



**THE REPUBLIC OF SERBIA**  
**The Ministry of Mining and Energy**

**Progress Report on the Implementation of the National Renewable Energy Action Plan  
of the Republic of Serbia for 2016 and 2017**

## LIST OF ABBREVIATIONS

GFEC	– Gross final energy consumption
GHG	– Greenhouse gases
EE	– Energy efficiency
EU	– European Union
EnC	– Energy Community
EC	– European Community
IPA	– Instrument for Pre-Accession Assistance of the European Union
ktoe	– Kilotonne of oil equivalent
Mtoe	– Million tonnes of oil equivalent
SHPP	– Small hydropower plants
NREAP	– National Renewable Energy Action Plan
RES	– Renewable energy sources
PPA	– Model power purchase agreement
TEEnC	– Treaty establishing the Energy Community
EUROSTAT	– Statistical Office of the European Community

## INTRODUCTION

Adopting the Law on ratifying the Treaty establishing the Energy Community between the European Community and the Republic of Albania, Republic of Bulgaria, Bosnia and Herzegovina, Republic of Croatia, Former Yugoslav Republic of Macedonia, Republic of Montenegro, Romania, Republic of Serbia and United Nations Interim Administration Mission in Kosovo in line with United Nations Security Council resolution 1244 (“Official Gazette of the Republic of Serbia”, Number 62/06), the Republic of Serbia became an Energy Community member in 2006.

Pursuant to the provision set forth in Article 20 of the Treaty establishing the Energy Community (hereinafter referred to as: TEEEnC), the Republic of Serbia has undertaken to implement European directives in the field of renewable energy sources (hereinafter referred to as: RES) – Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources and Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport. As of 2009, the aforementioned Directives were gradually superseded and eventually repealed in January 2012 with the new Directive 2009/28/EC of the European Parliament and of the Council of 23<sup>rd</sup> 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 CELEX No. 32009L0028.

In line with the Directive 2009/28/EC and Energy Community Ministerial Council Decision of 18<sup>th</sup> October 2012 (D/2012/04/MC-EnC) a very demanding and binding goal of achieving a 27% share of renewable energy sources in gross final energy consumption in 2020, was set for the Republic of Serbia. The same Decision required preparation of the National Renewable Energy Action Plan of the Republic of Serbia in line with the approved template for the preparation of this document (Decision 2009/548/EC) and its submission to the Energy Community Secretariat. The National Renewable Energy Action Plan was adopted by the Republic of Serbia in June 2013 (“Official Gazette of the Republic of Serbia”, No. 53/13).

Pursuant to Article 66 of the Energy Law (“Official Gazette of the Republic of Serbia”, No. 145/14) the Ministry in charge of activities in the energy sector shall monitor the National Renewable Action Plan implementation and submit a report on its implementation to the Government (hereinafter referred to as: Report). Moreover, in line with Article 15 of the Energy Community Ministerial Council Decision (D/2012/04/MC-EnC), TEEEnC signatories shall provide the EnC Secretariat with a Report every other year. The first Report was submitted by 31<sup>st</sup> December 2014. The second Report was submitted by 31<sup>st</sup> December 2016, and it contains data for 2014 and 2015. The third Report shall be submitted by 31<sup>st</sup> December 2018 and it contains data for 2016 and 2017.

The third Report of the Republic of Serbia was made in line with the recommended template of the European Commission (which is adapted by the EnC Secretariat for TEEEnC signatories), definitions and calculation rules set forth in the Directive 2009/28/EC and Regulation (EC) No. 1099/2008 of the European Parliament and of the Council.

Data shown in the Report were determined based on the 2018 Energy Balance of the Republic of Serbia, which was adopted by the Government on 29<sup>th</sup> December 2017 (“Official Gazette of the Republic of Serbia”, 119/17) and the working version of the Energy Balance for 2019 and statistical data provided by the Statistical Office of the Republic of Serbia to EUROSTAT for 2016 and 2017. In addition to the 2016 Energy Balance, the Register of Privileged Electricity Producers (<http://www.mre.gov.rs/doc/registar28.11.html>), maintained by the Ministry of Mining and Energy pursuant to Article 75 of the Energy Law, was also used as a data source for the Report preparation.

The Energy Balance for 2019 presents realized production and consumption for 2017, estimated data for 2018 and forecasts for 2019. The balancing of energy from renewable energy

sources includes production and consumption of electricity from small and large watercourses, wind and solar energy, as well as the production and consumption of heat energy from geothermal energy and solid biomass (firewood, pellet and briquette). Geothermal energy utilization is tracked by the Statistical Office of the Republic of Serbia as part of its statistical research, and the figures on such utilization do not include geothermal energy utilization through the use of heat pumps. Geothermal energy is used solely for heating purposes.

The solid biomass production and consumption includes firewood, pellet and briquette production and consumption for energy purposes to meet the heating needs. Article 5, Paragraph 3 of the Directive 2009/28/EC stipulates that motor biofuels and other liquid biofuels that do not meet the sustainability criteria set forth in Article 17, Paragraphs 2, 3, 4, 5 and 6 of the Directive, shall not be taken into account while calculating the share of renewable energy sources. Having in mind that the by-laws defining sustainability criteria and their verification have still not been adopted, the consumption of biofuel could not be shown for the purposes of meeting the RES goal in the transport sector.

### **1. Sectorial and overall shares of RES and actual consumption of energy from renewable sources in the preceding 2 years (2016 and 2017)**

*(Article 22 (1) of Directive 2009/28/EC).*

**Table 1:** The sectorial (electricity, heating and cooling, and transport), shares of energy renewable sources and overall share of energy from renewable sources in GFEC

	<b>2016</b>	<b>2017</b>
RES – heating and cooling (%)	24.65	24.43
RES – electricity (%)	29.15	28.71
RES - transport (%)	1.23	1.18
RES – overall share in GFEC (%)	20.98	20.60
<i>from cooperation mechanism (%)</i>	0	0
<i>Surplus for cooperation mechanism (%)</i>	0	0

**Table 1a:** Calculation of contribution of using RES of each sector to GFEC (ktoe)

	<b>2016</b>	<b>2017</b>
(A) GFEC of RES for heating and cooling	1046.7	1055.2
(B) GFEC of electricity from RES	910.4	910.9
(C) GFEC of energy from RES in transport *	9.2	9.3
(D) Gross total RES consumption (estimated surplus in relation to the target)	1966.2	1975.4
(E) Transfer of RES to EU Member States	0	0
(F) Transfer of RES from other Contracting Parties and 3rd countries	0	0
(G) RES consumption adjusted for target (D)-(E)+(F)	1966.2	1975.4

*\*The share of biofuels in transport is not shown, as there is no established system for verification of the fulfilment of the sustainability criteria for biofuels. After adoption of by-laws in the field of biofuels, it will be possible to display these data in the following reports*

### **Calculation method for individual values given in Table 1 and Table 1a**

Gross final energy consumption (GFEC) was calculated in line with Article 2 of the Directive 2009/28/EC as an overall final energy consumed for energy purposes in the industry, transport, households, public and commercial activities, agriculture, forestry and fisheries, including own consumption of electricity and heat energy in the sector of electricity and heat energy production, and losses in the transmission and distribution of electricity and heat energy.

The share of renewable energy sources in heating and cooling is calculated as the result of dividing the gross final consumption of energy from renewable sources in the heating and cooling sector (as defined in Article 5, Paragraph 1, Item b) and Article 5, Paragraph 4 of the Directive 2009/28/EC) by the gross final consumption of energy for heating and cooling.

The gross final consumption of energy from renewable sources for heating and cooling is calculated as the quantity of energy produced from renewable sources used in district heating and cooling systems, plus the quantity of energy from renewable sources used in industry, households, public and commercial activities, agriculture, forestry and fisheries, for heating, cooling and processing purposes (Article 5, Item 4 of the Directive 2009/28/EC).

The share of renewable energy sources in electricity is calculated as the GFEC from renewable energy sources (as defined in Article 5, Paragraphs 1 and 3 of the Directive 2009/28/EC) divided by the gross final consumption of electricity.

Gross final consumption of electricity from renewable energy sources is calculated as the quantity of electricity produced from renewable energy sources, excluding the electricity production in pumped storage units (reversible power plants) (Article 5, Item 3 of the Directive 2009/28/EC).

The share of renewable energy sources in transport is calculated as the final energy from renewable sources consumed in transport (please see Article 5, Paragraph 1, Item (c) and Article 5, Paragraph 5 of the Directive 2009/28/EC) divided by the consumption in transport of: 1) oil; 2) diesel; 3) biofuel used in road and rail transport and 4) electricity used in land transport, whereby it was taken into account that energy counted in other sectors is not counted in the transport sector, in order to avoid double counting.

The GFEC from renewable sources is calculated as the sum of: gross final consumption of electricity from renewable energy sources, gross final consumption of energy from renewable sources for heating and cooling and gross final consumption of energy from renewable sources in transport.

All calculations were made by using the RES SHARE TOOL tool downloaded from the European Commission website <https://ec.europa.eu/eurostat/web/energy/data/shares> which is used to calculate the share of RES in EU countries and members of the EnC, in order to monitor achievement of goals in the field of RES. RES SHARE TOOL is a tool of the European Statistical Office - EUROSTAT and it has been adapted to calculate the share of energy from renewable sources in accordance with Directive 2009/28/EC. The main advantage of this tool is that the same methodology for calculating individual values is applied to each EU member or EnC member. Its application prevents irregularities that might arise using a variety of methods and parameters when calculating the share of RES.

## Results achieved in terms of RES utilization increase and analysis of the shown data

Since 2009, when the legal framework with incentive measures (“feed-in” tariffs) was established for the first time in the Republic of Serbia, until December 2018, 222 new plants with the total installed capacity of 111 MW were constructed for the production of electricity from RES, as follows:

- 1) 100 small hydropower plants with the total installed capacity of around 63 MW (including two old, reconstructed power plants: Ovcar banja and Medjuvrsje);
- 2) 105 solar power plants with the capacity of 8,78 MW;
- 3) 4 wind power plants with the capacity of 25 MW, while 5 wind power plants have gained the temporary privileged producer status with the total capacity of 475 MW,
- 4) 13 biogas power plants with the total capacity of around 14 MW.

Data source is the Register of Privileged Electricity Producers (<http://mre.gov.rs/doc/registar-020818.html>).

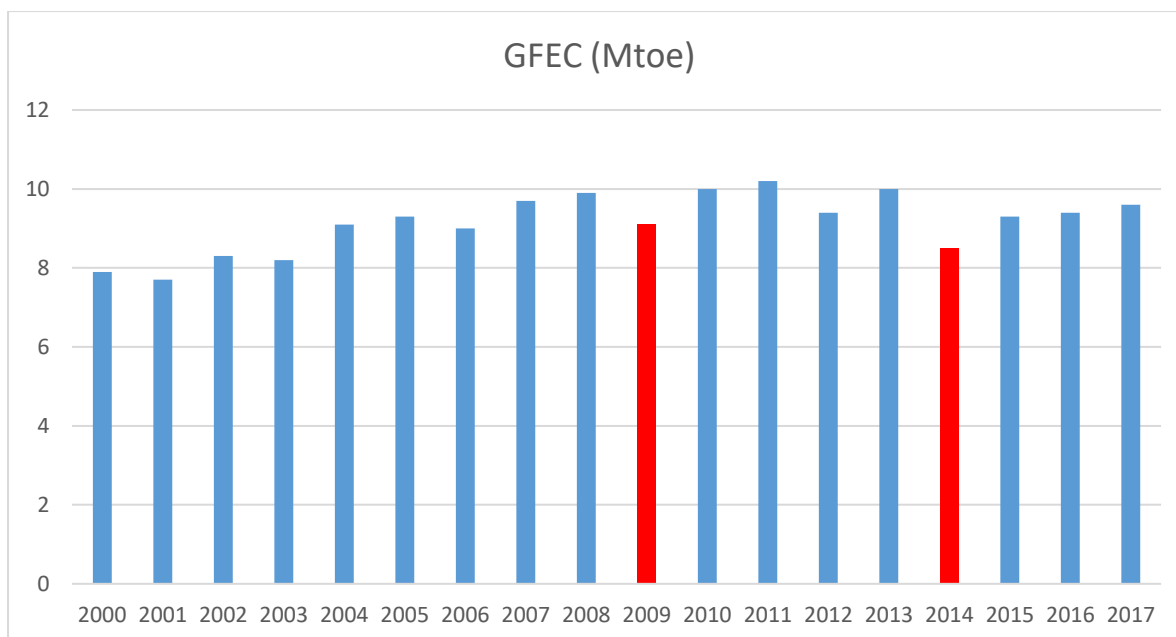
A detailed overview of the newly built plants is given in the table below.

### Overview of the planned (in line with NREAP) and constructed power plants in the RES field

Power plant type	Planned in line with NREAP [MW]	Current state, December 2018			
		Temporary privileged producer status [number and MW]		Privileged producer status (constructed) [number and MW]	
HPP larger than 10 MW	250	-	-	0	0
HPP up to 10 MW	188	16	12.6	100	62.9
Biomass	100	1	2.4	0	0
Biogas	30	7	7.4	13	14.2
Wind	500	5	475	4	25
Solar	10	0	0	105	8.78
Geothermal	1	0	0	0	0
Waste	3	0	0	0	0
Landfill gas	10	0	0	0	0

### The gross final energy consumption in Serbia, in the period from 2000 to 2017 (Mtoe)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
7.9	7.7	8.3	8.2	9.1	9.3	9.0	9.7	9.9	9.1	10.0	10.2	9.4	10.0	8.5	9.3	9.4	9.6

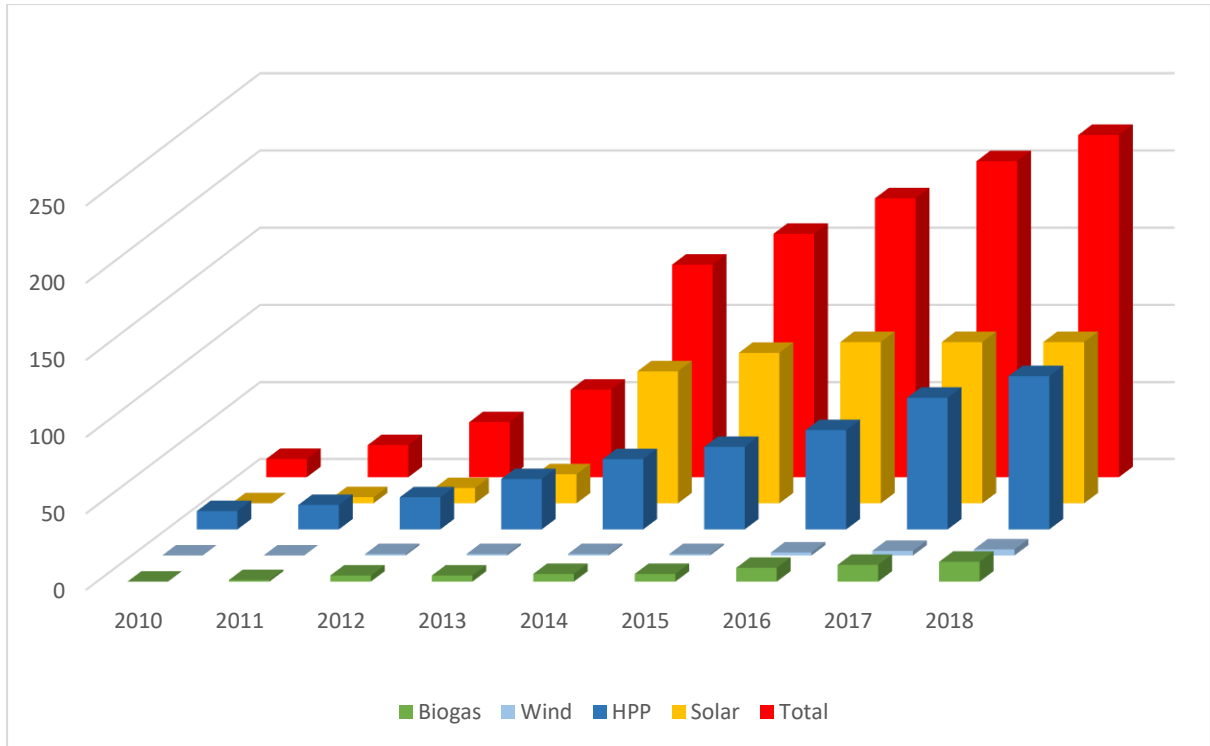


### The gross final energy consumption in Serbia, in the period from 2000 to 2017 (Mtoe)

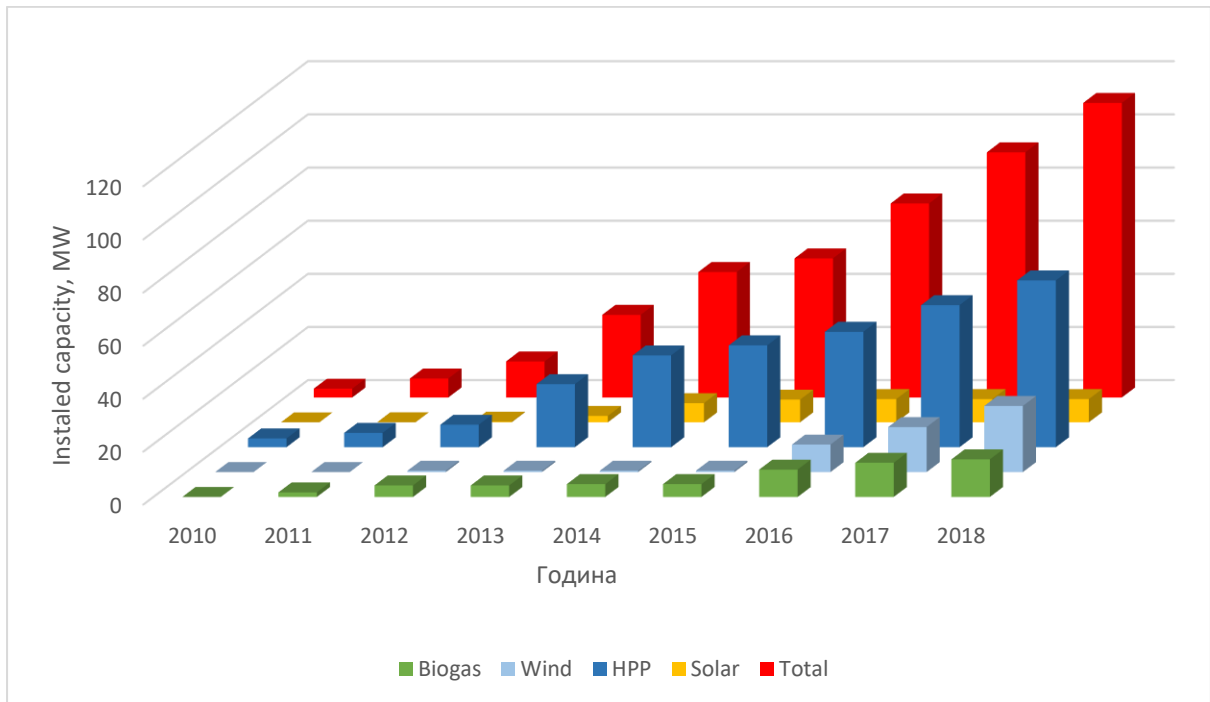
Looking at data from Table 1, as well as RES shares from previous years, it may be assumed that the undertaken incentive measures do not generate results. However, as it was emphasized in the previous reports on the implementation of NREAP, the year 2009, which was chosen as the base year for calculating the binding target, had clearly expressed specificities which led to the fact that RES share in GFEC for 2009 was 21.2%, which is considerably higher value than the real perennial average value. All of this shows that for small countries which are exposed to a strong influence on GFEC from big investments in economy, the RES share in GFEC is not a representative data on the status of renewable energy sources in the energy sector. This was particularly in 2014 when a significant decrease of GFEC in 2014 in relation to the average perennial trend led to a considerably higher RES share in GFEC in relation to other years.

Namely, since 2010 when the system of “feed-in” tariffs started to be implemented in Serbia, there has been a continuous growth of new capacities for production of electricity from RES. The growth is more significant in terms of the number of newly constructed capacities than in respect to the installed capacity, as it is shown on Graphs 1, 2 and 3.

It took a few years for the new system of incentives to come to life, and then to gain investors’ confidence in the functioning of the system, as well as to prepare appropriate projects, especially projects for large power plants.

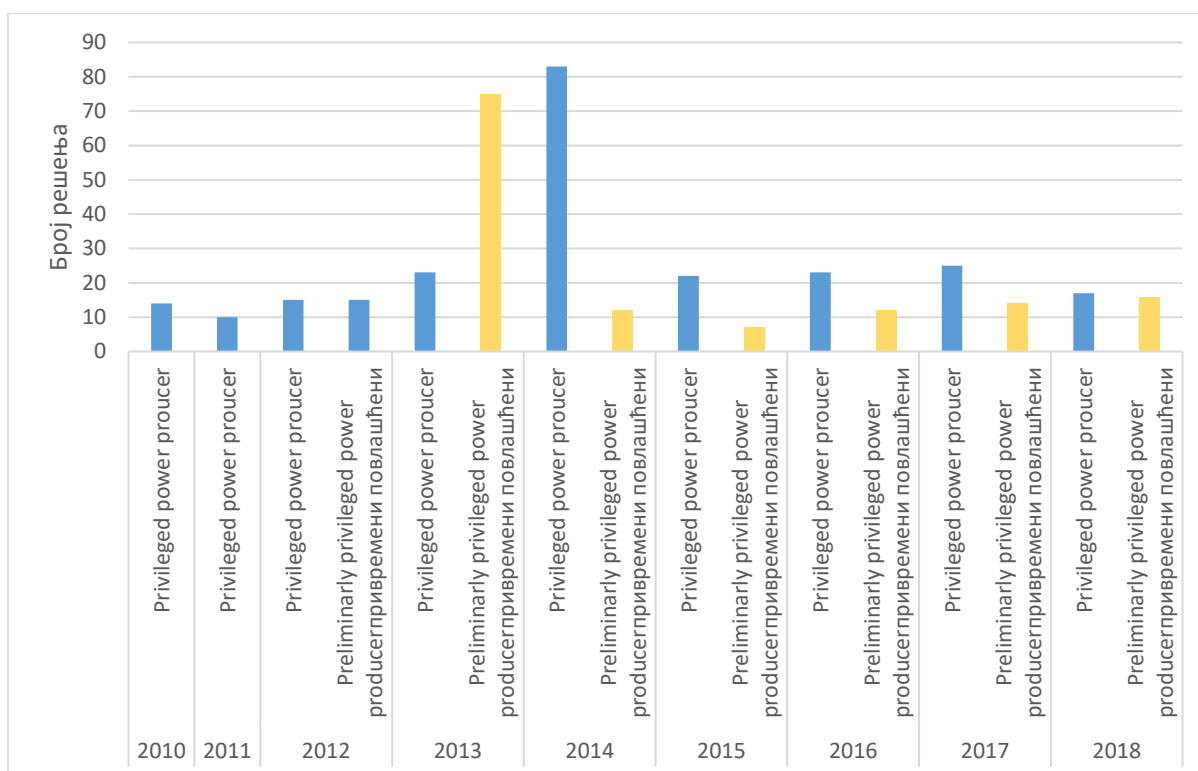


Graph 1 The number of all types of power plants on RES from introducing the system of incentives with “feed-in” tariffs



Graph 2 Installed capacities of all types of power plants on RES from introducing the system of incentives with “feed-in” tariffs





Graph 3 The number of issued status of temporary and privileged producers from introducing the system of incentives with “feed-in” tariffs

Table 1.b: Estimate of total contribution (installed capacity, gross electricity generation) expected from each renewable energy technology to meet the binding 2020 targets and the indicative trajectory for the share of energy from renewable resources in electricity generation

	2016		2017	
	MW	GWh	MW	GWh
Hydro*:	3030	10621	3038	10561
Excl. pump storage	2416	10792	2424	9153
<1MW	29,1	-	34,8	-
1MW–10 MW	34,2	-	38,6	-
>10MW	2372	-	2372	-
<i>Pump storage</i>	614	728	614	599
<i>mixed</i>	-	-	-	-
Geothermal	-	-	-	-
Solar:	11	12	11	13
photovoltaic	11	12	11	13
concentrated solar power	-	-	-	-
Tide, wave, ocean	-	-	-	-
Wind:	17	26	25	53
onshore	17	26	25	53
offshore	-	-	-	-
Biomass:	10	34	13	75

	2016		2017	
	MW	GWh	MW	GWh
solid biomass	-	-	-	-
biogas	10	34	13	75
bioliquids	-	-	-	-
<b>TOTAL:</b>	3068	10694	3087	10702
of which power plants with combined production	-	-	-	-

“-” data are not available

\* The production from hydropower plants is normalized in accordance with the rule set forth in Annex II to Directive 2009/28/EC by using the tool RES SHARE TOOL

**Table 1c:** Estimate of total contribution (final energy consumption) expected from each renewable energy technology to meet the binding 2020 targets and the indicative trajectory for the share of energy from renewable resources in heating and cooling sector

	<b>2016 (ktoe)</b>	<b>2017 (ktoe)</b>
Geothermal (excluding low temperature geothermal heat in heat pump applications)	5.1	5.1
Solar	-	-
Biomass	1041.6	1050.1
<i>solid biomass</i>	1039.2	1042.3
<i>biogas</i>	2.3	7.8
<i>bioliquids</i>	-	-
Renewable energy from heat pumps: - of which aerothermal - of which geothermal - of which hydrothermal	-	-
<b>TOTAL</b>	<b>1046.7</b>	<b>1055.2</b>
<i>Of which DH</i>		
<i>Of which biomass in households</i>	873.1	803.5

„-“ data are not available

**Table 1d:** Estimate of total contribution expected from each renewable energy technology to meet the binding 2020 targets and the indicative trajectory for the share of energy from renewable resources in the transport sector (ktoe)

	<b>2016</b>	<b>2017</b>
Bioethanol/ bio-ETBE [ktoe]	-	-
<i>Share of Biofuels (Article 21.2)</i>	-	-
<i>Of which imported [%]</i>	-	-
Biodiesel [ktoe]	-	-
<i>Biofuels (Article 21.2)</i>	-	-
<i>Imported [%]</i>	-	-
Hydrogen from renewables [ktoe]	-	-
Renewable electricity [ktoe]	9.3	9.5
Road transport [ktoe]	-	-
Non-road transport [ktoe]	-	-
Others (as biogas, vegetable oils, etc.) – please specify [ktoe]	-	-

Share of Biofuels Biofuels (Article 21.2)	-	-
TOTAL [ktoe]	9.3	9.5

„-“ data are not available

NOTE: Reliable data on the consumption of biofuels in the transport sector are not available. The data will be available upon the adoption of by-laws which regulate the sector of biofuels in the Republic of Serbia in accordance with the Directive 2009/28/EC.

**2. Measures taken in the preceding 2 years and/or planned at national level to promote the growth of energy from renewable sources taking into account the indicative trajectory for achieving the national RES targets as outlined in the National Renewable Energy Action Plan (Article 22(1) a) of Directive 2009/28/EC)**

Table 2: Overview of all policies and measures

Name and reference of the measure	Type of measure	Expected result	Target group and or activity	Existing or planned	Start and end dates of the measure
<b>1. Measure “Promotion of Electricity Production through Incentive Purchase Prices”</b> Energy Law (“Official Gazette of the Republic of Serbia”, No. 145/2014)	financial regulatory	increase in the production of electricity from RES	energy entities	existing	2009
<b>Measure implementation mechanisms</b>					
1.1 Decree on Conditions and Procedure for Acquiring the Status of the Privileged Electricity Producer, Temporary Privileged Producer of electricity from RES (“Official Gazette of the Republic of Serbia”, No. 56/16, 60/17)					15/12/2016
1.2 Decree on Incentive Measures for production of electricity from RES and from highly-efficient combined heat and power production (“Official Gazette of the Republic of Serbia”, No. 56/16, 60/17, 91/18)					15/06/2016 -31/12/2018
1.3. Decree on Power Purchase Agreement (“Official Gazette of the Republic of Serbia”, No. 56/16, 61/17)					15/06/2016 -31/12/2018
1.4. Decree on the Fee for promoting Privileged Electricity Producers (“Official Gazette of					13/02/2016

the Republic of Serbia”, No. 12/16)					
1.5 Decree on the Amount of the special fee for promotion in 2016 (“Official Gazette of the Republic of Serbia”, No. 12/16)					13/02/2016-31/12/2016
1.6 Decree on the Amount of the special fee for promotion in 2017 (“Official Gazette of the Republic of Serbia”, No. 7/17)					01/01/2017-31/12/2017
<b>2. Measure “Guarantee of Origin of Electricity Produced from Renewable Energy Sources”</b> Energy Law (“Official Gazette of the Republic of Serbia”, No. 145/2014)	financial regulatory	increase in the production of electricity from RES	energy entities	planned	2017
<b>Measure implementation mechanisms</b>					
2.1 Decree on the Guarantee of Origin (“Official Gazette of the Republic of Serbia”, No. 82/17)					2017
2.2 Rulebook on the Method of Calculation and Showing all shares of energy sources in sold electricity					2017
<b>3. Measure “Promotion of Biofuel Production and Consumption”</b> Energy Law (“Official Gazette of the Republic of Serbia”, No. 145/14)	financial regulatory	increase in biofuel production and consumption	energy entities	planned	2017
<b>Measure implementation mechanisms</b>					
3.1 Rulebook on Technical and Other Requirements for Liquid Fuels of Biological Origin					
3.2 Decree on Sustainability Criteria for Biofuels					
3.3 Decree on the Mandatory Marketing of a Certain Percentage of Biofuels					
3.4 Decree on Incentive Measures for Biofuel Production					
<b>4. Measure “Improvement of the Ministry of Mining and Energy Website”</b> URL: <a href="http://www.mre.gov.rs/energetska-efikasnost-obnovljivi-izvori.php">http://www.mre.gov.rs/energetska-efikasnost-obnovljivi-izvori.php</a>	soft informative	to increase information availability; to clarify administrative procedures in the RES field; to increase transparency in the work;	energy entities, natural persons	existing	2014

## **PROJECTS AND PROGRAMMES OF THE MINISTRY OF MINING AND ENERGY THAT CONTRIBUTE TO A HIGHER RES UTILIZATION**

### **Projects financed through IPA 2012 EU Instrument for Pre-Accession Assistance**

#### **Updating the Register of Small Hydropower Plants**

This program envisages a Service Agreement for the project of Updating the Register of Small Hydropower Plants, with the value of 1.5 million EUR. At the beginning of 2017, the project started and the project completion is planned in 2019 when it is expected that an updated Cadastre of SHPP will be completed. Its development will facilitate the implementation of the SHPP construction through streamlined search for potential locations and systematized presentation of main parameters.

### **Projects financed through IPA 2014 EU Instrument for Pre-Accession Assistance**

#### **Preparation of the National scheme for the verification of biofuels**

This program envisages a Service Agreement for the project of Developing a National scheme for the verification of biofuels. The signing of the Agreement with the most favourable bidder is in progress, and the project completion is planned for 2019 when it is expected that the analysis of possibilities for applying the national scheme for the verification of biofuels is completed. The study will provide a specific insight into the costs and benefits of a potential national scheme for the verification of biofuels and facilitate the achievement of the targets from the NREAP in the transport sector.

### **Cooperation between the Republic of Serbia and the Federal Republic of Germany in the energy sector**

This cooperation primarily involves the financial form of cooperation between the Federal Republic of Germany and the Republic of Serbia that is being implemented through appropriate projects in the fields of energy efficiency, renewable energy sources and district heating. The main partners of the Republic of Serbia are the Federal Ministry for Economic Cooperation and Development of the Federal Republic of Germany (in German: Bundesministerium für Wirtschaftliche Zusammenarbeit - BMZ), the German Development Bank (in German: Kreditanstalt für Wiederaufbau - KfW) and the German Agency for International Cooperation (in German: Deutsche Gesellschaft für Internationale Zusammenarbeit - GIZ), as part of the German Climate and Technology Initiative (in German: Deutsche Klima-und Technologieinitiative - DKTI).

#### **Project: “Promotion of Renewable Energy Sources Utilization – Biomass Market Development”**

The aim of this project is the biomass utilization in heating plants in the Republic of Serbia which use fossil fuels. Currently, the selection of the most mature projects, which can be quickly realized, is in progress.

## **Cooperation with the United Nations Development Programme – UNDP**

### **Project: “Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia”**

The Ministry of Mining and Energy and the United Nations Development Programme (UNDP), together with the Ministry of Agriculture and Environmental Protection, are implementing the project: “*Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia*”. The project funds are provided by the Global Environment Facility (2.85 million USD) and the UNDP (0.31 million USD). The overall objective of the project is the sustainable energy utilization through the diversification of energy sources and development of the biomass market for consumption for energy purposes in Serbia. The project funds shall be used to provide grants to investors for construction of plants for combined heat and power (CHP) production from biomass. The total amount of funds available for grants for this purpose is 1.6 million USD. The public call was completed in December 2015, and the Grant Agreement was signed with altogether 6 concrete projects for the construction of biogas plants. The construction of all 6 plants was completed during 2016 and 2017. The total installed capacity of all plants is 6.32 MWel, and the overall investment value of all projects is around 23 million USD. As a part of this project an interactive "step-by-step" Guide for investors was created and translated into English, with the aim to introduce potential investors with all the necessary procedures that they are expected to apply during the construction of various plants on RES.

Also the "Green Energy" internet portal was prepared as the official informative web site in the field of renewable energy sources and the site of biomass stock exchange. It was created in cooperation with the Chamber of Commerce of Serbia, and it was launched in 2017.

### **Energy Sector Development Strategy of the Republic of Serbia**

The National Assembly of the Republic of Serbia adopted on 4<sup>th</sup> December 2015, the Energy Development Strategy of Republic of Serbia until 2025 with projections to 2030.

The realization of sustainable energy development of the Republic of Serbia in the period up to 2030, in line with the needs and possibilities of the economy and society and achieving the set targets, will require that a further development of the energy sector of the Republic of Serbia is based, among other things, on the intensive utilization of RES, while it is anticipated that the promotion of RES is included in the energy plans of cities and local communities as part of the local energy strategies. The objectives, activities and measures foreseen in this area by the Strategy, are in line with EU policy in the field of RES, and in accordance with the objectives of the Regional Energy Strategy of the Energy Community, which presuppose providing a secure and sustainable energy supply. However, they are primarily aligned with the need for an economic development and technological modernization, that is, a sustainable economic and social development of the Republic of Serbia. In this sense, these objectives are also consistent with the National Strategy for Sustainable Development ("Official Gazette of RS", 57/08) as a document which is important for the harmonization of all sectorial, developmental, economic, social and environmental objectives of the society.

In 2017 the Decree on the Programme for Implementing the Energy Development Strategy of Republic of Serbia (hereinafter: PIS) until 2025 with projections to 2030, for the period from 2017 to 2023 was adopted. PIS will, in line with the Energy Development Strategy of Republic of Serbia until 2025 with projections to 2030, the Spatial Plan of the Republic of Serbia, Action plans in the field of RES and energy efficiency and other relevant strategic documents, define the measures relating to the adoption of new or harmonization of the existing laws and by-laws with EU Directives and recommendations, Decisions and recommendations of the Energy Community as well as the Western Balkans Sustainable Charter in the context of the Berlin

process. In the area of RES, PIS foresees 13 measures and 24 activities for the implementation of the proposed measures.

## **2.a Progress made in improving administrative procedures and removing regulatory and non-regulatory barriers to the utilization of RES (Article 22(1) e) of Directive 2009/28/EC)**

On 15<sup>th</sup> June 2016 the Government of the Republic of Serbia adopted three decrees governing the system of incentives in the sector of producing electricity from renewable.

The Decrees are fully compliant with the Energy Law and Directive 28/2009/EC and provide additional security for investments in the field of RES use.

The State Aid Control Commission passed the Decision on the basis of the State Aid Notification of the Ministry of Mining and Energy, dated 8 June 2016, allowing the use of state aid granted on the basis of the Decree on Incentive Measures for the Production of Electricity from the RES and Highly Efficient Combined Heat and Power Production.

The result of this attractive legal framework is 500 MW of new wind farms with the status of a temporary privileged producer, which represents around 700 million euros of investments. These capacities are important for Serbia for two very important reasons: the first is a contribution to gradually reaching the target of 27% of the share of RES in GFEC until 2020, the second is to gain the confidence of other investors that the Republic of Serbia is developing a stable investment climate and that it is a reliable partner to all those who want to invest in the RES.

One of the conditions for obtaining the temporary status of a privileged producer was the provision of financial security (bank guarantee or deposit) in the amount of 2% of the value of the project's investment. This condition was introduced to exclude investors who have no serious intention to implement the project. The Ministry of Mining and Energy has received bank guarantees in the amount of approximately 16 million euros, as a financial security instrument guaranteeing that 500 MW of new wind power plants will be built. The Ministry has the authority to collect guarantees if the plants are not built within the deadline. The collected funds would be used for the payment of privileged producers who produce electricity from RES, as envisaged by the Decree on Fees for Incentive of Privileged Electricity Producers.

## **2.b Measures in ensuring the transmission and distribution of electricity produced from renewable energy sources and in improving the framework or rules for bearing and sharing of costs related to grid connections and grid reinforcements (Article 22(1) f) of Directive 2009/28/EC)**

Connection to the electric power grid, or transmission and distribution system, is regulated by the Energy Law. Article 70 of the Energy Law and the Decree on Incentive Measures for Privileged Electricity Producers guarantees the purchase of the total amount of energy produced in plants using renewable energy sources, which meets the requirements set forth in Article 16 of Directive 2009/28/EC regarding the guaranteed or priority access to the grid-system of electricity produced from renewable energy sources.

The requirement of a minimum curtailment related to the takeover of energy from renewable energy sources is set forth in Article 162 of the Energy Law, which stipulates that the electricity produced utilizing RES shall have priority access in the takeover of electricity by the transmission or distribution system, except for instances where the system safety is jeopardized.

The requirement of the transparent, objective and non-discriminatory showing of costs related to access to the grid is set forth in Article 176 of the Energy Law. Consent to the operating rules of the distribution and transmission system is given by the Energy Agency.



**3. Support schemes and other measures currently in place that are applied to promote utilizing energy from renewable sources, developments in the measures used with respect to those set out in the National Renewable Energy Action Plan (Article 22 (1) b) of Directive 2009/28/EC)**

**Table 3:** Support schemes for RES

RES support schemes, 2017		Per unit support	Total (M€)*
Hydropower plants			
Guaranteed purchase of electricity from privileged producers – Feed-in tariff	Obligation/quota (%)		
	Penalty/Buy out option/ Buy out price (€/unit)		
	Average certificate price		
	Tax exemption/refund		
	Investment subsidies (capital grants or loans) (€/unit)		
	Production incentives		
	Feed-in tariff	7.5-12.60c€/kWh	20
Feed-in premiums			
Tendering			
Solar power plants			
Guaranteed purchase of electricity from privileged producers – Feed-in tariff	Obligation/quota (%)		
	Penalty/Buy out option/ Buy out price (€/unit)		
	Average certificate price		
	Tax exemption/refund		
	Investment subsidies (capital grants or loans) (€/unit)		
	Production incentives		
	Feed-in tariff	9-14.6 c€/kWh	3
Feed-in premiums			
Tendering			
Wind power plants			
Guaranteed purchase of electricity from privileged producers – Feed-in tariff	Obligation/quota (%)		
	Penalty/Buy out option/ Buy out price (€/unit)		
	Average certificate price		
	Tax exemption/refund		
	Investment subsidies (capital grants or loans) (€/unit)		
	Production incentives	9.2 c€/kWh	4
	Feed-in tariff		
Feed-in premiums			
Tendering			
Biogas power plants			
	Obligation/quota (%)		

Guaranteed purchase of electricity from privileged producers – Feed-in tariff	Penalty/Buy out option/ Buy out price (€/unit)		
	Average certificate price		
	Tax exemption/refund		
	Investment subsidies (capital grants or loans) (€/unit)	15-18.3 c€/kWh	13
	Production incentives		
	Feed-in tariff		
	Feed-in premiums		
	Tendering		
Biomass power plants			
Guaranteed purchase of electricity from privileged producers – Feed-in tariff	Obligation/quota (%)		
	Penalty/Buy out option/ Buy out price (€/unit)		
	Average certificate price		
	Tax exemption/refund		
	Investment subsidies (capital grants or loans) (€/unit)		
	Production incentives		
	Feed-in tariff	8.22-13.26 c€/kWh	0
	Feed-in premiums		
	Tendering		
Landfill gas power plants and sewage gas power plants			
Guaranteed purchase of electricity from privileged producers – Feed-in tariff	Obligation/quota (%)		
	Penalty/Buy out option/ Buy out price (€/unit)		
	Average certificate price		
	Tax exemption/refund		
	Investment subsidies (capital grants or loans) (€/unit)		
	Production incentives		
	Feed-in tariff	8.44 c€/kWh	0
	Feed-in premiums		
	Tendering		
Geothermal power plants			
Guaranteed purchase of electricity from privileged producers – Feed-in tariff	Obligation/quota (%)		
	Penalty/Buy out option/ Buy out price (€/unit)		
	Average certificate price		
	Tax exemption/refund		
	Investment subsidies (capital grants or loans) (€/unit)		
	Production incentives		
	Feed-in tariff	8.2 c€/kWh	0
	Feed-in premiums		
	Tendering		
Waste fired power plants			
	Obligation/quota (%)		

Guaranteed purchase of electricity from privileged producers – Feed-in tariff	Penalty/Buy out option/ Buy out price (€/unit)		
	Average certificate price		
	Tax exemption/refund		
	Investment subsidies (capital grants or loans) (€/unit)		
	Production incentives		
	Feed-in tariff	8.57 c€/kWh	0
	Feed-in premiums		
	Tendering		
Total annual estimated support in the electricity sector			50
Total annual estimated support in the heating sector			
Total annual estimated support in the transport sector			

*\*Data source: Notification of the guarantee supplier Pivredno društvo EPS Snabdevanje [Company Electric Power Industry of Serbia – Supply] regarding the total money amount invoiced to consumers serviced by the public supplier, excluding the transmission and distribution costs, for the period from October 2016 to September 2017, pursuant to Article 10 of the Decree on the Fee for Incentives to Privileged Electricity Producers.*

### **3.1. Information on the share of electricity produced from RES to final customers (Article 22(1) b) of Directive 2009/28/EC)**

Together with the delivered invoice for the supplied electricity or in another appropriate manner, the supplier and the public supplier of electricity are obliged to provide the customer with information on the share of each energy source in the total amount of electricity sold by such supplier in the previous year, as well as on the measures and manner, or effects of activities taken to increase the energy efficiency and protect the environment for production facilities from which the electricity was supplied (Article 196 of the Energy Law).

In 2017, the Ministry of Mining and Energy adopted the Rulebook on the method of calculation and presentation of the share of all types of energy sources in the sold electricity ("Official Gazette of RS", No. 96/17), which elaborated the obligation of the supplier to publish the share of energy from RES.

### **4. Information the support schemes for RES that give additional benefits (but may also have higher costs), including biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material (Article 22 (1) c of Directive 2009/28/EC)**

Currently there are no support schemes that would include additional benefits.

### **5. Information on the application of the system of guarantees of origin for electricity and heating and cooling from RES, and the measures taken to ensure reliability and protection of the system against fraud (Article 22(1)d of Directive 2009/28/EC)**

The Energy Law stipulates that the guarantee of origin is a document with the sole purpose to prove to the final customer that the given share or quantity of energy was produced from renewable energy sources, as well as from the combined heat and power production with the high degree of primary energy utilization. Articles 82, 83, 84, 85, 86 and 87 of the Energy Law have established the legal basis for the enactment of the Decree of the guarantee of origin and Rulebook on the Method of Calculation and Showing all shares of energy sources in sold electricity. This Decree and the Rulebook specify the contents of the guarantee of origin of

electricity produced from renewable energy sources, the procedure of issuance of guarantees, transfer and termination of validity of guarantees, manner of maintaining the register of issued guarantees of origin, as well as the manner of submitting data on produced electricity measured at the point of delivery to the transmission, or to the distribution system. The Energy Law stipulates that the operator of the distribution system issues guarantees of origin. Since the operator of the distribution system has ensured technical conditions for maintaining the register, by the adoption of the Decree of the guarantee of origin ("Official Gazette of RS No. 82/17) the system of the guarantee of origin entered into force. It is expected that the transmission system operator, as the issuer of the guarantee of origin, joint AIB (*Association of issuing bodies*) in 2019.

## 6. Developments in the preceding 2 years in the availability and use of biomass resources for energy purposes (*Article 22(1) g*) of Directive 2009/28/EC)

Table 4: Biomass supply for energy use

	Amount of domestic raw material (*)		Primary energy in domestic raw material (ktoe)		Amount of imported raw material from EU (*)		Primary energy in amount of imported raw material from EU (ktoe)		Amount of imported raw material from non EU(*)		Primary energy in amount of imported raw material from non EU (ktoe)	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
<b>Biomass supply for heating and electricity:</b>												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.) *	-	-	-	-	-	-	-	-	-	-	-	-
Indirect supply of wood biomass (residues and co-products from wood	-	-	-	-	-	-	-	-	-	-	-	-

industry etc.)												
Energy crops (grasses, etc.) and short rotation trees	-	-	-	-	-	-	-	-	-	-	-	-
Agricultural by-products / processed residues and fishery by-products	-	-	-	-	-	-	-	-	-	-	-	-
Biomass from waste (municipal, industrial etc.)	-	-	-	-	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	-	-
<b><i>Biomass supply for transport:</i></b>												
Common arable crops for biofuels	-	-	-	-	-	-	-	-	-	-	-	-
Energy crops (grasses, etc.) and short rotation trees for biofuels	-	-	-	-	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	-	-

“-” data are not available

\* Amount of raw material in m<sup>3</sup> for biomass from forestry and in tonnes for biomass from agriculture and fishery and biomass from waste.

Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (ha)

Land use	Area (ha)	
	2016	2017
1. Land used for common arable crops (wheat, sugar beet etc.) and oil seeds (rapeseed, sunflower etc.)	-	-
2. Land used for short rotation trees (willows, poplars)	-	-
3. Land used for other energy crops such as grasses (reed canary grass, switch grass, Miscanthus), sorghum	-	-

“-” data are not available

NOTE: The use of energy crops and short rotation trees is still in the experimental phase in the Republic of Serbia, and the required data are not currently available. The Agreement for the implementation of the project “Development of the Market of Biomass Used for Energy Purposes” is currently being prepared. The project was approved by the BMZ and planned to be implemented via cooperation between Serbia and Germany, through joint participation by KfW and GIZ, as part of the DKTl. Based on the onsite primary survey, one of the results of this project will provide statistical data required for completion of Tables 4 and 4a in future reports.

**7. Information on any changes in commodity prices and land use in the preceding 2 years associated with increased use of biomass and other forms of energy from renewable sources (Article 22 (1) h) of Directive 2009/28/EC)**

Currently, there are no data available. As part of the IPA 2 program the required data should be the result of a detailed study on financial aspects of the NREAP implementation and application of Directive 2009/28/EC.

**8. The development and share of biofuels made from wastes, residues, non-food cellulosic material, and lingo cellulosic material (Article 22(1) i) of Directive 2009/28/EC)**

There are currently no statistically processed data. There are known examples of individual production for own needs (mainly from waste oils), with negligibly small quantities.

**Table 5:** Production and consumption of Art. 21(2) biofuels (ktoe)

Article 21(2) biofuels of Directive 2009/28/EC	2016	2017
Production – Fuel type	-	-
Consumption – Fuel type	-	-
Total production Art.21.2.biofuels	-	-
Total consumption Art.21.2. biofuels	-	-
% share of 21.2. fuels from total RES- transport sector	-	-

“-” data are not available

**9. Information on the estimated impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality in the preceding 2 years (Article 22 (1) j) of Directive 2009/28/EC)**

There is currently no information on estimated impacts of the production of biofuels. The NREAP provides for a possibility of biofuel imports by the Republic of Serbia in case its own production capacities are not sufficient.

**10. Estimated net greenhouse gas emission savings due to the use of energy from renewable sources (Article 22 (1) k) of Directive 2009/28/EC).**

Table 6: Estimated GHG emission savings from the use of renewable energy (t CO<sub>2</sub>eq)

Environment protection	2016	2017
<b>Total estimated net GHG emission saving from using renewable energy</b>	<b>8,385,285</b>	<b>8,422,534</b>
Estimated net GHG saving from the use of electricity from RES	4,431,799	4,465,662
Estimated net GHG saving from the use of renewable energy sources in heating and cooling sector	3,953,486	3,956,873
Estimated net GHG saving from the use of RES energy in transport	-	-

"-" data are not available

**11. The excess/deficit production of energy from renewable sources compared to the indicative trajectory which could be transferred to/exported to other Member States and/or third countries, as well as estimated potential for joint projects until 2020 (Article 22 (1) l, m) of Directive 2009/28/EC)**

Table 7: Actual and estimated excess and/or deficit of production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries (ktoe)

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual/estimated excess or deficit production	0	0	0	0	0	0	-	-	-

"-" data are not available

**11.1. Statistical transfers, joint projects and joint support scheme decision rules**

The National Action Plan was adopted on 4<sup>th</sup> June 2013 and delivered to the EnC Secretariat together with the updated Document on Planned Cooperation Mechanisms (*Forecast document*) which, among other things, shows the estimated potential for joint projects with the EU member countries.

In October 2011, an agreement regarding the implementation of joint projects in the RES field was signed between the Ministry of Infrastructure and Energy of the Republic of Serbia

(on behalf of the Government of the Republic of Serbia) and the Ministry of Economic Development of the Republic of Italy (on behalf of the Government of the Republic of Italy) on implementation of joint projects in the field of RES. The Agreement on Cooperation between the Government of the Republic of Serbia and the Government of the Republic of Italy in the field of energy underwent the ratification process at the National Assembly of the Republic of Serbia in December 2012. The President of the Council of Ministers of the Republic of Italy is expected to sign the Decree in the forthcoming period, which will fully complete the ratification process of both parties. In this way the preconditions required for the commencement of implementation of the Agreement and projects provided for in its Annex will be met. Construction of small hydropower plants in Serbia and “green” energy exports to Italy are envisaged by the Agreement.

**12. The manner of estimating the share for biodegradable waste in waste used for producing energy, and actions taken to improve and verify such estimates** (*Article 22(1)(n) of Directive 2009/28/EC*)

Based on data on the total quantity of municipal waste generated annually and the share of biodegradable fractions in such waste, the value of the biodegradable quantity of the municipal solid waste was estimated for the purpose of drafting the energy development strategy. A precise estimate regarding the use of this waste for energy purposes could not be made due to dispersion of such waste and difficulties in terms of collecting and separating appropriate fractions. One of the results of the project “Development of the Market of Biomass Used for Energy Purposes”, which is currently being prepared, should provide data required for better estimates of these data.



## CONCLUSION:

In the Republic of Serbia, in reporting period 2016 and 2017, additional new RES power plants were connected, with overall installed capacity of 92.3 MW, out of which 53.58 MW were small hydropower plants, 17MW wind farms, about 12.93 MW of biogas plants and 8.78 MW solar plants. Thus, the total installed power potential of Serbia was increased by 1.26%, i.e. by 3.2%, considering the power potential of Serbia based on RES.

The expectations are that in 2019 additional 4 wind power plants with an installed capacity of 370 MW will be connected, and in 2020 an additional wind turbine of 102 MW and 66 MW, which will increase the total power potential by 8.98%, i.e. by 21.95%, considering the power potential of Serbia based on RES. In addition, PE EPS is working on the revitalization of large hydro power plants, Đerdap and Zvornik, by upgrading the installed power for several tens of MW and on the implementation of a 66 MW wind farm project in Kostolac. The start of the construction of the wind farm is planned in 2019.

In addition to the traditionally high use of biomass, which in the energy balance of final energy consumption in Serbia in 2017 and 2018 reached about 24%, in order to further increase this percentage, in the course of 2018, the Ministry launched a three-year project concerning the replacement of heating oil and coal as fuels in district heating systems with biomass. This replacement will be carried out in at least 10 municipalities in Serbia. Also, in order to obtain more precise data on biomass consumption, it is planned to conduct a new survey on consumption of this type of RES in Serbia in 2019 in cooperation with the Statistical Office of the Republic of Serbia and EnC.

The adoption of by-laws on the system for control and verification of origin and quality of biofuels is planned in the first quarter of 2019.

Also, in 2019, a partial modification of the existing legal framework for the promotion of the use of RES is planned i.e. the switching to the application of tenders in the area of large wind and solar power plants, as a mechanism that will enable the allocation of capacity and granting of the status of privileged producers according to the criterion of the lowest offered price.