

**NATIONAL RENEWABLE ENERGY
ACTION PLAN
OF BOSNIA AND HERZEGOVINA
(NREAP BiH)**

SARAJEVO, 28.03.2016.

ODLUKA KOMISIJE

od 30. lipnja 2009.

o utvrđivanju obrasca za nacionalne akcijske planove za obnovljivu energiju u skladu s Direktivom 2009/28/EZ Europskog parlamenta i Vijeća*(priopćena pod brojem dokumenta C(2009) 5174)***(Tekst značajan za EGP)**

(2009/548/EZ)

KOMISIJA EUROPSKIH ZAJEDNICA,

uzimajući u obzir Ugovor o osnivanju Europske zajednice,

uzimajući u obzir Direktivu 2009/28/EZ Europskog parlamenta i Vijeća od 23. travnja 2009. o promicanju korištenja energije iz obnovljivih izvora te o izmjeni i budućem stavljanju izvan snage Direktiva 2001/77/EZ i 2003/30/EZ⁽¹⁾, a posebno njezin članak 4. stavak 1. drugi podstavak,

budući da:

- (1) Direktivom 2009/28/EZ zahtijeva se da svaka država članica donese nacionalni plan za obnovljivu energiju. U tim planovima treba postaviti nacionalne ciljeve država članica za udio energije iz obnovljivih izvora za potrošnju u prometu, elektroenergetici te za grijanje i hlađenje za 2020. godinu, uzimajući u obzir utjecaje drugih mjera politike koje se odnose na energetske učinkovitost i na konačnu potrošnju energije, te utvrditi mjere za postizanje tih nacionalnih općih ciljeva, uključujući suradnju između lokalnih, regionalnih i nacionalnih tijela, planirane statističke prijenose ili zajedničke projekte, nacionalne politike za razvoj postojećih izvora biomase i mobilizaciju novih izvora biomase za različite primjene i mjere koje treba poduzeti da se ispune zahtjevi iz članka 13. do 19. Direktive 2009/28/EZ.

- (2) U skladu s Direktivom 2009/28/EZ, Komisija do 30. lipnja 2009. treba donijeti obrazac za nacionalne akcijske planove za obnovljivu energiju, koji obuhvaćaju minimalne zahtjeve utvrđene u Prilogu VI. toj Direktivi,

DONIJELA JE OVU ODLUKU:

Članak 1.

Obrazac za nacionalne akcijske planove za obnovljivu energiju u skladu sa zahtjevima iz članka 4. stavka 1. Direktive 2009/28/EZ donesen je kako je utvrđeno u Prilogu ovoj Odluci.

Članak 2.

Ova je Odluka upućena državama članicama.

Sastavljeno u Bruxellesu 30. lipnja 2009.

Za Komisiju
Andris PIEBALGS
Član Komisije

⁽¹⁾ SL L 140, 5.6.2009., str. 16.

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INTRODUCTION

In line with the Energy Community Treaty, on the 18th of October 2012, the Ministerial Council adopted the Decision on the Implementation of Directive 2009/28/EC on the promotion of the use of energy from renewable sources, which set the goal for Bosnia and Herzegovina of having a 40% share of its renewable energy sources (hereinafter: RES) in the final consumption of electric energy and a 10% share of RES energy in transport, before 2020. Article 16 of the Decision enabled revision of the acquired goals upon initiative from the Contractual Party in case other statistical indicators can be proven, having in mind that for defining of the 40% share for Bosnia and Herzegovina at the level of the working group of the Energy Community Secretariat, data for the year 2009 on the 34% share of RES were used as a starting point.

The policy of use of renewable energy sources defined by the EU Directive 2009/28/EC on the promotion of the use of energy from renewable sources is reflected in the following:

- safe, quality, and reliable electric power supply,
- environmental protection, and
- lower consumption depending on imports and use of fossil fuels.

Renewable Energy Action Plan of Bosnia and Herzegovina (NREAP BiH) is an obligation resulting from the international obligation assumed by Bosnia and Herzegovina in 2006, when it enacted the DECISION ON RATIFICATION OF THE TREATY ESTABLISHING ENERGY COMMUNITY (Official Gazette of BiH – International Treaties, issue no. 09/06, dated 25.08.2006). The Action Plan is based on previously adopted entity action plans for the use of renewable energy sources. Action Plan for the use of renewable energy in the FBiH is prescribed in Article 4 of the Law on the Use of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of the Federation of BiH, issue no. 70/13). In addition, in Republika Srpska, Article 10 of the Law on the Use of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of Republika Srpska, issues no. 39/13, 108/13 and 79/15) defined the obligation to enact the Action Plan for Use of Renewable Energy Sources of Republika Srpska, and to create bylaws to more closely regulate this area.

Action plans define policies, measures, mandatory targets concerning the share of RES energy in the overall final consumption of electric energy, heating/cooling energy, and energy for transport, taking into consideration effects of regulatory measures concerning improving energy efficiency and energy savings by the end user, as well as other measures aimed at reaching the set goals.

NREAP BiH is harmonised with strategic and planning documents of the Federation of Bosnia and Herzegovina, Republika Srpska, and the Brčko District of Bosnia and Herzegovina and, among other things, defines an overview of RES energy consumption in the reference year 2009, and in the period 2010 to 2020, where it includes:

- total planned final consumption of RES energy for heating and cooling, electric energy and transport, taking into consideration effects of energy efficiency and energy saving, expressed in kilotons of oil equivalent (ktoe),
- planned share of RES energy in total final consumption of RES energy for heating and cooling, electric energy and transport expressed in percentage,
- share of renewable energy of each sector in the total energy consumption,
- share of renewable energy in transport,

- estimate of the total share (installed capacity of total production of electric energy) expected from each renewable energy technology,
- maximum level of installed power of privileged producers for each technology (hereinafter: dynamic quotes),
- policy and measures for promotion and stimulation of use of RES energy, in line with regulations concerning competition and state assistance,
- common measures of ministries and institutions

Lack of actual statistical indicators of the overall final energy consumption, especially concerning biomass, makes it difficult to make a realistic forecast of the final consumption by 2020, therefore NREAP of BiH must be regularly updated and harmonised with the latest indicators as well as with actual economic and social possibilities, having in mind that the electric power coming from RES is much more expensive than the energy produced using fossil fuels.

Energy statistics is under development and cannot be used to produce sufficient data for monitoring and updating of the BiH RES sector overview.

The Energy Community Treaty

The Energy Community Treaty signed on 25. 10. 2005, which came into force on 1.7. 2006 enables creation of internal market for electric energy and gas, where the European Union is an active actor on one side, along with the following eight Contracting Parties: Albania, Bosnia and Herzegovina, Montenegro, Kosovo*, Macedonia, Moldova, Serbia, and Ukraine. According to their expressed interest, the following countries are involved in the activities of the Energy Community bodies: Austria, Bulgaria, the Czech Republic, France, Finland, Greece, Croatia, Italy, Cyprus, Latvia, Hungary, Holland, Germany, Poland, Romania, Slovakia, Slovenia, Sweden, and the United Kingdom. These 19 so-called participant countries of the European Union participate in activities of the Energy Community, and their positions at voting are expressed by the European Commission. The Observer Status in Energy Community bodies is held by Armenia, Georgia, Norway, and Turkey. The main goals of the Energy Community is to create stable and common regulatory framework and market space that ensures reliable supply with energy generating products and can attract investments in electric power and natural gas sectors. In addition, it is development of alternative gas supply options and improvement of the environment, with application of energy efficiency and use of renewable energy sources.

Entering into this Treaty, contracting parties of the region agreed to establish a common market for electric power and gas which will function according to energy market standards of the EU with which it will integrate. It shall be accomplished by gradual adoption of the EU acquis, that is, implementation of relevant directives and regulation of the EU concerning electric power, gas, environmental protection, competition, renewable energy sources, energy efficiency, oil, and statistics.

- Treaty Establishing the Energy Community (Official Gazette of BiH – International Treaties, issue no. 9/06)

As unanimously decided at the Ministerial Council of the Energy Community held on 24.10.2013, the Treaty initially concluded for the period of ten years is extended for additional ten years.

Energy Community Acquis

Acquis, or legal framework of the Energy Community, primarily means directives and regulations from the Third Energy Package of the EU that foresee universal regulations for internal electric power and natural gas markets, and regulate cross-border trade. The initial set of regulations from 2005 has been updated with new directives and regulations on several occasions, which resulted in integration of new regulations in the fields of environmental protection, competition, and renewable energy sources. In 2007, the acquis was extended to include EU directives on safety of supply, and since 2008 the term “grid energy”, initially used to describe electric power and gas, has been including the oil sector as well. In 2009 and 2010, the acquis was extended to include directives on energy efficiency, and in 2011, by means of a decision of the Ministerial Council, regulations of the “third package”, except the Regulation (EC) no. 713/2009, became legally binding for the Contracting Parties of the Energy Community as well. In 2012, the acquis was significantly extended to include directives concerning renewable sources, mandatory oil reserves and statistics, in 2013, to include a part of the directive on pollution prevention and control, and Regulation concerning ITC mechanism and charging for transfer; in 2014, it was extended to include regulation concerning transparency, that is, the obligation to publish data on the electric power markets. In 2015, the acquis was extended to include rules from the fields of energy efficiency, environmental protection, statistics, and infrastructure.

Acquis on Renewable Sources

Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (deadline: 1 January 2014).

National goals concerning the share of renewable energy in the final gross consumption in 2020 for Contracting Parties of the Energy Community are set by the Decision of the Ministerial Council from 18 October 2012.

1 SUMMARY OF THE RENEWABLE ENERGY POLICY

Bosnia and Herzegovina is in a peculiar political situation since the Constitution foresees two jurisdictions over the energy sector - responsibilities of entity governments, and responsibilities of the state level exercised through the activities of the Ministry of Foreign Trade and Economic Relations of BiH.

State Level

The Ministry of Foreign Trade and Economic Relations (MOFTER BiH) is responsible for performing tasks and duties at the state level such as defining of policies, fundamental principles, coordination of activities, and harmonisation of entity authorities and institutions active in the international context of energy, environment, development, and use of natural resources. Due to the structure of the state and responsibilities of the entities (FBiH and RS) concerning energy sector, the role of the ministry is to coordinate activities of the state government and entity governments regarding implementation of the directives concerned. Energy sector at the state level is defined by the following laws:

1. Law on Transmission of Electric Power, Regulator and System Operator in BiH (Official Gazette of BiH, no. 7/02, 13/03, 76/09 and 1/11)
 - Rulebook on Tariff Procedure (Official Gazette of BiH, no. 44/05).
 - Rulebook on Licences (Official Gazette of BiH, no. 98/15).
 - Rulebook on Amendments to the Rulebook on Licences (Official Gazette of BiH, no. 98/15).
 - Rulebook on Connection (Official Gazette of BiH, no. 95/08, 79/10, 60/12)
 - Rulebook on Protection of Confidential Information (Official Gazette of BiH, no. 13/07).
2. Law on Establishing of Independent System Operator for the Transmission System in BiH (Official Gazette of BiH, no. 35/04)
3. Law Establishing the Company for the Transmission of Electric Power in Bosnia and Herzegovina (Official Gazette of BiH, issues no. 35/04, 76/09, 20/14)

The Federation of Bosnia and Herzegovina

The following regulations for the energy sector in the Federation of BiH, among other things, define the policy for the use of RES providing the political and legal grounds for deep reform of the energy sector and normative adaptation and further development of the entire system:

1. Law on Electricity of the Federation of Bosnia and Herzegovina (Official Gazette of the Federation of BiH, issue no. 66/13)
 - Regulation on the Procedure, Criteria, Form, and Contents of the Application for Energy Permit for Construction of New and Reconstruction of the Existing Production Facilities (Official Gazette of the Federation of BiH, issue no. 27/14)
2. Law on the Use of Renewable Energy Sources and Efficient Cogeneration of BiH (Official Gazette of the Federation of BiH, issues no. 70/13 and 05/14).

- Regulation on Incentives for Generation of Electric Power from the Operator for Renewable Energy Sources and Efficient Cogeneration and Defining of Incentive Fees (Official Gazette of the Federation of BiH, issue no. 48/14)
 - Decision Establishing the Operator for Renewable Energy Sources and Efficient Cogeneration V. no. 1281/2013, 06.11.2013 (Official Gazette of the Federation of BiH, issue no. 90/13)
 - Rulebook on Methodology for Defining Guaranteed Price for Electric Power from the Plants for Use of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of the Federation of BiH, issue no. 50/14).
 - Rulebook on Methodology for Defining Reference Price for Electric Power (Official Gazette of the Federation of BiH, issue no. 50/14).
 - Decision on Adopting Calculations of Guaranteed Purchase Prices for Electric Power from OIEIEK plants, FERK 18.12.2015
 - Decision on Reference Price for Electric Power, FERK 18.12.2015
3. Renewable Energy Action Plan for the Federation of Bosnia and Herzegovina (Official Gazette of the Federation of BiH, issue no. 48/14)
4. Rulebooks and Electrical Engineering Regulations
- Rulebook on Technical Norms for Construction of Overhead Electric Power Lines capacity 1 to 400 kV (Official Gazette of SFRY, issue no. 65/88)
 - Rulebook on Technical Norms for Electric Power Plants of Nominal Voltage over 1000V (Official Gazette of SFRY, issue no. 4/74)
 - Rulebook on Technical Norms for Electric Power Plants of Overvoltage (Official Gazette of SFRY, issues no. 7/71 and 44/76)
 - Rulebook on Technical Norms for Electric Power Plants of Nominal Value of 10 KV for Operation Under 20 kV Voltage (Official Gazette of SFRY, issue no. 10/79)
 - Rulebook on Technical Norms for Construction of Overhead Electric Power Lines (Official Gazette of SFRY, issues no. 51/73 and 11/80)
 - Rulebook on Technical Norms for Low Voltage Electric Power Installations (Official Gazette of SFRY, issues no. 53/88 and 54/88)
 - Rulebook on Technical Norms for Protection of Low Voltage Grids and Supporting Transformer Stations (Official Gazette of SFRY, issue no. 13/78)
 - Rulebook on Technical Norms for Protection Electric Power Plants and Devices from Fire (Official Gazette of SFRY, issue no. 74/90)
 - Rulebook on Technical Norms for Installation of Overhead Electric Power Lines and Telecommunication Cable Lines (Official Gazette of SFRY, issue no. 36/86)
 - Rulebook on Regulations on Lightning Rods (Official Gazette of SFRY, issue no. 13/78)
 - IEC 61024-1 Protection of structures against lightning

Republika Srpska

The fundamental legal document in Republika Srpska regulating the RES is the Law on Energy. This document regulates the basis of the energy policy of Republika Srpska, enacting of the Energy Development Strategy, plans, programmes, and other acts necessary for its implementation, main issues concerning regulating and performing energy related activities, use of renewable energy sources, and energy efficiency requirements. The law prescribes use of renewable energy sources and efficient cogeneration in Republika Srpska of general interest for the Republic. Energy Development Strategy of Republika Srpska for the period until 2030, enacted in March 2012, defines strategic goals and analyses directions of development in several scenarios, in this area including the renewable energy sources area. On the other hand, the area of renewable energy sources is more closely defined

by the Law on Renewable Energy Sources and Efficient Cogeneration that regulates planning and incentives for generation and consumption of energy from renewable sources and in efficient cogeneration, technologies for use of renewable energy sources, incentive measures for production of energy using renewable sources and in efficient cogeneration, implementation of the system of incentives for production of energy from renewable sources and construction of renewable energy power plants as well as other issues of relevance.

National policy for renewable energy sources in Republika Srpska, including strategic, planning, legal, and regulatory framework, is presented in the following:

1. Law on Energy (Official Gazette of Republika Srpska, issue no. 49/09)
2. Energy Development Strategy of Republika Srpska until 2030
3. Law on the Use of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of Republika Srpska, issues no. 39/13 and 108/13 and 79/15)
4. Rulebook on Incentives for Production of Power from Renewable Sources and in Efficient Cogeneration (Official Gazette of Republika Srpska, issues no. 114/13 and 88/14)
5. Decision on the Amount of Purchase Price and Premiums for Electric Power Produced from Renewable Sources or in Efficient Cogeneration (Official Gazette of Republika Srpska, issues no. 116/13, 88/14 and 14/16)
6. Decision on the Amount of the Incentive for Production of Energy from Renewable Sources in Efficient Cogeneration (Official Gazette of Republika Srpska, issues no. 116/13, 4/15 and 14/16)
7. Rulebook on Issuing of Certificates for Production Plants Producing Electric Energy from Renewable Sources and in Efficient Cogeneration (Official Gazette of Republika Srpska, issues no. 114/13 and 112/13)
8. Rulebook on Issuing Warranties on the Origin of Electric Energy (Official Gazette of Republika Srpska, issue no. 1/14)
9. Renewable Energy Action Plan of Republika Srpska (Published by the Decision in the Official Gazette of Republika Srpska, issue no. 45/14 and 111/15)
10. Instruction on Keeping Register of Projects in Renewable Energy Sources and in Efficient Cogeneration (Official Gazette of Republika Srpska, issue no. 76/13)
11. Law on Concessions (Official Gazette of Republika Srpska, issue no. 59/13)
12. Law on Waste Management (Official Gazette of Republika Srpska, issue no. 111/13)
13. Law on the Fund and Financing of Environmental Protection of Republika Srpska (Official Gazette of Republika Srpska, issues no. 117/11 and 63/14)
14. Law on Electricity (Official Gazette of Republika Srpska, issue no. 8/08 – revised text, 34/09, 92/09 and 01/11).
15. Regulation on Types, Contents, Quality, and Share of Biofuels in Transport (Official Gazette of Republika Srpska, issue no. 8/16)

Brčko District of Bosnia and Herzegovina

- Law on Electricity (Official Gazette of the Brčko District of BiH, issue no. 36/04, 28/07, 61/10 and 4/13).
- Action Plan for Energy Sustainable Development of Brčko District of Bosnia and Herzegovina (18.05.2015)

2 EXPECTED FINAL ENERGY CONSUMPTION 2010 - 2020

In order to create the NREAP with recommendations of the EU Directive 2009/28/EC, it is necessary to develop scenarios for defining gross final energy consumption (hereinafter: GFEC) until 2020 specifically for the sector of electricity, heating and cooling sector, and transport sector. For each sector, two scenarios of GFEC dynamics until 2020 have been created, namely: for the reference (basic) scenario, and scenario involving energy efficiency measures. The scenario involving energy efficiency measures includes additional energy saving efforts.

The calculation of the expected final consumption until 2020 relied upon the baseline data from 2009 for both BiH and RS produced using PRIMES¹ model, extracted values for the FBiH for the year 2009, and the assessment for the Brčko District of Bosnia and Herzegovina based on the existing data for the BD². Total baseline GFEC for BiH, which is 3839.8 ktoe, is a sum of the appropriate values for entities and the Brčko District of Bosnia and Herzegovina.

In addition, in order to determine the second scenario for the expected GFEC by 2020, which includes effects of implementation of energy efficiency measures, the NREAP BiH takes into consideration the expected goals of reduced GFEC in the period 2010-2018, which is in line with the obligations of Bosnia and Herzegovina concerning fulfilling the obligations imposed by the EU Directive on energy end-use efficiency and energy services (2006/32/EC). Indicative goals of GFEC reduction are elaborated in the Draft of the First National Energy Efficiency Action Plan for BiH (February 2012) where the baseline final consumption for BiH, as the median value for the period 2006-2010, was 145.54 PJ or approx. 3476 ktoe. According to the same document, saved energy by 2018 is expected to be 12.47 PJ or approx. 297 ktoe assuming the annual savings of 1% starting from 2010, which will, in 2018, amount to the total of 9% of savings.

Taking into consideration both scenarios, the NREAP BiH that the GFEC in 2020 will be 4851.3 ktoe for the reference scenario, that is, taking into account energy efficiency measures, the GFEC is expected to be 4407.7 ktoe.

The following table shows the actual and expected gross final energy consumption in Bosnia and Herzegovina in the field of heating and cooling, electricity, and transport until 2020.

¹ IPA energy + Water Economics

² Study of Energy Sector in BiH, 2008

Sector	Baseline year	2010		2011		2012		2013		2014	
		Reference Scenario	Additional EE								
Heating and cooling (ktoe)	1861.5	1881.7	1877.3	1897.5	1897.5	1917.1	1913.1	1936.7	1898.8	1957.2	1899.5
Electricity (ktoe);	985.1	1035.8	1035.8	1073.3	1073.3	1083.4	1080.1	1082.5	1075.7	1113.4	1096.2
Transport (ktoe)	689.0	787.2	763.7	820.7	795.8	853.2	826.4	886.7	858.5	920.3	888.3
Gross Final Energy Consumption (GFEC) (ktoe)	3839.8	4039.6	4039.6	4133.0	4133.0	4192.3	4178.3	4251.6	4121.8	4338.0	4166.5

Sector	2015		2016		2017		2018		2019		2020	
	Reference Scenario	Additional EE										
Heating and cooling (ktoe)	1977.8	1900.1	1996.5	1898.3	2014.9	1896.0	2033.1	1893.2	2051.2	1889.3	2069.8	1886.1
Electricity (ktoe);	1137.4	1115.3	1169.3	1140.1	1201.8	1165.8	1235.0	1192.3	1268.9	1219.7	1303.6	1243.9
Transport (ktoe)	953.2	916.9	985.0	947.9	1017.0	975.9	1048.7	1004.4	1090.3	1042.8	1129.1	1081.2
Gross Final Energy Consumption (GFEC) (ktoe)	4417.1	4205.0	4503.0	4248.8	4588.9	4290.1	4675.6	4331.7	4763.0	4372.3	4851.3	4407.7

Table 1³: The table shows the expected gross final energy consumption in Bosnia and Herzegovina in the field of heating and cooling, electricity, and transport until 2020

³ Values presented in the table represent sums of values from entity action plans (Federation of Bosnia and Herzegovina and Republika Srpska) and evaluation for the Brčko District of BiH

3 RENEWABLE ENERGY TARGETS AND TRAJECTORIES

Mandatory goal of Bosnia and Herzegovina for RES by 2020 is calculated as a sum of indicative goals for the Federation of BiH and Republika Srpska, and the Brčko District of Bosnia and Herzegovina, taking into consideration their weighted shares in the overall GFEC for Bosnia and Herzegovina. Indicative goals are set by the entity action plans for the FBiH and RS, and assessed GFEC and typical shares for the Brčko District of Bosnia and Herzegovina, based on the baseline RES share in the GFEC for the baseline situation and lump increase of the RES share increased by the share of the relative gross domestic product (GDP) per capita.

3.1 Overall goal on the level of BiH

Total GFEC for Bosnia and Herzegovina for the baseline year was 3839.8 ktoe, out of which 1306.9 ktoe was produced using RES. Therefore, it can be concluded that the share of RES in the GFEC for the baseline situation was 34.0 %.

The overall goal for Bosnia and Herzegovina includes the 40.0 % target share of RES in the GFEC by 2020. That means that by the end of 2020, Bosnia and Herzegovina is expected to see increase in RES share in GFEC of 633 ktoe compared to the production in the baseline year.

The overall goal for Bosnia and Herzegovina concerning the target share of RES in the GFEC by 2020 is presented in the table below.

Share of energy from renewable sources in gross final consumption of energy in 2009	34.0 %
Target share of energy from renewable sources in gross final energy consumption in 2020	40.0 %
Expected total adjusted energy consumption in 2020	4851.3 (ktoe)
Expected amount of energy from renewable sources corresponding to the 2020 target	1940.5 ktoe

Table 2: Overall target for the share of energy from renewable sources in gross final consumption of energy in for the baseline year and 2020, for Bosnia and Herzegovina

In line with the Decision on Implementing the Directive 2009/28/EC and amendments to the Article 20 of the Energy Community (EnC) Treaty, the EnC Secretariat suggested, and the Ministerial Council of EnC adopted, the obliging goal of 40 % RES share in the gross final energy consumption in BiH in 2020, using the biomass data from the Study on the Biomass Consumption for Energy Purposes.⁴ Starting from the above mentioned, BiH has presumably high baseline RES share in the baseline 2009. The target RES share for BiH is one of the greatest among the Southeast Europe Countries of the Energy Community, which is justified by the EnC by high baseline share and application of a unique calculation methodology.

⁴ Study on the Biomass Consumption for Energy Purposes in the Energy Community, Februar 2010, CRES Greece

Success of realisation of the set goal for BiH depends on numerous factors, and the most important ones need to be put in focus:

- Infrastructure of centralised heating and cooling is insufficient;
- Data on production and consumption of energy for heating and cooling purposes, and related loss, are usually based on lump sums;
- Heat energy sector is not regulated;
- The Biomass Study⁵, i.e. the part concerning BiH, is unconfirmed and based on rough estimates. It was not accepted by the institutions responsible for statistics;
- Different sources of data take into consideration significant tolerances when producing energy potential assessments, especially for biomass, which results in different input data in the calculation;
- Official and forecasted data, especially concerning biomass consumption, can be characterised as unreliable;
- Biomass has a great influence on the RES energy share;
- Unlike majority of European countries, biomass in BiH is used directly at the source (cutting of wood for heating is done seasonally), which results in higher humidity (humidity is not standardised), and therefore reduced heating power;
- Proper energy statistics have not been established;
- Low GDP rate has been estimated, and there are also errors in the estimation due to unreliable baseline statistical data (results of the last census have not yet been published);
- Realisation period is rather short compared to EU Member States;
- Baseline RES share is set high;
- Realisation of the goals set higher than it would be realistic having in mind the actual status of RES sector in BiH, may adversely affect economic and social circumstances in the country.

3.2 Sectoral targets and trajectories

Pursuant to Article 4 (1) of the Directive 2009/28/EC, NREAP prescribes mandatory goals for RES share in the total final consumption by 2020, in the following sectors:

- heating and cooling;
- electricity;
- transport.

Sectoral goals for RES share in the electricity sector in 2020 are 52.4 % - 56.9 % in the sector of heating and cooling energy, 10% and in the transport sector. All these individual goals will enable achieving of the overall goal of 40 % in GFEC, and should not be seen as fixed goals for each sector individually.

3.2.1 Heating and cooling sector target

In the heating and cooling sector, increase of the RES share from 805.8 ktoe in the baseline year to 1085.2 ktoe in 2020 is foreseen. This will result in an increase of the RES share from 43.3 % to 52.4 %, which is an increase of 9.1 %. The goal of the heating and cooling sector for Bosnia and Herzegovina was based on the parameters from entity action plans where these goals for 2020 were set.

⁵ Study on the Biomass Consumption for Energy Purposes in the Energy Community, February 2010, CRES Greece

In order to achieve the goals set for the heating and cooling sector in Bosnia and Herzegovina by 2020, in addition to using biomass for household heating, other forms of renewable energy that have been neglected so far should also be used, all for the purpose of reducing the share of fossil fuels.

3.2.2 Electricity sector target

In the electricity sector, the foreseen goal is to increase RES share from 495.2 ktoe in the baseline year to 741.4 ktoe in 2020. This will result in an increase of the RES share from 50.3 % to 56.9 %, which is an increase of 6.6 %. The goal of the electricity sector for Bosnia and Herzegovina was based on the parameters from entity action plans.

3.2.3 Transport sector target

In the transport sector, values for the baseline year indicate only RES share in the GFEC in the domain of electricity in rail transport. Therefore, NREAP foresees increase of RES consumption in this sector up to 113.9 ktoe in 2020. By this, the RES share will increase to 10 %. The goal of the transport sector for Bosnia and Herzegovina was based on the parameters from entity action plans, and the 10% goal set for the Brčko District of Bosnia and Herzegovina.

In line with the assumed responsibilities from the level of the Energy Community, the mandatory goal for RES share in the transport sector is 10% by 2020, which is hardly achievable in BiH and cannot be done relying solely on internal potential, when compared to the current entity legal frameworks and the structure of available capacities.

Main weaknesses of the use of RES in the transport sector in BiH are the following:

- lack of regulation for RES use in the sector;
- undefined biofuel sustainability criteria;
- lack of incentive measures for the use of RES in the sector;
- lack of policy and strategic framework for RES use in transport;
- Testing laboratories hold no accreditations for testing quality and contents of biofuels in liquid oil fuels,
- Insufficiently developed energy statistics in the sector of fuel and biofuels.

	Baseline	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
RES - H&C	43.3 %	44.4 %	45.7 %	47.5 %	48.6%	51.4%	51.7%	51.7%	52.0%	51.2%	52.7%	52.4 %
RES-E	50.3 %	60.5 %	40.7%	42.8%	46.4 %	45.7 %	48.0 %	50.0 %	51.5 %	54.6 %	54.5 %	56.9 %
RES-T	0.9%	0.8%	0.7%	0.7%	0.7%	0.6%	1.0 %	3.3 %	5.4 %	7.4 %	8.5 %	10.1 %
Total RES share	34.0 %	36.4 %	31.7 %	32.9%	34.1%	35.0%	35.8%	36.7%	37.5%	38.4%	39.2%	40.0 %

Table 3⁶: Overall for 2020 and estimated trajectory of RES for heating and cooling, in electricity sector and transport in BiH

	Baseline	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
RES - H&C	792	835.4	867.2	910.1	941.8	1005.0	1023.2	1032.7	1047.6	1041.5	1081.7	1085.2
RES-E	495.2	627.2	436.7	463.8	502.2	509.0	546.4	585.1	619.4	674.8	691.7	741.4
RES-T	5.9	7.1	4.8	5.0	5.4	5.3	15.6	38.5	61.2	83.8	99.5	113.9
Total RES share	1306.9	1469.6	1308.7	1378.9	1449.4	1519.3	1585.2	1656.3	1728.2	1800.0	1872.9	1940.5

Table 4⁷: Table for calculating the share of renewable energy from each individual sector in the total energy consumption (ktoe)

	2011-2012	2013-2014	2015-2016	2017-2018	2020
	$C_{\text{bazno}}+20\%(C_{2020}-C_{\text{bazno}})$	$C_{\text{bazno}}+30\%(C_{2020}-C_{\text{bazno}})$	$C_{\text{bazno}}+40\%(C_{2020}-C_{\text{bazno}})$	$C_{\text{bazno}}+55\%(C_{2020}-C_{\text{bazno}})$	C_{2020}
RES minimum trajectory (%)	35.2	35.8	36.4	37.3	40
RES minimum trajectory (ktoe)	1433.6	1497.0	1560.3	1655.4	1940.5

Table 5: Estimated trajectory

⁶ Values presented in the table represent sums of values from entity action plans (Federation of Bosnia and Herzegovina and Republika Srpska) and evaluation for the Brčko District of BiH

⁷ Values presented in the table represent sums of values from entity action plans (Federation of Bosnia and Herzegovina and Republika Srpska) and evaluation for the Brčko District of BiH

ktoe	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
(A) Expected gross final consumption of RES for heating and cooling	805.8	835.4	867.2	910.1	941.8	1005.0	1023.2	1032.7	1047.6	1041.5	1081.7	1085.2
(B) Expected gross final consumption of electricity from RES	495.2	627.2	436.7	463.8	502.2	509.0	546.4	585.1	619.4	674.8	691.7	741.4
(C) Expected gross final consumption of RES in transport	5.9	7.1	4.8	5.0	5.4	5.3	15.6	38.5	61.2	83.8	99.5	113.9
(D) Expected overall consumption of RES	1306.9	1469.6	1308.7	1378.9	1449.4	1519.3	1585.2	1656.3	1728.2	1800.0	1872.9	1940.5
(E) Expected transfer of RES into other Member States	-	-	-	-	-	-	-	-	-	-	-	-
(F) Expected transfer of RES from other countries	-	-	-	-	-	-	-	-	-	-	-	-
(G) Expected consumption of PiE set for the goal (D)-(E)+(F)	-	-	-	-	-	-	-	-	-	-	-	-

Table 6⁸: Table of calculating RES contribution to final energy consumption of each sector (ktoe)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Expected consumption of RES in transport	5.9	7.1	4.8	5.0	5.4	5.3	15.6	38.5	61.2	83.8	99.5	113.9
Expected electric power generated from RES in road transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Expected consumption of biofuel generated from waste, left-overs, inedible cellulose material and lignocellulosic materials in transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Expected share of RES in transport, achieving the RES-T goal	5.9	7.1	4.8	5.0	5.4	5.3	15.6	38.5	61.2	83.8	99.5	113.9

Table 7⁹: Table for calculating share of renewable energy in transport (ktoe)

⁸ Values presented in the table represent sums of values from entity action plans (Federation of Bosnia and Herzegovina and Republika Srpska) and evaluation for the Brčko District of BiH

⁹ Values presented in the table represent sums of values from entity action plans (Federation of Bosnia and Herzegovina and Republika Srpska) and evaluation for the Brčko District of BiH

4 MEASURES FOR ACHIEVING THE TARGETS

4.1 Overview of all policies and measures to promote the use of energy from renewable resources

The entire programme of measures for achieving the goals set in this action plan includes programmes and measures to be realised on the state level of BiH, and can be seen in the table below, as well as programmes defined in entity action plans for the Federation of BiH and RS (Annex 1 and Annex 2).

Ordinal number	Institutional framework	Title and reference of the measure	Type of measure	Expected result	Target group and/or activity	Existing or planned	Date of start and finalisation of the measure
1.1	BiH	Strategic Policy of Energy Sector Operations in BiH	planned	Determinants of development of BiH energy sector including renewable energy defined based on entity strategies	All subjects in energy sector	planned	2017
1.2	BiH	Development and Improvement of the Renewable Energy Action Plan of Bosnia and Herzegovina in line with entity action plans	planned	Bosnia and Herzegovina implements and regularly updates programme provisions defined by the Action Plan	All subjects in energy sector	planned	2016 and further
1.3	BiH	Development, management, and reporting on Projects of Energy Community Interest (PECI)	Planned/financial	Efficient participation of Bosnia and Herzegovina in development and interoperability of priority corridors and areas of trans-European infrastructure (according to Regulation EU 347/2013)	All subjects in energy sector Carriers of development projects for RES plants.	planned	2016
1.4	BiH	Harmonisation of incentive programmes with other countries	regulatory	Bosnia and Herzegovina will have active exchange of renewable energy incentives using statistical transfers (Article 6 of Directive 2009/28/EC) and joint projects (Article 9 of Directive 2009/28/EC)	Carriers of development projects for RES plants.	planned	2016

1.5	BiH	Progress report concerning promotion and use of renewable energy sources	planned	Bosnia and Herzegovina regularly reports (every two years) to the Secretariat of the Energy Community on issues defined by Article 22 of Directive 2009/28/EC	All subjects in energy sector	planned	2017
1.6	BiH	Promotional programmes for sustainable use of energy in local communities	promotional	Bosnia and Herzegovina provides visible support to local communities in promoting sustainable use of energy (promotional activities, promotion of SEAP, pilot projects, etc.)	Local communities	existing	2016
1.7	BiH	Establishing mechanism for monitoring production, export/import, and consumption of biofuel	Regulatory Statistical	Bosnia and Herzegovina established an efficient mechanism of monitoring the biofuel market and has quality statistical data in possession	Customs, Indirect Taxation Authority, consumers	planned	2017
1.8	BiH	Programme of promoting use of biofuel on the level of BiH - including reconsidering provisions of the Law on Excise and the Law on Customs Tariffs with regards to the use of biofuel	Financial	Bosnia and Herzegovina established an incentive system for the use of biofuel introducing import and tax reliefs.	Suppliers and final users	Planned	2017 and further
1.9	BiH	Decision on quality of liquid petrol fuels in BiH	Regulatory	Quality increase	Entity administration, distributors	Planned new	2016

4.2 Special Measures for Meeting the Requirements

Special measures for meeting the requirements pursuant to Articles 13, 14, 16 and from 17 to 21 of Directive 2009/28/EC are described in detail in entity action plans for the Federation and RS (Annex 1 and Annex 2). Special measures concerning the Brčko District of Bosnia and Herzegovina are not included in this action plan.

Special measures in the following areas are included:

Administrative procedures and spatial planning (Article 13, Paragraph 1 of Directive 2009/28/EC)	√	√
Technical specifications (Article 13, Paragraph 2 of Directive 2009/28/EC)	√	√
Buildings (Article 13, Paragraph 3 of Directive 2009/28/EC)	√	√
Information provisions (Article 14, Paragraphs 1, 2 and 4 of Directive 2009/28/EC)	√	√
Certification of installers (Article 14, Paragraph 3 of Directive 2009/28/EC)	√	x
Electricity infrastructure development (Article 16, Paragraph 1, and Article 6. Paragraphs 3 to 6 of Directive 2009/28/EC)	√	√
Electricity network operation (Article 16, Paragraph 2, and Article 8. Paragraphs 3 to 6 of Directive 2009/28/EC)	√	√
Biogas integration into the natural gas network (Article 16, Paragraph 7 and Article, Paragraphs 9 and 10 of Directive 2009/28/EC)	x	√
District heating and cooling infrastructure development (Article 16, Paragraph 11 of Directive 2009/28/EC)	x	x
Biofuels and liquid biofuels — sustainability criteria and verification of compliance (Articles 17 to 21 of Directive 2009/28/EC)	x	x

Table 8: Overview of special measures for meeting the requirements defined in entity action plans

4.3 Support schemes to promote the use of energy from renewable resources in electricity

are described in detail in entity action plans for the Federation and RS (Annex 1 and Annex 2). Special measures concerning the Brčko District of Bosnia and Herzegovina are not included in this action plan.

financial support, and financial support for investments, tradable certificates, “Feed-in” fixed tariffs, Feed-in premiums and tendering.

In Bosnia and Herzegovina, regulatory authority for activities in production of electric power from renewable energy sources (RES), including issuing of licences for electric power production and granting of the eligible RES producer is divided between the entities. Having received the eligible producer status from the relevant entity regulatory boards, eligible RES producers become eligible for the following incentives:

- Feed-in tariff or guaranteed purchase price – in line with the tariff system for the period of 12 years in the FBiH and 15 years in RS;
- Feed-in premium, in case of production for personal use or free market trade (RS)
- Advantages in connecting to the grid;
- Priority in the dispatching system;
- Guaranteed takeover of produced electric power by the grid;

Since 2012, Bosnia and Herzegovina is using Feed-in fixed tariffs, which is under entity jurisdiction. In the Federation of BiH, pursuant to Article 22 of the Law on the Use of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of the FBiH, issues no. 70/13 and 5/14), the Federal Government enacted a Regulation on Incentives to Production of Electricity from Renewable Sources and Efficient Cogeneration and Determining of Incentives, which serves as a basis for implementation of incentives for the use of RES electric power in the Federation of BiH. In addition, the Federal

Government, upon proposal from the Federal Minister of Energy, Mining and Industry, enacted a decision establishing the Operator for Renewable Energy Sources and Efficient Cogeneration, as a non-profit institution running activities in line with the Law on the Use of Renewable Energy Sources and Efficient Cogeneration. In addition to activities prescribed by the Law, the RES&EC Operator engages in research and public informing activities concerning RES&EC incentives, develops special educational programmes, organises public and expert debates, workshops and trainings, in order to ensure timely introduction of information on the use of RES&EC to the stakeholders and general population in the Federation of BiH.

In Republika Srpska, this scheme is based on the Law on Renewable Energy Sources and Efficient Cogeneration (Official Gazette of Republika Srpska, issues no. 39/13, 108/13 and 79/15), and the Republika Srpska Renewable Energy Action Plan (the Republika Srpska Government, at the 61st session held on 15.05.2014). Until the incentives system Operator is established, administrative, financial, and other operations of the system of incentives for production of energy using RES and efficient cogeneration will be the responsibility of Elektroprivreda RS.

In the Federation of Bosnia and Herzegovina and Republika Srpska “Feed-in” incentive schemes are awarded to the following RES technologies:

Power Plant Type	Federation of BiH	Republika Srpska
Hydro Power Plants	<ul style="list-style-type: none"> ▪ Micro, up to 23 kW ▪ Mini, 23-150 kW ▪ Small, 150-1000 kW ▪ Medium, 1-10 MW 	<ul style="list-style-type: none"> ▪ < 1 MW ▪ 1 – 5 MW ▪ 5 – 10 MW
Wind Farms	<ul style="list-style-type: none"> ▪ Micro, up to 23 kW ▪ Mini, 23-150 kW ▪ Small, 150-1000 kW ▪ Medium, 1-10 MW ▪ Large, 10-15 MW 	<ul style="list-style-type: none"> ▪ < 10 MW, guaranteed tariff ▪ ≥ 10 MW, premium tariff
Photovoltaic Power Stations (Solar Parks)	<ul style="list-style-type: none"> ▪ Micro, up to 23 kW ▪ Mini, 23-150 kW ▪ Small, 150-1000 kW 	<ul style="list-style-type: none"> ▪ Roof, up to 50 kW ▪ Roof, 50 - 250 kW ▪ Roof, 250 - 1000 kW ▪ Ground, up to 250 kW
Biomass Power Plants	<ul style="list-style-type: none"> ▪ Micro, up to 23 kW ▪ Mini, 23-150 kW ▪ Small, 150-1000 kW ▪ Medium, 1-10 MW 	<ul style="list-style-type: none"> ▪ < 1 MW ▪ 1 – 10 MW
Biogas Power Plants	<ul style="list-style-type: none"> ▪ Micro, up to 23 kW ▪ Mini, 23-150 kW ▪ Small, 150-1000 kW ▪ Medium, 1-10 MW 	<ul style="list-style-type: none"> ▪ Biogas from agricultural waste, up to 1 MW ▪ Landfill gas in efficient cogeneration, up to 1 MW ▪ Landfill gas in efficient cogeneration, 1 - 10 MW
Efficient Cogeneration	<ul style="list-style-type: none"> ▪ Medium, up to 5 MW 	
Efficient Cogeneration – non-conventional energy sources		<ul style="list-style-type: none"> ▪ New gas cogeneration, up to 1 MW ▪ New gas cogeneration, 1 - 10 MW ▪ New lignite cogeneration, up to 1 MW ▪ New lignite cogeneration, 1 - 10 MW

Table 9: Categories of RES technology supported in BiH

Overview of production of electricity from RES that will receive support in the period until 2020 is presented in the following tables. Values are sums for Bosnia and Herzegovina, based on entity incentive plans.

			2010		2011		2012		2013		2014	
			MW	GWh								
Hydropower			1.10	4.50	6.55	29.00	43.63	188.72	49.08	213.25	55.98	247.61
< 1 MW			0.00	0.00	0.45	2.03	9.63	43.43	10.08	45.46	11.37	47.82
1 - 10 MW			1.10	4.50	6.10	27.00	34.00	145.29	39.00	167.79	44.61	199.79
Geothermal			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solar			0.00	0.00	0.21	0.25	2.11	2.86	2.32	3.11	6.90	9.45
Photovoltaic			0.00	0.00	0.21	0.25	2.11	2.86	2.32	3.11	6.90	9.45
concentrated			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tide and Waves Energy			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wind Energy			0.00	0.00	5.00	10.00	20.00	40.00	25.00	50.00	30.00	60.00
inland			0.00	0.00	5.00	10.00	20.00	40.00	25.00	50.00	30.00	60.00
on the sea			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass			0.00	0.00	0.83	2.23	3.30	8.91	4.13	11.14	5.87	19.37
hard			0.00	0.00	0.83	2.23	2.00	5.91	2.50	7.39	3.92	14.87
biogas			0.00	0.00	0.00	0.00	1.30	3.00	1.63	3.75	1.95	4.50
bioliquids			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL			1.10	4.50	12.59	41.48	69.03	240.49	80.52	277.50	98.75	336.43
	2015		2016		2017		2018		2019		2020	
	MW	GWh										
Hydropower	66.72	293.09	79.14	348.04	97.30	426.99	110.89	486.24	135.05	593.76	162.36	712.12
< 1 MW	13.32	56.66	15.88	67.86	20.58	88.20	23.66	101.78	26.97	116.70	32.88	70.00
1 - 10 MW	53.39	236.43	63.27	280.18	76.72	338.79	87.24	384.46	108.08	477.06	129.48	570.12
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solar	8.48	11.75	10.90	14.80	14.50	19.73	16.33	22.33	17.17	23.92	20.00	27.52
Photovoltaic	8.48	11.75	10.90	14.80	14.00	19.14	15.33	21.14	15.67	21.64	18.00	25.14
concentrated	0.00	0.00	0.00	0.00	0.50	0.59	1.00	1.19	1.50	1.78	2.00	2.38
Tide and Waves Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wind Energy	35.00	70.00	45.00	90.00	79.00	170.00	95.00	205.00	123.00	265.00	142.80	307.00
inland	35.00	70.00	45.00	90.00	79.00	170.00	95.00	205.00	123.00	265.00	142.80	307.00
on the sea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	7.63	27.60	9.12	32.70	11.29	40.86	13.13	48.27	16.37	58.82	19.45	70.04
hard	5.35	22.35	3.19	25.95	7.71	32.61	9.23	39.27	11.49	47.58	13.61	56.56
biogas	2.28	5.25	2.93	6.75	3.58	8.25	3.90	9.00	4.88	11.24	5.84	13.48
bioliquids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	117.82	402.44	143.08	485.08	199.79	655.88	233.19	760.83	289.65	941.50	342.48	1116.68

TABLE 10: Overview of production of electricity from RES that will receive support in the period until 2020 in Bosnia and Herzegovina

	2010		2011		2012		2013		2014			
	GWh	%										
Hydropower	4.50	100.0%	29.00	69.9%	188.72	78.5%	213.25	76.8%	247.61	73.6%		
Geothermal	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %		
Solar	0.00	0.0 %	0.25	0.6%	2.86	1.2%	3.11	1.1%	9.45	2.8%		
Tide and Waves Energy	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %		
Wind Energy	0.00	0.0 %	10.00	24.1%	40.00	16.6%	50.00	18.0%	60.00	17.8%		
Biomass	0.00	0.0 %	2.23	5.4 %	8.91	3.7%	11.14	4.0%	19.37	5.8%		
TOTAL	4.50	100%	41.48	100%	240.49	100%	277.50	100%	336.43	100%		
	2015		2016		2017		2018		2019		2020	
	GWh	%	GWh	%								
Hydropower	293.09	72.8%	348.04	71.7%	426.99	64.9%	486.24	63.8%	593.76	63.1%	712.12	63.8%
Geothermal	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %
Solar	11.75	2.9%	14.80	3.0%	19.73	3.0%	22.33	2.9%	23.92	2.5%	27.52	2.5%
Tide and Waves Energy	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %	0.00	0.0 %
Wind Energy	70.00	17.4%	90.00	18.5%	170.00	25.9%	205.00	26.9%	265.00	28.1%	307.00	27.5%
Biomass	27.60	6.9%	32.70	6.7%	40.86	6.2%	48.27	6.3%	58.82	6.2%	70.04	6.3%
TOTAL	402.44	100%	485.54	100%	657.58	100%	761.84	100%	941.50	100%	1116.68	100%

Table 11¹⁰: Overview of production of electricity from RES, per technology shares, which will receive support in the period until 2020 in Bosnia and Herzegovina

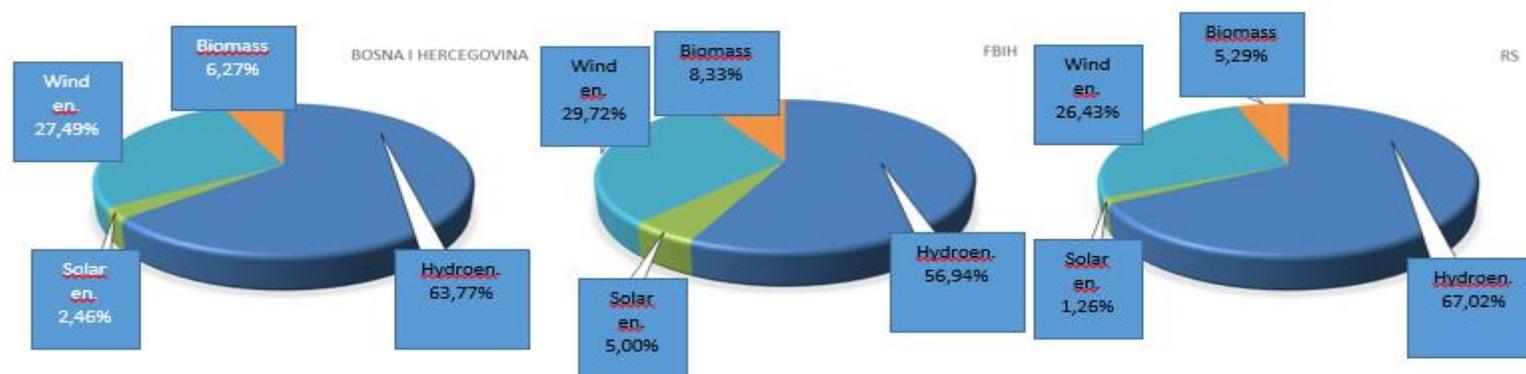


Diagram 1: Comparative view of RES technologies shares in incentive schemes in BiH

¹⁰ Values presented in the table represent sums of values from entity action plans (Federation of Bosnia and Herzegovina and Republika Srpska)

4.4 Support schemes to promote the use of energy from renewable resources in heating and cooling

Law on the Use of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of the FBiH 70/13 and 5/14)

- The Federal Government, upon proposal from the Ministry, shall enact a decision on issuing of the origin guarantee for heat energy generated using RES.
- Origin guarantees from the previous paragraph can be used on the federal territory only.
- Decision on issuing origin guarantee shall be enacted by the Federal Government once the RES&EC Operator is established.
- In addition, the same Law defines special incentive measures for RES in heating and cooling.

The Federal Government, upon proposal from the Ministry, may introduce the following additional incentive measures:

- reliefs for domestic production and procuring of equipment used for heating or cooling using RES, such as solar collectors for hot water, heat pumps for exploitation of aerothermal, geothermal, and hydrothermal energy, etc.,
- creation of local energy market for RES heat energy by introducing a register of heat energy origin and by introducing an obligation for large consumers of heat energy (industrial and city heating plants) to have some of the heat energy generated from RES,
- other incentive measures from the REAP.
- Listed measures include incentive measures for the use of small heating and cooling systems based on renewable energy sources.

In Republika Srpska, in line with the Law on Renewable Energy Sources and Efficient Cogeneration (Article 21, Paragraphs 1 and 2), incentive may be given to any electric power producer who produces energy in a new efficient cogeneration plant of 10 MWe max. In addition, premium may be given to a producer with a plant with installed power between 10 MW and 30 MW.

Article 11, Paragraph 2) of the Law on Renewable Energy Sources and Efficient Cogeneration defines that the ministry in charge of energy must perform annual analyses of achieved production compared to the Action Plan, in order to evaluate and, if necessary, modify measures supporting the production and consumption of RES&EC energy.

Article 32 of the Law on Renewable Energy Sources and Efficient Cogeneration defines that for the purpose of fulfilling the obligations foreseen in the Action Plan concerning share of RES in production of energy for heating and cooling, the Government can introduce the following incentive measures:

- subsidies and other reliefs for domestic production and procuring of equipment used for heating or cooling using RES (solar collectors for hot water, heat pumps for exploitation of aerothermal, geothermal, and hydrothermal energy, etc.),
- creation of local energy market for RES heat energy by introducing a register of heat energy origin,
- introducing an obligation for large consumers of heat energy (industrial and city heating plants) to have some of the heat energy generated from RES and
- other incentive measures.

4.5 Support schemes to promote the use of energy from renewable resources in transport

Currently, there is no state level incentives programme for the use of RES energy in transport. This action plan foresees establishing of the Biofuel Promotion on the level of Bosnia and Herzegovina for the purpose of establishing an incentive system for use of biofuel by introducing advantages for import of raw material for production of biofuel and tax reliefs.

In the Federation of BiH, Regulation on Types, Contents, and Quality of Biofuel in Motor Vehicle Fuels is in force (Official Gazette of the Federation of BiH, issue no. 26/08) and it prescribes names, types of biofuel, limit values of biofuel, quality and proving, biofuel share and monitoring, obligations of the supplier, and monitoring of implementation of the Regulation.

Having in mind that the existing Regulation does not provide sufficient detail concerning the elements that appear to be necessary in the current situation, and that the goals defined therein have not been achieved, the Law on RES&EC prescribes enacting of the Regulation on Amendments to the Regulation on Types, Contents, and Quality of Biofuel in Motor Vehicle Fuels.

At the moment, the FBiH does not have any incentive schemes for biofuels that meet the criteria from Article 21(2) of Directive 2009/28/EC.

In Republika Srpska, Regulation on Types, Contents, and Quality of Biofuel in Motor Vehicle Fuels (Official Gazette of Republika Srpska, issue no. 82/07) defines average annual content of biofuel in all motor vehicle fuels present on the Republika Srpska market as motor vehicle fuels, per year.

Content of biofuel is expressed as a percentage of energy value of fuel marketed as motor vehicle fuel, having in mind energy values of biofuels and fossil fuels. Since the defined goals had not been achieved, in line with the Law on Renewable Sources and Efficient Cogeneration (Official Gazette of RS, issue no. 39/13, 108/13, and 79/15) a new Regulation on Types, Contents, Quality, and Share of Biofuels in Transport (Official Gazette of Republika Srpska, issue no. 8/16) has been enacted.

At the moment, RS does not have any incentive schemes for biofuels that meet the criteria from Article 21(2) of Directive 2009/28/EC.

As one of the important requirements of increased use of RES in transport is reconsidering state laws on excise and customs tariffs and their harmonisation with the policy of RES use.

4.6 Specific measures for the promotion of the use of energy from biomass

At the moment, Bosnia and Herzegovina does not have any incentive programmes for the use of energy generated from biomass, except feed-in tariffs on entity level for stimulating use of biomass in production of electric power.

Entity renewable energy action plans only contain estimates on the following:

- Biomass supply - production and import/export
- Measures to increase biomass availability, taking into consideration other biomass users (forestry and agriculture)

4.6.1 Biomass supply: both domestic and trade

Summary values of volume and type of biomass supply/production for Bosnia and Herzegovina are shown in the following table:

Sector of origin	Quantity of domestic sources	Import		Export	Net quantity	Production of primary energy (ktoe)
		EU	Outside EU	EU/outside EU		
A) Biomass from forestry	1. Direct supply with wood for producing energy from forests and areas under woods					792 ktoe
	Optional – if information are available, you may indicate details on raw material from this category: a) cutting woods b) leftovers after wood cutting (tops, branches, bark, stumps) c) landscaping leftovers (wood biomass from parks, gardens, wood biomass from parks, gardens, alleys, bushes) d) other;					
	2. Indirect supply with biomass for energy generation					
	Optional – if information are available, you may indicate details: a) leftovers from primary processing of wood, furniture industry (bark, sawdust) b) by-products from cellulose and paper industry (black ash, liquid resin) c) processed fire wood d) post-consumer recycled wood (recycled wood for production of energy, waste household wood) e) other (define)					
B) Biomass from agriculture and forestry	1. agricultural crops and fishing products directly intended for energy production					
	Optional – if information are available, you may indicate details: a) tillage crops (cereals, oleaceous plants, sugar beet, corn silage) b) plantations c) fast growing trees c) other crops for energy generation (grasses) d) algae e) other					
	2. Agricultural by-products and leftovers after processing, and by-products in fishery for energy generation					
	Optional – if information are available, you may indicate details: a) straw b) fertilizer c) animal fat d) meat and bone-dust e) by-products of cakes (including oilcakes from oleaceous plants and olives for energy generation) f) fruit biomass (including skin and pits) g) fishery by-products h) pieces of vine, olive trees, fruit h) other					
C) Waste biomass	1. Biodegradable parts of urban waste including the bio-waste (biodegradable waste from gardens and parks, food waste,					

	kitchen waste from households, restaurants, hotels and shops, and similar waste from food processing factories) and landfill gas						
	2. Biodegradable parts of industrial waste (including paper, cardboard, pallets)						
	3. Sewage sludge						

Table 12: Biomass supply in the baseline year – BiH

Sector of origin		2015		2020	
		Expected quantity from domestic sources	Production of primary energy (ktoe)	Expected quantity from domestic sources	Production of primary energy (ktoe)
A) Biomass from forestry	1. Direct supply of wood mass for generation of energy from woods and areas under forests		1022		1081
	2. Indirect supply of wood mass for generation of energy				
B) Biomass from agriculture and forestry	1. agricultural crops and fishing products directly intended for energy production				
	2. Agricultural by-products and leftovers after processing, and by-products in fishery for energy generation				
C) Waste biomass	1. Biodegradable parts of urban waste including the bio-waste (biodegradable waste from gardens and parks, food waste, kitchen waste from households, restaurants, hotels and shops, and similar waste from food processing factories) and landfill gas				
	2. Biodegradable parts of industrial waste (including paper, cardboard, pallets)				
	3. Sewage sludge				

Table 13: Estimated domestic biomass production in 2015 and 2020 – BiH

4.7 Planned use of statistical transfers between the states and planned participation in joint projects with other member states and third countries

is described in detail in entity action plans for the Federation of BiH and RS (Annex 1 and Annex 2). Special measures concerning the Brčko District of Bosnia and Herzegovina are not included in this action plan. These plans provide detailed description per following categories:

- Procedural aspects

- Estimated surplus of produced renewable energy compared to indicative trajectory that could be transferred to other member states
- Estimated possibilities for joint projects
- Estimated needs for renewable energy met from domestic production

Framework for planning statistical transfers

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Estimated excess in forecast										
Estimated excess in NREAP	7.5	9.1	15.7	18.6						19.2
Estimated deficit in forecast document										
Estimated deficit in NREAP					-5.2	-27.8	-14.8	-10.2	-0.8	

Table 14: Estimated surplus and/or deficit of RES production compared to the indicative trajectory that can be transferred to/from other member states or third countries in Bosnia and Herzegovina (ktoe)

It is evident that the planned capacity development for RES production in BiH shares the trend of indicative RES share in the final energy consumption, with a goal to reach the 40% share in GFEC by 2020.

5 ASSESSMENTS

5.1 Total expected contribution and indicative trajectories for RES energy shares

In order to reach the RES share in the final energy consumption in 2020, which is 40% for Bosnia and Herzegovina, NREAP BiH defines indicative trajectory based on expected increase in this share during the period 2010-2020, as well as planned production of energy from renewable sources. Therefore, mandatory goal for consumption of final RES energy, including electricity, energy for heating and cooling, and energy for transport, in the year of 2020 is 1940.5 ktoe.

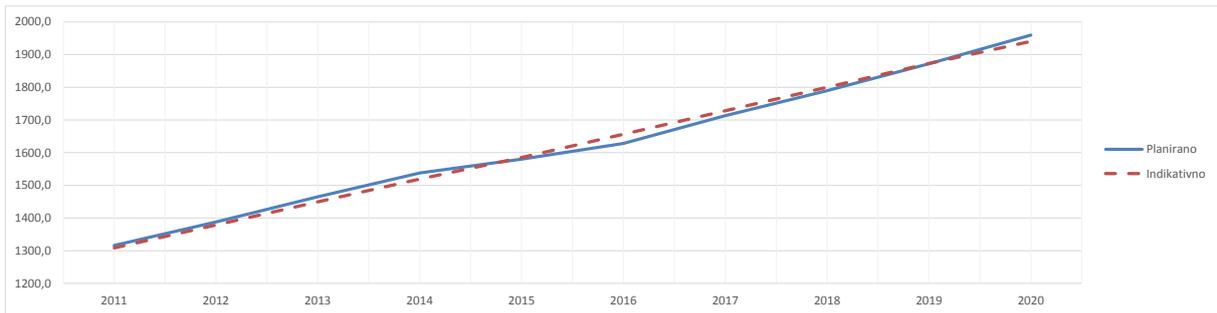


Diagram 2: Comparative presentation of indicative trajectories of increase in consumption of final RES energy and planning of RES energy production for BiH in the period 2010-2020 (ktoe)

Production of RES energy in Bosnia and Herzegovina is dominated by the heating and cooling sector, for which an increase from the baseline 867.2 ktoe to 1085.2 ktoe in 2020 was planned. In addition, the share of electric energy sector in production of RES energy in the planned period increases from the baseline 444.2 ktoe to 760.6 ktoe in 2020. On the other hand, the RES share in transport sector is relatively low compared to other sectors, however, growth to 113.9 ktoe in 2020 is planned, **gdje se bazna vrijednost posmatra koje se odnosi na korištenje OIE u željezničkom transportu**. The diagram below shows trajectories of production during the planned period concerning three main energy sectors.

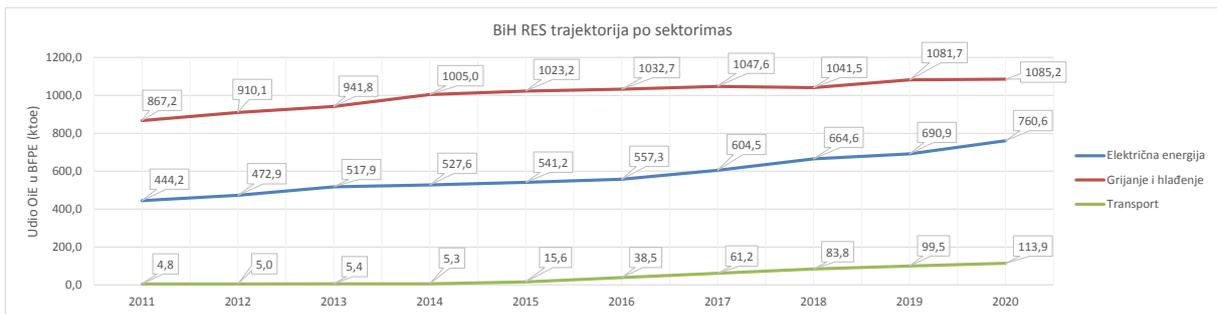


Diagram 3: Planned production of energy from RES in main sectors in Bosnia and Herzegovina for the planned period 2010-2020 (ktoe)

5.1.1 Electricity Sector

The planned trajectory for the electricity sector in Bosnia and Herzegovina shows that the production of electric power from RES in 2020 would be 8846 GWh, which is assumed 3082.2 MW of installed capacities for production of electricity from water flows, solar energy, wind energy, and biomass, out of which 32.7 MW concerns cogeneration plants. Out of that, the dominant share is hydropower

production, with significant shares of wind energy production, and smaller share of biomass and solar energy. Shares of different forms of RES in electric power production for the end of the planned period are shown in the following diagram.

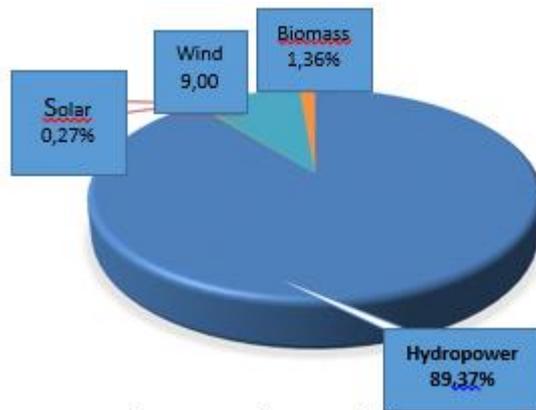


Diagram 4: Shares of different types of RES in production of electricity in 2020 in Bosnia and Herzegovina

Domestic operational capacities have significant experience in constructing **hydropower plants**, and having in mind unused available potentials, it is the easiest way to achieve 2020 goals yielding, at the same time, the greatest benefit. Construction of HPP can be particularly important to development of rural and isolated areas, solving of the issue of unemployment and development of economy in general. Hydropower requires the least incentives, and at the same time significantly reduces the need for fossil fuel energy. In addition, use of hydropower plans from the aspect of environmental protection is also acceptable, provided that optimum power aggregates are installed since they require maximum exploiting with minimal accumulation, as well as to ensure biological flow and positive effect on incidence of floods and landslides.

According to the plan, Bosnia and Herzegovina should construct small, medium and large hydropower plants with 694 MW of installed capacity. Therefore, in 2020, hydropower plants would be generating 7699 GWh of electric power per year.

Diagrams below show planned trajectories of electric power generation in hydropower plants (small, medium, large) in Bosnia and Herzegovina for the period 2010-2020.



Diagram 5: Planned installed power for electricity generation using hydro-potential in Bosnia and Herzegovina for the planned period 2010-2020 (MW)



Diagram 6: Planned electricity generation in hydropower plants in Bosnia and Herzegovina for the planned period 2010-2020 (GWh)

Solar energy is a form of RE which is practically inexhaustible and ecologically most acceptable; however, due to currently expensive production technology it requires the greatest incentives. The desired option is to build micro solar plants to supply the immediate surrounding with the generated power, and to a certain extent support development of economy and local community, as well as development of rural and isolated areas. Use of solar energy for heating and hot water results in significant savings concerning other forms of energy and energy generating materials, as well as in increase in energy efficiency. It is particularly desirable and possible to have domestic, local capacities engaged in construction of solar plants, production and installation of equipment, engineering, and other related services.

Power generation in solar plants represents a smaller share in the overall production of electricity from RES in Bosnia and Herzegovina. The planned trajectory foresees construction of solar plants for power generation in the planned period with installed capacity of 16.2 MW, which would ensure annual production of electricity in amount of 23 GWh. The following diagram shows the trajectory of expansion of production capacities for solar farms for the planned period.

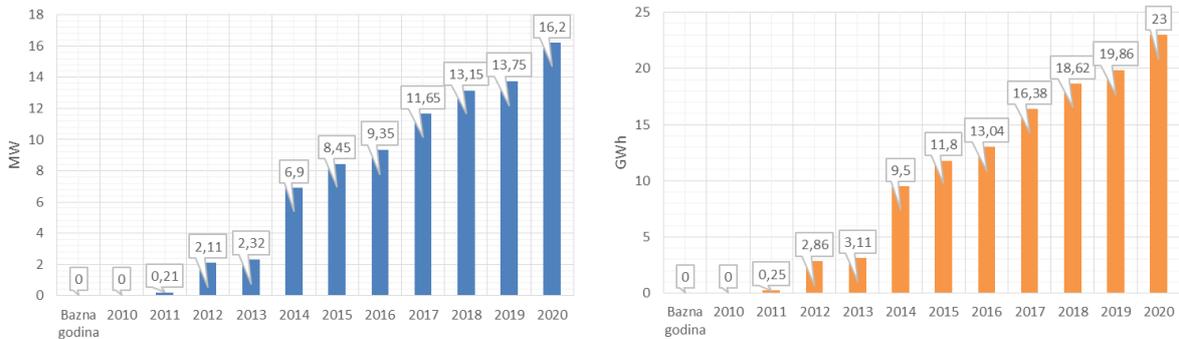


Diagram 7: Planned electricity generation in hydropower plants in Bosnia and Herzegovina for the planned period 2010-2020.

Power generation using **wind energy** has a significant role in the overall production of electric power from RES in Bosnia and Herzegovina.

The planned trajectory foresees construction of wind farms for power generation in the planned period with installed capacity of 330 MW, which would ensure annual production of electric power in amount of 775 GWh. The following diagram shows the trajectory of expansion of production capacities for wind farms for the planned period.

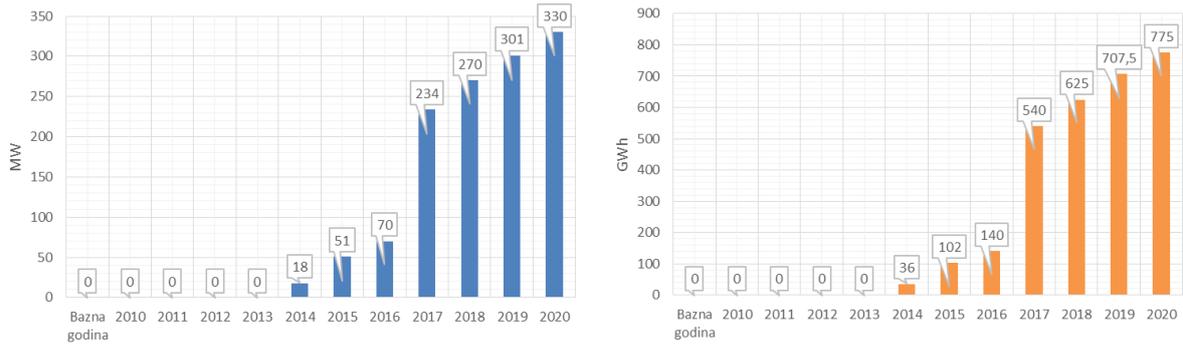


Diagram 8: Planned electricity generation in wind farms in Bosnia and Herzegovina for the planned period 2010-2020

Biomass for generation of heat and electricity is one of possible strategic goals in Bosnia and Herzegovina having in mind available quantities and possible benefits of biomass use. Use of biomass in the central heating system means improved energy efficiency and replacing of fossil fuels, mobilisation of forestry and agriculture for the purpose of achieving sustainable development, creation of jobs, and yielding general benefit. Solid biomass will have the main role in the total RES energy generation for heating and cooling. Solid biomass includes wood biomass and biomass from agriculture.

Advantage of using biomass compared to other types of RES is in the possibility to build power plants with stable production of energy (heat and electricity) on locations convenient for the consumers, which is not the case with other types of RES, since they require positioning the plant where the energy is generated.

The planned trajectory foresees construction of cogeneration biomass power plants in the planned period with an installed capacity of 35.7 MW, which would ensure annual production of electricity in amount of 117.4 GWh. The following diagram shows the trajectory of expansion of production capacities for wind farms for the planned period.

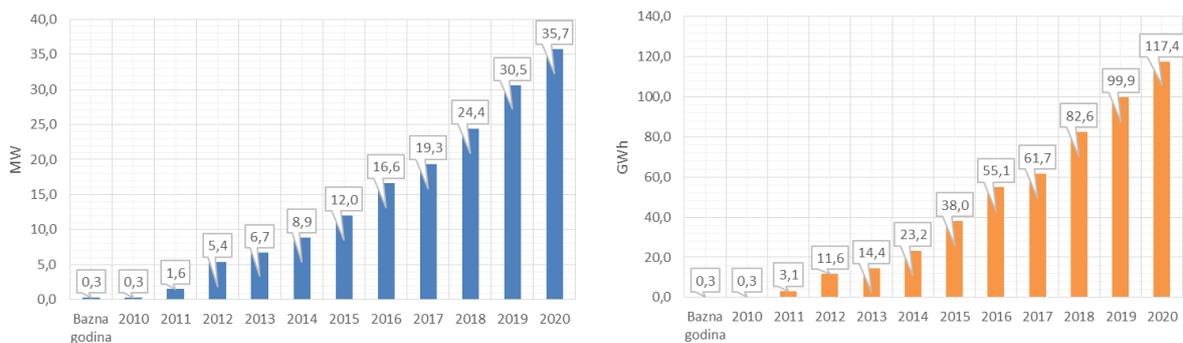


Diagram 9: Planned production of electricity from biomass in Bosnia and Herzegovina for the planned period 2010-2020

Construction of capacities for power generation using other types of RES such as geothermal energy and tide and wave energy is not included in the planned trajectory of power generation capacity development using RES in Bosnia and Herzegovina, which is the subject of this action plan.

5.1.2 Heating and Cooling

The planned trajectory for the heating and cooling sector in Bosnia and Herzegovina shows that production of heat energy from RES in 2020 would be 1085.2 ktoe, which represents an increase in

production of renewable heat energy by 279.4 ktoe compared to the baseline year. The RES structure in heating and cooling in BiH is consisted of biomass energy use (solid, biogas, and liquid biofuels), and geothermal energy (excluding low-temperature geothermal energy in case of heat pumps). The dominant production of heat energy involves biomass, and the goal is to reach 1082.4 ktoe in 2020, while the planned geothermal energy production amounts to modest 2.84 ktoe for the same period.

The foreseen **biomass** for production of heat energy in BiH includes solid biomass and biogas. The use of solid biomass in amount of 1082.35 ktoe in 2020 is dominant. However, the planned increase in production of heat energy using solid biomass compared to the baseline year, and during the planned period, is based on the transitioning from the individual heating systems and central heating systems using fossil fuels to systems using biomass. Due to extreme complexity of collection of data on implemented transitioning from one type of heating to another, especially in individual buildings, and imprecise data, it will be rather complicated to prove that the desired increase in production has been achieved. The following diagram shows the planned trajectory of production of heat energy using solid biomass.

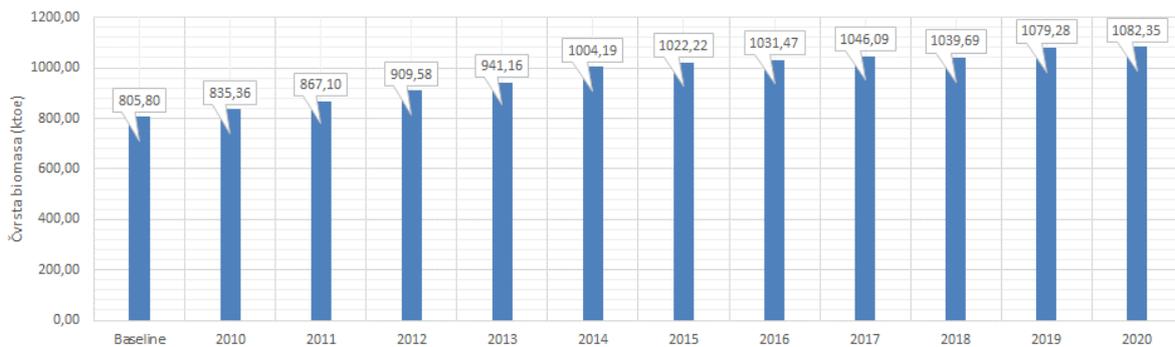


Diagram 10: The planned trajectory of production of heat energy using solid biomass in Bosnia and Herzegovina for the planned period 2010-2020.

Use of heat energy from **biofuels** is not significantly present in the overall structure of energy production using RES in Bosnia and Herzegovina. In fact, the planned trajectory foresees annual production of biogas of 1.22 ktoe, which is almost insignificant compared to the use of solid biomass. The diagram below shows the planned trajectory for production of heat energy using biogas.

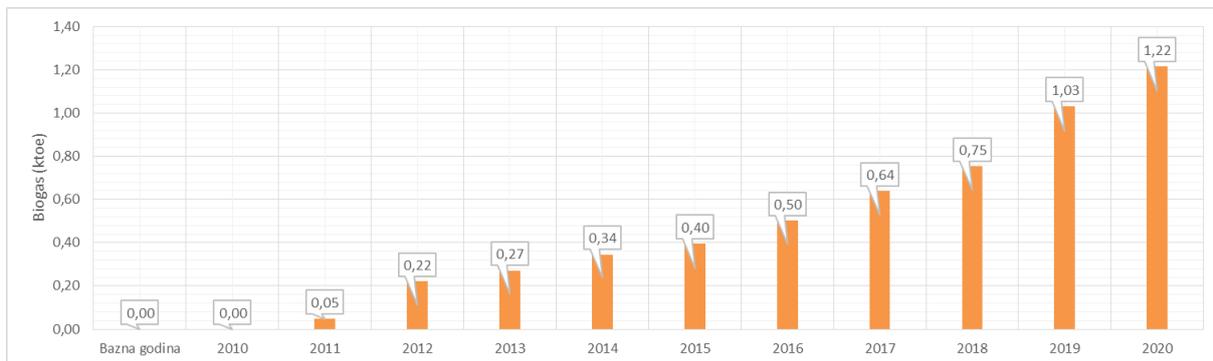


Diagram 11: The planned trajectory of production of heat energy using biogas in Bosnia and Herzegovina for the planned period 2010-2020.

Construction of capacities for production and use of liquid biofuels is not included in the planned trajectory of power generation capacity development in Bosnia and Herzegovina, which is the subject of this action plan.

In addition, the use of renewable heat energy from heat pumps, including aerothermal, geothermal, and hydrothermal energy, is not subject to this action plan.

5.1.3 Transport

Total value of renewable energy in transport in 2020 in Bosnia and Herzegovina will be 113.9 ktoe. Renewable energy consumed in transport in 2020 will mainly include biofuel energy, while the use of electricity in transport, hydrogen from RES, is not foreseen in this action plan.

It is foreseen that the majority of the used biofuel will involve biodiesel and bioethanol.

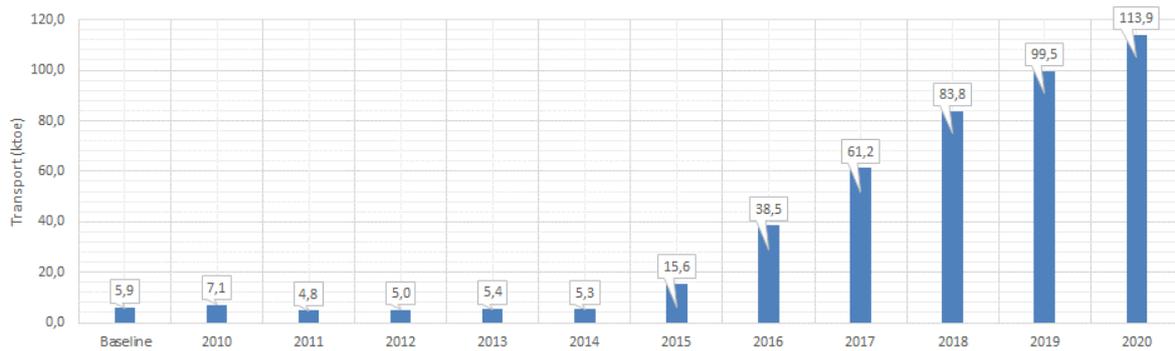


Diagram 12: Planned use of renewable energy in transport in Bosnia and Herzegovina for the planned period 2010-2020.

Planned trajectories

The following tables provide details on planned trajectories of RES use in Bosnia and Herzegovina over the planned period, for electricity sector, heating and cooling, and transport, and overall shares per different technologies.

	Baseline year		2010		2011		2012		2013		2014	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh
Hydropower	2006	5711	2119	7241	2131	5019	2147	5337	2155	5857	2168	5915
< 1 MW	1.90	8.94	8.84	37.08	10.91	28.85	12.26	34.93	13.11	58.43	17.86	75.17
1 - 10 MW	26.32	132.92	42.32	182.04	52.32	158.42	66.82	230.08	74.32	321.42	82.28	363.47
> 10 MW	1978.00	5568.80	2068.00	7021.80	2068.00	4831.80	2068.00	5071.80	2068.00	5476.80	2068.00	5476.80
out of which pump	440.00	0.00	440.00	0.00	440.00	0.00	440.00	0.00	440.00	0.00	440.00	0.00
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solar	0.00	0.00	0.00	0.00	0.21	0.25	2.11	2.86	2.32	3.11	6.90	9.50
Photovoltaic	0.00	0.00	0.00	0.00	0.21	0.25	2.11	2.86	2.32	3.11	6.90	9.50
concentrated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tide and Waves Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wind Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.00	36.00
inland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.00	36.00
on the sea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	0.30	0.30	0.30	0.30	1.56	3.12	5.40	11.57	6.68	14.40	8.87	23.22
hard	0.00	0.00	0.00	0.00	0.50	1.48	2.00	5.91	2.50	7.39	3.92	14.87
biogas	0.30	0.30	0.30	0.30	1.06	1.64	3.40	5.66	4.18	7.01	4.95	8.35
bioliquids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	2007	5830	2119	7360	2133	5166	2155	5500	2164	6023	2202	6136
out of which CHP	0.00	(501.25)	0.00	(632.83)	1.18	(444.23)	2.26	(472.91)	5.88	(517.90)	7.97	(527.57)
		0.00	0.00	0.00	1.18	2.26	4.70	9.06	5.88	11.32	7.97	16.58
	2015		2016		2017		2018		2019		2020	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh
Hydropower	2185	5986	2213	6111	2258	6239	2396	6801	2439	6997	2700	7699
< 1 MW	20.56	86.90	29.72	125.16	34.42	145.50	37.81	160.36	45.76	194.18	53.74	228.58
1 - 10 MW	96.49	422.35	115.45	509.35	130.33	568.21	143.14	622.88	171.13	744.98	197.70	859.04
> 10 MW	2068.00	5476.80	2068.00	5476.80	2093.51	5524.87	2214.56	6017.76	2222.07	6057.90	2448.78	6611.46
out of which pump	440.00	0.00	440.00	0.00	440.00	0.00	440.00	0.00	440.00	0.00	492.00	126.00
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solar	8.45	11.80	9.35	13.04	11.65	16.38	13.15	18.62	13.75	19.86	16.20	23.00
Photovoltaic	8.45	11.80	9.35	13.04	11.65	16.38	13.15	18.62	13.75	19.86	16.20	23.00
concentrated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tide and Waves Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wind Energy	51.00	102.00	70.00	140.00	234.00	540.00	270.00	625.00	301.00	707.50	330.00	775.00
inland	51.00	102.00	70.00	140.00	234.00	540.00	270.00	625.00	301.00	707.50	330.00	775.00
on the sea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	12.00	38.04	16.64	55.07	19.35	61.71	24.40	82.55	30.53	99.93	35.73	117.38
hard	6.27	28.35	8.96	42.30	10.12	46.26	13.42	64.22	16.35	76.13	19.23	89.56
biogas	5.73	9.69	7.68	12.77	9.23	15.45	10.98	18.33	14.18	23.80	16.50	27.82
bioliquids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	2256	6294	2309	6481	2523	7031	2703	7729	2784	8036	3082	8846
out of which CHP	11.00	(541.15)	15.04	(557.25)	17.55	(604.54)	39.90	(664.60)	27.83	(690.94)	32.73	(760.61)
		24.85	15.04	34.88	17.55	39.90	22.20	51.93	27.83	63.99	32.73	75.28

Table 15¹¹: Planned goals of electricity production using RES in the period 2010 – 2020, in the existing and new production capacities – BiH

¹¹ Values presented in the table represent sums of values from entity action plans (Federation of Bosnia and Herzegovina and Republika Srpska) However, only total value in GWh (ktoe) includes planned value for the Brčko District of BiH.

ktoe	B. year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Geothermal energy (excluding low-temperature geothermal energy in case of heat pumps)	0.00	0.00	0.12	0.53	0.66	0.83	0.97	1.24	1.54	1.78	2.41	2.84
Solar energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	792	835.36	867.10	909.58	941.16	1004.19	1022.22	1031.47	1046.09	1039.69	1079.28	1082.35
Hard	792	799.65	796.17	877.04	901.70	947.45	979.80	1001.09	1028.00	1033.36	1082.23	1081.13
Biogas	0.00	0.00	0.05	0.23	0.28	0.36	0.42	0.53	0.66	0.76	1.05	1.22
Liquid biofuels	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewable energy from heat pumps	0	0	0	0	0	0	0	0	0	0	0	0
Out of which aerothermal												
Out of which geothermal												
Out of which hydrothermal												
TOTAL	792	835.4	867.2	910.1	941.8	1005.0	1023.2	1032.7	1047.6	1041.5	1081.7	1085.2
Out of which remote heating	7.8	7.9	8.1	9.1	9.4	9.8	10.2	10.6	11.1	11.4	12.7	13.3
Out of which household biomass	784.2	827.5	859.1	901.0	932.5	995.2	1013.0	1022.1	1036.5	1030.0	1069.0	1071.8

Table 16¹²: Estimated overall share (annual energy consumption) expected from each renewable energy technology in Bosnia and Herzegovina in meeting the mandatory goals for 2020 and indicative temporary trajectory for shares of energy from renewable sources for heating and cooling for the period 2010-2020.

ktoe	B. year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bioethanol/bio-ETBE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	10.9
Out of which biofuel Article 21, Paragraph 2												
Out of which imported												
Biodiesel	0.0	0.0	0.0	0.0	0.0	0.0	10.0	32.6	55.2	77.4	83.8	96.4
Out of which biofuel Article 21, Paragraph 2												
Out of which imported												
Hydrogen from RES												
Renewable electric power	5.9	7.1	4.8	5.0	5.4	5.3	5.6	5.9	6.0	6.4	6.4	6.7
Out of which road transport												
Out of which non-road transport												
Other (biogas, vegetable oils, etc.)												
Out of which biofuel Article 21, Paragraph 2												
TOTAL	5.9	7.1	4.8	5.0	5.4	5.3	15.6	38.5	61.2	83.8	99.5	113.9

Table 17¹³: Estimated overall share expected from each renewable energy technology in Bosnia and Herzegovina in meeting the mandatory goals for 2020 and indicative temporary trajectory for shares of energy from renewable sources for transport for the period 2010-2020.

¹² Values presented in the table represent sums of values from entity action plans (Federation of Bosnia and Herzegovina and Republika Srpska) and planned values for the Brčko District of BiH, based on estimates.

¹³ Values presented in the table represent sums of values from entity action plans (Federation of Bosnia and Herzegovina and Republika Srpska) and planned values for the Brčko District of BiH, based on estimates.

5.2 Estimate of the total contribution expected from EE measures

Acting in line with requirements of Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services (ESD), Bosnia and Herzegovina has prepared a proposal for National Energy Efficiency Action Plan (NEEAP), focusing on the entire period 2010-2018, providing overall goal for 2018, as well as direct goals for 2012 and 2015.

Based on the ESD requirements, Bosnia and Herzegovina has adopted a national indicative goals of energy savings of at least 9% of the final domestic consumption for the period of 9 until 2018, which means planned energy savings of 12.47 PJ (297.8 ktoe), including 3.77 PJ (90.1 ktoe) energy savings for Republika Srpska and 8.33 PJ (198.9 ktoe) for the Federation of BiH.

The energy savings goal can be achieved by introducing energy efficiency measures in the following:

- Residential sector,
- commercial sector and services,
- industry and
- transport.

Residential sector

Residential sector is the largest individual segment considered in the NEEAP with about 58% of the baseline net final energy consumption which was 145.54 PJ (3476.1 ktoe) for Bosnia and Herzegovina.

In order to improve energy efficiency in this sector, implementation of the following programmes/measures is foreseen:

- Minimum energy efficiency standard for energy powered household devices;
- Reconstruction of the existing residential buildings and private houses;
- Energy efficient construction of new buildings;
- Energy efficient heating system;
- Mandatory distribution and calculation of heating costs, in residential buildings and other buildings, in line with the actual consumption;
- Domestic production of renewable sources;
- Introduction of “green” public procurements;

According to the NEEAP proposal, by the end of 2018, the housing sector should have energy efficiency programmes/measures introduced in order to save 5.25 PJ (125.4 ktoe) of energy annually. If this trend continues until 2020, the overall savings would be 6.41 PJ (153.1 ktoe).

Commercial sector and services

Commercial sector and services include commercial and public services. Share of the services sector in the overall consumption is approx. 7%. Improving energy efficiency in this sector includes implementation of the following programmes/measures:

- Energy efficient use of electric power in commercial / public buildings;
- Energy efficient HVAC systems in the existing and newly built energy efficient and passive commercial and public buildings;
- Energy efficient reconstruction of the existing and sustainable construction of new buildings;
- Construction of the energy management system;
- Integrated generation of energy from renewable sources;
- Integrated cogeneration/three-generation systems;
- The “Energy Efficiency in Water Supply Networks” Programme;

- Energy efficient lights.

According to the NEEAP proposal, by the end of 2018, the commercial sector and services should have energy efficiency programmes/measures introduced in order to save 1.62 PJ (38.7 ktoe) of energy annually. If this trend continues until 2020, the overall savings would be 1.98 PJ (47.3 ktoe).

Industry

The industry sector share in the total final consumption in the baseline year 2010 is approx. 20.1 %. Industry is a sector going through a long term decline in energy consumption which is a result of technological progress (improved energy efficiency) and of reduced volume caused by the financial crisis. Energy efficiency measures package for the industry sector includes:

- Improved energy characteristics of processes;
- Improved energy characteristics of new non-residential facilities;
- Improved heat generation systems in industrial processes;
- CHP - Combined heat and power;
- Installation of renewable energy source systems for generating power for industrial purposes;
- Energy efficiency networks for efficient industry;

According to the NEEAP proposal, by the end of 2018, the industry sector should have energy efficiency programmes/measures introduced in order to save 4.79 PJ (114.4 ktoe) of energy annually. If this trend continues until 2020, the overall savings would be 5.85 PJ (139.7 ktoe).

Transport

The transport sector represents approx. 14.9 % of total final energy consumption in the baseline 2010. With more than 90%, road transport has the largest share in energy consumption in this sector. The energy efficiency measures package aimed at reducing energy consumption in transport includes:

- Reconstruction of the road fleet in public/commercial sector;
- Awareness campaigns dedicated to energy efficiency in transport and demo (pilot) projects;
- Infrastructural measures in transport aimed at saving energy

Subject to additional consideration will be incentive measures for use of low-emission (up to 130 g CO₂/km), hybrid vehicles and vehicles running on alternative fuels - for legal and private persons using subsidies for investments, but also by ensuring free parking space, right to use yellow lane, etc.

According to the NEEAP proposal, by the end of 2018, the industry sector should have energy efficiency programmes/measures introduced in order to save 0.81 PJ (19.3 ktoe) of energy annually. If this trend continues until 2020, the overall savings would be 0.99 PJ (23.6 ktoe).

5.3 Preparing Renewable Energy Action Plan and Monitoring its Application

National Renewable Energy Action Plan of Bosnia and Herzegovina was prepared by the Action Plan Working Group under and led by the Ministry of Foreign Trade and Economic Relations of BiH, and

with involvement of the Federal Ministry of Energy, Mining and Industry, RS Ministry of Industry, Energy and Mining, and representatives of the Brčko District Government.

The Action Plan sublimates entity action plans and collectively defines parameters for Bosnia and Herzegovina, and includes programmes to be implemented from the state level. This Action Plan is a sublimation of the Republika Srpska Renewable Energy Action Plan (enacted by the Republika Srpska Government at the 61st session held on 15.05.2014) and the Renewable Energy Action Plan of the Federation of BiH (enacted by the Federal Government at the 118th session held on 05.06.2014). In addition, the Action Plan contains parameters for the Brčko District of Bosnia and Herzegovina which have not been subject to adoption by the BD BiH Government so far.

The report on realisation of the Action Plan will be regularly prepared by the Ministry of Foreign Trade and Economic Relations of BiH, and will be based upon entity reports on realisation of action plans, and the report on implementation of measures implemented on the state level.

ANNEX 1: RENEWABLE ENERGY ACTION PLAN OF THE FEDERATION OF BIH (REAP)

ANNEX 2: RENEWABLE ENERGY ACTION PLAN OF REPUBLIKA SRPSKA