REPUBLIC OF BULGARIA

MINISTRY OF ENERGY

FOURTH NATIONAL REPORT
ON BULGARIA'S PROGRESS IN THE PROMOTION AND USE OF
ENERGY FROM RENEWABLE SOURCES

Drafted in accordance with Article 22(1) of Directive 2009/28/EC on the promotion of the use of energy from renewable sources

and in accordance with the

Template for Member State progress reports under Directive 2009/28/EC

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ACRONYMS

AUER	Agency for Sustainable Energy Development
RES	Renewable energy sources
HPP	Hydropower plant
VNDNBNIEVI	Second National Report on Bulgaria's Progress in the Promotion and Use of Energy from Renewable Sources
RS	Renewable sources
WPP	Wind power plant
GO	Guarantees of origin
DAMTN	State Agency for Metrological and Technical Surveillance
TFEU	Treaty on the Functioning of the European Union
EC	European Commission
EA	Environmental Assessment
EU	European Union
ESO EAD	Electricity System Operator EAD
BDA	Biological Diversity Act
ZVAEIB	Renewable and Alternative Energy Sources and Biofuels Act
ZE	Energy Act
ZEE	Energy Efficiency Act
ZID	Act Amending and Supplementing
EPA	Environment Protection Act
LTFA	the Local Taxes and Fees Act
EFA	Executive Forest Agency
KEVR	Energy and Water Regulatory Committee
EERECL	Energy Efficiency and Renewable Energy Credit Line
SHPP	Small hydropower plant
ME	Ministry of Energy
MZH	Ministry of Agriculture, Food and Forestry
MOSV	Ministry of Environment and Water
NEK	National Electric Company
NPDEVI	National Renewable Energy Action Plan

NSI	National Statistical Institute
EIA	Environmental Impact Assessment
OP	Operational Programme
OPRD	Operational Programme (OP) Regional Development 2007-2013
PSHPP	Pumped storage hydropower plant
PG	Greenhouse gases
AAUs	Assigned amount units
RIOSV	Regional Inspectorate for the Environment
TNDNBNIEVI	Third National Report on Bulgaria's Progress in the Promotion and Use of Energy from Renewable Sources
PPP	Photovoltaic power plant
FEEVI	Energy Efficiency and Renewable Sources Fund

UNITS OF MEASUREMENT

Y	year
kg	kilogram
BGN	leva
m^3	cubic meter
sp. m^3	spatial cubic meter
t	ton
ha	hectare
gCO2eq.	grams carbon dioxide equivalent
GWh	gigawatt-hour
l	litre
MJ	megajoule
MW	megawatt
MWh	megawatt-hour
ktoe	tonne oil equivalent
kW	kilowatt
tCO2eq.	tonnes carbon dioxide equivalent

1. (Sectoral and overall) Shares and actual consumption of energy from renewable sources in the preceding two years (2015 and 2016) (Article 22(1) of Directive 2009/28/EC)

In 2012 the Republic of Bulgaria reported attainment of the mandatory national target of a 16 % share of renewable energy in the gross final energy consumption in the country for 2020. In the next years the consumption of renewable energy continued to increase, thus increasing the achieved share of renewable energy in the gross final energy consumption, which was 18.2 % in 2015 and 18.8 % in 2016.

Upon comparison with the sector objectives laid down in the National Renewable Energy Action Plan (NPDEVI), for the reporting period under consideration (2015 and 2016) it is evident that in 2016 in the energy for heating and cooling sector there is overfulfilment by 37%, in the electricity sector by 1% and in the transport sector by 2 %.

The distribution of renewable energy by sectors is presented in Table 1 for the period 2009–2016. The data have been updated in accordance with Article 22(4) of Directive 2009/28/EC on the promotion of the use of energy from renewable sources (Directive 2009/28/EC).

Table 1: *The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources*[1]

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
RES-H&C (%)[2]	21.7 %	24.4 %	24.9 %	27.5 %	29.2 %	28.3 %	28.6%	30.0%
RES-E (%)[3]	11.3 %	12.7 %	12.9 %	16.1 %	18.9 %	18.9 %	19.1%	19.2%
RES-T (%)[4]	1.0 %	1.4 %	0.8%	0.6 %	6.0 %	5.8 %	6.5%	7.3%
Overall RES share (%)[5]	**12.2 %**	**14.1 %**	**14.3 %**	**16.1 %**	**19.0 %**	**18.0 %**	**18.2%**	**18.8%**
Of which share of renewable energy generated under the cooperation mechanisms (%)[6]	0	0	0	0	0	0	0	0

[1] This table facilitates comparison with Table 3 and Table 4a of the NPDEVI.
[2] Share of renewable energy in heating and cooling: gross final consumption of energy from renewable sources for heating and cooling (as defined in Articles 5(1)(b) and 5(4) of Directive 2009/28/EC) divided by gross final consumption of energy for heating and cooling. The same methodology as in Table 3 of the NPDEVI is used.
[3] Share of renewable energy, used for electricity: gross final consumption of electricity from renewable sources for electricity (as defined in Articles 5(1)(a) and 5(3) of Directive 2009/28/EC divided by total gross final consumption of electricity. The same methodology as in Table 3 of the NPDEVI is used.
[4] Share of renewable energy in transport: final energy from renewable sources consumed in transport (as defined in Article 5(1)(c) and 5(5) of Directive 2009/28/EC), divided by the total consumption in transport of: 1) petrol; 2) diesel fuel; 3) biofuels used in road and railway transport (as reflected in row 3 of Table 1 of the NPDEVI). The same methodology as in Table 3 of the NPDEVI is used.
[5] Share of the renewable energy in the gross final consumption of energy. The same methodology as in Table 3 of the NPDEVI is used.
[6] In percentage point of overall RES share.

	2009	2010	2011	2012	2013	2014	2015	2016
Surplus for cooperation mechanisms (%)[7]	0	0	0	0	0	0	0	0

***Source**: The table uses assessments of the NSI submitted to the ME prior to their official publication.*

In 2016 the gross final consumption of RES energy was 1 999.5 ktoe, and compared to the energy consumption in 2009 it increased by 70%. There is a growth in the consumption of RES energy in all sectors, the change in 2016 compared to 2009 is the following: over 16 times increase in the transport sector, 76% increase in the consumption in the electricity sector and 48% increase in consumption in the energy for heating and cooling sector.

[7] In percentage point of overall RES share.

Table 1a. *Calculation table for the renewable energy contribution of each sector to final energy consumption (ktoe)*[8]

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
(A) Gross final consumption of RES for heating and cooling	811.5	974.3	1 043.3	1 122.0	1 142.5	1 087.3	1 146.6	1 203.0
(B) Gross final consumption of electricity from RES	354.8	403.1	430.1	523.2	594.1	602.1	620.3	624.9
(C) Gross final consumption of energy from RES in transport	10.2	19.2	6.0	5.1	109.4	117.1	152.5	171.6
(D) Gross total RES consumption[9]	**1 176.6**	**1 396.7**	**1 479.4**	**1 650.2**	**1 846.1**	**1 806.5**	**1 919.3**	**1 999.5**
(E) Statistical transfer of RES to other Member States	0	0	0	0	0	0	0	0
(F) Statistical transfer of RES from other Member States and 3rd countries	0	0	0	0	0	0	0	0
(G) RES consumption adjusted for target (D)-(E)+(F)	0	0	0	0	0	0	0	0

Source*: The table uses assessments of the NSI submitted to the ME prior to their official publication.*

In the reporting period 2009–2016 the installed facilities for the production of electricity from RES put into operation increased by 50 %, in 2015 and 2016 they were 5 001 MW and 5 007 MW. In 2009 the installed capacity of the power plants, using RES is 3 345 MW and 90% of this capacity belongs to hydro power plants, 10% is wind plants and only 0.3% is photovoltaic plants and biomass plants. As a result of the use of the existing potential of the wind and solar energy and biomass in 2015 and 2016 the share of water plants decreased to 64 % and at the same time the share of photovoltaic, wind and biomass plants increased, reaching 20.5 %, 14.0 % and 1.1 % respectively[10].

[8] This table facilitates comparison with Table 4a of the NPDEVI.

[9] According to Article 5(1) of Directive 2009/28/EC gas, electricity and hydrogen from renewable energy sources shall only be considered once. No double counting is allowed.

[10] Annex 1 presents information of the installed capacity and the gross production of electricity from RES for the period 2009-2014.

In the reporting period 2015-2016 the new facilities for the production of electricity from RES put into exploitation increased, whereas in 2015 the increase is by 17 MW compared to 2014 and in 2016 it is by 6 MW compared to 2015.

The increase of the installed capacity of the plants, using RES in the period 2009-2016 led to an increase by 75% of the gross production of electricity from RES and to changes in the structure of the produced electricity. While in 2009 93.1 % of the produced electricity[11] was from water plants, and only 6.9 % was from plants, using other RES (6.6 % from wind plants, 0.1 % from photovoltaic plants and 0.2 % from biomass plants), in 2016 57.3 % of the produced electricity was from water plants, 19.1 % from wind plants, 18.8 % from photovoltaic plants and 4.8 % from biomass plants.

Table 1b presents information of the installed capacity and the gross production of electricity from RES and normalisation of the production of electricity from water and wind plants was carried out in accordance with Directive 2009/28/EC.

Table 1b. *Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in the Republic of Bulgaria to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity[12]*

	2015		**2016**	
	MW	**GWh**	**MW**	**GWh**
Hydro[13]	**3 219**	**4 284**	**3 223**	**4 218**
non pumped	2 206	4 065	2 210	3 917
<1 MW	63	168	63	177
1 MW–10 MW	238	634	258	721
>10 MW	1 905	3 671	1 889	3 441
pumped	864		864	
mixed (with and without pump accumulation)[14]	149	407	149	422
Geothermal				
Solar	**1 029**	**1 383**	**1 028**	**1 386**
photovoltaic	1 029	1 383	1 028	1 386
concentrated solar power				

[11] In 2009 the gross production of electricity from RES was 3 345 GWh.
[12] This table facilitates comparison with Table 10a of the NPDEVI.
[13] Normalised in accordance with Directive 2009/28/EC and Eurostat methodology.
[14] In accordance with new Eurostat methodology.

	2015		2016	
	MW	**GWh**	**MW**	**GWh**
Tide, wave, ocean				
Wind	**699**	**1 366**	**699**	**1 408**
onshore				
offshore				
Biomass[15]	**54**	**270**	**57**	**354**
solid biomass	34	151	19	163
biogas	20	119	38	191
bio liquids				
TOTAL	**5 001**	**7 303**	**5 007**	**7 365**
of which in CHP		234		254

***Source**: The table uses assessments of the NSI submitted to the ME prior to their official publication.*

The solid biomass is a RES with the broadest application in the heat energy and cooling energy sector and in 2015 and 2016 its share in the gross final consumption of RES energy is 88 %. This sector is still characterised by insignificant consumption of the other types of biomass, including waste. However, a positive trend is the slow increase in the use of solar energy and energy from heat pumps, and in the period 2015-2016 the use of solar energy increased by 13 % on average and the use of energy from heat pumps increased by 20 %, compared to the previous reporting period 2013–2014.

[15] Take into account only the electricity from biomass, which corresponds to the sustainability criteria – cf. Article 5(1) last subparagraph of Directive 2009/28/EC.

Table 1c. *Total actual contribution (to final energy consumption[16]) from each renewable energy technology in the Republic of Bulgaria to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in heating and cooling (ktoe)[17]*

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Geothermal (excluding low temperature geothermal heat in heat pump applications)	33	33	33	33	33	33	33	35
Solar	**0**	**10**	**14**	**15**	**19**	**20**	**22**	**22**
Biomass[18]	**741**	**884**	**944**	**1 005**	**1 010**	**963**	**1 009**	**1 036**
solid biomass	741	883	943	1 005	1 010	961	1 005	1 010
biogas	0	1	1	0	1	2	4	26
bioliquids	0	0	0	0	0	0	0	0
Renewable energy from heat pumps:	32	38	43	47	64	65	75	81
of which aerothermal	0	0	0	0	0	0	59	63
of which geothermal	0	0	0	0	0	0	0	0
of which hydrothermal	0	0	0	0	0	0	16	18
TOTAL	**806**	**964**	**1 033**	**1 101**	**1 127**	**1 081**	**1 139**	**1 174**
Of which DH[19]								
Of which biomass in households[20]	653	711	747	759	750	733	716	758

Source*: The table uses assessments of the NSI submitted to the ME prior to their official publication.*

In the period 2009-2016 the consumption of RES energy in the transport sector increased considerably, up to 166.1 ktoe in 2015 and 186.5 ktoe in 2016, respectively. Compared to 2009 the use of RES energy increased more than 8 times. This is mainly due to biodiesel, the consumption of which in 2015 and 2016 is respectively 68 % and 70 % of the gross final consumption of RES energy in the transport sector.

[16] Direct use and district heat as defined in Article 5(4) of Directive 2009/28/EC.
[17] This table facilitates comparison with Table 11 of the NPDEVI.
[18] Take into account only the biomass, complying with applicable sustainability criteria, cf. Article 5(1) last subparagraph of Directive 2009/28/EC.
[19] This table facilitates the comparison with Table 3 and Table 4a of the National Renewable Energy Action Plans (RES-DH).
[20] From the total renewable heating and cooling consumption.

Table 1d: *Total actual contribution from each renewable energy technology in the Republic of Bulgaria to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transport sector (ktoe)*[21] [22]

	2009	2010	2011	2012	2013	2014	2015	2016
-Bioethanol	**0.0**	**0.0**	**0.0**	**0.0**	**8.4**	**14.8**	**32.2**	**32.9**
-Biodiesel (FAME)	3.7	13.4	0.0	0.0				
-Hydrogenated vegetable oil (HVO)								
- Biomethane								
-Diesel fuel produced in the Fischer-Tropsch process								
- Bio-ethyl tert-butyl ether (bio-ETBE)								
-Bio-methyl-tert-butyl-ether (Bio-MTBE)								
- Bio-dimethyl ether (bio-DME)								
-bio-tertiary-amyl-ethylether (bio-TAEE)								
-Biobutanol								
-Biomethanol								
-Pure plant oil								
Total biofuels, produced in a sustainable manner								
Including:								
biofuels, produced in a sustainable manner from resources, specified in section A of Annex IX								
other biofuels, produced in a sustainable manner, which may be reported in relation to the objective pursuant to Article 3(4)(E)								
biofuels, produced in a sustainable manner from resources , specified in section B of Annex IX								

[21] For biofuels take into account only those compliant with the sustainability criteria, cf. Article 5(1) last subparagraph of Directive 2009/28/EC.
[22] The table facilitates comparison with Table 12 of the NPDEVI.

biofuels, produced in a sustainable manner, for the contribution of which to achieve the RES objective a limitation was introduced pursuant to Article 3(4)(D)								
Import from third countries	**0.0**	**0.0**	**0.0**	**0.0**	**90.0**	**61.0**	**111.0**	**119.0**
Hydrogen, produced based on RES								
Electricity from RES	6.5	5.8	6.0	5.1	5.2	6.2	7.7	8.4
Including:								
consumed for automobile transport	1.1	1.1	1.4	0.7	1.0	1.7	1.2	1.3
consumed for railroad transport	5.0	4.3	4.1	3.9	3.6	3.9	5.9	6.5
consumed in other transport sectors	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6
Others (please specify)								

Source: *The table uses assessments of the NSI submitted to the ME prior to their official publication.*

2. Measures taken in the preceding 2 years (2015 and 2016) 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 your 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	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
Existing measures under Table 5 of the NPDEVI					
1. Preferential prices for electricity produced from renewable sources (FiT)	Financial	Energy generated (ktoe)	Investors	Existing*	Started in 2007. The measure is effective but changes were implemented during the reporting period. They are presented in item 2a. As of 1 January 2016 the measure applies only to energy sites, set out in item 1 of Article 24 of the ZEVI.
2. Obligatory and priority connection of producers of electricity from renewable sources to the grid	Regulatory	Energy generated (ktoe)	Investors	Existing**	Started in 2007. The ZEVI, adopted in 2011, introduced a new approach.
3. Payment only of the direct costs of connection to the grid	Regulatory	Installed capacity (MW/year)	Investors	Existing**	Started in 2011. The measure is effective. No deadline.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
4. Long-term contract for the purchase of electricity generated from RES	Regulatory	Electricity generated energy (ktoe)	Investors	Existing*	Started in 2007. The measure is effective but changes were implemented in the reporting period. They are presented in item 2a. As of 1 January 2016 the measure applies only to energy sites, set out in item 1 of Article 24 of the ZEVI.
5. Obligatory purchase of electricity produced from renewable sources, except for RS of HPPs with installed capacity over 10 MW.	Regulatory	Energy generated (ktoe)	Investors	Existing**	In the period 2007 – May 2011, in accordance with the ZVAEIB. The measure is effective in accordance with the ZEVI.
6. Penalty payments in the event of curtailment of production due to the grid operator's fault	Financial	Energy generated (ktoe)	Investors	Existing**	Started in May 2011. The measure is effective.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
7. Compensation mechanism for the costs of the Public Supplier and Public Retailers of purchasing electricity from renewable sources at preferential prices	Regulatory	Energy generated (ktoe)	Operators of grids, investors and consumers	Existing*	Amendments to the Energy Act (ZE) were made, by which the 'Security of the Electricity System' fund was established to manage the funds to cover the costs, incurred by the public provider, where these costs arise from its obligations to purchase the produced electricity under long-term contracts and preferential prices (SG No 56 of 2015).
8. Licensing procedures for producers of electricity from renewable sources with installed capacity over 5 MW	Regulatory	Energy generated	Producers	Existing**	The measure is effective. No deadline.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
9. Certificates of origin	Regulatory	Generated electricity from RS (ktoe)	Investors	Existing**	The measure is effective. The guarantees of origin are issued by the Agency for Sustainable Energy Development (AUER) in accordance with Regulation No RD-16-1117 of 14 October 2011 on the conditions and procedure for the issuing, transfer, revocation and recognition of guarantees of origin of energy from renewable sources.
10. Obligation of the persons placing on the market petroleum-derived liquid fuels for transport purposes to offer fuels for diesel and petrol engines blended with biofuels in the percentage terms laid down in the ZVAEIB and, currently, in the ZEVI	Regulatory	Production and use of biofuel (ktoe)	Investors, traders	Existing*	The measure is effective. The ZEVI envisages a blending obligation for petroleum-derived liquid fuels with biocomponents, with a phased increase of the content of biocomponents in petroleum-derived liquid fuels, used in the transport sector.
11. Energy Efficiency and Renewable Energy Credit Line (EERECL)	Financial	Energy generated (ktoe)	Investors, end consumers (business)	Existing**	Funds have been provided through the credit line since 2004.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
12. Operational Programme Development of the Competitiveness of the Bulgarian Economy 2007–2013	Financial	Energy generated from RES (ktoe)	Investors	Existing**	Measure launched in 2010. At present the funds are provided under the Operational Programme Innovations and Competitiveness 2014–2020.
13. Rural Development Programme, 2007–2013	Financial	Generation of energy from RS	Investors	Existing**	Measure launched in 2007. During the reporting period, procedures related to the improvement of energy efficiency and the use of RS were implemented under the Rural Development Programme. The measure is also effective in the programming period 2014–2020.
14. Operational Programme Environment	Financial	Generation of energy from RS	Municipalities	Existing*	Measure launched in 2007. The measure is also effective in the programming period 2014–2020.
Measures planned under Table 5 (Annex 1) of the NPDEVI					

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
1. Establishment of the Agency for Sustainable Energy Development	Administrative	Installed capacity, generated and used energy from RS, behavioural change	Investors, energy undertakings, end consumers, planning authorities, associations and sectoral chambers, installation structures	Implemented**	The Agency was set up in 2011 under the ZEVI as a successor to the Energy Efficiency Agency.
2. Elaboration of a geographical information system for Bulgaria	Soft	Installed capacity, energy generation	Investors, public administration, end consumers	Implemented **	Establishment of an Information Platform for Interoperability of Spatial Data and Services for Use by the Public Administration and Citizens in Relation to RES Energy under Operational Programme Administrative Capacity, priority axis III 'Quality Administrative Service Delivery and E-governance Development', Sub-priority 3.2. 'Standard Information and Communication Environment and Interoperability'.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
3. One-stop shops	Administrative	New installed capacity (MW/year)	Investors, end consumers	Implemented	Started in July 2014. A web-based system introduced by the AUER for on-line submission, registration and handling of applications and information regarding generation of energy from RS, guarantees of origin, transmission and distribution of electricity, production and use of biofuels. No deadline for implementation.
4. Enhancing the administrative competence and capacity of officials responsible for authorisation and licensing	Administrative	Behavioural change	Authorisation bodies (all levels)	Implemented	The measure is implemented and there is no deadline for submission. In the period 2015-2016, within Programme BG04 'Energy Efficiency and Renewable Energy' trainings were provided to experts of state institutions and municipalities in various cities and towns in Bulgaria. AUER carries out active events to increase the administrative capacity. Detailed information has been presented in item 3.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
5. Financing of projects for the production of energy from RS and energy efficiency	Financial	Installed capacity, energy generated and consumed, emissions savings	Investors, end consumers	Implemented	Ongoing implementation; no deadline for application. The information is provided in item 3.
6. Developing rules and using financial resources from the Emissions Trading Scheme	Financial	Installed capacity, energy generated and consumed, emissions savings	Investors, end consumers	Implemented	The amendments to the Energy Act (ZE, SG No 56 of 2015) lay down the sources of raising funds under the 'Security of the Electricity System' fund, including the income, received from the tenders for the sale of quotas, which are used for the development of RES.
7. Enhancing the procedures for issuing authorisations and signing connection contracts	Regulatory	Installed capacity, energy generation	companies, investors	Implemented	Started in 2011 – permanent. No deadline.
8. Support for construction new transmission and distribution infrastructure, in relation to the connection of new producers from RS: status of a national infrastructure site	Administrative and regulatory	New installed capacity (MW/year)	Investors, end consumers	Implemented***	Started in 2010 – permanent. No deadline.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
9. Competition between RS for energy generation	Regulatory	Installed capacity, energy generation	Electricity companies, investors	Planned***	Since 1 January 2016 all new producers of electricity from RS (with the exception of the energy sites under item 1 of Article 24 of the ZEVI) should sell their electricity on the free electricity market.
10. Assistance for the development of intelligent networks and accumulating facilities	Regulatory	Installed capacity (more effective integration)	Grid owners, Investors, end consumers	Implemented **	Regulations for Management of the Grid were adopted in 2014 (SG No 6 of 21 January 2014), which envisage that the plans for the development of the electricity system are developed every two years in accordance with the development of the transmission and distribution grids, including intelligent networks, and the construction of regulating and accumulating facilities, related to the secure operation of the electricity system in the development of the production of energy from RS. On the basis of Article 3(1) of the Regulations on the management of the electricity distributing grids the distributing companies develop plans for the development of the electricity distributing network.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
11. Use of options for managing consumption and load reaction	Regulatory	Installed capacity (more efficient integration)	Research community, industry	Implemented **	Regulations for Management of the Grid (SG No 6 of 21 January 2014). Regulations for Trade in Electricity (SG No 66 of 26 July 2013, last amended and supplements No 90 of 20 November 2015, effective from 20 November 2015).
12. List of qualified installers	Regulatory	Behavioural change, energy generated	Installer organisations, end consumers, investors, authorisation bodies, financial organisations	Implemented**	The institutions licensed to provide vocational education and training under the ZPOO shall be obliged to submit a list of persons qualified to carry out the activities annually to the AUER.
13. Application or use of cost/benefit analysis	Financial, regulatory	Improving the business environment	Investors, end consumers, planning authorities	Implemented**	Permanent. No deadline for application.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
14. Public awareness campaign, promoting RS	Informational	Behavioural change	Installer organisations, end consumers, investors, authorising bodies, financial organisations	Existing**	Permanent. No deadline.
15. List of facilities for generating energy from RS	Informational	Behavioural change	Investors, end consumers, public administration	Implemented **	Started in 2012. The AUER maintains an electronic register of the guarantees of origin and publishes data from it on its webpage, including data for the facilities. No deadline.
16. List with detailed current information on the investment interest and the condition of the administrative and licensing procedures	Informational	New installed capacity (MW/year)	Investors, end consumers	Implemented**	Started in 2011. The measure is effective and there is no deadline.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
17. Harmonisation of the Bulgarian legislation with the requirements of the amended Directive 2002/91/EC and of Directive 2009/28/EC, Directive 2009/29/EC, Directive 2009/30/EC.	Regulatory	Development and improvement of the legal framework for the implementation of the national policy for reducing greenhouse gas emissions	Construction, designers, public administration	Implemented**	The measure is effective and there is no deadline.
18. Replacement of liquid fuels and electricity used for heating public buildings with biofuels and energy from RS	Regulatory and financial	ktoe	Energy suppliers, municipalities	Existing**	The measure is permanent. No deadline.
19. Mandatory use of RS in new buildings	Legislative	ktoe	Investors, construction, designers, end consumers, public administration	Existing**	The measure has been introduced by the Energy Efficiency Act (ZEE) and the ZEVI. No deadline.
20. Funding of projects under FEEVI	Financial	ktoe	End consumers	Existing**	The measure is permanent. No deadline.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
21. Promotion of the use of individual systems for generating energy from RS	Financial	New installed capacity (MW/year)	Investors, end consumers, public administration	Implemented**	The measure was introduced by the ZEVI and the ZEE. No deadline.
22. Aid scheme for heat generation and cooling from RS in industry	Financial, regulatory	Behavioural change, installed capacity (MW/year), energy generated (ktoe)	Investors, end consumers, public administration	Implemented****	The production of heat energy from RS is supported under operational programs and Programme BG04 'Energy Efficiency and Renewable Energy' financed under FM of EEA 2009-2014.
23. Aid scheme for heat generation from RS in residential and public buildings	Financial, regulatory	Behavioural change, installed capacity (MW/year), energy generated (ktoe)	Investors, end consumers, public administration	Existing	The measure is permanent. No deadline. A National Energy Efficiency Programme for Multifamily Residential Buildings was adopted with decree No 18 of 2 February 2015 of the Council of Ministers.
24. Programme for Financial Incentives for the Use of Local Heating	Financial	ktoe	Investors	Planned	2013: permanent. No deadline.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
25. Tax incentives for investment in the production of energy from RS for household consumption	Financial	ktoe	End consumers	Existing**	The measure was introduced in 2009 with the Local Taxes and Fees Act. In accordance with Article 24(1)(18-19) of the Local Taxes and Fees Act, the buildings that comply with the stipulated conditions and implement measures for the use of RS for energy production to satisfy the building consumption shall be released from taxes for the statutory time period. No deadline.
26. Elaboration of assessment procedures, requiring mandatory marking of equipment used for the incineration of biomass	Regulatory, financial	ktoe	Energy suppliers	Implemented**	The measure was introduced in 2011. The marking is carried out in accordance with the Technical Requirements for Products Act, in accordance with the requirements for ecodesign. No deadline.
27. Development of a Programme for Accelerated Switch of State and Municipal Transport Vehicles to Biofuels	Regulatory, financial	ktoe	Energy suppliers	Implemented**	The measure is effective and there is no deadline.

Name and reference of the measure	Type of measure	Expected result	Targeted group and/or activity	Existing or planned measure	Start and end dates of the measure
28. Biofuels quality control system	Regulatory, financial	ktoe	Energy suppliers	Existing**	The measure was initially introduced by the ZVAEIB in 2007 and updated under the ZEVI in 2011. No deadline.
29. Programme for the Promotion and Introduction of Electric Cars	Indeterminate	Installed capacity (more efficient integration)	Research community, industry	Implemented****	The core strategic documents at a national level discuss the theme of the alternative fuels and technologies. No deadline.

* The measure features in Table 5 of the NPDEVI as 'Existing' and has been changed in the reporting period;
** The measure features in Table 5 of the NPDEVI as 'Existing' and has not been changed in the reporting period compared to the previous reporting period;
*** The measure features in Table 5 of the NPDEVI as 'Planned' and became effective in the reporting period;
**** The measure features in Table 5 of the NPDEVI as 'Planned' and its implementation began in the reporting period. It is an ongoing measure.

2.a Please describe the support schemes and other measures currently in place that are applied to promote energy from renewable sources and report on any developments in the measures used with respect to those set out in your National Renewable Energy Action Plan. (Article 22(1)(b) of Directive 2009/28/EC)

The following more important changes were made in the ZEVI in 2015 and 2016:

- **The Act Amending and Supplementing the ZEVI (SG No 17 of 6 March 2015, effective from 6 March 2015)**

The adopted amendments and supplements to the ZEVI lay down the requirement not to apply the promotional measures for the purchase of the produced electricity at preferential prices and long-term contracts for the energy sites for the production of electricity from RS, which were put into exploitation after the entry into force of the law. An exception is small sites with total installed capacity up to 30 kW included, which are planned to be erected on roofs and facades of buildings for production and storage activities, joined to the electricity transmission or electricity distributing network in urbanised territories (Article 24, item 1 of the ZEVI) and for sites with a combined cycle and indirect use of biomass, which are planned to be erected in the urbanised territories, agricultural sites or production zones and which are with an installed electric capacity up to:
-1.5 MW and use biomass, whose total weight of animal manure is not less than 60% (Article 24, item 3 (a) of the ZEVI);
-500kW and use biomass from plant waste of own agricultural production (Article 24, item 3 (b) of the ZEVI);

Amendment of the ZEVI (SG No 35 of 15 March 2015, effective from 15 March 2015) through the Energy Efficiency Act;

These amendments postpone the obligation of the persons, who launch on the market liquid fuels of oil origin to continue the gradual increase in the percentage of bioethanol in the fuels for benzene engines, offered on the market. In the period 1 March 2015 – 1 September 2018 the fuels for benzene engines are planned to contain bio component, of volume minimum 7% and after this date the increase in the market share will continue, as follows
-from 1 September 2018 – the fuel for benzene engines will contain bioethanol or ethers, produced from bioethanol, of volume minimum 8%;
- from 1 March 2019 – the fuel for benzene engines will contain bioethanol or ethers, produced from bioethanol, of volume minimum 9%;

- **Amendments and supplements to the ZEVI (SG No 56 of 24 July 2015, effective from 24 July 2015, via the Act Amending and Supplementing the Energy Act).**

The amendments to the ZEVI introduce the requirement for the purchase from the public supplier, respectively the end supplier of the quantity of electricity from RS, in accordance with the amount of the net specific production of electricity, based on which preferential prices were determined in the respective decision of the Energy and Water Regulatory Commission. This condition does not apply to the sites under Article 24, item 3 of the ZEVI and preferences are provided only to the sites with installed capacity up to 30 kW included, which are planned to be erected on roofs and

facades of buildings for production and storage activities and the sites for the production of electricity from biomass under Article 24, item 3 of the ZEVI, which will be put into exploitation by 1 July 2016.

In accordance with § 18, paragraph 1 of the transitional and concluding provisions of the Act Amending and Supplementing the Energy Act for the producers of electricity from RS via energy sites, which were built up with funds from the national or European support scheme and with respect to which applications for support were received till the entry into force of the ZEVI. The purchase of electricity from these sites is carried out in price groups, determined by the Energy and Water Regulatory Commission by the procedures of the Regulation on electricity prices, which were last determined with a decision of the Energy and Water Regulatory Commission as at the date of entry into force of these changes.

The Security of the Electricity System Fund was established for the management of the funds to cover the expenses, incurred by the public supplier, which arise from the supplier's obligations to purchase the produced electricity under long-term contracts and preferential prices.

- **Amendments and Supplements to the ZEVI (SG No 100 of 2015) via the Act Amending and Supplementing the Energy Act**

In accordance with this amendment to the ZEVI the promotional measures related to the purchase of electricity from RS at preferential prices are provided only to the sites for the production of electricity from RS with total installed capacity up to 30 kW included, which are planned to be erected on roofs and facades of buildings, integrated in the electricity distributing network and on real estates thereto in urbanised territories after 1 January 2016.

- **Adopted new and amended existing regulatory and administrative acts in 2015 and 2016:**
- Regulation on amending and supplementing Regulation N 6 of 24 February 2014 on joining producers and clients of electricity to the transmission or electricity distributing networks (amended and supplemented SG No 36 of 2016, amended and supplemented SG No 77 of 2016), adopted by the Energy and Water Regulatory Commission;

Two amendments and supplements of Regulation No 6 were adopted in 2016.

The first initiated procedure for amending and supplementing the regulation (SG No 36 of 2016, of 13 May 2016, effective from 13 May 2016) concerns the projects for the production of electricity from RS and was realised on the basis of the amendments and supplements to the ZEVI, adopted with the transitional and concluding provisions of the Act Amending and Supplementing the Energy Act (PZR of ZID of ZE, SG No 56 of 2015). The amendments to the regulation stipulate the procedure and the necessary documents for establishing and proving the circumstances under Article 18(7) of the ZEVI regarding the energy sites for production of electricity from RS with a combined cycle and indirect use of biomass.

- Regulation No 7 of 2004 on the energy efficiency of buildings (amended title – SG No 85 of 2009, SG No 27 of 2015, effective from 15 July 2015), issued by the Minister for Regional Development and Public Works.

The regulation introduces the regulatory requirements with respect to the produced energy from thermo pumps. Within

project No BG161P0001/5-01/2008/076 'Analysis, research and update of legislative instruments in support of OPRD 2014-2020', financed under OP Regional Development 2007-2013 (OPRD), in the performance of Activity 2: 'Analysis, research and update (development of new legislative instruments) of legislative instruments in the field of energy efficiency for the design, construction and renovation of buildings in compliance with the requirements of Directive 2010/31/EU', a national definition of net-zero energy buildings (NZEB) was developed.

The national definition of NZEB is laid down in § 1, item 28 of the Additional Provisions of the Energy Efficiency Act and in § 1, item 31 of Regulation No 7 of 2004 on the energy efficiency of buildings.

- Rules for trade in electricity, adopted by the Energy and Water Regulatory Commission (SG No 66 of 26 July 2013, effective from 26 July 2013, amended and supplemented, SG No 39 of 9 May 2014, SG No 90 of 20 November 2015, effective from 20 November 2015).

With decision on Protocol No 231 of 11 November 2015, item 1, the Energy and Water Regulatory Commission adopted the Rules for the amendment and supplement of the Rules on electricity trade. The amendments are with regard to considering the effective amendments and supplements to the Energy Act and the ZEVI (SG No 56 of 2015, effective from 24 July 2015).
Provisions were introduced regarding the participation of the producers of electricity from RS and highly efficient combined production of heat and electricity on the free market. By virtue of the amendments to Article 31 of the ZEVI and Article 162 of the Energy Act quantities of electricity, produced from RS and highly efficient combined production of heat and electricity may be sold on the free market. There is a clearer regulation of the trade participants, which pay the price for 'obligations to society'. The trade participants, who have an obligation to cover the expenses, arising from obligations to society, imposed under the Energy Act, are clearly determined. The purpose is to achieve a fair allocation of these expenses in a transparent manner among the end clients integrated in the electricity system, including the operator of the electricity transmission grid and the operators of the electricity distributing networks.
The conditions for participation in the organised exchange market of electricity and the rights and obligations of the market operator and of the trade participants were made precise and supplemented.

By its decisions the Energy and Water Regulatory Commission determined preferential prices of electricity, produced from RS, as follows:

- Decision Ts-1 of 28 January 2015 regarding the procedure for determining preferential prices of electricity, produced from RS - biomass from timber, obtained from timber remains, cleaning of forests, forest cutting and other timber garbage;
- Decision Ts-5 of 20 February 2015 for determining a preferential price for the purchase of electricity, produced from existing hydro power plants with installed capacity up to 10 MW, as from 1 April 2011;
- Decision Ts-24 of 30 June 2015 on determining preferential prices of electricity, produced from renewable sources and update of the preferential prices of electricity, produced from biomass;
- Decision No SP-1 of 31 July 2015 , with which the Energy and Water Regulatory Commission established the net specific production of electricity, based on which were determined preferential prices in the respective

decisions of Energy and Water Regulatory Commission, adopted till the entry into force of the Energy Act - 24 July 2015;

- Decision No Ts-36 of 9 November 2015 , with which the Commission determined, as from 1 December 2015, preferential prices for the purchase of electricity, produced from the following RS:
  - Power plants with installed electricity capacity up to 500 kW included, for the production of energy with a combined cycle and indirect use of biomass, where the animal manure is not less than 60% of the total biomass weight, planned to be erected in urbanised territories, agricultural sites or production zones;
  - Power plants with installed electric capacity above 500 kW up to 1.5 MW for the production of energy with a combined cycle and indirect use of biomass, where the animal manure is not less than 60% of the total biomass weight, planned to be erected in urbanised territories, agricultural sites or production zones;
  - Power plants with installed electric capacity up to 500 kW for the production of energy with a combined cycle and indirect use of biomass from plant remains from own agricultural production, planned to be erected in urbanised territories, agricultural sites or production zones;

- Decision No Ts-17 of 30 June 2016 on determining preferential prices of electricity, produced from RS from energy sites under Article 24, item 1 of the ZEVI and an update of the preferential prices of electricity, produced from biomass;
- Commission Decision No C (2016) 5205 final of 04.08.2016 for state aid, regarding supporting the production of electricity from renewable sources in Bulgaria – SA.44840 (2016/NN).

At the initiative of Directorate - General Competition of the European Commission in March 2016 there started a *notification procedure in front of the EC of identified state aid 'Scheme for assisting the production of electricity from renewable sources under the ZEVI"*. The notification is regarding the operative aid, provided in the period after 3 May 2011 to the producers of electricity from RS in the form of preferential prices for the purchase of the electricity, producer by them, in accordance with the ZEVI.

In Commission Decision No C (2016) 5205 final of 4 August 2016 regarding assisting the production of energy from renewable sources in Bulgaria – SA.44840 (2016/NN), the EC concluded that the measure represented state aid in the sense of the Treaty on the Functioning of the European Union (TFEU). According to the EC, since the local production of electricity from RS is assisted via the 'green energy' component, which accrues on the total quantity of electricity from RS, consumed in Bulgaria (including the consumption of electricity, produced in other member states), the applied method of financing, imposes a burden on the electricity produced in other member states, which does not benefit from this financing. This leads to a risk of a discriminatory effect on the electricity from RS, produced in other member states and consumed in Bulgaria and in this way breaches Article 30 and/or Article 110 of the TFEU.

The conclusion of the EC is that Bulgaria implemented the measure in breach of Article 108 (3) of the TFEU, but despite this the EC will not raise an objection with respect to the aid, considering the fact that it is compatible with the internal market by virtue of Article 107, § 3 (c) of the TFEU under the following conditions:
-Amending the Energy Act for excluding the component to the 'price for obligation to society', reflecting the expenses for the purchase of electricity from RS (the 'green energy' component) for the electricity from RS, produced in other

EU member states and consumed in Bulgaria.
-Determining the amount of the compensation for the period from 1 July 2011 to the entry into force of the amendments to the Energy Act, which is invested for the development of the capacity of the interconnections and in particular for building a new interconnection electricity distribution line 400 kV from substation 'Maritsa East' in Bulgaria to substation 'Nea Santa' in Greece.

- **Strategic documents:**
- National Energy Efficiency Programme for Multifamily Residential Buildings;

The National strategy was adopted with Decree No 18 of 2 February 2015 of the Council of Ministers and focused on the renovation of multifamily residential buildings via the implementation of energy efficiency measures, thus ensuring better living conditions for the citizens, heat comfort and higher quality of the living environment.

- National plan for net-zero energy buildings 2015-2020

The National plan was developed on the basis of Article 5(3)(2) of the Energy Efficiency Act and in compliance with the requirements of Article 9 of Directive 2010/31/EU on the energy performance of buildings. The plan was adopted with Decision No 1035 of 30 December 2015 of the Council of Ministers.

In accordance with the requirement under Article 9 of Directive 2010/31/EU on the energy performance of buildings member states guarantee that:
-by 31 December 2020 all new buildings will be net-zero energy buildings;

-after 31 December 2018 the new buildings, occupied or possessed by the public authorities, will be net-zero energy buildings.

2.b Please describe the measures in ensuring the transmission and distribution of electricity produced from renewable energy sources and in improving the regulatory framework for bearing and sharing of costs related to grid connections and grid reinforcements (for accepting greater loads). ***(Article 22(1)(f) of Directive 2009/28/EC)***

The public relationships, related to the generation and consumption of electricity from RS are regulated by the ZEVI and have been detailed in the previous national reports on the progress.

Energy sites of producers with signed preliminary contracts and contracts for the connection of energy sites for the production of electricity from RS as well as sites under Article 24 of the ZEVI were connected to the electricity transmission and distribution grids in the reporting period.

Due to the high number of planned investments for the construction of sites for the production of electricity from RS, rescheduled timetables were introduced for the connection of these sites to the electricity transmission and distribution grids. The timetables for connecting energy sites under signed preliminary connection contracts cover the period from 2012 to 2018.

In accordance with Article 28(1) of the ZEVI and in order to satisfy the objectives and measures set out in the NPDEVI, the annual investment and maintenance programmes of electricity transmission and distribution grid operators shall include funds for the development of the grids with respect to the connection, transmission and distribution of electricity produced from renewable sources .

In 2015 Electricity System Operator EAD (ESO EAD) imposed restrictions on producers from North-eastern Bulgaria, connected to the Dobrich Ring of the electricity system and biannual reports were drafted and submitted to the KEVR in accordance with Article 30(7) of the ZEVI and Article 57 of Regulation No 3 of 21 March 2013 on the licensing of activities in energy.

The limitations were imposed due to impossibility to maintain the balance of the electricity system and the occurrence of deviations from the interconnector timetables for exchange with neighbouring operators above the admissible limits, specified in the Rules on the management of the electricity system and the rules of European Network of Transmission System Operators for Electricity (ENTSO-E). In these cases, in accordance with the abovementioned legal provision, the operator of the electricity transmission grid is entitled to order without notification temporary interruption or limitation of the electricity production. Despite this, immediately before the occurrence of the need to limit production, ESO EAD in its capacity of a system operator of the transmission grid informed all producers, connected to the electricity transmission grid and the operators of electricity distributing grids on time, via its web site and in an operative procedure. In the limitation ESO EAD followed the principle of priority dispatching for the producers of electricity from RS by virtue of Article 18(1)(4) of the ZEVI (transposing the requirements of Article 16(2)(c) of Directive 2009/28/EU) and the security criteria, determined with the rules under Article 83(1)(4-5) of the Energy Act.
ESO EAD took the possible corrective measures to prevent the decrease in these quantities, because before easing the power plants using RS, all the remaining facilities were with decreased electricity production up to the critical

minimum, which guarantees the security and stability of the electricity system.
In accordance with the statements from the dispatcher's registers, the limitations imposed by ESO EAD on all producers of electricity from RS were performed for all installations/power plants on the territory of Bulgaria.
The corrective measures undertaken to prevent the decrease in the quantities of transmitted electricity from RS concern stimulating the export of electricity during spring high water. As a result of negotiations with the Greek transmission operator IPTO, ESO EAD managed to negotiate an additional increase in the cross-border transmission capacity above the negotiated capacity before that, respectively by 200 MW and 50 MW in the direction of Greece. In this way for the abovementioned periods the preconditions under Article 73(1)(7) of the Energy Act were evaded and no limitation was necessary on the production from RS power plants.

In 2015 local limitations were made of the electricity production on the basis of Article 24(2)(1-2) of Regulation No 10 on the procedures for the introduction of a limitation regime, temporary interruption or limiting the production or supply with electricity, heat energy and natural gas (planned inspections and repair of the facilities for the supply of electricity and heat energy and natural gas and planned operational switching).

To prevent the decrease in the quantities of transmitted electricity from RS to medium voltage in the region of the town of Shabla and towards the Dobrich ring 110 kV, as a corrective measure by ESO EAD reconstruction and deployment of substation Shabla 110/20 kV was made.

In 2016 ESO EAD did not have limitations of the production of electricity from RS.

In 2015 in relation to the orders of ESO EAD EVN Elektrorazpredelenie EAD (EVN ER) imposed periodic self-limitations on the maximum operational capacity of the producers of electricity from RS. The limitations were imposed for various time ranges with different percentages of limiting the maximum working capacity of the power stations, mainly as a result of heavy weather conditions.

With the aim of optimising the production of electricity from RS, EVN ER took measures to timely inform the producers for the time of applying the provisions on the grounds of Article 73(1) of the Energy Act for temporary limiting the access to the electricity distributing grid for sites for the production of electricity from RS.

In view of guaranteeing the development of the grids, related to the connections and distribution of electricity, produced from RS, the network operators prepare annual investment and repair programs and report the progress in the implementation thereof in front of the KEVR in accordance with Article 28 of the ZEVI and Article 58 of Regulation No 3 of 21 March 2013 on the licensing of the activities in energy.

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

The utilisation of the potential of energy from RS in Bulgaria is stimulated by a system of measures: administrative, financial, regulatory and informational.

- **Administrative measures:**
- **One-stop shop administrative measures**

The Agency for Sustainable Energy Development has been administrating an Information Platform for Interoperability of Spatial Data and Services in relation to RES, which allows the maintenance of a Register of the guarantees of origin of RS energy and information of the sites for the production of electricity from RS. The Agency disposes with a web-based system for registering and processing applications, which allows registration of documents and applications for one-stop shop, automatic distribution of document processing tasks, a check of applications and three-month and annual information, generation of orders, automated maintenance of the register, etc.

– **Enhancing the administrative competence and capacity of officials responsible for authorisation and licensing;**

o **Programme BG04 'Energy Efficiency and Renewable Energy' under FM of EEA 2009–2014;**

In 2016 there ended the implementation of 9 projects, financed under Procedure BG04-04-05: 'Training to strengthen the administrative capacity in relation to measures for energy efficiency and renewable energy', Program BG04 ‘Energy efficiency and renewable energy’ under the FM of EEA 2009–2014. As a result of the trainings carried out the capacity for applying the measures for energy efficiency and RES of the staff of the administration at a local level (municipalities, provincial authorities, state institutions, a total of 2 661 trained people). The trainings carried out had a practical orientation, including theory and seminars on issues, related to energy management and the measures for energy efficiency and RES. The total value of verified expenses amounts to EUR 542 569 000.

- **Agency for Sustainable Energy Development**

Representatives of AUER currently participate in the meetings of the regional energy efficiency councils and render methodological guidance in the preparation of the plans for energy efficiency and the programs for the implementation thereof, as well as in an organised training of the employees in the state administration (the Customs Agency) for the management of energy efficiency.

In 2015 AUER organised and carried out 6 trainings in energy management and energy planning for all municipal administrations on the territory of Bulgaria. Representatives of AUER currently provide methodological guidance and participate in the training of municipal experts in energy management and energy planning.

Within the project, financed by OP Development of the Competitiveness of the Bulgarian economy 21 trainings were

organised and carried out for energy managers in industrial companies, during which 340 employees were trained.

Experts from AUER regularly participate in a great number of forums, organised by mayors of municipalities and provincial governors on the issues of energy efficiency and the energy from RS.

- **Regulatory measures:**

- Security of the Energy System Fund

The Security of the Energy System Fund (SES Fund) was established with amendment and supplement of the Energy Act (SG No 56 of 2015). In accordance with Article 366(1) of the Energy Act, the SES Fund was established to manage the funds to cover the expenditure, incurred by the public supplier, which arise from the supplier's obligations under Article 93a of the Energy Act, determined with a decision of the KEVR, including for past regulatory periods. The procedure and way of raising, spending, reporting and control of the funds of the SES Fund were determined with Regulation on the procedure and way of raising, spending, reporting and control of the funds of the Security of the Energy System Fund (SG No 97 of 11 December 2015). The financing of the SES Fund is carried out by:

- monthly instalments in the amount of 5% from: all producers of electricity from the revenues from the sold electricity; the traders that import electricity from the revenues from the imported energy, sold on the market in Bulgaria; the operator of the electricity transmission grid from the revenues for access and transmission of electricity; the operators of the gas transmission grids from the revenues from access and transmission of natural gas and the operators of facilities for keeping natural gas from the revenues from the access and keeping of natural gas;
- the revenues from the sale of quotas for greenhouse gas emissions under the Law on the Limitation of the Climate Change.

The specific expenses, which the SES Fund covers, are determined in the price decisions of the KEVR.
-for funds to decrease the price for obligations to society, which is established based on the expenses, reflecting the difference between the market price of electricity and the prices, at which Public Supplier purchases electricity under Article 93a and 94 of the Energy Act;
- to compensate the public supplier for the rebates from the green energy component, laid down in the Regulation on decreasing the burden, related to the expenses for energy from renewable sources, rebates from the component for green energy;

-compensation for past periods - expenses of the public supplier from the repealed Methodology of 2012 for the compensation of expenses under Article 35 of the Energy Act and for allocating these expenses among end clients, connected to the electricity system, regarding the purchase of electricity, produced from renewable sources;
-compensation of the public supplier for the contribution under Article 36f of the Energy Act, due from the producers with concluded agreements for the purchase of electricity.
The first three of the specified expenses concern the policy of encouraging the production of energy from RS.

The establishment of the SES Fund is a key step in the direction of stabilization of the financial state of the electricity

sector in Bulgaria. In the context of the forthcoming full liberalisation of the wholesale market, one of the envisioned possibilities is that the SES Fund turns into a main compensatory mechanism, which is a party under the contracts for encouraging the production of RS energy.

- Regulation No E-RD-04-06/28.09.2016 on decreasing the burden related to the expenses for RS energy, issued on the grounds of Article 4(2)(21) of the Energy Act by the Ministers for Energy, Economy and Finance (SG No 77 of 4 October 2016);

In compliance with the Guidelines regarding the state aid for preservation of the environment and energy for the period 2014-2020 the Republic of Bulgaria notified in front of the EC the draft of the Regulation on decreasing the burden regarding the expenses for RS energy (approved with decision No SA.45861 (2016/N) of 4 August 2016).

Regulation No E-RD-04-06/28.09.2016 lays down the conditions and procedures for the granting of aid to decrease the burden, regarding the allocation of expenses for the purchase of electricity from RS, determined by the KEVR. The statutory aid for each of the price periods under Regulation No E-RD-04-06/28.09.2016 applies for the period from 1 August 2015 to 31 December 2020.

The Minister for Energy organises the implementation and carries out the coordination of the activities under Regulation No E-RD-04-06/28.09.2016. The state aid is provided to traders in the sense of Article 1 of the Commerce Act. The traders carry out activities in sectors, whose competitive position is exposed to risk, as a result of the expenses for RES, as a function of their energy intensity and their interaction with international trade. The aid is provided to the beneficiary companies in the form of a rebate from the determined by KEVR component for allocating the expenses for the purchase of electricity from RS, as part of the price for obligations to society. The rebate is determined depending on the 'intensity of the energy" for the quantities of consumed energy for the respective price period.

- **Financial measures:**
- Preferential prices;

In 2015 changes were made to the ZEVI, and these changes limit the possibility for the purchase of electricity from RS at preferential prices.[23] The preferential prices are provided only for the sites for the production of electricity from RS with total installed capacity up to 30 kW included, which are planned to be built on roofs and facades of buildings, connected to the electricity distributing grid and on real estates thereto in urbanised territories after 1 January 2016.

- Programs, financing measures for the use of energy from RS:

-OP 'Development of the competitiveness of the Bulgarian economy' 2007-2013 and OP 'Innovations and competitiveness' 2014-2020;

Under OP 'Development of the competitiveness of the Bulgarian economy' 2007-2013 for the period 2015-2016 a total of 413 projects were implemented, of which one project was related to the construction of cogeneration from biomass (installed capacity 12 kW). The remaining projects are for the production of heat energy and cooling energy from RS with total installed capacity of 61.6MW. The expected annual production of heat energy is 143 232 MWh, and of the cooling energy - 42 970 MWh.

-OP 'Regional development' 2007-2013 and OP 'Regions in growth' 2014-2020 (OPRD 2014-2020);

[23] The legislative changes were presented in p.2a of the present report.

Under investment priority 'Providing support for energy efficiency, integrated energy management and the use of renewable energy in the public infrastructure, including in the public buildings and the residential sector' under OPRD 2014-2020 in the period from 2015 to 2016 171 grant contracts were concluded the amount of BGN 176 593 506.40. All financial projects are in process of implementation.

With respect to the measure 'Energy efficiency of buildings' project BG161P0001-1.2.01-0001 'Energy renovation of Bulgarian homes' under scheme BG161P0001/1.2.-01/2011 'Support for energy efficiency in multifamily residential buildings' under OPRD 2007-2013 was implemented fully by the Ministry of Regional Development and Public Works via the Residential Policy Directorate, which is a specific program beneficiary. The purpose of the project is via applying measures for energy efficiency in multifamily residential buildings to achieve the minimum regulatory required class of energy consumption of buildings in accordance with the European Scale for annual energy consumption and the implemented European standards. The direct benefits from the project consist of saving the expenses of households via decreasing the energy consumption, ensuring a higher quality of the micro climate and better environment for inhabitance, improving the outlook of buildings and extending their useful life. 6 buildings, in which the use of RES is envisioned, are renovated under the project. The investment for building systems for the use of RES is BGN 142 881.87 and the expected saved consumed energy of the used RES is 70.565 MWh/y.

-Program for the development of rural regions 2007-2013 – Under measures 312 'Support for the Establishment of Microcompanies'[24] in 2015 payments were made in the amount of BGN 45 064 059 of public funds, 27% of the approved projects were for investments for the production of energy from RS and value of the investment of BGN 108 351 320.
-Program for the Development of Rural Regions 2014-2020, approved with Commission Implementing Decision C (2015) 3480 of 26 May 2015. The program's total budget amounts to BGN 5 706 727 515 (EUR 2 917 848 203), allocated among 17 measures and Thematic subprogram for the development of small farms[25].

Measure M04 'Investments in tangible assets' envisions co-financing in building up systems for additional processing of residues and side products of the primary sector for the purposes of other companies from the processing industry, transport, energy based on RES, and the construction, investments for the building of new and reconstruction of the existing production facilities for the processing of secondary products, waste, residues and other resources in bio energy in the agricultural and forest farms and the processing companies. The measure will assist the investments for facilitation of the deliveries and use of RS energy from secondary products, waste, residues and other non-food resources for the purposes of bio-economy. The measure budget is EUR 43.3 million.
Measure M07 'Main services and renovation of the villages in the rural areas' will support projects for the use of energy from RS for own consumption and the measure budget is EUR 70 million.
Submeasure 4.2 'Investments in processing/marketing of agricultural products' will finance activities related to improving the overall activity, the economic efficiency and competitiveness of the companies from the food processing industry[26]. The submeasure application starts at the end of 2015 and the negotiated financial aid for projects with included investments for the introduction of new and energy saving technologies and innovations in the

[24] Agrarian report 2016
[25] State Fund Agriculture, http://www.dfz.bg/bg/prsr-2014-2020/ prsr-2014-2020
[26] Agrarian report 2017

processing industry is in the amount of BGN 15 255 240 (6% of the subsidy under the submeasure). Maritime and Fishery Program 2014-2020.

In the period 27 July – 25 October 2016 there started the collection of project proposals under measure 2.2 'Productive investments in aquaculture', Small projects[27] sector.
The measure is directed at the modernisation of the existing aquaculture farms, increasing their competitiveness and improving the labour conditions. Among the eligible activities are investments, which lead to smaller water consumption, decrease the use of chemicals and antibiotics and encourage the use of RS energy. The measure budget is BGN 2 000 000. The approved amount for support for 15 project proposals is in the amount of BGN 579 766.85.

- **Energy Efficiency and Renewable Sources Fund (FEEVI)**

From the beginning of the operation of the FEEVI to 31 December 2016 a total of 185 loan contracts were signed to ensure financing of investment projects to a total value of BGN 75 762 145. The total amount of the loans is BGN 52 574 913.

In 2015 6 loan contracts were signed and these contracts ensure financing of investment projects at the total value of BGN 1 412 090, and in 2016 – 9 loan contracts, which ensure financing of investment projects at the total value of BGN 6 742 672.

For the period from the beginning of the activity of the FEEVI to 31 December 2016, 29 agreements were concluded to guarantee the receivables under contracts with guaranteed result. The guarantee commitment, assumed by the FEEVI, is in the amount of BGN 601 760, ensuring 5% coverage of a portfolio of receivables in the amount of BGN 12 035 192. As at 31 December 2016 the specified 29 contracts expired.

As at 31 December the 2016 FEEVI provided 3 partial credit guarantees, covering up to 80% of the loan amount: two of them were provided to Raiffeisenbank (Bulgaria) EAD, which were fully repaid and one was provided to GS Expressbank AD, where the FEEVI is responsible for the amount of BGN 617 000 (which is a prolongation of the guarantee, provided to Tokuda Bank AD, where the FEEVI is responsible for the amount of BGN 800 000, due to refinancing the loan from SG Expressbank AD, with a current value as at 31 December 2016 in the amount of BGN 229 512. In 2015 6 new loan contracts, ensuring financing of investment projects in the amount of BGN 1 412 090, were signed.

- **Energy Efficiency and Renewable Energy Credit Line (EERECL);**

The EERECL is a credit facility, created with the aim to support projects in the private sector for energy efficiency in industry and small projects in the fields of RES. The EERECL provides to households, associations of condominium owners or service companies a possibility to obtain purposeful loans and grants via a network of Bulgarian commercial banks. The funds are provided for the implementation of energy saving measures, such as: energy efficient windows; isolation of walls, floors and roofs; efficient cookers and boilers, burning biomass; sun heaters for water;

[27] Agrarian report 2017

efficient gas boilers and gasification systems; heat pump air-conditioning systems; photovoltaic systems, integrated in the building; substations and building installations; heat recovery ventilation systems and energy efficient lifts.

In 2015 the EERECL financed and implemented 3 052 projects for the implementation of energy saving measure at home at the total value of BGN 9 755 101 and the forecasted equivalent of the saved electricity is 14 145 MWh_{el}/y., and the savings of greenhouse gas emissions are 9 661 tCO2 eq./y.

In 2016 there started a new stage of the program EERECL 3. At this new stage loans and grants are offered to the potential borrowers till 31 December 2018. The implementation of EERECL 3 in 2016 is the following:

- ➔ Number of projects: 57, of 44 are projects, in which there will be use of RES in existing and newly constructed buildings;
- ➔ Total value: BGN 1 747 555, of which BGN 209 522.46 for RES projects;
- ➔ Total savings of energy: 5 808 MWh/y.;
- ➔ Total savings of emissions CO2: 1 319 t/y.

In 2016 the abovementioned projects for RES provided funds as follows:

- ➔ For heat pumps: BGN 48 635;
- ➔ For systems for the production of energy from biomass: BGN 96 205.70;
- ➔ For systems for solar hot water: BGN 40 340.81;
- ➔ For gas boilers and installations: BGN 24 340.95.

- o **Programme BG04 'Energy efficiency and renewable energy';**

In 2017 16 grant contracts under Measure ‘Use of energy from RS for heating’, Grant scheme BG04-02-03: Measures to improve the energy efficiency and use of renewable energy in municipal and state buildings and local heating systems, financed under Program BG04 were finalised. The total value of the negotiated funds amounts to EUR 5 115 thousand. As a result of the implementation of the projects installations for the production of heat energy were built with a total installed capacity of 10.15 MW and the savings of greenhouse gas emissions are expected to amount to 3 442 tCO2/y.

Under grant scheme BG04-03-04: Production of fuels from biomass, financed under Program BG04 9 projects for the production of pallets were implemented at the total value of EUR 1 510 thousand with beneficiaries SMEs.

- o **National Trust EcoFund;**

In 2015 and 2016 the National Trust EcoFund financed 9 projects at the total amount of BGN 478 555. The produced quantity of electricity and heat energy from RS (solar energy) is expected to be in the amount of 767 MWh.

3.1 Please provide the information on how supported electricity is allocated to final customers for purposes of Article 3(6) of Directive 2003/54/EC. *(Article 22(1)(b) of Directive 2009/28/EC)*

In Accordance with Article 35(5) of the Energy Act the way of compensating the expenses, incurred from obligations

to society, is determined by the methodology adopted by the KEVR for allocating these expenses among all final clients, including the consumer of electricity from import, joined to the electricity system, the operator of the electricity transmission grid and the operators of the electricity distributing grids.

The production of electricity from RS is supported by the 'green energy' component, which accrues on the total quantity of electricity from RS, consumed in the country.

At present with the amendments and supplements to the Energy Act (SG No 56 of 24 July 2015, effective from 24 July 2015) the SES Fund was established to manage the funds to finance the expenses, incurred by the public supplier, which arise from the supplier's obligations to purchase the produced electricity under long-term contracts and preferential prices. The financing of the fund is raised from the revenues, received from tenders for the sale of quotas of greenhouse gas emissions, which are used for the development of renewable energy sources; from interest; donations; from statistical transfers of energy from RS, which are used for the development of renewable energy sources and contributions to the amount of 5% from:

-the electricity producers from the revenues of the sold electricity;

-the traders, who import electricity from the revenues from electricity, imported and sold on the market in Bulgaria;

-the operator of the electricity transmission grid from the revenue for access and transmission of electricity;

-the operators of the gas transmission grids from the revenues from access and transmission of natural gas;

-the operators of facilities for the storage of natural gas from the revenues from access and storage of natural gas.

- Degree of support

The next table presents calculations of the amount of the total annual support as a result of the purchase of the produced electricity from RS at preferential prices and under long-term contracts.

The calculations are based on data provided by NEK EAD, which in its capacity as a public supplier purchases electricity, produced from RS.

The total annual support to the production of electricity from RS is calculated as the difference between the expenses for the purchase of this energy at preferential prices and the expenses, calculated based on average annual market price of 70.00 BGN/MWh, adopted for the purposes of pricing, under Decision Ts-19/30.06.2016 and Decision Ts-19/01.07.2017 regarding the establishment of prices in the Energy sector.

Table 3: Support schemes for renewable energy

Types of source	**Quantities of electricity from RS, purchased by the public supplier at preferential prices, MWh**		**Expenses of the public supplier for the purchase of electricity from RS at preferential prices, thousand BGN**		**Difference[28], thousand BGN**	
	2015	**2016**	**2015**	**2016**	**2015**	**2016**
HPPs with an installed capacity less than 10 MW	815 720	748 374	128 867	117 677	71 767	65 290
Wind power plants	1 312 335	1 313 279	241 946	242 181	150 082	150 252
Photovoltaic power plants	1 227 180	1 222 788	612 235	602 582	526 333	516 987
Power plants operating on biomass	203 427	280 083	71 683	96 458	57 443	76 852

[28] The difference between the real expenses of the public supplier for the purchase of electricity from RS at preferential prices and the adopted average annual market price of 70.00 BGN/MWh under Decision Ts 19/01.07.2017 and Decision Ts-19/30.06.2016)

4. Please provide information on how, where applicable, the support schemes have been structured to take into account RES applications 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)*

The purchase of electricity at preferential prices and long-term contracts is the most attractive support scheme, compensating as it does for the higher costs of realising investments in RES energy generation.

Detailed information on the functioning of the scheme and the method used to calculate the preferential prices is contained in the previous progress reports and in sections 2 and 3 of this report.

Under Article 31(8) of the ZEVI, where the investment for the construction of an energy facility for the production of electricity from renewable sources receives financial support under a national or European support scheme, the Public Provider or Public Retailers respectively shall purchase the electricity at prices set by the KEVR pursuant to Regulation No 1 of 18 March 2013 on the Regulatory Control of Electricity Prices (SG No 33 of 5 April 2013).

According to amendments and supplements to the ZEVI, adopted in 2015 (SG No 56 of 24 July 2015, effective from 24 July 2015), the prices under Article 31(8) of the ZEVI, as last determined by a KEVR decision (KEVR decision No Ts-14/01.07.2014), will apply to producers of RS energy from sites constructed with national or EU support scheme financing and where aid applications were submitted before the ZEVI entered into effect.

The motives for the amendments to the ZEVI are with regard to:
- ensuring coverage of the own expenses for the implementation of the investment and avoiding double financing upon the granting of operational and/or investment aid for the production of RS energy;
-a need of undertaking measures to adjust the irregularities, ascertained by the EC departments in the audit mission RD1/2012/806/BG, concerning the financing of the producers of electricity from photovoltaic power plants under the measures of the Rural Development Program 2007-2013;
-the need of aligning the existing support scheme in compliance with the new requirements in the field of state aid;
-achieving compliance of the applied promotional schemes with the guidelines in the EU energy policy for the integration of the RS energy market.

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

The requirements of Directive 2009/28/EC regarding the system of guarantees of origin of RS energy are transposed into Bulgarian legislation through:

- ZEVI: Chapter Four 'Production of energy from renewable sources', Section IV 'Guarantees of origin for energy from renewable sources' and

- Regulation No RD-16-1117 of 14 October 2011 on the conditions and procedure for the issuance, transfer, revocation and recognition of the guarantees of origin for energy from renewable sources (SG No 84 of 28 October 2011, effective from 1 January 2012, last amended SG No 42 of 9 June 2015, effective from 9 June 2015, Regulation No RD-16-1117).

The ZEVI provides that the guarantees of origin shall be issued for a standard amount of electricity of 1 MWh and shall be valid for 12 months. The issue, transfer and revocation of guarantees of origin shall be completed by the AUER Executive Director. The guarantee of origin is an electronic document which has the sole function of providing proof to a final customer (buyer for own consumption) that a given share or quantity of delivered energy was produced from renewable sources.

Regulation No RD-16-1117 lays down the conditions and procedure for establishing, maintaining and using the system for the issuing guarantees of origin for energy from RS, their form and the content. The Regulation also determines the conditions and procedure for maintaining the register of guarantees of origin, subject to the entry and deletion circumstances, how to obtain information from the register, and the conditions and procedure for recognising the guarantees of origin issued by the competent authorities in other EU Member States.

The guarantees of origin of the electricity from RS are used by the electricity supplier to certify the share of RS in its overall energy mix. The guarantee of origin of RS energy is also used to determine the amount of energy, which the Public Supplier and the Public Retailers will purchase at preferential prices, set by the KEVR.

Detailed information of the effectiveness of the system of guarantees of origin of the electricity has been presented in the previous progress reports. In the period 2015-2016 no change was made to the regulatory documents, which lay down the functioning of the guarantees of origin system.

In 2015 AUER issued 9 224 452 guarantees of origin of electricity from RS, and in 2016 7 011 630 guarantees of origin were issued.

6. Please describe the 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)*

Biomass is the main renewable source used in Bulgaria. The gross domestic consumption of biomass was 1 206 ktoe in 2015 and 1 308 ktoe in 2016.

- **Wood biomass**[29]

The total area of forests in Bulgaria as at 31 December 2016 amounts to 4 230 825 ha, of which 2 913 090 ha are state forest territories, 172 473 ha are forests in the national parks, reserve and maintained reserves, managed by the Ministry of the Environment and Water (MOSV), 11 415 ha are forest territories, provided for management to training forest farms, 546 931 ha are municipal forest territories, 426 082 ha are forest territories, owned by private individuals, 43 916 ha are forest territories, owned by private legal entities, 20 911 ha are forest territories, owned by religious communities and 96 007 ha are agricultural territories with the characteristics of a forest.
Compared to 2015 the total area of forests increases by 7 951 ha, as a result of inclusion areas of hitherto unregulated forests.
The afforested area increases from 3 857 658 ha in 2015 to 3 864 965 ha in 2016, which is the result of stock taking of the forests, not recorded so far, afforestation, revaluation of inappropriate forest areas in the stock taking of forests, and also of self-afforestation between the two last stock-takings of the individual forest and hunting farms in unwooded forest areas or abandoned lands outside the forests.

Fuelwood is the main type of biomass, which is consumed in Bulgaria. In 2015 and 2016 the gross internal consumption of fuelwood amounts respectively to 8 061 587 sp.m^3 (733 ktoe) and 8 453 288 sp.m^3 (769 ktoe). The wood used for burning in 2016 has a 59% share of the biomass, used in Bulgaria. More than 97% of the fuelwood is used in the household sector.

Compared to the period 2013-2014 in the present reporting period 2015-2016 the consumption of this RS has decreased by 1 %.

- **Wood residues**[30]

The use of wood residues in the period 2015-2016 increased by 13% compared to the previous reporting period (2013-2014). The produced wood residues (recovered products) in 2015 and 2016 are 12 755 TJ (305 ktoe) and 12 486 TJ (298 ktoe). In 2015 import of 1 150 TJ (ktoe) was realised, and in 2016 there is an increase by 25% of the imported quantities of wood – 1 440 TJ (34 ktoe). The gross internal consumption of wood residues for energy purposes in 2015 is 978.9 thousand tonnes (240 ktoe), and in 2016 it is 978.6 thousand tonnes (258 ktoe). In 2016 there was a 93% increase in the use of wood residues for the production of electricity and heat energy at power plants with a public purpose and factory power plants compared to 2015. At the same time in 2016 the final consumption of this RS

[29] Based on information from energy balances for 2015 and 2016, the National Statistical Institute; Agrarian Report 2017, MZHG
[30] Based on information from energy balances for 2015 and 2016, the National Statistical Institute

decreased by 3% compared to 2015, which is due to the lower consumption in the Industry, Agriculture and Services sectors.

- Biomass from agriculture[31];

The consumption of plant residues for the production of energy in the period 2015-2016 has a growth of 56% compared to 2013-2014. At the same time in 2016 the consumption of this type of RS decreases by 51% compared to 2015. The reported decrease is due to a decrease in consumption in the sectors industry (by 46.6%) and agriculture (by 94%), as well as a decrease in the use of plant residues for the production of electricity and heat energy.

The biofuels used in Bulgaria are biodiesel and bioethanol, produced from cereals and oil crops. In the last two years the consumption of biofuels in the Transport sector increased by 43% compared to the period 2013-2014, and the reason for this is the almost three times increase in bioethanol consumption and 27% growth in the biodiesel consumption.

- **Waste**

In 2015, there was an improving trend in waste management practices, the national goals for recycling household waste, utilisation and recycling of packaging waste were achieved and in addition, the goals related to the recycling of the mass spread waste were achieved. At present the level of material recycling of household waste in Bulgaria is 142 kg/man/year and the target is this quantity to grow (for 2014 this indicator is 103 kg/person).

The accumulated household waste for 2015 is 3 011 kt. Since 2009 there is a tendency for a decrease in the accumulated waste and since 2011 the quantities of the accumulated household waste have remained relatively constant.

The quantities include the accumulated household waste and similar waste from administrative buildings, trade sites, schools and other public places. The share of the population, serviced by the systems for organised waste collection is up to 99.6% and the serviced settlements are 4 593. In 2015 the accumulated household waste per person is 419 kg/person/year.

According to Eurostat data the degree of recycling of household waste in Bulgaria is 78 kg/person/year.
In 2016 the use of waste is carried out in subsector 'Production of items from other non-metal mineral resources' and amounts to 1 209 TJ (29 ktoe). Compared to 2015 the consumption of waste has increased almost three times.
The production of biogas from anaerobic fermentation of biomass, garbage and sewerage residues is still insignificant. In 2015 and 2016 the gross domestic consumption of biogas amounts to 820 TJ (19 ktoe) and 2 511 TJ (60 ktoe) respectively. Biodiesel is used for the production of electricity and heat energy, in the agricultural and other sectors.
The information of the use of biomass has been shown in Table 4 and Table 4a.

[31] Based on information from energy balances, the National Statistical Institute; Agrarian Report 2017, MZHG

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)**	
	2015	***2016***	***2015***	***2016***	***2015***	***2016***	***2015***	***2016***	***2015***	***2016***	***2015***	***2016***
Biomass supply for heating and electricity:												
Direct supply of wood biomass from forests and other wooded land for energy generation (felling, etc.) [**32], m^3	4 263 307	4 487 807			1 821	1 470			455			
Indirect supply of wood biomass (residues and co- products from wood industry, etc.) [**33], t	99 423	79 567										

[32] Source: Annual report of the extraction of timber, the Executive Forest Agency.

[33] Source: According to data from National Statistical Institute, provided by the Executive Forest Agency.

	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)**	
	2015	***2016***	***2015***	***2016***	***2015***	***2016***	***2015***	***2016***	***2015***	***2016***	***2015***	***2016***
Agricultural by-products / processed residues and fishery by-products**, TJ												
Biomass from waste (household, industrial etc.)** [34], TJ	12 755	12 486	305	298								
Energy crops (grasses, etc.) and short rotation trees (please specify main types)[35], m^3	197 289	226 409										
Other types of biomass (please specify)												

[34] The data includes timber, plant and garbage waste. Source: Energy balances for 2015 and 2016, National Statistical Institute

[35] Source: According to Eurostat data, provided by the Executive Forest Agency.

	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)**	
	2015	***2016***	***2015***	***2016***	***2015***	***2016***	***2015***	***2016***	***2015***	***2016***	***2015***	***2016***
Biomass supply for energy use in transport:												
Use of common arable crops for biofuels (please specify main types)												
Energy crops (grasses, etc.) and short rotation trees for biofuels (please specify main types)												
Other (specify)												

Source: NSI

* If possible, the quantity of resources should be expressed in m^3 for the forestry biomass and in tonnes for the biomass from agriculture, fishing and for the biomass from waste.

**Determining this type of biomass should be understood in compliance with Table 7 in Section 4.6.1 of Commission Decision C (2009) 5174 final establishing a template for National Renewable Energy Action Plans under Directive 2009/28/EC

Table 4a. Current domestic agricultural land use for production of crops dedicated to energy production (ha)[36]

Arable land use	**Surface (ha)**	
	2015	**2016**
1. Land used for common arable crops (wheat, sugar beet etc.) and oil seeds (rapeseed, sunflower etc.). (Please specify main types)	2 886 137	2 864 916
2. Land used for short rotation trees (willow, poplar). (Please specify main types)		
3. Land used for other energy crops such as grasses, sorghum.	6 821	3 286

[36] Information from the MZHG

7. Please provide information on any changes in biomass-based commodity prices and land use within your Member State in the preceding 2 years associated with increased use of biomass and other forms of energy from renewable sources. Please provide where available references to relevant documentation on these impacts in your country. *(Article 22(1)(h) of Directive 2009/28/EC)*[37]

In 2015, the farmed land was 5 202 752 ha, and in 2016 it was 5 214 640 ha, which is about 47% of the country's territory

In 2015 the utilised agricultural land[38] is 5 011 494 ha, which is 45% of the country's territory. Compared to the previous year the utilised agricultural land has increased by 0.7%. In 2016 the used agricultural land was 5 021 412 ha or 45.2 % of the country's territory, and there is an increase by 0.2 % compared to 2015.

In 2015 arable land[39] increases by 0.7% compared to 2014, and occupies 3 493 688 ha. The relative share of arable land compared to the used agricultural land of Bulgaria remains a permanent value compared to 2014 (69.7 %). In 2016 the arable land deceases insignificantly by 0.4 % (3 480 991 ha) compared to 2015, which is 69.3 % of the used agricultural land.

In 2015 higher average yields on an annual basis in wheat, oats and rice were recorded. In almost all main grain crops (with the exception of rice) there is a decrease in production compared to the previous year, which is as a result of a decrease in the harvested areas and the unfavourable climate conditions – floods, freezing, hailstorm and droughts. In 2016 higher average yields in almost all main grain crops, with the exception of rice were recorded. In combination with the increased harvested areas, this leads to a significant increase in the production of wheat, rice, triticale and oats compared to 2015. On the other hand, in the production of oats, maize and rice there is a decrease on an annual basis as a result of contraction of the harvested areas.

The table below includes data of the production of grain and oil seeds from the harvests in 2015 and 2016.

Crop	Harvested areas (ha)			Average yield (t/ha)			Production (t)		
	2015	2016	Change 2016/2016	2015	2016	Change 2016/2016	2015	2016	Change 2016/2016
Wheat	1 105 916	1 192 589	7.8%	4.53	4.75	4.9%	5 011 597	5 662 721	13.0%
Rye	6 304	7 468	18.5%	1.78	2.03	14.0%	11 210	15 170	35.4%
Triticale	12 714	16 096	26.6%	3.02	3.06	1.3%	38 402	49 265	28.3%
Barley	175 957	159 830	-9.2%	3.97	4.32	8.7%	697 863	689 850	-1.1%
Oats	11 076	15 323	38.3%	1.96	2.05	4.4%	21 694	31 372	44.6%
Grain maize	498 644	406 942	-18.4%	5.41	5.47	1.1%	2 696 923	2 226 094	-17.5%

[37] Annual report on the state and development of agriculture (Agrarian report for 2016), MZH and Annual report on the state and development of agriculture (Agrarian report for 2017), MZHG

[38] The used agricultural area is made up of arable land, permanent plants, nurseries, permanent grassland and family gardens.

[39] The arable land includes areas involved in crop rotation, temporary grassland with grain and grasses legumes, set-aside land and greenhouses.

Rice	12 410	11 988	-3.4%	5.45	5.40	-0.9%	67 684	64 773	-4.3%
Sunflower	810 841	817 511	0.8 %	2.10	2.25	7.3%	1 699 228	1 837 677	8.1%
Rape	170 421	171 511	0.6%	2.48	2.97	19.8%	422 092	509 251	20.6%

Source: MZHG, Agrostatistic department, survey 'Production of agricultural crops'

The production of wheat in 2015 is in the amount of 5 011.6 thousand tonnes, by 6.3% below the level of 2014, due to a decrease in the harvested areas by 12.7 %, which is partially compensated by an increase of the average yield by 7.3 %. The areas cultivated with wheat in 2015 are 1 113 561 ha, 13% less compared to the previous year. The harvested areas were 1 105 916 ha or 99.3% of these areas. The production of wheat in 2016 amounts to 5 662.7 thousand tones, 13% more compared to 2015. This is due to the increase in the harvested areas by 7.8% and the favourable climate conditions in the process of development of the crop. The areas, cultivated with wheat in 2016, are 1 195 888 ha and of these 1 192 589 ha were harvested, 7.8% more on an annual basis.

The grain harvested from maize in 2015 decreases by 14 % compared to the previous year, up to 2 696.9 thousand tonnes, which is due to the drought during the summer season.

The average yield for the country decreases by 29.5% compared to 2014. The areas cultivated with grain maize in 2015 are 500 902 ha, which is 19.1% more compared to 2014, where 99.5% or 498 644 ha of these areas were harvested. In 2016 2 226.1 thousand tonnes grain maize were produced in the country, 17.5% below the level of the previous year due to a reduction in the areas. The areas cultivated with maize for harvest 2016 amount to 411 066 ha, 17.9 % less compared to the previous year and as a result of the drought during the summer season the harvested areas have shrunk by 18.4 %. The average yield of maize during the year is 5.47 t/ha or 1.1% greater than harvest 2015.

The main oil seeds grown in the country are sunflower and winter oilseed rape. The areas with oil seeds in 2015 are 1 077 092 ha and there is a decrease by 0.8 % compared to 2014.

The production of sunflower in 2015 shrank by 15.5% compared to 2014, up to 1 699 thousand tonnes. The decrease is due to a reduction in the harvested areas with sunflower by 3.9 % (with 4% less planted areas) in combination with a decrease in the average yield by 12.2 %. The production in 2016 increases by 8.1 % compared to 2015, up to 1 837.7 thousand tonnes, mainly as a result of an increase in the average yield by 7.3%, up to 2.25 t/ha. The harvested areas amount to 817 511 ha, 0.8% more compared to 2015.

In 2015 the production of rape was 422.1 thousand tonnes, 20% less than the level of 2014, with 10.4% less harvested areas and 10.5% lower average yield. The production of rape from harvest 2016 amounts to 509 251 tonnes. This is 20.6% more compared to 2015, mainly as a result of an increase in the average yield by 19.8 %, up to 2.97 t/ha.

Among the plants with the greatest contribution in the formation of the value of the end product in the agricultural sector in 2015 are:

-Common wheat, a share of 16.8 % by BGN 1 281.9 million (a decrease in the value of 14.7 % compared to 2014);

-Sunflower, a share of 14.1 % by BGN 1 078.4 million (a decrease of 10.2 %);

-Grain maize, a share of 8.8 % by BGN 673.3 million (a decrease of 13.4 %);
-Rape and colza, a share of 4.0 % by BGN 306.7 million (a decrease of 7.6 %).

The realised decrease compared to the previous year in all major crops is mainly the result of a decrease in the physical volume of production, which is not compensated by an increase in the prices. There is a decrease in the prices of wheat.

In 2015 almost half of the value of end production (47.7%) continues to be made up of the production of grain crops and oil seeds (respectively in the amount of BGN 2 264.1 million and BGN 1 386.0 million).

In 2016 there continued the tendency of an increase in the share of the cereals and oil seeds in the value of the end production. The two groups of crops together (respectively in the amount of BGN 2 312.2 million for the cereals and BGN 1 504.2 million for the oil seeds) already constitute over half (52%) of the agricultural sector's production.

The following plants have the greatest contribution in the formation of the value of end production in the agricultural sector in 2016:
-Common wheat, a share of 18.7 % by BGN 1 379.1 million;

Despite the considerable growth in the physical volume by 15.2 % compared to 2015, as a result of the serious decrease in the prices (by 13.2 %), the production of common wheat in terms of value preserves the level of 2015.
-Sunflower, a share of 15.8 % by BGN 1 165.7 million;

Sunflower realized growth in the physical volume by 5.5 % and at the same time a decrease of 10.1% of the prices, which explains the decrease in the value of production by 5.1 compared to the previous year.
-Grain maize, a share of 8.6 % by BGN 634.03 million;

In grain maize there is a decrease of 14.1% in terms of value on an annual basis, which at similar prices in 2015 was influenced by the decrease (by 14.9%) of the physical volume of production.
-Rape and colza, a share of 4.4 % by BGN 324.9 million (a growth of 10.4 %)

In rape and colza there is a considerable growth of 18.4 % of the physical volume of production, which compensates the decrease in the prices and contributes to achieving growth by 10.4 % in terms of value.

The table below presents the indexes of the producer prices for the period 2014-2016 compared to 2010.

Indicator	2010	2014	2015	2016
Cereals	100.0	114.1	118.7	109.4
Wheat	100.0	120.2	122.5	109.0
Common wheat	100.0	120.1	122.2	108.9
Durum wheat	100.0	131.2	149.0	115.0
Rye	100.0	120.3	121.8	127.2
Barley	100.0	141.4	146.9	133.5
Barley for feed	100.0	139.2	147.2	131.9
Barley for brewing	100.0	146.2	146.5	136.9
Oats	100.0	147.5	165.5	140.2

Maize	100.0	89.1	99.0	100.7
Rice	100.0	136.7	129.2	108.4
Other cereals	100.0	118.3	125.2	115.9
Technical crops	100.0	111.5	132.5	128.9
Oil seeds	100.0	108.7	131.3	124.6
Colza or rape seeds	100.0	108.0	130.0	121.9
Sunflower seeds	100.0	108.9	131.8	125.6
Soybeans	100.0	137.6	85.4	92.5
Other oil seeds	100.0	81.4	81.4	91.7

Source: *Agrarian report 2017, MZHG*

The table below presents information of the prices of agricultural production (in accordance with the Eurostat's Guide on the statistics of agricultural prices in EC) at producer prices for the period 2014-2016. The presented crops may be used for energy purposes.

Products	**Unit**	**2014**	**2015**	**2016**
Cereals				
Durum wheat	**t**	335.52	349.62	319.3
Common wheat	**t**	314.05	304.94	274.87
Maize	**t**	278.02	273.65	278.64
Rice in the husk (paddy or rough)	**t**	717.47	656.5	604.57
Barley	**t**	299.8	303.05	275.19
Barley for brewing	**t**	306.73	312.24	280.56
Barley for feed	**t**	294.2	296.25	269.9
Rye	**t**	256.16	259.73	282.05
Oats	**t**	337.7	361.27	342.97
Grain sorghum	**t**	299.59	302.42	272.15
Triticale	**t**	285.2	299.41	277.39

Products	Unit	2014	2015	2016
Industrial crops				
Peas, dry	tonne	794.61	622.98	515.5
Beans, dry	tonne	3 731.31	2 739.53	2 189.62
Lentils, dry	tonne	1 505.14	1 400.9	1 445.93
Soybeans	tonne	1 206.56	947.35	718.84
Peanuts/groundnuts	tonne	2 350	-	2 200
Rape or colza seed	tonne	602.13	670.4	681.41
Sunflower seed	tonne	597.94	697.72	696.5
'Oriental' tobacco	tonne	3 949.57	5 251.47	5 509.13
'Virginia' tobacco	tonne	3 583.05	3 494.17	3 208.19
'Burley' tobacco	tonne	3 655.16	3 055.71	2 824.56
Unginned cotton	tonne	-	700	738.95
Hops	kg	7.51	7.95	19.81
Lime blossom	kg	7.75	9.69	9.25
Sumach	kg	1.87	3.16	1.5
Peppermint	kg	3.55	3.79	5.53
Oil-yielding rose	kg	2.69	3.57	4.85
Lavender (green mass)	kg	0.77	1.94	1.83
Coriander seed	kg	1.56	1.42	0.87
Feed crops	x	x	x	x
Hay from natural meadows	kg	0.19	0.18	0.12
Lucerne	kg	0.21	0.2	0.2
Bales of cereals	Kg	0.12	0.11	0.09
Straw from cereals	Kg	0.09	0.11	0.07
Green mass for maize silage	Kg	0.11	0.09	0.15
Lucerne (alfalfa) seed	Kg	6.65	7.27	8.69
Potatoes	tonne	398.34	386.35	379.52

Source: *NSI*

In 2015 the total revenues of the state companies for the management of forest territories – state property from the sale of timber amount to BGN 266 548 thousand, 102% more compared to 2014. The reported total expenses in the use of timber amount to BGN 95 117 thousand, 110% compared to the values reported in 2014, and they include the distributions from the timber sales price to the 'Investments in forests' fund in the amount of BGN 31 849 thousand. The reported total revenues from the sale of timber in 2016 are BGN 275 835 thousand, 3% more compared to 2015.
The reported total expenses in the use of wood are BGN 97 649 thousand.

In 2016 49.2% of the total quantities of timber at a store were realized via sale of the obtained timber. The remaining 50.8 % are via sale of the staying timber of individuals for personal use and of legal entities after the tenders. To satisfy the needs of individuals a total of 705 thousand m^3 of timber were sold according to the price list, mainly timber for heating, which compared to 2015 is 87 thousand m^3 more.

The greatest demand and consumption is recorded in the assortment of timber for technological processing and wood for burning, of which 75.5% of the sales of staying timber at root and 63.8% of the sales of the obtained timber at store (a total of 3 428 thousand m^3 , which is 132 thousand m^3 more than in 2015) were realized.

The weighted average sales price from forest store of timber, obtained from forest territories - state property for 2015 is 69.23 BGN/ m^3, insignificantly greater (by 0.25 BGN/ m^3) than the reported value at the end of 2014. The weighted average sales price of staying timber is 35.20 BGN/ m^3 or 0.34 BGN/ m^3 more than in 2014.

The weighted average sales price from forest store of obtained timber from forest territories - state property for 2016 is 68.60 BGN/ m^3, insignificantly greater (0.63 BGN/ m^3 more) than the reported value at the end of 2015. The weighted average sales price of staying timber is 36.70 BGN/ m^3 or 1.50 BGN/ m^3 (4%) more than in 2015.

The reported average expense for obtaining timber in 2016 is in the amount of 23.60 BGN/ m^3, 0.74 BGN/ m^3 (3%) more than in 2015.

The table below presents information of the use of timber from forest territories, provided for management to the state companies and the sales revenues in 2015 and 2016.

Way of use and sale	*Report 2015*		*Report 2016*			
	quantity, m^3	*value, thousand BGN*	*quantity*		*value*	
			m^3	*changes compared to 2015, %*	*thousand BGN*	*changes compared to 2015, %*
I. Income from the sale of timber	*5 140 343*	*266 548*	*5 331 804*	*4 %*	*275 835*	*103 %*
1. Sale of staying timber at root	*2 515 675*	*88 464*	*2 710 685*	*8 %*	*99 531*	*113 %*
1.1 including according to the price list of individuals for personal use	*274 584*	*4 248*	*295 676*	*8 %*	*3 253*	*77 %*
2.Sale of obtained timber	*2 552 708*	*172 211*	*2 545 118*	*0 %*	*174 620*	*101 %*
2.1 including according to the price list of individuals for personal use	*377 887*	*19 233*	*295 676*	*-22 %*	*17 006*	*88*
3.Use of timber for activities from the financial plans of DP	*6 329*	*	*7 101*	*12 %*	*	*
4.Use of timber by the Executive Forest Agency and its structures	*65 631*	*1 547*	*68 899*	*5 %*	*1 547*	*100 %*

Source: *MZHG*

8. Please describe 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)***

- **An evaluation of the resources for the production of biodiesel of a new generation[40]:**

-Oils submitted as waste in Bulgaria;

The quantities of oils submitted as waste in Bulgaria in 2014 have been presented in the table below.

Category	Quantity, t
Waste oils from households	0
Waste oils from the services sector	2 172
Waste oils from the food industry	31
Waste oils from other industries	7 611
Total	**9 814**

Source: *Eurostat, 2017*

The data shows the relatively low share of waste oils, submitted as such in the food industry, services (incl. public restaurants) and households.

-Waste oil;

Based on the data of the consumption of oil by the population and the industry in 2011 of 450 kt per year and the justified assumption that waste oil is 15% of the consumed quantity, the quantity of waste oil in Bulgaria was evaluated as 67.5 kt.

In 2015 the consumption of sunflower oil on the average per person of the household was 12.3 l/y, and of margarine and other plant oils – 1.3 kg/y. It was assessed that the waste oil in the households amounts to about 13.4 kt, the total quantity of waste oil in the restaurants amounts to 5.6 thousand m^3 or 5.2 kt.

- Waste Hydrogenated Vegetable Oils (HVO)

Research of the production of Hydrogenated Vegetable Oils from waste oil was not undertaken for Bulgaria. Based on the total potential in EU (in EU-27) it is evaluated at 1.5 Mt per year (IGU & UN ECE, 2012) it is considered that the production of HVO in the country is about several tens of thousand tonnes per year.

[40] Source: 'An analysis of the possibilities for the production of biofuel of a new generation and of other renewable sources in transport and determining an indicative subgoal for the consumption of biofuels of a new generation in the Transport sector for the needs of the Ministry of Energy', assigned by the Ministry of Energy for determining the national goal for minimum consumption of biofuels of a 'new generation' in transport on the territory of the Republic of Bulgaria in 2020, in the performance of Article 2(2)(e) of Directive 2015/1513/EC.

- **An evaluation of the resources for the production of bioethanol of a new generation**

In Bulgaria there is no production of bioethanol of a new generation, nor a stated investor's interest.

The table below presents the waste (residue) of the agricultural crops in Bulgaria from harvest 2015 and the potential for the production of bioethanol from them. The crops, included in the table, are only those, where there is significant waste and the production of which is significant (over 100 kt). The calculations are based on the assumption for using 50% of the residues.

Agricultural crops in Bulgaria – production, waste and potential for the production of bioethanol, harvest 2015

Crops	**Production of a useful product[41], t**	**Ratio balance to useful product[42]**	**Balance, t**	**Use 50% balance, t**	**Bioethanol thousand m^3**
Wheat and spelt	5 011 597	1.2	6 013 916	3 006 958	691 600
Barley	697 863	1.7	1 186 367	593 184	136 432
Grain maize	2 696 923	1.5	4 045 385	2 022 693	566 354
Rape	422 092	2.75	1 160 753	580 377	133 487
Sunflower	1 699 228	2.62	4 451 977	2 225 989	511 977
Total	**10 527 703**	**-**	**16 858 398**	**8 429 199**	**2 039 850**

It was assessed that the potential for the production of bioethanol from agricultural waste is about 2 040 thousand m^3 or 1 609 kt.

The average annual yield of wood and brushwood in Bulgaria in the period 2012-2014 was 3 997 thousand dense m^3 (where this does not include the obtained construction timber)[43].

It was assessed that the forest waste, which may be used for the production of ethanol, is about 600 dense tm^3, which is equal to approximately 150 thousand m^3 (118 kt) ethanol.

In 2015 and 2016 biofuels of a new generation were not consumed in Bulgaria.

Table 5: Newly developed types of biofuels

Biofuels of resources, specified in part A of Annex IX to Directive 2009/28/EC	**2015**	**2016**
a) Sea weeds, grown on dry land in basins or photobioreactors	0	0

[41] Source: MZH, Agrostatistics department, survey 'Yield of agricultural crops-harvest 2015'

[42] Source: IEA

https://www.iea.org/publications/freepublications/publication/second_generation_biofuels.pdf

[43] http://www.nsi,bg/sites/default/files/files/publications/StatBook2016.pdf

b) Fraction of biomass in mixed household waste, but not in particular household waste subject to recycling according to the objectives pursuant to Article 11(2)(a) of Directive 2008/98/EO	0	0

Biofuels of resources, specified in Part A of Annex IX to Directive 2009/28/EC	**2015**	**2016**
c) Biological waste pursuant to the definition in Article 3(4) of Directive 2008/98/EC of households, subject to separate collection pursuant to the definition in Article 3(11) of the same directive	0	0
d) Fraction of the biomass in industrial waste, not subject to use in the chain of food products or feed, incl. materials from wholesale and retail commerce, from the agrofood industry, fishing and aquacultures, but without the resources, specified in Part B of Annex IX;	0	0
e) Straw	0	0
f) Animal manure and residues of purifying waste water	0	0
g) Waste water from the production of palm oil and empty grapes from palm fruits;	0	0
h) Resin from tall oil	0	0
i) Crude glycerin	0	0
j) Remains of sugar-cane (bagasse)	0	0
k) Grape marc and vine residue	0	0
l) Walnut shells	0	0
m) Husk	0	0
n) corn-cobs, cleaned of the maize grain	0	0
o) Fraction of the biomass in waste and remaining products of the forestry and the related industrial branches such as bark, branches, timber from pre-commercial thinning, leaves, spines, tips of trees, smithereens, shavings, black lye, brown lye, containing fibres residues, woodwool and tall oil;	0	0
p) Other non-food cellulosic materials according to the definition in Article 2(2)(s) of Directive 2009/28/EC;	0	0
q) Other ligno-cellulosic materials according to the definition in Article 2(2)(r) of Directive 2009/28/EC, with the exception of wood trunks and veneer trunks;	0	0
Biofuels of resources, specified in Part B of Annex IX of Directive 2009/28/EC	**2015**	**2016**

a) Used cooking oil	0	0
b) Animal fats, classified in categories 1 and 2 in accordance with Regulation (EC) No 1069/2009 of the European Parliament and of the Council	0	0

9. Please provide information on the estimated impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within your country in the preceding 2 years. Please provide information on how these impacts were assessed, with references to relevant documentation on these impacts within your country. ***(Article 22 (1)(j) of Directive 2009/28/EC)***

Within the procedure for the issuance of the Opinion on the environmental assessment No 1-2/2012 of 12 August 2012 of the NPDEVI an Environmental Assessment Report and a Report on the assessment of the compliance with the subject and objectives of preservation of the protected areas. The Environmental Assessment Report of the NPDEVI reviews the possible impacts on the components of the environment upon the implementation of the present technologies for RES, including biofuels in transport, bioethanol and biodiesel. They have been presented in detail in the previous reports on the progress and as a whole were evaluated as insignificant.

The control of the impact on the components of the environment, caused by the production of RS energy, including the production of biofuels, is carried out by the MOSV departments within their authority in compliance with the Environment Protection Act (ZOOS) and the by-laws thereto. In accordance with the annual plans on the control activity, the regional inspectorates for the environment and water (RIOSVs) carry out checks on the compliance with the requirements of the environmental legislation, the conditions regarding the issued environmental impact assessments (EIAs) and the complex permits for these sites.

The information of the degree of the impact of the factors, which lead to contamination and harms the environment, is presented annually in the Regional annual reports on the state of the environment, which are prepared and published by the RIOSV based on their overall control activity.

The annual reports of the 16 RIOSVs for the reporting period do not have any data of ascertained unfavourable consequences or new circumstances of the impact on the biodiversity, as a result of the production of transport biofuels and other liquid fuels of biomass on the biodiversity.
The supervision and control of the impact on the environment in the application of the NPDEVI is carried out based on the measures and indicators, determined in the Opinion on the environmental assessment of the NPDEVI, included in Annex 2 to the present report.

10. Please estimate the net greenhouse gas emission savings due to the use of energy from renewable sources. ***(Article 22 (1)(k) of Directive 2009/28/EC)***[44]

- **Electrical energy**

The net reduction in greenhouse gas (GHG) emissions attributable to the use of electricity from renewable sources were estimated by applying a carbon emission factor for electricity calculated on the basis of the fuel types, their calorific values and their contribution to the annual electricity output in 2015 and 2016.

The calculated values for the emission factors for 2015 and 2016 were :

[44] The evaluation was made by the MOSV.

- For 2015 - 0.5103 tCO2eq/MWh and
- For 2016 - 0.49541 tCO2eq/MWh.

Using renewable energies to produce electricity reduced GHG emissions by 3 681 390 tCO2eq in 2015 and 3 600 468 tCO2eq in 2016.

In percentage terms, the savings were 14.7 % in 2015 and 16.1 % in 2016.

- **Heating and cooling energy**

Reductions in GHG emissions attributable to the use of heat from renewable sources (solid and gaseous biomass) were estimated by applying comparative values, validated across the EU, for emissions generated by the use of fossil fuels (fossil fuel comparators) in the production of heat and electricity, as specified in the Report on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling.

Reductions in GHG emissions attributable to the replacement of fossil fuels with solid and gaseous biomass in the production of heat are calculated according to the following formula:

Reductions (savings) = (ECF(h,el,c) – ECh,el,c)/ ECF(h,el,c), where:

- ECh,el,c is the overall emissions value for the generation of a quantity of heat energy, cooling energy or electricity using biomass;

- ECF(h,el,c) is the overall emissions value for the generation of the relevant quantity of heat energy, cooling energy or electricity based on mineral fuels.

In this case, the recommended value of the fossil fuel comparator is ECF(h,el,c) = 87 gCO2eq/MJ. Traditionally, tree species with a typical default value 1 gCO2eq/MJ are used as an analogue for biomass in Bulgaria.

The comparative calculations were made for two scenarios, each with a different percentage of fossil fuel contribution to the production of heat (as per the table below) in order to estimate the GHG emissions upon the replacement of these fuels with biomass.

Table: Proportion of fossil fuels used in the overall production of heat

Sources for replacement	Scenario 1, %	Scenario 2, %
Coal	40	45
Methane gas	30	25
Electricity	15	20
Naphtha	15	10
Total	100	100

The calculated GHG emissions at these ratios show that the values for the fossil fuel comparator will be:

- in Scenario 1: ECF(h,el,c) =81.95 gCO2eq/MJ
- in Scenario 2: ECF(h,el,c) = 85.00 gCO2eq/MJ.

The percentage reduction of GHG emissions attributable to replacing fossil fuels with biomass in the production of energy for heating and cooling purposes was 28.28 % in 2015 and 29.64 % in 2016.

The net reductions in GHG emissions achieved by the use of heating and cooling energy from RS were 4 128 503 tCO2eq in 2015 and 4 331 580 tCO2eq in 2016 (Details are given in Table No 6).

The greatest reductions in GHG emissions are clearly achieved with the biomass used for the production of heat, followed by renewable sources used for the production of electricity.

- In 2015 and 2016, there was an increase of the proportion of biofuels **in the transport sector** compared to 2014, which leads to a reduction in GHG emissions due to the use of RS in transport. There was only negligible growth in the amount of electricity from RS and, therefore, the reductions in GHG emissions were close to the 2013 – 2014 levels.

Table 6: Estimated GHG emission savings from the use of renewable energy (t CO_2 eq)

Environmental aspects	2015	2016
Total estimated net GHG emission saving from using renewable energy[45]	8 012 208	8 159 901
Estimated net GHG saving from the use of renewable electricity	3 681 390	3 600 468
Estimated net GHG saving from the use of renewable energy in heating and cooling	4 128 503	4 331 580
Estimated net GHG saving from the use of renewable energy in transport	202 315	227 853

The estimated net GHG saving from the use of renewable energy continues the tendency of a gradual increase and the achieved saving in 2016 is 3.1% higher compared to the reported total saving in 2014 in the TNDNBNIEVI.

[45] The contribution of gas, electricity and hydrogen from renewable energy sources should be reported by final use (electricity, heating and cooling or transport) and only be counted once towards the total estimated net GHG savings.

11. Please report on (for 2015 and 2016) and estimate (for the following years up to 2020) the excess/deficit production of energy from renewable sources compared to the indicative trajectory which could be transferred to/imported from other Member States and/or third countries, as well as estimated potential for joint projects until 2020. ***(Article 22 (1)(l) and (m) of Directive 2009/28/EC)***

In 2015 and 2016, according to the indicative trajectory of the growth of energy from RS from the NPDEVI (Table 3) Bulgaria should have achieved 12.4 % share of the energy from RS in the gross final consumption of energy. Table 1a indicates that in 2015 and 2016 the actual achieved share of the energy from RS in the gross final consumption of energy is higher and amounts to 18.2% and 18.8% respectively. The quantity of consumed energy from RS in Bulgaria for 2015 and 2016 according to Table 3 of the NPDEVI was evaluated at 1 309 ktoe. In fact the consumed quantity of energy from RS is 1 919.3 ktoe for 2015 and 1 999.5 ktoe for 2016. The provided data evidence that in 2015 and 2016 there is an excess of 610.3 ktoe and 690.5 ktoe energy from RS.

In 2017 and 2018 Bulgaria expects to achieve the share of energy from RS in the gross final consumption of energy, determined in accordance with the indicative trajectory of growth in NPDEVI, which amounts to 13.7% due to which the forecasted evaluation of the possible excess of energy from RS is preserved.

Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory of the production of energy from RS, which could be transferred to/from other Member States and/or third countries in Bulgaria (ktoe)[46][47]

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual / estimated excess or deficit production of energy from RS (please, present the data separately for the types of renewable energy and depending on the origin/destination upon import/export)		**371.6**	**357.4**	**528.2**	**641.1**	**601.4**	610.3	690.5	420	471	411	341

[46] Please use actual figures to report on the excess production/deficit in the two years preceding submission of the report, and estimates for the following years up 2020. In each report Member State may correct the data of the previous reports.

[47] When filling in the table, please mark the shortage of production using negative numbers (e.g. – ktoe).

11.1. Please provide details of statistical transfers, joint projects and joint support scheme decision rules.

During the period 2015–2016 Bulgaria did not use the possibility to make statistical transfers, implement joint projects and joint support schemes.

The present report records Bulgaria's implementation of the target for 2020, which is a possibility to make statistical transfers to Member States, experiencing deficit of energy from RS for the implementation of their national targets.

12. Please provide information on how the share for biodegradable waste in waste used for producing energy has been estimated, and what steps have been taken to improve and verify such estimates. ***(Article 22 (1)(n) of Directive 2009/28/EC)***

Information of how the estimate of the share of biodegradable waste for the period 2015-2020 was made has been presented in the previous reports on the progress and in particular in the Second National Report on Bulgaria's Progress in the Promotion and Use of Energy from Renewable Sources (VNDNBNIEVI).

The Methodology for Determining the Morphological Composition of Household Waste applies during the reporting period. The methodology has been published on the web site of the MOSV (http://www.moew.government.bg/bg/otpaduci/bitovi-otpaduci/) and ensures a single approach for determining and forecasting the quantity and morphological composition of the household waste, in view of assisting all stakeholders (state institutions, municipalities, recycling organisations, etc.) upon long-term planning of the processes in the field of waste management.

The Manual on the Management of Biowaste in the Republic of Bulgaria has been published on the web site of the MOSV. It serves in the development of an overall system for managing biowaste, including development and establishment of systems for split collection of biowaste, standardisation of the processes of treating biowaste, development of a market for compost, including the development of standards for ensuring the compost's quality.[48]

At present the requirements with respect to the activities related to the split collection of biowaste are laid down in the Regulation for split collection of biowaste and treatment of biodegradable waste (SG No 11 of 31 January 2017).

[48] http://www.moew.government.bg/bg/otpaduci/specifichni-otpaduchni-potoci/biorazgradimi-otpaduci/programi-planove-metodicheski-ukazaniya-i-rukovodstva/

13. Please, specify the quantities of shipped biofuels and the not shipped bioliquids in units of energy (ktoe), which correspond to each category of the groups of resources, specified in part A of Annex VIII, reported by this member state , in view of achieving the targets, laid down in Article 3(1-2) and first subparagraph of Article 3(4)

In 2015 and 2016 biofuels (biodiesel and bioethanol) were consumed entirely in the automobile transport. The biofuels used were produced from crops, rich in starch and oil seeds.

Groups of resources	2015	2016
Grain-wheat crops and other crops, rich in starch, ktoe	32.2	32.9
Sugar crops		
Oil seeds, ktoe	112.5	130.3

Annex 1

Total actual contribution for the period 2009-2014 (expressed as installed capacity and gross production of electricity) of each technology for electricity production from RS in the Republic of Bulgaria to achieve the goals for 2020 and the indicative trajectory of the shares of energy from RS in electricity

	2009		2010		2011		2012		2013		2014	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh
HPP*	3 001	3 912	3 048	4 101	3 108	4 113	3 181	4 225	3 203	4 277	3 219	4 321
No pump	1 988	2 846	2 035	3 248	2 095	3 552	2 168	3 926	2 190	4 017	2 206	4 103
<1 MW	40	71	49	101	47	106	61	146	64	156	67	171
1 MW-10 MW	201	371	224	469	226	509	249	601	251	605	264	674
>10 MW	1 747	2 820	1 762	3 112	1 822	3 367	1 858	3 600	1 875	3 670	1 875	3 666
Pumping and accumu lating HPP	864		864		864		864		864		864	
With a mix regime of operation (with and without pumping and accumulatio n) **	149	416	149	433	149	431	149	421	149	413	149	409
Geothermal power plants												
Solar power plants	2	3	25	15	154	101	1 013	814	1 020	1 361	1 026	1 252
photovoltaic	2	3	25	15	154	101	1 013	814	1 020	1 361	1 026	1 252
with concentratio n of light												
energy of the high and low tides, waves and ocean energy												
wind installations	333	278	488	604	541	802	677	1 039	683	1 220	699	1 301
situated on land												
situated in the sea												
Biomass***	9	7	10	35	11	56	14	66	34	112	40	201
hard biomass	6	6	6	20	6	37	14	65	30	95	30	139
biogas	3	2	4	16	5	19	0	1	4	17	10	62
liquid fuels of biomass												
TOTAL	**3 345**	**4 201**	**3 571**	**4 756**	**3 814**	**5 072**	**4 885**	**6 144**	**4 940**	**6 970**	**4 984**	**7 075**

of which Combined Heat and Power (CHP)		7		35		56		66		110		182

Source: *Assessment data of the National Statistical Institute, provided to the Ministry of Energy before the data official publication have been used*

*Data, normalized in compliance with Directive 2009/28/EC and the methodology of Eurostat.
**According to the new methodology of Eurostat.
*** Take into account only the electricity from biomass, which corresponds to the sustainability criteria – cf. Article 5(1) last subparagraph of Directive 2009/28/EC.

Annex 2

Monitoring and control report of the environmental impacts following the application of the NPDEVI in accordance with Opinion on Environmental Assessment No 1–2/2012 of 8 August 2012

Within the Measures and conditions for preventing, reducing and remedying as fully as possible any adverse effects from the implementation of the NPDEVI:

A. General measures:

The construction of sites for the production of energy from RS is subject to the legislative procedures required under the environmental legislation.

The development proposals for projects which require an environmental impact assessment/environmental assessment (EIA/EA) and assessment of compatibility with the objectives and goals for the conservation of protected areas are approved once coordination with the competent authorities in charge of the environment has been agreed in compliance with the assessment's recommendations and the conditions of the relevant act.

In accordance with the Spatial Planning Act the energy sites for the production of electricity, including electricity from RS are launched into exploitation on the basis of a use permit, issued by the authorities of the Directorate for National Construction Control, under conditions and by procedures, laid down in a regulation of the Minster for Regional Development and Public Works, including a decision for an opinion whether to carry out an EIA.

A condition for the issuance of a use permit is the realisation of the construction in compliance with the requirements of effective administrative acts, which depending on the type and size of the construction are a condition precedent for allowing the construction under the Environment Protection Act (ZOOS), the Law on the Cultural Heritage or another special law, as well as reflecting the measures and conditions of these acts in the project.

In addition, in accordance with Article 148(8) of the Spatial Planning Act, an effective decision under EIA or a decision not to perform an EIA, as well as a decision for approving a report on the safety of building up or reconstruction of a company and/or a facility with a high risk potential or parts thereof under the Environment Protection Act is an annex, an inseparable part of the construction permit.
In accordance with Article 2(5) of Regulation No 6 of 24 February 2014 on the accession of electricity producers and clients to the electricity transmission or distributing networks, the contract for the accession of sites for the production of electricity from RS is concluded after the approval of the investment project and issuance of a construction permit for building up or reconstruction of the connected site, when the issuance thereof is obligatory in accordance with the provisions of the Spatial Planning Act.

According to sources of the MOSV in the period 2015-2016 the following decisions were issued under EIA/EA (by

the procedures of chapter six of the ZOOS), and evaluations of the compliance with the subject and the purposes of preservation of the protected areas (by the procedures of the Biological Diversity Act) for investment proposals/plans, programs or projects, concerning the production of energy from RS:

- Decisions were issued under EIA (by the procedures of chapter six of the ZOOS):
  - Decision No VT-45-PR/2015 for investment proposal 'Building up premises for the production of electricity and hot water from biogas, storage premises and a site for temporary storage of manure', which will be realised in land estates (PI) Nos: 005030, 005028 and 056053 on the territory of the village of Lesicharka, Gabrovo municipality, Gabrovo province, with contracting authority 'ELVI' OOD, the town of Gabrovo.
  - Decision No VT-54-PR/2016 for investment proposal: 'Installation of a micro turbine up to 20 kW for the production of electricity, without deviating water from the stream of Zlatarishka river, on the territory of the village of Djulunitsa, Liaskovec municipality', which will be realised in land estate No 000254, on the territory of the village of Stokite, Sevlievo municipality, with contracting authority ZP Rusi Zahariev, the village of Djulunitsa.
  - Decisions were issued for considering the need of an EIA with an opinion not to perform an EIA (by the procedures of chapter six of the ZOOS and the Biological Diversity Act) – for the period 2015-2016 21 investment proposals were coordinated, of which 7 proposals are within the protected areas of the Natura 2000 network, as follows for an investment proposal:
  - 'Building up micro HPP 'Baba Tsveta" on Struzhka and Elovitsa rivers, on the territory of the village of Gradevo, Simitli municipality, Blagoevgrad region.
  - 'Installing a modular complex for thermal gasification of biomass with a combined production of electricity and heat energy' in land estate No 66250.502.21 'for farm yard' on the territory of the village of Senokos, Balchik municipality, Dobrich province, with contracting authority: 'AGROPAKT' EOOD, the town of Dobrich.
  - 'Building up an entry self-purifying grid of the type 'Koanda filter' at the existing micro HPP 'Starna', the territory of the town of Apriltsi (with use permit No CT-12-165/08.04.2005 of Directorate for National Construction Control).
  - 'Mini HPP SOKOL' on Biala river, on the territory of the village of Sokolovtsi, EKATTE 67965, Smoliyan municipality, with contracting authority: 'SOKOL-11' OOD.
  - for the deployment of the existing company for processing agricultural production in the town of Dulovo, Silistra province, including the installation of a modular complex for thermal gasification of biomass with a combined production of electricity and heat energy. The nominal capacity of the engine is 500 kW.

  - for the reconstruction of the combustion system of steam boilers Nos 5 and 6 for burning biomass (sunflower husks) at 'Toplofikacia – Razgrad' EAD. Long with this, two water heating boilers operating on mazut ceased to operate. After the implementation of the investment project, the total installed nominal capacity of the power plant will be 42.5 MW.
  - for building up a system for autonomous supply with electricity of production headquarters on the territory of the town of Biala (a farm yard), via photovoltaic panels and wind generators with a vertical rotating axis (10kW) on the roofs of silos and farm buildings. It falls within the protected BG0000610 'Yantra River' for preservation of the natural habitats and the wild flora and fauna, adopted with decision of the Council of

Ministers No 122/02.03.2007 (SG No 21/2007). For the protected area there is issued order No RD-966/20.12.2013 of the Minister for the Environment and Water (SG No 9/2014), which introduces bans on certain categories of activities. After a verification of the admissibility, in the sense of Article 12(2) of the Regulation on the conditions and procedures for the performance of an evaluation of the compliance with the plans, programs, projects and investment proposals with the subject and the purposes of preserving the protected areas it was found that the investment proposal was admissible with respect to the regime of the activities in the protected area, determined with the order of the Minister for the Environment and Water.

- 'Building up store premises with a photovoltaic system for own needs and storage with subsequent processing of the agricultural production in UPI III-1194 on the territory of the village of Kukorevo, Tundzha municipality. Fig-trees were planted in estates Nos 065007, 043003, 065015, 066001 on the territory of the village of Denitsa, Boliarovo municipality. Purchase of farm technology (tractors and the associated inventory)', concerning protected area 'Zapadna Strandzha', with code BG0002066 under Article 6(1)(3-4) of the Biological Diversity Act.
- 'Store headquarters for keeping agricultural production and agricultural technology with photovoltaic devices on the roof for own needs with a capacity of 5 KW' in estate No 67338.882.108 on the territory of the town of Sliven, Sliven municipality, Sliven province, within protected area 'Adata – Tundzha' with code BG0002094 under Article 6(1)(1-2) of the Biological Diversity Act.
- 'Installation of hydro turbines for the production of electricity in the existing facilitating shafts - part of the water supply system of ViK Stara Zagora in estates with Nos 68850.508.16 and 68850.508.22 according to the cadastre map of the town of Stara Zagora, the municipality of Stara Zagora'.
- 'Building up a workshop for bottling spring water' in estate No 000510, on the territory of the village of Belitsa, Ihtiman municipality, with contracting authority 'Voda BG' EOOD. The electricity supply of the site is planned to be realised by solar panels, situated on the roof of the workshop, as well as by a wind turbine with a maximum height up to 15 m. The total capacity of the installation is up to 35 kW.

- 'Building up a site for the production of electricity from RES of biomass' in UPI XXI, quarter 256, the town of Aytos, with contracting authority 'Mehanizatsia i borba s eroziata' OOD.
- 'Building of an installation for the production of bio manure and biogas via a dry thermophile process in the processing according to the method of dry methanisation' in estate No 014262, Razklona locality, the town of Kableshkovo, Pomorie municipality', with contracting authority: 'RIC 6' OOD – within protected area 'Aytoska planina' BG0000151 (preservation of habitats).
- 'Building up an installation for the production of electricity and heat energy via indirect use of biomass' in estate No 73571.31.22, 'Babini draki' locality, the territory of the village of Tankovo, Nesebar municipality', with contracting authority ET 'Ipolita – Zlatka Ivanova' – within protected area BG0002043 'Emine' (bird preservation).
- Building up an installation for the gasification of biomass in PI07079.605.460, Hadzhi Tarla location, PZ 'Sever', the town of Burgas, with contracting authority: 'Grand Energy' EOOD.
- 'Composting installation in land estate No 301013, situated in Industrial zone 'Sever', the territory of Karnobat, with contracting authority: 'Agroshans Commerce' EOOD.
- 'Planting of orchards, building up stores for keeping agricultural production, pipe wells with photovoltaic

pumps, structure against hailstorm and fence in land estate 166064, 166065, 'Borchliata' locality in land estate 113015, 'Ahmachevski pat' locality, the territory of the town Karnobat, with contracting authority 'SID-Krastevi' EOOD.

- 'Building up a farm diary, solar installation for hot water and photovoltaic electricity installation for own needs up to 15 kW, in land estate No 27 according to the cadastre map of the village of Kameniak, Ruen municipality', with contracting authority ET 'BIOMANDRA-REYHAN RUZHDI' the village of Kameniak, Ruen municipality, Burgas province – with protected area BG0002044 'Kamchiyska planina' (preservation of birds).
- 'Planting an orchard of walnut, hazel and almond trees, building up sprinkling irrigation, two drill wells, an autonomous photovoltaic system for electricity supply and fence in land estate No 001008, 034020 on the territory of the village of Kozichino, Pomorie municipality' – within protected area BG0002043 'Emine' (birds preservation).
- Building up a store for keeping agricultural production and agricultural technology, administrative building, photovoltaic installation for own needs and drill wells in land estate 030035, Kartela locality, the village of Cherkovo, Karnobat municipality' with contracting authority: ET 'YAHONT-S-STANCHO STANKOV'.
- 'Building up a water sourcing facility – a pipe well for permanent plants via sprinkling irrigation, a photovoltaic installation and a fence in land estates 4081.003.053, 40381.003.054, 40381.003.055, 40381.003.056 and 40381.003.057, Malak Kurdiv locality, the village of Krastina, Kameno municipality', with contracting authority: 'Chernomorski leshnitsi' EOOD.

- Issued permit for considering the probable degree of a negative impact on the protected areas (by the procedures of the Biological Diversity Act):

- Decision No SM-17-OS/2016 coordinates the investment proposal 'Partial amendment of the adopted scheme of micro HPP 'Laki-2 –existing', which is not likely to have a considerable negative impact on protected area BG0001031 'Rodopi-Sredni' for preservation of the natural habitats and the wild flora and fauna and on protected area BG0002073 'Dobrostan' for the preservation of wild birds. Location: land estate with project number 167003, made up of estate with No 167002, the territory of the village of Yugovo, Laki municipality, Plovdiv province with contracting authority: 'Laki Invest' AD.

Control on the performance of the investment projects for building up energy sites for the production of electricity, including electricity from RS is carried out by the competent authorities under the Spatial Planning Act and the Minister for Energy does not have control authority in the process of building up and launching these sites into exploitation.

The control with respect to the compliance with the regulatory requirements in the field of the environment is carried out by the competent authorities under the Environment Protection Act and the specialised environmental legislation.

B. The following measures and conditions should be reflected in the final version of the NPDEVI

All measures and conditions, determined in the Opinion on the environmental assessment No 1-2/2012 of 8 August 2012 of the Minister for the Environment and Water have been reflected in the final version of the NPDEVI, adopted

with Decision of 9 January 2013 of the Council of Ministers.

The implementation of the measures and conditions is as follows:

1. Mitigating measures to prevent, decrease and overcome to a maximum extent the unfavourable consequences of the action plan implementation on the protected areas, related to the introduced ban on the implementation of new coordinated procedures (for which there is no initiated procedure as at the date of issuance of the Opinion on the environmental assessment) by the procedures of the Environment Protection Act and Biological Diversity Act with respect to the construction of HPP, micro HPP, photovoltaic power plants and wind generators is carried out by the MOSV.

This measure guarantees that on the territory of the protected areas and in a considerable perimeter around them, as well as on the vulnerable territories outside Natura 2000 no projects for RES will be implemented/approved.

According to sources of the Ministry of the Environment and Water (MOSV) in the performance of the requirement for a prohibition of new procedures Decision No SO-57-P/2015 was taken to prevent the procedure under Chapter Six of the Environment Protection Act, including the evaluation procedure for compliance with the subject and purposes to preserve the protected areas, amending the investment proposal for the construction of micro HPP 'Preboinitsa' in land estates Nos: 000395, 000709, 066013, 067020, 067022, 067023, 067025, 067026, 067027 according to the map of restored property of the village of Zanoge, 000098, 000101, 000102, 000103, 000104, 000105, 000106, 038014, 038024, 038025 according to the map of restored property of the village of Gubislav, Svoge municipality, Sofia province, with contracting authority 'Energy MB' OOD.

2. The introduction of incentives for second and third-generation biofuels:

- The ZEVI lays down promotional measures related to the production of a new generation of biofuels, including in accordance with Article 36(4) of the ZEVI in case of providing financial support for the production of biofuels priority is given to the production of biofuels from waste, residues, non-food cellulose materials and lignocelluloses materials;
- With the aim to implement the requirements of Article 2(2)(4)(e) of Directive 2015/1513/EC amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources (Directive 2015/1513/EC) in 2016 the Ministry of Energy assigned the performance of the service 'Preparation of an analysis of the possibilities for the production of biofuels of a new generation and other renewable sources in transport and determining an indicative subgoal for the consumption of biofuels of a new generation in the transport sector for the needs of the Ministry of Energy';

Within the specified time period under Directive 2015/1513/EC (till 6 April 2017) Bulgaria determined and presented at the European Commission a national goal for the consumption of biofuels of a new generation (biofuels, produced from waste and residues, such as straw, sea weeds, grape marcs, animal manure, precipitate, waste, etc) in the amount of 0.05% of energy content of the obligatory share of energy from RS in all types of transport, which should be achieved by 2020.

- Promotional measures to stimulate the production and consumption of biofuels of a new generation will be introduced with the adoption of the draft of the Act Amending and Supplementing the ZEVI in relation to the transposition of Directive 2015/1513. At the present moment a draft of the Act Amending and Supplementing

the ZEVI, transposing the requirements of Directive 2015/1513/EC is prepared. Procedures of public consulting and interagency coordination of the draft law are carried out;

- Innovations in the field of the low-carbon economy are an integral part of the approach of OP 'Innovations and competitiveness' 2014-2020, which is an opportunity to develop this type of innovative products;

3. The assessment of the available and estimated potential of the types of resources for the production of energy from RS on the country's territory (within the meaning of Article 19(1) of the ZEVI) should contain data on the sensitivity of the territories with respect to their biodiversity (where 'biodiversity' shall cover both protected areas and zones and known biodiversity sites outside the Natura 2000 network and the network of protected areas such as nests of globally endangered species of birds, migration bottlenecks, and key bat conservation areas, etc.).

The assessment of the available and estimated resources for the production of energy is an integral part of the investment research included in the investment processes associated with the construction of sites for the generation of electricity from RS.

As part of the regulated scope, totality and depth of the investment research, the relevant contracting authority should inform the authorities responsible for the environment of its intentions under Article 95(1) of ZOOS by requesting the specific applicable procedures under Chapter Six of ZOOS. In this context and taking into account the requirements arising from the scope of the investment research's specific legal framework, the contracting authorities should be requested to provide full, adequate and detailed information about their intention at the investment research stage.

4. The National information system of the potential, production and consumption of energy from RS (in accordance with Article 52 of the ZEVI) should contain and maintain data of:

- familiar territories of importance to biodiversity, outside the Natura 2000 network and the network of protected areas (nests of globally endangered species of birds, migration bottlenecks, and key bat conservation areas, etc.);
- real estates and movable cultural values.

In accordance with Article 52 of the ZEVI to ensuring accessibility via the National information system the following is provided:

-information of the national targets for the production and use of energy from RS total and according to sectors;
-reports for the implementation of the NPDEVI;
-qualification schemes for training to acquire professional qualification for the activities under Article 21(1) of the ZEVI;
-a list for acquiring professional qualification for the activities under Article 21(1) of the ZEVI;
- a list of the persons, who carry out audit for the compliance of biofuels and the liquid fuels of biomass with the sustainability criteria;

-information of the measures to stimulate the production and consumption of electricity, heat energy and cooling energy from RS and gas from RS;
-information of measures to stimulate the production and consumption of biofuels and energy from RS in transport;
-information of seminars, conferences and other events, related to the production and consumption of electricity, heat energy and cooling energy from RS, gas from RS and with the production and consumption of biofuels and energy from RS in transport;
-information of the pure benefits, spending of energy and the energy efficiency of equipment and the systems for the production and consumption of electricity, heat energy and cooling energy from RS, provided by the suppliers of equipment and systems;
-information of training and awareness campaigns on the support measures, the benefits and the practical aspects of the development and use of electricity, heat energy and cooling energy from RS, gas from RS, biofuels and energy from RS in transport;
-information of the procedure for reviewing the applications for the issuance of permits, certificates and licences for the energy sites for the production of energy from RS;
-other information.
To ensure availability through the system, information is provided of:
-the production of energy from RS, gas from RS, biofuels and energy from RS in transport;
-the consumption of energy, produced from RS, biofuels and energy from RS in transport;
-the projects, financed by the FEEVI.

The information is provided by:
-the producers, grid operators, the public supplier and the end suppliers of electricity;
-the producers and heat transmission companies for heat energy and cooling energy, the producers of gas from RS;
-the economic operators under Article 40(1) of the ZEVI;
- the distributors and end distributors of biofuels and their mixtures with liquid fuels of oil origin in transport;
-the persons, who carry out audit for the compliance of biofuels and liquid fuels of biomass with the sustainability criteria;
-the executive director of the FEEVI;
-the suppliers of equipment and systems for the production and consumption of electricity, heat energy and cooling energy from RS;
-suppliers of services related to the installation and maintenance of installations for the production of electricity, heat energy and cooling energy from RS;
-the state and local authorities;
-the owners of buildings for public use;
-the owners of individual systems for the production of electricity, heat energy and cooling energy.

5. Along with promoting the measures to encourage the production and consumption of energy from RS, attention should be paid to the risks posed to sensitive biodiversity areas

Implemented within the specific activities in accordance with the goal of the activity or event.

6. Long- and short-term municipal programmes for promoting the use of renewable energy and biofuels are to contain detailed information on environmental risks posed to sensitive areas in the relevant municipality

The programmes under Article 9 of the ZEVI include information about environmental and economic benefits from the implementation of projects in the field of energy from RS on the territory of the relevant municipalities and their resource provision as well as the options for the different types of RES and the environmental impact from their use.

7. Incentives are to be created for the use of biodegradable waste instead of wood or energy crops.

Implemented within the application and implementation of the environmental policy and, specifically, the waste management policy.

8. Introduction of administrative or other incentives for the development of renewable energy sources in areas that have already suffered from human impact, including damaged sites

Implemented within the application and implementation of the environmental policy.

C. When implementing NPDEVI, the following measures and conditions are to be fulfilled:

1. When planning energy system components, preference is to be given to low-risk areas, such as land in the vicinity of industrial areas, motorways and other artificial landscapes.

Plans for the construction and operation of facilities for the production of electricity and facilities for electricity transmission via overhead cables are subject to EIA or an assessment of whether an EIA needs to be completed. This will include an assessment of any adverse impact on the environment from implementing the development proposal.

2. When electricity distribution and transmission companies expand and renew their grids, better coordination and greater clarity of their investments is to be ensured in order to improve the chances of including new renewable energy projects.

According to Article 21(1)(30) of the Energy Act, the KEVR 'controls the implementation of electricity transmission grid operators' investment plans and submits in its annual report an evaluation of the operators' investment plans in relation to their conformity with the 10-year plans for development of the grids in the European Union. Furthermore, on the grounds of Article 21(3)(8) of the Energy Act, the KEVR approves a 10-year plan for the development of the transmission grid, monitors and controls its implementation under the provisions and its adherence to the procedure of Regulation No 3 on the licensing of activities in the energy sector.

3. Indicators for monitoring and control of the impact on the environment from the implementation of the NPDEVI.

- Realised facilities (built and/or commissioned) for the production of energy from RES within and outside protected areas and territories;

According to sources of the MOSV in accordance with the provision of Article 183 of the Water Act, the MOSV summarises the registers of the permits issued under the procedures of the Water Act on sourcing water and use with the aim of electricity production by HPP. In the period 2015-2016 14 HPP were realised (built and commissioned), of which 8 were built within the protected areas of the Natura 2000 network, as follows:

- HPP 'Debnevo' with an installed capacity of 0.6 MW, the river valley of Yantra, situated in protected area BG0000618 – Vidima.
- HPP 'Energy' Chiprovtsi, with an installed capacity of 0.81 MW, the river valley of Ogosta, BG0001040 – Zapadna Stara planina and Predbalkan.
- HPP 'Kadievo', with an installed capacity of 1.3 MW, the river valley of Maritsa, BG0000424 - Vacha river – Thrace, with utilised area in protected areas 3.606 dca.
- HPP 'Laki', with an installed capacity of 0.07 MW, the river valley of Mesta, BG0001028 – Sreden Pirin-Alibotush.
- HPP 'Matnitsa-2', the river valley of Mesta, with an installed capacity of 0.3 MW, BG0002078 – Slavianka.
- Micro HPP of 'Nik-energy-87' EOOD, with an installed capacity of 0.58 MW, the river valley of Mesta, BG0001028 – Sreden Pirin-Alibotush.
- HPP 'Petrich', with an installed capacity of 0.14 MW, the river valley of Struma, BG0001023 – Rupite-Strumeshnitsa.
- HPP 'Pchelina', with an installed capacity of 1.2 MW, the river valley of Struma, BG0001012 – Zemen.
- HPP 'Malak Iskar' with an installed capacity of 0.48 MW, the river valley of Iskar.
- HPP 'Rosa' with an installed capacity of 1.231 MW, the river valley of Iskar.
- 'Micro HPP 4', with an installed capacity of 0.265 MW, the river valley of Mesta.
- HPP 'Lenishta', with an installed capacity of 0.265 MW, the river valley of Mesta.
- HPP 'Tsarevec', with an installed capacity of 1.89 MW, the river valley of Iskar.
- HPP 'Diakovo', with an installed capacity of 0.192 MW, the river valley of Struma.

- Noise in territories with a regulated noise regime around wind energy systems in accordance with the requirements of Regulation No 6/2006;

According to the regional annual reports on the state of the environment in 2015 and 2016, published on the web sites of the 16 regional inspectorates of environment and water, there is no data from performed control measurements which indicate that permissible noise levels have been exceeded as regulated for by the legislation in force or the issued integrated permits for the operation of sites for the production of energy from RS, including wind generators;

- Noise around sites subject to health protection in accordance with the definition of item 3 to §1 of the

Additional Provisions to Regulation on the conditions and procedures for the performance of EIA;

According to the regional annual reports on the state of the environment in 2015 and 2016, published on the web sites of the 16 regional inspectorates of environment and water, there is no data from control measurements which indicate that permissible noise levels have been exceeded as regulated for by the legislation in force or the issued integrated permits for the operation of sites for the production of electricity from wind generators around sites subject to health protection in accordance with the definition of item 3 to §1 of the Additional Provisions to Regulation on the conditions and procedures for the performance of EIA.

With respect to the activities and measures, for the realisation of which the Ministry of Energy is the responsible institution, the following conclusions can be made within the implementation of the energy policy:

- The general measures and conditions for prevention, decrease or possible maximum elimination of the supposed unfavourable consequences of the implementation of the NPDEVI are implemented based on the requirements, laid down in the legislation in the field of investment design, construction and the environment and the statutory sequence of the activities within the investment process and the exploitation of the energy sites;
- All measures and conditions for the prevention, decrease or possible maximum elimination of the supposed unfavourable consequences of the implementation of the NPDEVI, determined in the Opinion on the environmental assessment No 1-2/2012 of 8 August 2012 of the Minister for the Environment and Water have been reflected in the final version of the NPDEVI, adopted with decision of 9 January 2013 of the Council of Ministers;
- The measures and conditions are implemented currently;
- The Ministry of Energy does not have data of unfavourable consequences from the implementation of the NPDEVI and within its competence does not have proposals to undertake corrective measures.

  The present report has been drawn up in accordance with the requirements, determined in the Opinion on the environmental assessment No 1-2/2012 of 8 August 2012.