

The availability of informations to the general population is enabled through a dedicated website www.energetska-efikasnost.me, which is timely updated with the necessary information.

### 3.5 Obligations of energy entities to encourage the reduction of energy consumption by the final consumers

Law on energy efficiency prescribed certain obligations for the distribution system operators and suppliers of electricity and heat energy, which relate to the provision of devices for measuring energy consumption, as well as the provision of adequate information to consumers through energy bills, in accordance with the requirements of ESD.

Individual measurements of electricity have been a common practice in Montenegro, for many years. During the implementation period of the first EEAP, EPCG has started a program "smart metering" (remote reading of consumption), which has substantially been implemented.

Also, the EPCG has introduced a new accounting system and a new form of bills for delivered electricity, which largely complies with the obligations in terms of informing consumers about their consumption and energy efficiency.

### 3.6 The market for energy services in Montenegro

In Montenegro the market for energy services is still not developed in terms of promoting and encouraging energy efficiency.

The Law on Energy Efficiency contains specific provisions regarding the performance of energy services and energy performance contracts, which is the first step towards establishing a legal framework in this field.

In 2013, the EBRD launched a regional project to support the development of a framework for the establishment of ESCO financing model and Montenegro joined the project.

### 3.7 The strategy for increasing the number of near zero energy buildings

The second EEAP does not elaborate the issue of the construction of near zero energy buildings, since there are still no binding strategic guidelines in this area. The next (third) EEAP will decide this issue, depending on the possibilities and priorities established in the field of energy efficiency.

### 3.8 Alternative measures for heating systems and air conditioning systems

A regulatory framework is established for carrying out regular energy audits of heating and air conditioning systems in buildings:

- Rulebook on regular energy audits of air conditioning and heating ("Official Gazette of Montenegro", no. 24/2013)
- Rulebook on training programs for energy audits, content of requirements for issuing authorizations and registry of authorized persons ("Official Gazette of Montenegro", no. 24/2013).

These regulations were passed on the basis of the Energy Efficiency Law. Regulations on regular energy audits of air conditioning and heating determines the manner and the deadlines for carrying out regular energy audits of air conditioning systems with a nominal power of 12 kW or more , and systems for heating on gas, liquid or solid fuels with a nominal power of 20 kW or more. Regular energy audits of heating system and/or air conditioning systems helps to estimate energy efficiency of the system under actual operating conditions with in comparison to the efficiency defined with the technical documentation and manufacturer's specifications for the designed operation modes, taking into account the actual and designed conditions of the building usage as well as to propose measures for energy efficiency improvement of the system. Regular energy audits may be conducted by professional persons authorized by the competent institution of the state administration. Authorized persons acquire their license on the basis of the training program prescribed by the Regulations on training programs for energy audits, content requirements for issuing authorizations and registry of authorized persons.

In 2013, training of the first group of experts on this type of examination was conducted, which was successfully completed by seven (7) participants. Previously, within the trainings for performing energy audits of buildings, 11 mechanical engineers acquired the necessary qualifications to carry out these audits.

### 3.9 Support measures for the implementation of the EPBD

Measures supporting the implementation of the EPBD are defined in this EEAP and described in detail in sections 3.2.1, 3.2.2. and 3.2.3.

# 4 INSTITUTIONAL FRAMEWORK FOR IMPLEMENTATION OF ENERGY EFFICIENCY POLICIES

## 4.1. Analysis of the situation during the implementation period of the 1st EEAP

The Law on Energy Efficiency commits the Ministry of Economy with the most important role in the implementation of energy efficiency policy. The Act stipulates that the Ministry:

- overlooks the implementation of the Strategy and the Action Plan and submits an annual reports on the implementation of the Action Plan of the Government;
- cooperates with international institutions in the implementation of the energy efficiency programs;
- provides technical assistance to local self-governments with the development programs to improve energy efficiency in order to bring them in line with the Action Plan;
- establishes and maintains an information system on energy consumption in Montenegro;
- collects data on the consumption of all forms of energy and the factors that influence the consumption;
- issues authorizations for conducting energy audits and certification of buildings;
- keeps a register of persons authorized for conducting energy audits and certification of buildings;
- promotes the implementation of energy efficiency measures and issues publications in order to inform and raise consumer awareness about the importance and effects of energy efficiency;
- organizes program trainings for the implementation of energy efficiency measures and performs other duties in accordance with this Law.

The Law stipulates the obligation that the local self-governments should:

- manage the energy in buildings and facilities that are used by the local self-government, public services and public enterprises founded by the local self-government;
- inform the citizens about the possibilities of improving energy efficiency, significance and effects of the application of energy efficiency measures;
- establishes incentives for improving energy efficiency in their area and
- establishes and maintains the information system of energy consumption in buildings and facilities that they use.

The Law on energy efficiency also provides for certain obligations for other subjects that are relevant for the implementation of energy efficiency policy, the most important are:

- *large energy consumers* (energy management, implementation of energy audits, implementation of energy efficiency measures, energy monitoring and the establishment of an information system on energy consumption);
- *distribution system operators and energy suppliers* (organization of energy services offers to final consumers at competitive prices);
- *suppliers and distributors of home appliances (*providing technical documentation for home appliances with the expressed amount of energy consumption in the specified operating conditions and usage).

During the implementation period of the 1st EEAP, the Department for Energy Efficiency in the Ministry of Economy had the leading role in the implementation of national energy efficiency policy, and realized the activities outlined in section 3.2 of this Action Plan (*Measures to improve energy efficiency and save energy in final consumption*).

Activities of the Sector for Energy Efficiency were mainly realized through donations provided by renowned international institutions, in the form of technical assistance or within designated (promotional) projects and energy efficiency programs, funded on a loan basis. The position of this sector, as an integral part of the Ministry of economy, conditions a strict compliance with the rules and regulations of the state authorities, which indicates its limited flexibility and available mechanisms for operational activities. This position of the Sector for Energy Efficiency largely imposed the coordination and advisory role in the

implementation of planned activities. An additional problem is the lack of personnel and financial capacities of the sector, which does not provide a guarantee for the successful implementation of the tasks set.

The inconsistent application of the Law on energy efficiency, during the period of the 1st EEAP, caused lack in forming appropriate institutions in other relevant entities. The exception is the forming of the Montenegrin Center for Energy Efficiency (CCEE) (15.03.2010), or the associations of experts for conducting energy audits of buildings, as well as the establishment of the Institute for Energy Efficiency and Environment (IEEE) (2011.) within the ETG Group company Podgorica, which focuses on the design, construction works and optimization of energy facilities and installations. However, the scope of activities of these subjects in the field of energy efficiency is not significantly contributed to the institutional development in this area.

It is important to emphasize that there are no specialized bodies for funding of energy efficiency programs and projects in Montenegro (e.g. Energy Efficiency Fund), this has slowed the development of energy efficiency for the final energy consumer and reduced the ability to achieve energy savings and other ancillary benefits. This also significantly hampered the achievement of the national indicative targets and the monitoring of actual energy savings.

It is evident that institutional development in Montenegro in terms of energy efficiency are still in their early stages, so there is a strong need for efficient establishment of specialized subjects, which will, on the basis of market principles provide certain services in the field of energy efficiency. The absence of a strong national agency is obvious, which in addition to technical assistance, within its own operating rules and with no conflict of interest, may receive financial support from national and international organizations receive fees for certain services and participate in international projects.

Bearing in mind the current economic crisis, and thus insufficient financial capacity's in almost all subjects relevant for the implementation of energy efficiency policy's, and the fact that the existing legal framework in the field of energy efficiency does not regulate issues of institutional development, the 2nd EEAP does not offer substantial solutions, such as; the establishment of a national agency for energy efficiency, fund for energy efficiency or other similar bodies.

Within the Ministry of Economy, the Sector for Energy Efficiency was renamed to, the Directorate for Energy Efficiency, which did not substantially improve its status. On the contrary, the current economic problems significantly reduced its acting capacity.

Finally, the institutional development in the field of energy efficiency will be directly dependent on the overall socio-economic environment and the level of engagement of available mechanisms to control the implementation of the Energy Efficiency Law.

## 5 EXPECTED RESOURCES FOR IMPLEMENTATION OF THE 2ND EEAP

Overview of the foreseen funds for the implementation of measures for the 2nd EEAP are given in the following table:

| Section | Title of the Energy Efficiency Measure | Budget | Donation | Loan |
|---|---|---|---|---|
| B.1 | Development and preparation of a regulatory framework for energy efficiency of buildings | 12.000 | 500.000 | |
| B.2 | Implementation of regular energy audits of heating systems and air conditioning systems | 5.000 | 15.000 | |
| B.3 | Energy performance certification of buildings | 20.000 | | |
| R.1 | Information campaigns and network of EE info centers | 30.000 | | |
| R.2 | Energy labelling of household appliances | 10.000 | | |
| R.3 | Financial support for citizens for investments in renewable energy sources on the consumption side | 70.000 | 570.000 | |
| P.1 | Development of energy management in the public sector | 25.000 | | |
| P.2 | Establishment and implementation of EE criteria in public procurement of goods and services, as well as in purchase and rental of buildings | 10.000 | | |
| P.3 | Improvement of energy performance of buildings in the public sector | 30.000 | 1.500.000 | 16.500.000 |
| P.4 | Implementation of energy efficiency improvement measures in public utility companies of local self-governments and other public companies (demand side) | 25.000 | | |
| C.1 | Establishment of energy management system in the commercial services | 15.000 | | |
| C.2 | Incentive program related to the use of solar energy in the tourism sector | 5.000 | | |
| C.3 | Development of mechanisms for improvement of energy performance of commercial non-residential buildings | 15.000 | | |
| I.1 | Establishment of energy management system in the industry sector | 10.000 | | |
| T.1 | Establishment and implementation of EE criteria in public procurement of vehicles and transport services in the wider public sector | 10.000 | | |
| T.2 | Introduction of the chapter "Energy efficiency in transport" in EE improvement programs and plans | 10.000 | | |
| T.3 | Information campaign on EE behavior in transport and demonstration (pilot) activities | 15.000 | | |
| T.4 | Study - Action Plan on energy efficiency in transport | 6.000 | 80.000 | |
| T.5 | Infrastructural measures in the transport sector with the energy savings effects | 0 | | |
| E.1 | Individual metering and informative billing | 0 | | |
| H.1 | Development of basic legislative, regulatory and institutional framework for energy efficiency in Montenegro | 10.000 | | |
| H.2 | Adoption of strategic and planning documents for energy efficiency | 5.000 | | |
| H.3 | Establishment of statistical and monitoring systems for energy | 12.000 | | |

| | | | | |
|---|---|---|---|---|
| | efficiency | | | |
| H.4 | Promotion of financial mechanisms for sustainable energy and alternative mechanisms of financing | 10.000 | | |
| H.5 | Strengthening education on energy efficiency | 5.000 | | |
| H.6 | Introduction of a regulatory framework for eco-design of energy related products | 5.000 | | |
| H.7 | Introduction of requirements and criteria for energy efficiency in spatial planning and the development of infrastructural investments | 0 | | |
| **Total** | | **370.000** | **2.665.000** | **16.500.000** |

## ANNEX 1: REVIEW OF THE BY-LAWS FOR ENERGY EFFICIENCY (WITH STATUS)

| No | BY-LAW | STATUS AND NOTES |
|---|---|---|
| 1 | Instruction on determining methodology for calculation of the indicative energy saving target | **adopted** (Official Gazette of Montenegro, no. 18/11 of 01.04.2011) |
| 2 | Decision on determining the indicative energy saving target | **adopted** (Official Gazette of Montenegro, no. 48/2011 of 30.09.2011) |
| 3 | Rulebook on determining limit for energy consumption to define big consumer, the content of the energy efficiency improvement plan and report on the plan implementation | **adopted** (Official Gazette of Montenegro, no. 10/12 of 15.02.2012) |
| 4 | Rulebook on the content of the report on implementation of the Energy Efficiency Improvement Plan by local self-government unit | **adopted** (Official Gazette of Montenegro, no. 61/11 of 23.12.2011) |
| 5 | Rulebook on the information system of energy consumption and on the manner of submission of data on annual consumption of energy | **adopted** (Official Gazette of Montenegro, no. 6/12 of 27.01.2012) |
| 6 | Instructions on energy efficiency measures and guidelines for their implementation | **adopted** (Official Gazette of Montenegro, no. 51/2012 of 10/09/2012) |
| 7 | Rulebook of the content and manner of delivery of data on energy consumption by the distribution system operators, energy suppliers and distributors of energy | The ordinance was dropped because it was estimated that is unnecessary at this moment; most of the provisions that should have been defined by the ordinance, will be integrated in the ordinance regulating the preparation of energy balance. |
| 8 | Rulebook on the minimal energy efficiency requirements in buildings | **adopted** (Official Gazette of Montenegro", no. 23/2013 of 05/27/2013) |
| 9 | Rulebook on energy performance certification of buildings | **adopted** (Official Gazette of Montenegro", no. 23/2013 of 05/27/2013) |
| 10 | Rulebook on methodology for energy audit performing | **adopted** (Official Gazette of Montenegro", no. 23/2013 of 05/27/2013) |
| 11 | Rulebook on training program for energy audits, content of the requests for issuing the authorization and registry of authorized persons | **adopted** (Official Gazette of Montenegro", no. 24/2013 of 05/31/2013) |
| 12 | Rulebook on regular energy audits of air conditioning systems and heating systems | **adopted** (Official Gazette of Montenegro", no. 24/2013 of 05/31/2013) |
| 13 | Rulebook on energy labeling of household appliances | draft completed - in the course of finalization of the proposal |
| 14 | Rulebook on the eco-designs requirements for energy related products | draft completed - a draft document has been prepared and it is necessary to finalize |
| 15 | Rulebook on the methodology for determining the level of energy efficiency in public procurement procedures for goods and services | draft completed – draft document has been prepared and it is necessary to finalize. A prerequisite for the adoption of the rulebook is adoption of by-laws which regulates energy certification of buildings, energy labeling and eco-design of energy related products |

**Note:** All adopted documents can be downloaded from the link http://energetskaefikasnost.me/dokumenti.php?l=mn.

## ANNEX 2: EXPLANATION FOR EXCLUDING KAP FROM THE INDICATIVE ENERGY SAVINGS TARGET (BUT NOT FROM THE OBLIGATION TO ACHIEVE ENERGY SAVINGS)

Structure of final energy consumption in Montenegro is very unbalanced. In the past, only one company, KAP, consumed around 40 % of the final energy consumption. Due to technological constraints of aluminum production KAP cannot achieve significant savings. Any contribution to the improved energy management in terms of reducing energy use outside the manufacturing sector would be negligible compared to the energy used in the production process. In addition, the annual production of KAP and its energy consumption varies considerably in recent years, significantly influencing all the energy and economic indicators of the country. Considering the foregoing, the inclusion of KAP in the calculation of final energy consumption according to the Directive (which is used as the basis for calculating the indicative energy savings target) would lead to the fact that other energy consumers must achieve savings around 15-16 %, to Montenegro achieve an indicative energy savings target of 9 %. Results of calculations are presented in the following tables.

Assuming that KAP is included in the final energy consumption (according to the Directive) total final energy consumption expressed in primary energy amounted to 1,189 ktoe. Savings target of 9% would amount to 107 ktoe:

| **Final energy consumption (including KAP)** | **The five-year average (ktoe)** | **The conversion factor** | **Primary energy equivalent (ktoe)** | **The goal of energy saving 9%** |
|---|---|---|---|---|
| **Final energy consumption in accordance with the Directive** | **705.7** | | **1188.9** | **107.0** |
| Electrical energy | 322.1 | 2.5 | 805.3 | 72.5 |
| Other | 383.6 | 1.0 | 383.6 | 34.5 |

The average final energy consumption of KAP is 534 ktoe (equivalent to primary energy). Potential energy savings is about 2%, which would mean 10.7 ktoe annually, as shown in the following table:

| **Final energy consumption KAP** | **The five-year average (ktoe)** | **The conversion factor** | **Primary energy equivalent (ktoe)** | **The goal of energy saving 2%** |
|---|---|---|---|---|
| **Final energy consumption** | **289.7** | | **534.3** | **10.7** |
| Electrical energy | 163.0 | 2.5 | 407.6 | 8.2 |
| Other | 126.7 | 1.0 | 126.7 | 2.5 |

**Case 1:** Assuming that KAP does not realize any savings, the overall savings (107 ktoe of primary energy equivalent) must acheeved by other consumers whose total current consumption is 654.6 ktoe. In other words, other consumers have to achieve savings of around 16%.

| **Final energy consumption (including KAP) KAP saves 0%** | **The five-year average (ktoe)** | **The conversion factor** | **Primary energy equivalent (ktoe)** | **Savings that other consumers have to achieve in the case of CAP-saving 0%** |
|---|---|---|---|---|
| **Final energy consumption in accordance with the Directive** | **416.0** | | **654.6** | **16%** |
| Electrical energy | 159.1 | 2.5 | 397.7 | 18% |
| Other | 256.9 | 1.0 | 256.9 | 13% |

**Case 2:** The same budget only this time with the assumption that KAP saves about 2% of energy, resulting in an obligation of 15% energy savings for other consumers.

| **Final energy consumption (including KAP) KAP saves 2%** | **The five-year average (ktoe)** | **The conversion factor** | **Primary energy equivalent (ktoe)** | **Savings that other consumers have to achieve in the case of CAP-saving 2%** |
|---|---|---|---|---|
| **Final energy consumption in accordance with the Directive** | **416.0** | | **654.6** | **15%** |
| Electrical energy | 159.1 | 2.5 | 397.7 | 16% |
| Other | 256.9 | 1.0 | 256.9 | 12% |

Weak institutional capacity of Montenegro and limited available funds for the implementation of EE measures, conditions on the achievement of the objective of energy savings of 15% unrealistic. The specifics of the structure of the final consumption of energy by the Montenegrin delegation in the Energy Community, presented at a meeting of the Working Group on Energy Efficiency, which was held on the 8th February 2010. The participants of the meeting have accepted that explanation established Montenegrin delegation, and that the proposal is justified exclusion KAP from the calculation of final energy consumption according to the Directive.

The exclusion of KAP from the indicative target does not mean it will be excluded from the obligation to achieve energy savings. The law on energy efficiency targets all major consumers, including KAP, (introduction of energy management, implementation of EE measures and reporting to the Ministry of Economy, etc.) Therefore, any savings KAP will represent the addition to 9% indicative target, which is set for the entire period up to 2018 or the addition to interim indicative target to 2015, which is provided in this EEAP.

## ANNEX 3: LIST OF CATEGORIES AND SUBCATEGORIES FOR EE IMPROVEMENT MEASURES

| Category | Subcategory |
|---|---|
| **1 *Regulation*** | *Standards and norms:*<br>*1.1 Building codes and enforcement*<br>*1.2 Minimum equipment energy performance standards* |
| **2 Measures of information and mandatory information (eg mandatory labeling)** | 2.1 Focused information campaigns<br>2.2 Energy labeling schemes<br>2.3 Information Centers<br>2.4 *Energy Audits*<br>2.5 *Training and Education*<br>2.6 Demonstration *<br>2.7 *Exemplary role of the public sector*<br>2.8 *Metering and informative billing* * |
| **3 *Financial instruments*** | 3.1 *Grants*<br>3.2 *Tax rebates and other taxes reducing energy end-use consumption*<br>3.3 *Loans (soft and / or subsidized)* |
| **4 Voluntary agreements and instruments of cooperation** | 4.1 Industrial companies<br>4.2 Commercial or institutional organizations<br>4.3 *Energy efficiency public procurement*<br>4.4 Bulk Purchasing<br>4.5 Technology procurement |
| **5 Energy services in order to save** | 5.1 *Guarantee of energy savings contracts*<br>5.2 Third Party Financing<br>5.3 *Energy Performance Contracting*<br>5.4 *Energy outsourcing* |
| **6 Mechanisms to improve energy efficiency and other combinations of previous (sub) category** | 6.1 Public service obligation for energy companies on energy savings including "*White certificates*"<br>6.2 *Voluntary agreements* with energy production, transmission and distribution companies<br>6.3 Energy efficiency funds and trusts |

* Energy savings can be listed in this subcategory only if direct or multiplied effect can be demonstrated. Otherwise, they will be assessed as part of the package. Terms in "italic" are those used in ESD.