

**First Annual Report
under the Energy Efficiency Directive**

Bosnia and Herzegovina

November 2017

A. National energy efficiency target for 2020

By the end of 2020, Primary Energy Consumption (PEC) will be reduced by 12% compared to forecasted consumption without energy efficiency measures. In absolute terms, in comparison to the forecasted PEC of 8,031.98 ktoe without any energy efficiency measures, this amounts to 7,068.14 ktoe with implementation of planned energy efficiency measures or a reduction of consumption by **963.84 ktoe**.

Bosnia and Herzegovina TARGETS	2015¹	2016	2017	2018	2019	2020
BUILDINGS [ktoe]	52.31 ² /110.04 ³	-	-	234.31 ⁴	-	286.38 ⁵
INDUSTRY [ktoe]	54.70 /10.56	-	-	44.64	-	54.56
TRANSPORT [ktoe]	4.30 /6.50	-	-	18.87	-	23.06
OTHER [ktoe]	-	-	-	-	-	-
ARTICLE 3 [ktoe]				-		963.84
ARTICLE 5 [ktoe]				-	-	-
ARTICLE 7 [ktoe]			-	30.94	-	77.33
FEC [ktoe]	4155.50	4241.40	4327.30	4414.00	4501.40	4589.70
PEC [ktoe]	7272.12	7422.45	7572.775	7724.5	7877.45	8031.98

Table 1: Division of targets per sectors and per different articles of EED

The reduction of Primary Energy Consumption 2020 target, in amount of 963.84 ktoe, includes the following:

- **Primary energy savings achieved through energy efficiency measures in final energy consumption sectors** - The stated final energy savings of 11%, compared to the baseline year value (2005-2010 average) of 15.24 PJ, will result in primary energy savings in 2020 in the amount of 637.01 ktoe,
- **Primary energy savings achieved through energy efficiency measures in energy generation, transmission and distribution** - it was estimated that, by 2020, implementation of planned measures could result in a maximum of 330 ktoe of primary

¹ LEFT amounts for buildings, industry and transport represent amounts planned in draft NEEAP BiH 2010-2018, which was never adopted /RIGHT amounts for buildings, industry, and transport represent savings actually achieved in 2015, as per APEE BiH 2016-2018;

² This figure includes: (a) savings planned for residential savings (1,59 PJ) and (b) savings planned for buildings in public sector and commerce (0,60 PJ);

³ This figure includes: (a) savings achieved in residential sector (2,107 PJ) and (b) savings achieved in sector of buildings in public sector and commerce (2,50 PJ);

⁴ This figure includes: (a) planned savings in residential sector (5,1910 PJ) and (b) planned savings in sector of buildings in public sector and commerce (4,6189 PJ)

⁵ This figure includes: (a) planned savings in residential sector and (b) planned savings in sector of buildings in public sector and commerce

energy savings against the forecasted consumption without measures, which represents approx. 4% of the forecasted primary consumption in 2020.

The table below shows the forecasted values of primary and final energy consumption in 2020 for Bosnia and Herzegovina, Federation BiH, Republika Srpska and Brčko District BiH, for the scenario without energy efficiency measures and for the scenario with 12% savings compared to total primary energy consumption without energy efficiency measures.

Primary and final energy consumption	BiH	FBiH	RS	BD BiH
Total final energy consumption - without EE measures; (TFEC(ktoe))	4589.70	2971.83	1532.96	84.91
Scenario without energy efficiency measures				
Total primary energy consumption - without EE measures; (TPES (ktoe))	8031.98	5200.70	2682.68	148.59
Scenario with 12% savings in primary energy consumption				
Savings in primary energy consumption (12% TPES (ktoe))	963.84	624.08	321.92	17.83
Total primary energy consumption - with EE measures; (TPES-12% (ktoe))	7068.14	4576.62	2360.76	130.76

Table 2: Division of targets per sectors and per different articles of EED

B. Key statistics data

This is a first annual report prepared by Bosnia and Herzegovina, based on the Template proposed by the Energy Community Secretariat and fully consistent with the requirements of the Energy Efficiency Directive - EED (2012/27/EU). Explanations for all numbers provided in the following table are given below, including the sources of information.

Data on primary and final energy consumption are given for year 2014 because of the problems with energy statistics elaborated in the text which follows. This also includes the final energy consumption division per sectors, while all other required data are given for year 2015.

Estimation of key energy statistics in 2015 (PEC, FEC and FEC per sectors for 2014)	Value	Unit
Total primary energy consumption ⁶	7714.0	ktoe
Total final energy consumption ⁷	4214.0	ktoe
Final energy consumption – Transport ⁸	989.0	ktoe
Final Energy consumption – Industry ⁹	664.0	ktoe

⁶ BHAS: <http://www.bhas.ba/?lang=en>

⁷ BHAS: <http://www.bhas.ba/?lang=en>

⁸ BHAS: <http://www.bhas.ba/?lang=en>

⁹ BHAS: <http://www.bhas.ba/?lang=en>

Estimation of key energy statistics in 2015 (PEC, FEC and FEC per sectors for 2014)	Value	Unit
Final energy consumption – Households ¹⁰	2159.0	ktoe
Final energy consumption – Other ¹¹	402.0	ktoe
Gross value added by sector – Industry ¹²	4.09	billion US\$
Gross value added by sector – Services ¹³	9.78	billion US\$
Disposable income of households	NA	NA
Gross domestic product (GDP) ¹⁴	28522	mio KM
Electricity generation from thermal power plants ¹⁵	8712.1	GWh
Electricity generation from combined heat and power ¹⁶	1641.0	GWh
Heat generation from DH and industrial auto producers ¹⁷	4038.0	TJ
Heat generation from combined heat and power plants ¹⁸	1540.8	TJ
Fuel input for thermal power generation ¹⁹	101035.6	TJ
Passenger kilometres (pkm), if available ²⁰	1702.9	million pkm
Tonne kilometres (tkm), if available ²¹	3458.4	million tkm
Combined transport kilometres (pkm + tkm) ²²	NA	NA
Population ²³	3531159	

Table 3: Key energy statistics data.

¹⁰ BHAS: <http://www.bhas.ba/?lang=en>

¹¹ BHAS: <http://www.bhas.ba/?lang=en>

¹² World Bank data (based on constant 2010 US\$): <https://data.worldbank.org/indicator>

¹³ World Bank data (based on constant 2010 US\$): <https://data.worldbank.org/indicator>

¹⁴ BHAS: <http://www.bhas.ba/?lang=en>

¹⁵ BHAS: Annual environmental report EPBiH: (http://www.elektroprivreda.ba/upload/documents/Godisnji_izvjestaj_o_zastiti_okolisa_%202015.pdf), Independent System Operator (NOS) Indicative development plan 2017-2027: <https://www.derk.ba/DocumentsPDFs/IPRP-2017-2026.pdf>, Energy balances RS.

¹⁶ BHAS: Annual environmental report EPBiH: (http://www.elektroprivreda.ba/upload/documents/Godisnji_izvjestaj_o_zastiti_okolisa_%202015.pdf), Independent System Operator (NOS) Indicative development plan 2017-2027: <https://www.derk.ba/DocumentsPDFs/IPRP-2017-2026.pdf>, Energy balances RS.

¹⁷ BHAS: <http://www.bhas.ba/?lang=en>

¹⁸ BHAS: <http://www.bhas.ba/?lang=en>; BHAS: Annual environmental report EPBiH: (http://www.elektroprivreda.ba/upload/documents/Godisnji_izvjestaj_o_zastiti_okolisa_%202015.pdf), Independent System Operator (NOS) Indicative development plan 2017-2027: <https://www.derk.ba/DocumentsPDFs/IPRP-2017-2026.pdf>, Energy balances RS.

¹⁹ BHAS: Annual environmental report EPBiH: (http://www.elektroprivreda.ba/upload/documents/Godisnji_izvjestaj_o_zastiti_okolisa_%202015.pdf), Independent System Operator (NOS) Indicative development plan 2017-2027: <https://www.derk.ba/DocumentsPDFs/IPRP-2017-2026.pdf>, Energy balances RS.

²⁰ BHAS: <http://www.bhas.ba/?lang=en>

²¹ BHAS: <http://www.bhas.ba/?lang=en>

²² World Bank data (based on constant 2010 US\$): <https://data.worldbank.org/indicator>

²³ World Bank data (based on constant 2010 US\$): <https://data.worldbank.org/indicator>

Data on electricity generation from thermal power plants are given for all plants including the ones which partly operate as combined heat and power (CHP). Consistently, the fuel input for thermal power generation is given for all TPPs as well. The ratio of these two parameters provides the overall efficiency of energy conversion in TPPs which is an indicative parameter and will be analyzed in the following years. It is expected that this parameter will grow in years with new and/or revitalized blocks within TPPs.

The fact is that the heating energy from TPP Kakanj and TPP Tuzla (when working in CHP mode) are provided from different blocks. Namely, almost all available and operating steam turbines can work with extraction of steam for heating. This practically means that almost all blocks from these two TPPs provide combined heat and power. Data provided in the Table 1 correspond to the approach that the CHP mode is assigned to the most active blocks (steam turbines) in terms of heating energy generation. This means that the whole heat supply in CHP mode is assigned to block 6 in TE Kakanj with ratio of 57% in overall TPP Kakanj heat production, while in TPP Tuzla the heat generation is assigned to block 4 with ratio of 92%.

In order to preserve the consistency with the electricity production in CHP mode, the parameter – electricity generation from combined heat and power (see Table 3) is also taken only for these two blocks (6 at TPP Kakanj and 4 at TPP Tuzla). This approach is used in order to track eventual expansion of the CHP mode in the future which is promoted in the development plans of the EPBiH.

In terms of the heat generation from thermal power generation the numbers are given for district heating systems and industrial auto-producers. Values are taken from the BHAS statistics for year 2015. The idea here is to track the expansion of the district heating systems in Bosnia and Herzegovina which is partly in progress and is one of the EED targets.

Comments:

One of the crucial issues in B&H is the fact that the energy statistics is still not completely reliable (see Section C). As already said, the primary and final energy consumption in Table 1 is given for year 2014, instead for year 2015 as required. The explanation is that the energy balance for 2015 is still not consolidated and available. This is also recognized by the EnC Secretariat and more details can be found at²⁴

Energy balance for year 2014, from which numbers are used, is consistent with the EUROSTAT methodology. Energy balance in year 2014 shows an enormous increase in biomass use in comparison with 2013 and before, which can be observed also at International Energy Agency energy balances²⁵. Sudden increase of biomass use is mostly result of the conducted Survey of household energy consumption in 2015²⁶.

After discussion with national experts regarding the high biomass use, the additional analysis is under progress in order to evaluate the numbers obtained by the Survey. Preliminary results

²⁴ https://www.energy-community.org/implementation/Bosnia_Herzegovina/STAT.html.

²⁵ <http://www.iea.org/statistics/statisticssearch/report/?country=BOSNIAHERZ&product=balances&year=2014>

²⁶ http://www.bhas.ba/tematski_bilteni/Potrosnja/EnergijeFinalBS.pdf

show that the biomass use, provided in year 2014, is significantly overestimated, affecting the primary and final energy consumption. At this stage, this is only a remark and current analysis should result in more reliable data, with the combination of top-down and bottom-up approaches in terms of data collection and analysis.

It is expected that the more reliable numbers will be provided in the next annual report by ensuring the backward compatibility with previous year energy balances and data on primary and final energy consumption.

C. Overview of energy consumption trends

As already partly elaborated in the Section B, the trends in energy consumption for B&H are here given for years 2012-2014. In that sense, the energy balance from the EUROSTAT publication and provided by BHAS in 2014 is used. For two previous years and in order to provide consistency with already officially published data, the Energy Community Secretariat Annual Implementation report is used²⁷.

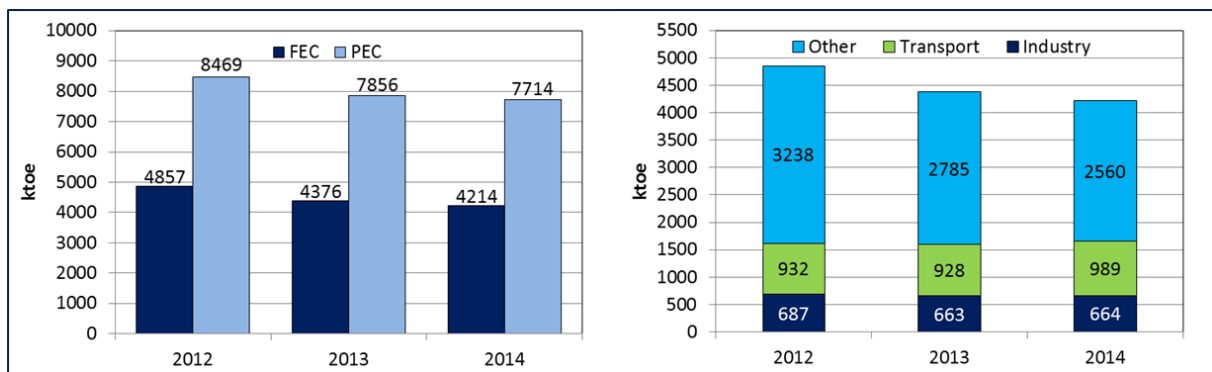


Figure 1: Final and primary energy consumption (left) and final energy consumption per sectors (right) in 2012 – 2014 (based on EnC annual implementation report).

Numbers provided in Figure 1 corresponds to the Annual implementation report for 2016 prepared by the Energy Community Secretariat with minor corrections for year 2014 in order to align the numbers with BHAS. However, the Annual implementation report made by Energy Community Secretariat for 2015 provides different numbers for Bosnia and Herzegovina in years 2011 to 2013, which again addresses the key problem of the B&H energy statistics. For example, the primary energy consumption differs in these two reports 19% and final energy consumption 33%, both for year 2012.

Major differences between the numbers in Figure 1 and the ongoing analysis are noticed in the residential sector which belongs to the other sectors, but as well influences the numbers on FEC and PEC.

²⁷ <https://www.energy-community.org/documents /strategic.html>

D. Update of measures implemented in last year

Considering the problems encountered during data collection based on calculated TD indicators, Bosnia and Herzegovina opted for a market analysis (Study of Sales of EE Materials and Equipment in Bosnia and Herzegovina 2010-2015). This market analysis was based on the BU methodology, in accordance with the Recommendations on Measurement and Verification Methods in the Framework of Directive 2006/32/EC on energy end-use efficiency and energy services, European Commission, Directorate-General for Energy, for verification of savings based on collected data.

The measures, defined within the NEEAP implementation process in BiH, are as follows:

- Residential sector;
 - **R.1** Renovation of the envelope of existing residential buildings and family houses in order to improve their energy efficiency,
 - **R.2** Energy performance improvements of existing systems and installation of new, energy efficient technical systems in residential buildings and family houses,
 - **R.3** Energy generation from RES in households,
 - **R.4** Construction of new residential buildings and family houses with prescribed energy performance characteristics,
 - **R.5** Procurement and use of energy efficient electrical household appliances.
- Commercial sector and services;
 - **U.1** Energy renovation of the envelope of existing buildings in the public and commercial sector,
 - **U.2** Improvement of energy performance of existing systems and installation of new, energy efficient technical systems in buildings,
 - **U.3** Energy generation from RES in the public and commercial sector,
 - **U.4** Construction of new buildings with prescribed energy performance characteristics in the public and commercial sector,
 - **U.5** Procurement and use of energy efficient electrical equipment and lighting in the public and commercial sector,
 - **U.6** Energy efficiency improvements in the water supply and waste water treatment system,
 - **U.7** Improvement of energy efficiency of the public lighting system.
- Industry;
 - **I.1** Energy efficiency improvements in industrial processes,
 - **I.2** Improvement of energy performance of buildings in the industry sector,
 - **I.3** Use of cogeneration and trigeneration in industry,
 - **I.4** Energy generation from RES in the industry sector.
- Transport;
 - **S.1** Use of energy efficient vehicles in road and urban transport,
 - **S.2** Infrastructural measures on the road network which provide energy saving effects.

Table 4 shows a summary overview of actual and planned final energy savings with an overview of methodologies used for calculation of savings in individual sectors.

Final energy consumption sector	Included individual EE measures (according to Section 3.3.2).	Final energy savings calculation methodology	Actual FEC savings in 2015 (ktoe)	Expected FEC savings in 2018 (ktoe)	FEC Savings forecast for 2020 (ktoe)
Residential sector	Measures R1-R5	BU market analysis based on distributed equipment and materials by year. 2010-2015	50.44	123.96	151.51
Public and commercial service sector	Measures U1-U7	BU MVP + analysis of the equipment market	59.87	110.30	134.81
Industry sector	Measures I1-I4	Credit programmes with verified measures and analysis of installed HVAC equipment in BiH	8.21	44.63	54.55
Transport sector	Measures S1-S2	Specific transport-related measures implemented in municipalities which have SEAPs	6.48	18.87	23.06
Other sectors	-		-	-	-
Horizontal measures	Measures H1-H13	No reliable measure verification method	-	-	--
Supply	-		-	-	-
TOTAL			125.00	297.76	363.93
ESD energy savings			125.00	297.76	363.93
Non-ESD energy savings			-	-	-

Table 4 - Overview of methodologies used for calculation of savings in individual final energy consumption sectors

Overview of individual horizontal and cross-sectoral measures

A progress overview of the individual horizontal and cross-sectoral measures, defined within the NEEAP implementation process in BiH, is given as follows:

H.1 Development and application of the legislative and regulatory framework for energy efficiency in final energy consumption

In the Federation of BiH, the main progress in the development of the legislative and regulative framework was made in March 2017 by **adopting the Law on Energy Efficiency of the Federation of Bosnia and Herzegovina** (Official Gazette of FBiH no. 22/17). However, in order to make the law fully operational, the regulation

framework coming out from the has to be adopted. Moreover, the public sector in the Federation of Bosnia and Herzegovina mainly plays the leading role in the implementation of energy efficiency activities, as part of implementation of Directive 2010/31/EU, by implementing the **Law on Spatial Planning and Land Use in the Federation BiH** (Official Gazette of the Federation BiH, no. 02/06, 72/07, 42/08, 04/10, 13/10, 54/10). The draft Law on Energy Efficiency prescribes mandatory energy audits for buildings and introduces energy classification. Updates to three existing regulations are currently under way:

- Rulebook on Energy Certification of Buildings in the Federation BiH (Official Gazette of the Federation BiH, no. 50/10);
- Methodology for calculation and declaration of energy characteristics of residential and non-residential buildings;
- Rulebook on Technical Requirements for Heat Insulation of Buildings and Rational Use of Energy (Official Gazette of the Federation BiH, no. 49/09);

The Federal Ministry of Physical Planning approves the certificates prior to their issuance by companies authorised for certification of buildings and delivery of training and licensing of legal and natural persons as energy auditors.

In Republika Srpska, the energy efficiency topic has been covered with two laws: The **Law on Energy Efficiency** (Official Gazette of RS, no. 59/13) and the **Law on Spatial Planning and Construction** (Official Gazette of RS, no. 40/13, 106/15). This legal framework contains the adopted regulations, as follows:

- Rulebook on energy auditing and certification of buildings (Official Gazette of RS, no. 30/15);
- Rulebook on calculation of energy performance of buildings (Official Gazette of RS, no. 30/15);
- Regulation on Minimum Requirements for Energy Performance of Buildings (Official Gazette of RS, no. 30/15);

Mandatory **energy certificates** for all new buildings, buildings undergoing major reconstruction and buildings traded on the real estate market are in force since early 2016. The Environmental Protection and Energy Efficiency Fund is responsible for issuance of certificates and related training and licencing of legal and natural persons for energy audits of buildings.

Currently, the methodological approach determining the energy characteristics of buildings, is being harmonized for the FBiH and RS, in the following way:

- The **typology of residential buildings** in FBiH and RS is complete and the typology of public buildings is in progress. These typologies will form the basis for further planning and implementation of building renovation projects.
- The **climate database** for energy performance calculation in FBiH and RS is complete. The typical meteorological years were determined both for reference geographical zones, but also for more than 30 locations in BiH.;

- The **cost-optimal levels** of implementation of energy efficiency measures in buildings are calculated, for residential buildings both in FBiH and RS. The update of the Regulation on Minimum Requirements for Energy Performance of Buildings will take the cost-optimal levels as a basis for optimizing the current requirements. However, cost-optimality of minimum requirements for public buildings should still be developed. Performed assessments of cost-optimality, provide a basis for further development of **reference data** for calculation of energy performance of buildings, final and primary energy, and CO₂ emissions.

H.2 Drafting and adoption of strategic and planning documents on energy efficiency

The **BiH's framework energy strategy by 2035** is consisted of the Framework energy strategy of the FBiH, up to 2035, and the updated Energy Strategy of Republika Srpska. In July 2017, the Government of the Federation of BiH gave a positive opinion on the strategy, while the Government of Republika Srpska still hasn't provided an opinion. In order to formally adopt the Strategy, the Council of Ministers of BiH, needs to have positive opinions from both entity governments.

The **National energy efficiency action plan 2010-2018 (NEEAP)** is also consisted of the entity action plans and parts related to the level of BiH institutions and District Brčko. In July 2017, the Government of the Federation of BiH has given a positive opinion on the NEEAP and adopted the Energy efficiency action plan of FBiH, while the Government of Republika Srpska still hasn't provided an opinion. In order to formally adopt the NEEAP, the Council of Ministers of BiH, needs to have positive opinions from both entity governments.

H.3 Establishment, application and development of the energy efficiency information system in all final energy consumption sectors

In order to maintain the mechanism for monitoring and verification of NEEAP implementation, collect information on energy consumption, maintain a database of all local and cantonal energy efficiency action plans, maintain the registries of energy certificates of buildings and technical systems, the entity line ministries are introducing the **integrated energy efficiency information system (EEIS)**. Based on the entity energy efficiency law, the content, structure and responsibilities for data provision and processing in the EEIS will be defined in the rulebooks on the Information system. Currently, two working groups, one by each entity, are finalizing the draft rulebooks.

The EEIS structure is made of the following modules:

- a. Energy efficiency action plans:
- b. Energy savings:
- c. Energy consumption:
- d. Energy certificates for buildings:
- e. Technical systems in buildings:

The owners of the information systems are the Environmental Protection and Energy Efficiency Fund of RS and the Environmental protection fund of FBiH, in RS and FBiH respectively. They establish and manage the information systems based on the data collected from consumption parties. Consumption parties are the relevant ministries, relevant cantonal ministries in FBiH, local self-governance units, large consumers, fuel distributors, distribution system operators, small distribution system operators, small suppliers, owners of central heating and air conditioning systems, and energy service providers.

Currently, achievements made in the process of establishing the EEIS, are as follows:

- Two working groups, one by each entity, are currently drafting the **regulations on information system**. The work is in its final stage;
- The **module on energy savings**, based on the MVP platform, is installed both in the FBiH and RS. It was used to collect data on implemented projects in the public sector in the period 2010-2015, as part of the NEEAP implementation reporting. The MVP regulation framework is to be defined by the regulations on information system, including data structure, obligations for data submission, corresponding methodologies (BU, TD, market analysis). It is planned to have the first round of trainings for MVP users to be organized by the end of 2017.
- The **module on energy consumption**, based on the EMIS platform, is functional and includes data on public buildings. Further development of the module is foreseen.
- The **module on energy certificates for buildings** is in operation in RS. Certified energy auditing companies submit energy audit reports to the Fund for issuing the certificate, electronically through the Register of certificates (RECRS). In the Federation, the platform for energy certificates is being developed.

H.4 Public energy efficiency information and motivation campaigns

EE information is regularly published on the websites of:

- Ministry of industry, energy and mining of Republika Srpska,
- Ministry of spatial planning, civil engineering and ecology of Republika Srpska,
- Federation Ministry of Spatial Planning,
- Environmental protection and energy efficiency fund of Republika Srpska,
- Environmental protection fund of Federation of BiH
- Association of Local Authorities of RS;

The efficiency segments within the websites of Environmental protection and energy efficiency fund of Republika Srpska (<http://ekofondrs.org/energetskaefikasnost.html>) and the Environmental protection fund of Federation of BiH (<http://www.fzofbih.org.ba>) are to inform LSGUs, public institution, general public and

other target groups of the news in this area (legislation, events), organisational and technical solutions for energy management (EE library). etc.

Moreover, the energy efficiency web portal (<http://energetskaefikasnost.org/>), as part of the “Bosnia Energy Efficiency Project” (BEEP), is implemented through the Ministry of spatial planning, civil engineering and ecology of Republika Srpska and the Federation Ministry of Spatial Planning. A part of this project is a promotional campaign “Raising Awareness about Energy Efficiency”. In addition to project-related reporting, this portal informs the public about other EE activities such as conferences, campaigns, training, educational materials (glossary of EE terms, brochures about specific aspects of EE,) as well as EE-related news and interesting facts from other countries and the EU.

H.5 Introduction and implementation of the system for energy efficiency education, training and professional development

In the preceding period a number of important conferences and similar events were held on topics of energy efficiency in various final energy consumption sectors. The most important are the following:

- **Second Energy Summit 2016** - The United States Agency for International Development – Energy Investment Activity (USAID EIA), together with the German International Cooperation (GIZ), successfully organized the Second Energy Summit in Bosnia and Herzegovina on April 21 and 22, 2016;
- **Third Energy Summit 2017** - April 4-6 2017; supported by the United States Agency for International Development (USAID) and German International Cooperation gathered more than 400 representatives from the B&H energy sector, legislative and executive level of government, non-government organizations and media. The Summit is a continuation of the dialogue of key stakeholders aimed at improving the regulatory framework, removing obstacles to investments and creating a more favourable market-oriented environment.
- **RENEXPO BiH 2016** – November 9-10 2016; 3th International trade fair and conferences on renewables, energy efficiency, environment protection and water treatment in Bosnia and Herzegovina. Within the fair, a two-day energy efficiency conference was held, organized by the German International Cooperation (GIZ).
- **Conference “Improved EE in civil engineering as a driver of economic development”** – September 20-21, 2016. organised by the Ministry of spatial planning, civil engineering and ecology of Republika Srpska in cooperation with international agencies GIZ, UNDP, USAID and the Environmental protection and energy efficiency fund of Republika Srpska.
- International scientific-professional **Conference “SFERA 2016”** - Mostar. 3-4.11.2016; on the topic: “Design and heat insulation of façade walls: Traditional and modern approach”.

H.7 Establishment of a system for training and certification of licensed professionals for energy auditing of buildings, public utilities, industrial plants and technological processes, and for issuing energy certificates

In Bosnia and Herzegovina, systems for training and certification of licensed professionals for energy auditing of buildings and for issuing energy certificates have been established. Similar systems for public utilities, industrial plants and technological processes still do not exist.

In the Federation of BiH, 550 energy auditors with background in mechanical, electrical and civil engineering and architecture were trained and licensed to date. Due to the fact that the cantons in FBiH have not yet introduced the minimum energy requirements for buildings, and most of the institutions responsible for the building permitting regime, do not implement the procedures respecting the energy efficiency criteria, most of licenced auditors are not provided with necessary energy service market conditions.

In Republika Srpska, the Environmental protection and energy efficiency fund of Republika Srpska adopted the Programme of training and professional development of persons conducting energy certification of buildings in September 2016. More than 70 trainees successfully passed the exam and fulfilled the requirements for an energy certification license issued by the Ministry of spatial planning, civil engineering and ecology of Republika Srpska pursuant to the Law on Spatial Planning and Construction.

H.8 Metering and informative billing of energy consumption to end consumers

No progress on implementation of metering and informative billing of heat consumption to end consumers has been made up to date.

H.9 Introduction and implementation of energy management, inclusive of energy audits

The objective of this measure is to establish a systemic process for continuous reduction of energy consumption. The measure applies to: (1) Service and industry sector buildings; (2) Utility services (public lighting, water supply and waste water treatment, district heating systems); (3) Industrial processes and plants.

So far, no systematic approach has been applied to introduce and implement energy management in Bosnia and Herzegovina. However, the energy management in the public-sector buildings is being introduced through different programs, as follows:

- 6 municipalities in BiH introduced the municipal energy management, through Promotion of Energy Efficiency in BiH (GIZ) program;
- Building energy management is being introduced on buildings under the scope of the “Bosnia Energy Efficiency Project” (BEEP);
- Building energy management is being introduced on buildings under the scope of the The United Nations Development Programme (UNDP) through “Green Economic Development”.

H.10 Institutional strengthening of the environmental protection funds

The objective of this measure is to establish and develop efficient financing, implementation and monitoring mechanisms for EE measures in final energy consumption. The measure includes strengthening of the Fund's personnel and tangible/technical resources and development of mechanisms for securing funds for implementation of the Fund's legally prescribed functions in the field of EE.

In the Federation of BiH, the Law on Energy Efficiency in the Federation BiH (Official Gazette of FBiH no. 22/17) defines the role of the Environmental protection fund of FBiH in the field of energy efficiency. The fund is entitled to operate the energy efficiency information system. So far, it operates a database with more than 3000 public buildings, by managing the energy performance data. Recently, the fund has started with operating the MVP platform for FBiH. Furthermore, the revolving fund for financing of EE measures has been operational as well.

In Republika Srpska, the Law on Spatial Planning and Construction (Official Gazette of RS, no. 40/13, 106/15) entitled the Environmental protection and Energy efficiency fund of RS with a role of an energy efficiency agency. According to this, the fund is issuing energy performance certificates for buildings, provides training and licences for energy auditors in buildings and operates a web-based register of certificates. Moreover, the fund is responsible for the operation of the energy efficiency information system in Republika Srpska, including the registry of public buildings and MVP platform for energy savings data.

H.11 Strengthening of existing institutional capacities for systemic energy management

The objective of this measure is to enable existing institutions at all levels of government to properly perform their tasks in the capacity of: (a) energy consumers, service providers and EE leaders; (b) planners and implementers of sustainable development, and regulators; (c) energy producers and energy suppliers. The measure includes the following activities:

1. Raising the awareness of all levels of government of the effects of energy management at the local, cantonal and federal level, and of the importance of the EEAP (implemented as part of activities in H.4);
2. Training of employees in existing institutions at all levels of government about: (a) Key steps in introduction and implementation of energy management in cities, municipalities, cantons and federal institutions; (b) Creation of federal, cantonal and municipal EEAPs in accordance with the law and best practice; (c) Implementation of planned measures; (d) Regular measurement, periodic evaluation of energy consumption, reporting and review of EEAPs at all levels;

H.12 Use of energy efficiency criteria in the public procurement system

In the Federation of BiH, the Law on Energy Efficiency in the Federation BiH (Official Gazette of FBiH no. 22/17) defines the energy efficiency criteria to be used in public procurement. According to these criteria, budget users in the Federation BiH, cantons and local self-government units will, in selecting suppliers in public procurement procedures, evaluate energy efficiency of goods and services together with other relevant criteria and give priority, if all other considerations are equal, to equipment and services with a higher energy efficiency rating. Energy efficiency criteria will also be taken into account in public tenders published for purchase or lease of buildings/parts of buildings, reconstruction of buildings/parts of buildings, and for design of buildings/parts of buildings for the public sector, in the form of specifications of energy performance of the constructed or designed building/part of building.

In Republika Srpska, the Law on Energy Efficiency (Official Gazette of RS, no. 59/13) defines the criteria for use of energy efficiency criteria in public procurement. Users of financing from the Fund, budgets of the Republic of Srpska and local self-governance units apply energy efficiency criteria in public procurement procedures to evaluate, amongst other criteria, energy efficiency of goods and services, and, if all other considerations are equal, priority is given to equipment and services with a higher energy efficiency rating. Also, in the process of purchasing or leasing of buildings, users of financing from the Fund, Republic of Srpska budget or local self-governance budgets must, if all other considerations are equal, give priority to buildings with higher energy performance.

Although this requirement has been transposed into sectoral laws at the entity level, no significant application of energy efficiency criteria in local public procurement procedures has been noticed. The reason for this lies in the fact that public procurements are regulated by the State Law on Public Procurement, which currently does not prescribe these requirements. In order to make their implementation more effective, it is necessary to make changes to the state law in this direction.

H.13 Introduction and application of a financial framework for improvement of energy efficiency in final energy consumption

A review of the situation in Bosnia and Herzegovina identified the main sources and methods of financing which currently play an important role in the implementation of energy efficiency measures, is shown in the table below. In order to secure the funding required to achieve indicative goals and successfully implement the energy efficiency policy described in this EEAP, the plan is to introduce additional financial options to ensure implementation of measures planned in this EEAP, both within programmes and as individual measures. The main financial options that are currently available, their planned improvements and the roadmap for introduction of new financial mechanisms are described below.

The main sources of financing currently present in Bosnia and Herzegovina are: public budgets, environmental and other fees, international financial institutions' funds, foreign funds (e.g. GCF, IPA and other EU funds, and similar). On the other hand, the most important currently available methods of financing are: international loans, subsidies and grants. It is important to note that funding obtained from a single source may be allocated using various distribution methods. For example, budget funds may be allocated in a number of different ways, such as e.g. loans, grants, subsidies and similar. Along the same lines, environmental fees as a source of financing, i.e. the existing fiscal mechanisms, may be used as a financial instrument (or method of allocation of funds) in the form of loans, grants or other forms of financing (e.g. funds collected from registration of motor vehicles are allocated through both grants and loans).

Financing source	Status of the financing source	Financing method	Status of the financing method
Energy taxes	<i>N/a</i>	Preferential loans	<i>Available (further development needed)</i>
CO ₂ taxes	<i>N/a</i>	Grants	<i>Available (downward trend)</i>
Air protection fees	<i>Available</i>	Subsidies	<i>Available (further development needed)</i>
Other environmental fees	<i>Available</i>	Foreign (preferential) loans	<i>Available</i>
Public budgets	<i>Available</i>	Regular budget lines	<i>Available</i>
International financial institutions' funds (IFI)	<i>Available</i>	Budget financing with repayment of investments through reduction of future budget expenditure (budget capturing)	<i>N/a</i>
UN funds and bilateral cooperation	<i>Available</i>	Energy efficiency obligation schemes / alternative measures	<i>N/a</i>
EU funds	<i>Available (further development needed)</i>	Income tax incentives (investment-based tax deductions)	<i>N/a</i>
Private financing	<i>Available (further development needed)</i>	ESCO	<i>N/a</i>
		Public-Private Partnership (PPP)	<i>Available (further development needed)</i>
		Commercial loans	<i>Available</i>
		Technical assistance	<i>Available</i>

Table 4: Financing options for implementation of energy efficiency policy in Bosnia and Herzegovina

The National energy efficiency action plan 2010-2018 (NEEAP) presents a roadmap for introduction of different financing sources and methods.

E. Central Government buildings (Article 5)

Bosnia and Herzegovina will follow the **default approach**. The default approach implies establishing and making publicly available an inventory of central government buildings. The established working group is currently discussing the objectives of Article 5 of EED, focusing on the determination of the Article 5 target for Bosnia and Herzegovina.

The United Nations Development Programme (UNDP) through “Green Economic Development”²⁸ project created a significant change in this thematic, primarily by creating database of public sector buildings through Energy Management Information System (EMIS). The EMIS database is also in place in Croatia and Serbia. Through past activities, EMIS has been established in about 4.000 buildings throughout BiH in which, among other parameters, energy consumption, energy costs and CO₂ emission are monitored on a monthly basis. Along EMIS, for developing inventory of central government buildings and statistical database of public buildings of great help will be recently done “Public building typology of BiH”, which is a comprehensive catalogue of information for assessment of the entire public building stock. This includes defined building physics parameters, data on energy consumption for 36 reference buildings differentiated by construction year and sector (childcare, education, health, etc.), which are representatives of **total number of 7.600 public buildings with total area of 9.1 million square meters**. The typology is developed in accordance with directive 2010/31/EU (Annex I and Annex III) in order to primarily serve as input for cost-optimal calculations, defined by Commission Delegated Regulation (EU) No 244/2012.

BiH has not submitted the first report on cost-optimality to the Energy Community Secretariat. The calculation on cost-optimality for residential buildings has been done (financed by GiZ BiH, as the logical follow up after finished “Typology for residential Buildings in BiH” which was financed also by GiZ BiH), and recommendations for adaptation of minimum requirements for residential buildings have been made. On the other hand, the calculation on cost-optimality for public buildings are planned to be done in 2018, and will be financed through GED22 2nd phase project (as the logical follow up after finished “Public building typology of BiH” which was financed also by GED22 project).

Moreover, the cost optimal calculations and methodology are tools to facilitate a smooth transition towards nearly zero energy buildings (nZEB). As a contracted party of the Energy Community, Bosnia and Herzegovina has to develop Roadmap for implementation of energy efficiency directives, among which is Directive on Energy Performance of Buildings (EPBD). This Directive introduces Nearly Zero Energy Buildings (nZEB) and requires that all new buildings in European Union have to be nZEB by the end of 2020 and all new public buildings have to be nZEB by 2018. Nearly zero energy buildings are not defined in enforced regulation

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http://www.ba.undp.org/content/bosnia_and_herzegovina/en/home/operations/projects/environment_and_energy/zeleni-ekonomski-razvoj.html

in BiH. and the one of the activities in 2018 of the GED22 project will be drafting /updating regulation regarding definition of the Nearly Zero-Energy Public Buildings.

F. Energy efficiency obligations (Article 7)

The Energy Efficiency Obligation Scheme Outline and Proposed Approach for Bosnia and Herzegovina²⁹ that has been developed by the EEO Working Group in BiH³⁰ sets the overall structure for the Energy Efficiency Obligation (EEO) scheme in BiH. Furthermore. The EEO Working Group in BiH developed the Guidelines for the Development of EEO Legislation³¹ proposing the framework of the EEO model that should be defined in primary and secondary legislation of both entities and District Brcko, given the complex structure of the country and its jurisdictions. Figure 2 is a basic illustration of the proposed EEO model structure and roles, as defined in the EEO Scheme Outline document.

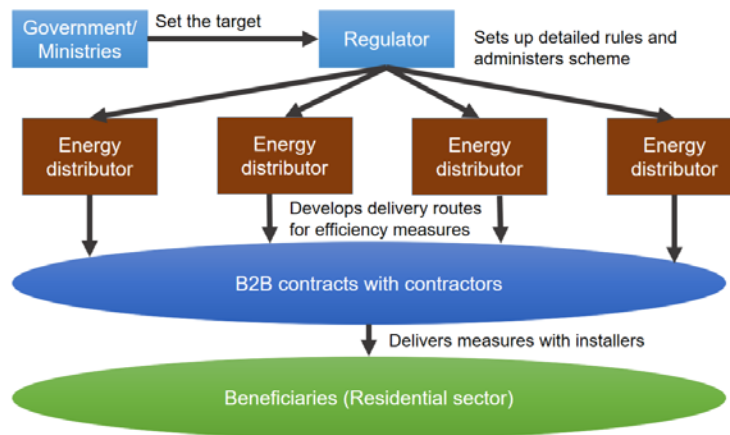


Figure 2: EEO Model Architecture

In order to put an EEO mechanism in place in Bosnia and Herzegovina, there are four steps that must be taken: (1) draft and pass amendments to the Entity Energy Efficiency Laws³². (2) formulate the EEO calculation methodologies. (3) issue a decree/regulation on implementation of EEO, and (4) issue detailed implementation regulations and/or guidelines. There are four parties in each Entity that are involved in putting the EEO mechanism in place: the parliaments, ministries, governments and regulators. The process is illustrated in the Table 5:

²⁹ <http://www.usaideia.ba/dpa/document.php?id=96353>

³⁰ USAID Energy Investment Activity established a Working Group to develop the Energy Efficiency Obligation (EEO) Scheme model for Bosnia and Herzegovina. Representatives of the relevant ministries, energy regulatory commissions, electricity utility companies, energy efficiency/environment funds, and Chambers of Commerce make up the EEO Working Group.

³¹ <http://www.usaideia.ba/dpa/document.php?id=89374>

³² <http://www.usaideia.ba/dpa/document.php?id=89377>

Document	Party Responsible for Development	To Whom	Action Required	Deadlines for Development
1. Amendments to the existing Entity EE laws to authorize the EEO mechanism.	Entity Ministries. in consultation with the Regulators	Entity Governments Entity Legislatures	Passage of amendments	December 2016
2. Regulation/ Decree on implementation of EEO	Entity Ministries. in cooperation with the Regulators	Entity Governments	Issuance of Regulation/ Decree by the Governments	March 2017
Timeline: 90 days after adoption of the amendments to the Law				
3. EEO Savings Target Methodology	Regulators	Entity Ministries	Issuance of Methodology by the Entity Ministries	March 2017
Timeline: 60 days after the issuance of the EEO Regulation/Decree				
4. EEO Collection Fee Calculation Methodology	Regulators	Regulators	Issuance of Methodology	March 2017
Timeline: 60 days after the issuance of the EEO Savings Target Methodology				
5. Detailed EEO Rulebook	Regulators	Regulators	Issuance of Regulation/ Guidelines	September 2017
Timeline: 120 days after the issuance of the EEO Regulation/Decree				

Table 5: EEO legislative development road map

The EEO Working Group has developed the Amendments to the existing Entity EE laws. The EEO Decree., EEO Savings Target Methodology and EEO Collection Fee Calculation Methodology are currently being revised, while the detailed EEO Rulebook is in development. In addition, the EEO Model has been included in the adopted FBiH Energy Efficiency Action Plan, the draft Energy Efficiency Action Plan for Republika Srpska and Energy Efficiency Action Plan.

The EEO Working Group is expected to complete the EEO Model, including the necessary primary and secondary legislation documents by early 2018, and initiate the adoption procedure for the EEO model implementation with the relevant state and entity institutions.

National Energy Efficiency Action Plan of Bosnia And Herzegovina for the period 2016 - 2018³³ defines the following programs related to the energy efficiency obligation schemes:

³³ In October 2017, the document is in the adoption procedure. Ministry of Foreign Trade and Economic Relations of BiH is currently in consultation with line ministries. As part of the document, Energy Efficiency Action Plan of the Federation Of Bosnia And Herzegovina for the period 2016 – 2018, has been adopted by the Government of the Federation of BiH in June 2017. Its other part, Amendments to the Energy Efficiency Action Plan of the Republic Of Srpska for the Period to 2018, is pending the government decision on adoption.

- PRG.03 FBiH: Program for energy efficiency obligation schemes in the Federation BiH through electricity distributors.
- PRG.04 FBiH: Program for energy efficiency obligation schemes in the Federation BiH through heating energy distributors.
- PRG.03 RS: Program for energy efficiency obligation schemes in the Republic of Srpska through electricity distributors.
- PRG.03 RS: Program for energy efficiency obligation schemes in the Republic of Srpska through heating energy distributors.

The programs should introduce the energy efficiency obligation schemes in both entities, by targeting the reduction of Final Energy Consumption in a three-year period. The National Energy Efficiency Action Plan 2010-2018 (NEEAP) presents four-year cumulative targets for final energy savings implemented through the obligation schemes, as shown in the following table:

<i>ktoe</i>	BiH		FBiH		RS		<i>TOTAL</i>
	PRG.03	PRG.04	PRG.03	PRG.04	PRG.03	PRG.04	
Year 1	13.17	2.29	9.1	1.58	4.07	0.71	15.99
Year 2	26.35	4.59	18.2	3.16	8.15	1.43	30.94
Year 3	44.79	7.79	30.94	5.37	13.85	2.42	52.58
Year 4	63.23	14.1	43.68	9.73	19.55	4.37	77.33

Table 6: NEEAP four-year cumulative targets for final energy savings implemented through the obligation schemes