

REPUBLIC OF BULGARIA
Ministry of the Economy, Energy and Tourism

**FIRST PROGRESS REPORT ON THE PROMOTION AND USE OF
ENERGY FROM RENEWABLE SOURCES**

**drawn up under 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
States' progress reports under Directive 2009/28/EC**

December 2011

Table of Contents

0. Gross final consumption of energy	5
1. Sectoral and overall shares and actual consumption of energy from renewable sources in the preceding 2 years (2009 and 2010). (<i>Article 22(1) of Directive 2009/28/EC</i>)	5
2. Measures taken in the preceding 2 years and/or planned at national level to promote the use of energy from renewable sources taking into account the indicative trajectory for achieving the national renewable energy targets as outlined in the National Renewable Energy Action Plan. (<i>Article 22(1)(a) of Directive 2009/28/EC</i>)	10
2a. Please describe the progress made in evaluating and improving administrative procedures to remove regulatory and non-regulatory barriers to the development of renewable energy. (<i>Article 22(1)(e) of Directive 2009/28/EC</i>)	22
2b. Please describe the measures in ensuring the transmission and distribution of electricity produced from renewable energy sources and in improving the framework or rules for bearing and sharing of costs related to grid connections and grid reinforcements. (<i>Article 22(1)(f) of Directive 2009/28/EC</i>)	25
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. (<i>Article 22(1)(b) of Directive 2009/28/EC</i>)	28
Administrative measures.....	28
Financial measures.....	29
Projects supported in 2009 and 2010 under individual measures of the Rural Development Programme 2007-2013.....	36
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? (<i>Article 22(1)(c) of Directive 2009/28/EC</i>).....	42
5. Please provide information on the functioning of the system of guarantees of origin for electricity and heating and cooling from renewable sources, and the measures taken to ensure the reliability and protection against fraud of the system. (<i>Article 22(1)(d) of Directive 2009/28/EC</i>)	43
6. Please describe the developments in the preceding 2 years in the availability and use of biomass resources for energy purposes. (<i>Article 22(1)(g) of Directive 2009/28/EC</i>).....	45
Wood biomass.....	45
Biomass from agriculture.....	45
Energy crops	46
Wood residues.....	46
7. Please provide information on any changes in prices of commodities based on biomass and on 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. (<i>Article 22(1)(h) of Directive 2009/28/EC</i>)	50
8. Please describe the development and share of biofuels made from wastes, residues, non-food cellulosic material, and lingo-cellulosic material. (<i>Article 22(1)(i) of Directive 2009/28/EC</i>)	51

9. Please provide information on the estimated impacts of the production of biofuels and bioliquids for the transport sector 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. (<i>Article 22(1)(j) of Directive 2009/28/EC</i>)	52
Climatic factors and air quality	53
Water resources	53
Soil and subsoil	53
Landscape	53
Biodiversity	53
10. Please estimate the net greenhouse gas emission savings due to the use of energy from renewable sources. (<i>Article 22(1)(k) of Directive 2009/28/EC</i>)	54
Biofuels	54
Electricity	55
Heating and cooling	55
11. Please report on (for the preceding 2 years) 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. (<i>Article 22(1)(l, m) of Directive 2009/28/EC</i>)	56
11.1. Please provide details of statistical transfers, joint projects and joint support scheme decision rules	57
12. Please provide information on how the share of biodegradable waste in waste used for producing energy has been estimated, and what steps have been taken to improve and verify such estimates. (<i>Article 22(1)(n) of Directive 2009/28/EC</i>)	57

0. Gross final consumption of energy

Bulgaria's gross final consumption of energy is shown in the table below. It remained constant for the period 2009-2010. Heating had the largest share, followed by that of electricity.

Table 0: Gross final consumption of energy

Sectors	2009	2010
Heating and cooling, ktoe	4 447	4 586
Electricity, ktoe	3 203	3 224
Transport, ktoe	2 776	2 729
Total, ktoe	10 426	10 539

Source: Energy balance sheets, 2009 and 2010, National Statistical Institute (NSI)

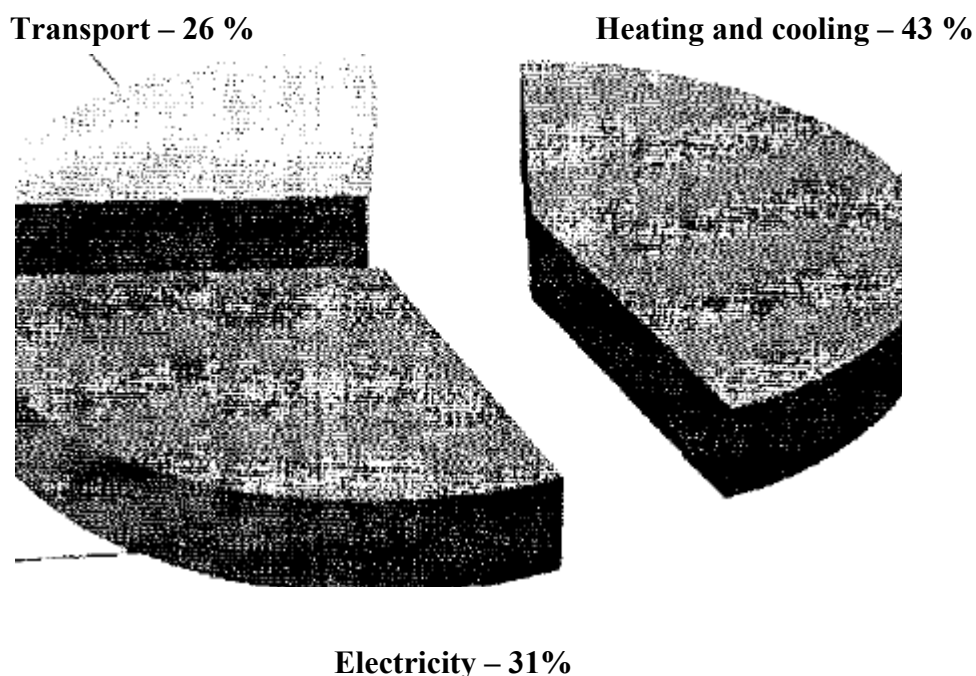


Figure 0: Sectoral breakdown of gross final energy consumption in 2010

1. Sectoral and overall shares and actual consumption of energy from renewable sources in the preceding 2 years (2009 and 2010). (*Article 22(1) of Directive 2009/28/EC*)

The shares of energy from renewable energy sources (RES) are shown in Table 1 and Figure 1. It is worth noting that the share of renewable energy in heating (RES-H) has increased substantially, unlike its share in the transport sector.

Table 1: Sectoral (heating and cooling, electricity and transport) and overall shares of energy from renewable sources¹

¹ Facilitates comparison with Table 3 and Table 4a of the National Renewable Energy Action Plans (NREAPs).

	2009	2010
RES-H&C ² (%)	17.4 %	20.1 %
RES-E ³ (%)	11.4 %	12.0 %
RES-T ⁴ (%)	0.3 %	0.6 %
Overall RES share ⁵ (%)	11.0 %	12.6 %
<i>Of which from cooperation mechanisms⁶ (%)</i>	0.0 %	0.0 %
<i>Surplus possible under cooperation mechanisms⁷ (%)</i>	0.0 %	0.0 %

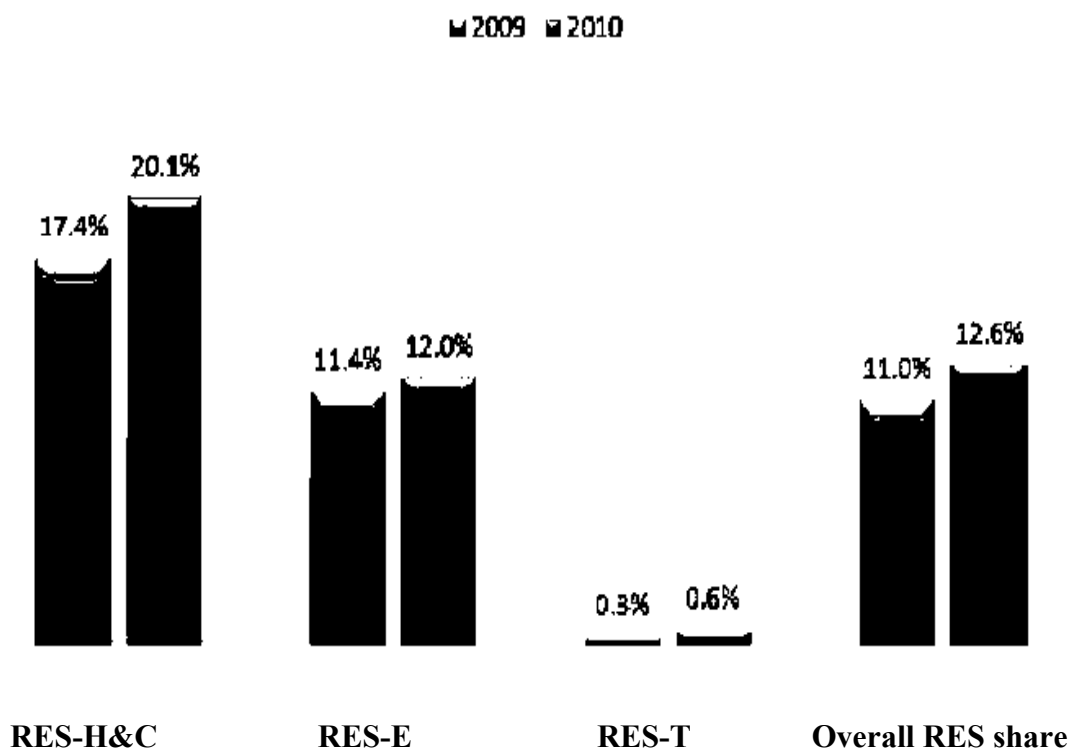


Figure 1: Sectoral and overall shares of energy from renewable sources

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 total gross final consumption of energy for heating and cooling. The same methodology as in Table 3 of NREAPs applies.

³ Share of renewable energy in electricity: gross final consumption of electricity from renewable sources (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 NREAPs applies.

⁴ Share of renewable energy in transport: gross final consumption of energy from renewable sources for 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; 3) biofuels used in road and rail transport and 4) electricity in land transport (as reflected in row 3 of Table 1 of the NREAPs). The same methodology as in Table 3 of NREAPs applies.

⁵ Share of renewable energy in gross final energy consumption. The same methodology as in Table 3 of NREAPs applies.

⁶ As percentage of overall RES share.

⁷ As percentage of overall RES share.

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

	2009	2010
(A) Gross final consumption of RES for heating and cooling	772	923
(B) Gross final consumption of electricity from RES	345	384
(C) Gross final consumption of energy from RES in transport	8	17
(D) <i>Gross total RES consumption</i> ⁹	1 125	1 324
(E) Statistical transfers of RES consumption to other Member States	0	0
(F) Statistical transfers of RES consumption from other Member States and third countries	0	0
(G) RES consumption adjusted for target (D)-(E)+(F)	1 125	1 324

The contribution from each renewable energy source/technology is shown in the table below. In the case of hydropower, units comprising mixed components – generators and pumps – are shown separately. Chaira PSHPP is a power plant with reversible generator assemblies which do not use any additional amount of water other than those pumped. The capacity of the pumps and the energy used by them to pump water to the upper reservoir is shown in the relevant row.

Table 1b: Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in Bulgaria to meet the 2020 targets and the indicative interim trajectory for the shares of energy from renewable sources in electricity¹⁰

	2009		2010	
	MW	GWh	MW	GWh
Hydro ¹¹ :	2 156	3 598	2 188	3 709
non pumped	1 621	2 957	1 653	4 330
<1 MW	44	137	47	187
1 MW–10 MW	204	614	216	815
>10 MW	1 373	2 206	1 390	3 328
pumped	788	852	788	929
mixed ¹²	535	462	535	769

⁸ Facilitates comparison with Table 4a of the NREAPs.

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 Facilitates comparison with Table 10a of the NREAPs.

¹¹ Normalised in accordance with Directive 2009/28/EC and Eurostat methodology.

¹² In accordance with new Eurostat methodology.

	2009		2010	
	MW	GWh	MW	GWh
Geothermal	0	0	0	0
Solar:	2	3	25	15
photovoltaic	2	3	25	15
concentrated solar power	0	0	0	0
Tide, wave, ocean	0	0	0	0
Wind:	333	412	488	722
onshore	333	237	488	681
offshore	0	0	0	0
Biomass ¹³ :	3	4	3	16
solid biomass	0	0	0	0
biogas	3	4	3	16
bioliquids	0	0	0	0
TOTAL	2 494	4 017	2 704	4 461
of which in CHP	0	0	0	0

Table 1c: Total actual contribution (final energy consumption) from each renewable energy technology in Bulgaria to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable sources in heating and cooling (ktoe)¹⁴

	2009	2010
Geothermal (excluding low temperature geothermal heat in heat pump applications)	33	33
Solar	0	10
Biomass:	746	899
<i>solid biomass</i>	742	883
<i>biogas</i>	0	3
<i>bioliquids</i>	4	13
Renewable energy from heat pumps	0	0
<i>of which aerothermal</i>	0	0
<i>of which geothermal</i>	0	0
<i>of which hydrothermal</i>	0	0
TOTAL	779	942

¹³ Take into account only those complying with applicable sustainability criteria, cf. Article 5(1) of Directive 2009/28/EC last subparagraph.

¹⁴ Facilitates comparison with Table 11 of the NREAPs.

	2009	2010
<i>of which DH</i>	1	2
<i>of which biomass in households</i>	672	710

Table 1d: Total actual contribution from each renewable energy technology in Bulgaria to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable sources in the transport sector (ktoe)^{15,16}

	2009	2010
Bioethanol/bio-ETBE	0	0
<i>of which biofuels under Article 21(2)</i>	0	0
<i>of which imported</i>	0	0
Biodiesel	4	11
<i>of which biofuels under Article 21(2)</i>	0	0
<i>of which imported</i>	0	0
Hydrogen from renewables	0	0
Renewable electricity	3	3
<i>of which road transport</i>	0	0
<i>Of which non-road transport</i>	3	3
Other (as biogas, vegetable oils, etc.)	0	0
<i>of which biofuels under Article 21(2)</i>		
TOTAL	7	14

¹⁵ For biofuels take into account only those compliant with the sustainability criteria, cf. Article 5(1) of Directive 2009/28/EC last subparagraph.

¹⁶ Facilitates comparison with Table 12 of the NREAPs.

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

Table 2: Overview of all policies and measures

Name and reference of the measure	Type of measure ⁱ	Expected result ⁱⁱ	Targeted group and or activity ⁱⁱⁱ	Existing or planned ^{iv}	Start and end dates of the measure
Measures relating to existing measures included in Table 5 of the NREAP					
1. Feed-in tariffs for electricity produced from renewable sources (FiT)	Financial	Energy generated (ktoe)	Investors	Existing ^v	<p>The feed-in tariffs were introduced by the Renewable and Alternative Energy Sources and Biofuels Act (ZVAEIB) in 2007. The periods of validity of power purchase agreements were as follows:</p> <ul style="list-style-type: none"> - 25 years with respect to electricity produced from geothermal and solar energy; - 15 years with respect to electricity produced by hydropower plants of up to 10 MW installed capacity. <p>With the adoption of the Renewable Energy Act (ZEVI), these were</p>

Name and reference of the measure	Type of measure ⁱ	Expected result ⁱⁱ	Targeted group and or activity ⁱⁱⁱ	Existing or planned ^{iv}	Start and end dates of the measure
					<p>modified as follows:</p> <ul style="list-style-type: none"> - 20 years with respect to electricity produced from geothermal and solar energy and biomass; - 12 years with respect to electricity produced from wind energy; - 15 years with respect to electricity produced by hydropower plants. <p>The measure is in place.</p>
2. Obligatory and priority connection of renewable electricity producers to the grid	Regulatory	Energy generated (ktoe)	Investors	Existing	<p>The measure was introduced in 2007. The new Renewable Energy Act has laid down a new approach and introduced a number of steps preceding the process of connection.</p>
3. Payment only of the direct costs of connection to the grid	Regulatory	Installed capacity (MW/year)	Investors	Existing	<p>Pursuant to the new Renewable Energy Act, the connection price includes the construction costs of connection facilities.</p> <p>The measure is in place and not limited in time.</p>
4. Long-term power purchase	Regulatory	Energy generated (ktoe)	Investors	Existing	Under the ZVAEIB:

Name and reference of the measure	Type of measure ⁱ	Expected result ⁱⁱ	Targeted group and or activity ⁱⁱⁱ	Existing or planned ^{iv}	Start and end dates of the measure
agreements for electricity produced from renewable sources					25/15 years. Under the new ZEVI: 20/15/12 years.
5. Purchase obligation in respect of electricity produced from renewable sources, excluding electricity produced by HPPs of more than 10 MW installed capacity	Regulatory	Energy generated (ktoe)	Investors	Existing	Under the ZVAEIB, within the period 2007 - May 2011. The new ZEVI provides for ensuring guaranteed access, transmission and distribution; priority dispatching; off-take of electricity produced from renewable sources for the period laid down in the Act. The measure is in place.
6. Penalty payments in the event of curtailment of production due to the network operator's fault ¹⁷	Financial	Energy generated (ktoe)	Investors	Existing	Start date: 2007. No time limit.
7. Compensation mechanism for the costs of the public supplier and public retailers incurred in purchasing renewable electricity at	Regulatory	Energy generated	Networks, investors, users	Existing	Start date: 2007. No time limit.

¹⁷ The electricity system operator is required to give priority to the operation and load of installations using renewable energy sources. In the process of operational management, in order to maintain the operational security of the system or prevent overload of grid components, the electricity system operator or the distribution system operators may limit – or even shut down – the operation of facilities generating electricity from RES. In such cases, the electricity network operators are not liable to pay penalties or compensation for loss of earnings.

Name and reference of the measure	Type of measure ⁱ	Expected result ⁱⁱ	Targeted group and or activity ⁱⁱⁱ	Existing or planned ^{iv}	Start and end dates of the measure
preferential prices					
8. Licensing procedures for renewable electricity producers of more than 5 MW installed capacity	Regulatory	Energy generated	Producers	Existing	The measure is in place and not limited in time.
9. Certificates of origin	Regulatory	Renewable energy generated (ktoe)	Investors	Existing	<p>Certificates of origin were issued in accordance with the Regulation on issuing certificates of origin for electricity produced from renewable energy sources in the period from 1 January 2008 until 31 December 2011.</p> <p>Under the new ZEVI, they are replaced by guarantees of origin and are issued under the Regulation on the terms and procedure for the issue, transfer, cancellation and recognition of guarantees of origin for energy produced from renewable sources for a standard quantity of 1 MWh of renewable energy.</p>
10. Obligations for persons placing petroleum-derived	Regulatory	Biofuel production and consumption (ktoe)	Investors, traders	Existing	Under the ZVAEIB, from 2007.

Name and reference of the measure	Type of measureⁱ	Expected resultⁱⁱ	Targeted group and or activityⁱⁱⁱ	Existing or planned^{iv}	Start and end dates of the measure
liquid fuels on the market for transport purposes to offer fuels for diesel and petrol engines blended with biofuels in the percentage terms laid down in the ZVAEIB and ZEVI					The new ZEVI provides for a stepwise approach: - biodiesel: from 1 January 2012; - bioethanol: from 1 June 2012. There is no time limit.
11. Reduced rate of excise duty for biofuel blends of a specified percentage	Financial	Biofuel production and consumption (ktoe)	Investors, traders and public administration	Existing	November 2009 to November 2011 ¹⁸
12. The authority responsible for monitoring the quality of pure biofuels and biofuel blends has been clearly designated	Administrative	Use of biofuels for transport	Distributors and end users	Existing	2007 The measure is in place and not limited in time.
13. Testing equipment for pure biofuels provided to the State Agency for Metrology and Technical Control	Administrative	Use of biofuels for transport	Distributors, end users and public administration	Existing	Since the end of 2009. There is no time limit.
14. Energy Efficiency and Renewable Energy Credit Line (EERECL)	Financial	Energy generated (ktoe)	Investors and (industrial) end users	Existing	The facility reached its end in 2011 but is expected to be extended until 2013.
15. Energy Efficiency Facility of the European Investment Bank and the KIDS Fund	Financial	Energy generation from renewable sources	Investors	Existing	No specific time limit

¹⁸ State aid decision No N 607/2008 - Bulgaria: Tax reduction for biofuels, 23 November 2009.

Name and reference of the measure	Type of measureⁱ	Expected resultⁱⁱ	Targeted group and or activityⁱⁱⁱ	Existing or planned^{iv}	Start and end dates of the measure
16. Enterprise for the Management of Environmental Protection Activities	Financial	Electricity generation by small HPPs	Investors	Existing	No specific time limit
17. Operational Programme "Development of the Competitiveness of the Bulgarian Economy" 2007-2013	Financial	Electricity generation from renewable sources	Investors	Existing	Start date: 2010. End date: 2013.
18. Rural Development Programme 2007-2013	Financial	Energy generation from renewable sources	Investors	Existing	Start date: 2010. End date: 2013.
19. Operational Programme "Regional Development"	Financial	Generation and consumption of energy from renewable sources	Investors, users	Existing	2007 - 2013
20. Operational Programme "Environment"	Financial	Electricity generation through the use of the gas (methane) emissions generated by household waste landfill sites	Municipalities	Existing	2007 - 2013
21. Implementation of the measures provided for in the Investment Promotion Act (ZNI) and its implementing rules, where appropriate	Administrative, Financial	Improving the business environment	Investors	Existing	2008 - 2010
Measures relating to planned measures included in Table 5 (Annex 1) of the NREAP					
1. Setting up an Agency for Sustainable Energy Development (ASED)	Administrative	Installed capacity, renewable energy generated and consumed, behavioural	Investors, energy companies, end users, planning authorities, associations and branch	Existing	2011 - no time limit

Name and reference of the measure	Type of measure ⁱ	Expected result ⁱⁱ	Targeted group and or activity ⁱⁱⁱ	Existing or planned ^{iv}	Start and end dates of the measure
		change	organisations, installers		
2. Setting up an inter-ministerial council at political level to coordinate the policy on the promotion of renewable energy	Administrative	Developing policies and legislative actions to promote renewable energy	Public administration	Planned	2012 - no time limit
3. Setting up an advisory group to support the implementation of the NREAP	Soft	Installed capacity, energy generated, behavioural change, introducing high-efficiency technologies	Investors, energy companies, end users, public administration, associations and branch organisations, installers	Planned	2012 - no time limit
4. Developing a geographical information system (GIS) for Bulgaria	Soft	Installed capacity, energy generation	Investors, public administration, end users	Planned	2013 - no time limit
5. Methodological manuals outlining the steps to be taken in the investment process in renewable sources by types of sources	Administrative	Investment process, installed capacity, behavioural change	Investors, public administration, end users	Planned	2012 - no time limit
6. Bringing the concluded preliminary connection agreements into line with the requirements of the new Renewable Energy Act	Administrative	Installed capacity, behavioural change	Investors, public administration	Existing	2011 - no time limit
7. One-stop shops	Administrative	New installed capacity (MW/year)	Investors, end users	Proposed	2015 - no time limit
8. Enhancing the administrative competence and capacity of officials	Administrative	Behavioural change	Authorisation bodies (all levels)	Planned	2011 - no time limit

Name and reference of the measure	Type of measureⁱ	Expected resultⁱⁱ	Targeted group and or activityⁱⁱⁱ	Existing or planned^{iv}	Start and end dates of the measure
responsible for issuing licences and authorisations					
9. Financing renewable energy and energy efficiency projects	Financial	Installed capacity, energy generated and consumed, emission savings	Investors, end users	Planned	2011 - no time limit
10. Developing rules and using financial resources from the Emissions Trading Scheme (ETS)	Financial	Installed capacity, energy generated and consumed, emission savings	Investors, end users	Planned	2013 - 2020
11. Streamlining authorisation procedures and signing connection agreements	Regulatory	Installed capacity, energy generation	Electricity companies, investors	Proposed	2011 - no time limit Permanent
12. Supporting the construction of new transmission and distribution infrastructure and attaching to it the status of a national infrastructure asset in view of the connection of new renewable energy producers	Administrative and regulatory	New installed capacity (MW/year)	Investors, end users	Proposed	2011 - no time limit Permanent
13. Enhancing competition between renewable energy technologies	Regulatory	Installed capacity, energy generation	Electricity companies, investors	Planned	2012 - no time limit Permanent
14. Supporting the development of smart grids and storage facilities	Regulatory	Installed capacity (more efficient integration)	Network owners, investors, end users	Planned	2012 - no time limit Permanent
15. Utilising demand-side management and congestion	Regulatory	Installed capacity (more efficient integration)	Scientific community, industry	Planned	2012 - no time limit Permanent

Name and reference of the measure	Type of measureⁱ	Expected resultⁱⁱ	Targeted group and or activityⁱⁱⁱ	Existing or planned^{iv}	Start and end dates of the measure
response options					
16. Code/rules of conduct for installers	Information	Behavioural change	Installers, suppliers of equipment, end users	Planned	2011 - 2013
17. Qualification requirements for installers	Administrative	Behavioural change, energy generated	Installers, end users, investors, authorisation bodies, financial organisations	Planned	2012 - no time limit Permanent
18. List of qualified installers	Regulatory	Behavioural change, energy generated	Installers, end users, investors, authorisation bodies, financial organisations	Planned	2012 - no time limit
19. Making or using cost-benefit analyses	General, financial, regulatory	Improving the business environment	Investors, end users, planning authorities	Proposed	2012 - 2013
20. Public information campaign promoting the use of renewable sources	General	Behavioural change	Installers, end users, investors, authorisation bodies, financial organisations	Planned	2012 - no time limit Permanent
21. List of renewable energy generation facilities	Information	Behavioural change	Investors, end users, public administration	Planned	2013 onwards
22. Translation of the national legislation	Information	Behavioural change	Investors	Existing	2011 - no time limit
23. Detailed up-to-date information on investor appetite and administrative and authorisation procedures	Information	New installed capacity (MW/year)	Investors, end users	Proposed	2012 - no time limit
24. Transposing into the Bulgarian legislation the requirements of the amended	Regulatory	Installed capacity, energy generation	Construction organisations, public	Planned	2012 onwards

Name and reference of the measure	Type of measure ⁱ	Expected result ⁱⁱ	Targeted group and or activity ⁱⁱⁱ	Existing or planned ^{iv}	Start and end dates of the measure
Directive 2002/91/EC, Directive 2009/28/EC, Directive 2009/29/EC and Directive 2009/30/EC			administration		
25. Replacing fossil fuels and electricity for heating in public buildings by biofuels and renewable energy	Regulatory and financial	ktoe	Energy suppliers, municipalities	Planned	2011 - no time limit Permanent
26. Mandatory use of renewable energy in new buildings	Legislative	ktoe	Investors, construction organisations, end users, public administration	Planned	2011 - no time limit Permanent
27. Financing projects through the Energy Efficiency and Renewable Energy Fund	Financial	ktoe	End users	Existing	2011 - no time limit Permanent
28. Promoting the use of individual renewable energy systems	Financial	New installed capacity (MW/year)	Investors, end users, public administration	Planned	2011 - no time limit Permanent
29. Support scheme for the implementation of renewable heating and cooling technologies in industry	Financial, regulatory	Behavioural change, installed capacity (MW; t/year), energy generated (ktoe)	Investors, end users, public administration	Proposed	2011 - no time limit Permanent
30. Support scheme for the implementation of renewable heating technologies in residential and public buildings	Financial, regulatory	Behavioural change, installed capacity (MW; t/year), energy generated (ktoe)	Investors, end users, public administration	Existing	2011 - no time limit Permanent
31. Financial incentives for the use of local heating systems	Financial	ktoe	Investors	Planned	2013 - no time limit Permanent

Name and reference of the measure	Type of measure ⁱ	Expected result ⁱⁱ	Targeted group and or activity ⁱⁱⁱ	Existing or planned ^{iv}	Start and end dates of the measure
32. Tax incentives for investment in renewable energy generation for household purposes	Financial	ktoe	End users	Existing	2009 - no time limit Permanent
33. Establishing assessment procedures requiring the obligatory marking of biomass incineration equipment	Regulatory, financial	ktoe	Energy suppliers	Planned	2012 - no time limit Permanent
34. Gradual increase of the share of biomass fuels in the "energy benefits" programme	Regulatory, financial	ktoe	Energy suppliers	Planned	2012 onwards
35. Developing a programme for accelerated switchover to biofuels for the public and municipal transport	Regulatory, financial	ktoe	Energy suppliers	Planned	2011 onwards
36. Quality control system for biofuels	Regulatory, financial	ktoe	Energy suppliers	Planned	2010 onwards
37. Requiring distributors and retailers of petroleum-derived liquid fuels to have available pumps which sell pure biofuels	Regulatory	ktoe	Energy suppliers	Planned	2015 onwards
38. Promotion and marketing programme for electric cars	General	Installed capacity (more efficient integration)	Scientific community, industry	Planned	2011 - no time limit Permanent
Additional measures relating to the planned measures included in Table 5 (Annex 1) of the NREAP					
1. Forests Act	Regulatory	Promoting the production of biomass	State forestry services, gaming protection	Planned	2010 - no time limit

Name and reference of the measure	Type of measure ⁱ	Expected result ⁱⁱ	Targeted group and or activity ⁱⁱⁱ	Existing or planned ^{iv}	Start and end dates of the measure
		from wood	services, municipalities, forestry and wood processing companies		
2. Partnership project entitled "GEO.POWER – Geothermal energy utilisation in residential and industrial buildings"	Administrative	Exploiting the potential of geothermal energy	Investors, end users, public administration	Planned	2010 - 2012

- i. Indicate if the measure is (predominantly) regulatory, financial or soft (i.e. information campaign).
- ii. Is the expected result behavioural change, installed capacity (MW; t/year), energy generated (ktoe)?
- iii. Who are the targeted persons: investors, end users, public administration, planners, architects, installers, etc.? Or what is the targeted activity/sector: biofuel production, energy use of animal manure, etc.?
- iv. Does this measure replace or complement measures contained in Table 5 of the NREAP?
- v. The measure is existing but has been modified or optimised in the period under review.

2a. Please describe the progress made in evaluating and improving administrative procedures to remove regulatory and non-regulatory barriers to the development of renewable energy. (Article 22(1)(e) of Directive 2009/28/EC)

The Renewable and Alternative Energy Sources and Biofuels Act (ZVAEIB) was the main national instrument governing Bulgaria's policy on the promotion of the production and use of energy from renewable sources before Directive 2009/28/EC was transposed in 2011.

This Act was adopted in 2007 and transposed Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market and Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport.

It was the first legal instrument to lay down rules promoting the production and use of electricity, heating and/or cooling from renewable and alternative energy sources, as well as the production and use of biofuels.

In order to optimise the administration of procedures after the ZVAEIB was adopted, a number of amendments (SG No 98, 14.11.2008, in force from 14 November 2008; No 82, 16.10.2009, in force from 16 October 2009; No 102, 22.12.2009) were made to this Act, as well as to other legal instruments. These amendments aimed at ensuring:

- Progress in the evaluation and improvement of administrative procedures in order to remove regulatory and non-regulatory barriers to the development of renewable electricity

The number of incentives for the production of electricity from renewable sources in terms of preferential prices, purchase obligations in respect of the electricity produced and long-term agreements, introduced by the ZVAEIB, along with numerous other factors, stoked investor interest in producing electricity from renewable energy sources. This, however, created a number of problems which impeded the development of the sector, the most important of which were:

➤ too many wind and solar farms were planned to be constructed, which went far beyond the capacity of the energy system;

➤ renewable energy projects were implemented in environmentally sensitive areas in breach of environmental assessment procedures;

➤ requests were submitted for the conversion of agricultural land to non-agricultural purposes in connection with the implementation of projects for the construction of wind and photovoltaic power plants, which led to the alteration of the status and designation of fertile land and precluded its further use for agricultural purposes;

➤ a large number of the potential investors who submitted feasibility study applications did not have serious investment intentions or the necessary financial and technical capacity to implement those projects.

In order to address those problems, the following actions were taken:

In order to coordinate and streamline the procedures for connection of renewable energy producers and optimise the investment process, the newly adopted Renewable Energy Act (ZEVI) (SG No 35, 3.5.2011), transposing Directive 2009/28/EC, introduced a new approach, outlining the steps preceding the process of connection. Detailed information is given in section 2b below.

An important task facing the State authorities in 2009 and 2010 was to coordinate the interests of investors and electricity network owners. Experience showed that a regulatory framework which was too favourable to investors gave rise to a number of unrealistic connection requests, which far exceeded the capacity of the electricity system. This led to the need to draw up a new Renewable Energy Act (ZEVI) to better meet the requirements of stakeholders for equal treatment.

➤ Amendments to the Agricultural Land Protection Act

The cases in which no change in the designation of agricultural land was allowed in connection with the construction of solar photovoltaic systems were clearly defined: In particular, the construction of facilities on irrigated land and on category 1 to category 4 land, where the surface of the site exceeded 500 daa, was prohibited, unless authorised by the Council of Ministers, acting upon a proposal from the Agricultural Land Committee. The construction and/or expansion of sites for the production of electricity from renewable sources using photovoltaic (solar) systems was allowed on non-irrigated agricultural land of category 5 to category 10 or on non-categorised land. This prohibition did not apply to electricity production for own needs.

➤ Amendments to the Forests Act with a view to optimising the sustainable use of timber from forests

A new Forests Act (promulgated: SG No 19, 8.3.2011) was adopted in 2010, which created new opportunities and promoted the production of biomass from wood.

In order to facilitate long-term planning of the activities both of state-owned forestry enterprises and of logging and wood processing companies, the state-owned enterprises were allowed to conclude long-term agreements with traders for up to 15 years for wood harvesting and sale. They were also allowed to conclude lease and rental contracts for up to 30 years in respect of public and municipal forest areas.

In this way, companies trading in timber would be sure of their timber resources and would be encouraged to invest in new machinery, equipment, infrastructure, vocational training and staff. An opportunity for sustainable production, management and use of the forests was created.

In order to promote the cultivation of energy crops, plantations of trees and shrubs created for the purpose of accelerated production of biomass were not required to be managed as forests. This meant that these plantations were not subject to the usual forest management restrictions and requirements, such as preparation of management plans, projects or programmes; felling age requirements; logging intensity restrictions, etc.

➤ Amendments to the Spatial Planning Act

The ZEVI introduced amendments to the Spatial Planning Act, aimed at facilitating the authorisation procedure for the construction (installation) of systems and equipment for renewable energy generation of up to 30 kW installed capacity, including on the roofs and facades of existing buildings in urban areas and on private land properties.

➤ Regulatory documents in respect of additional renewable energy technologies were prepared, other than those initially included in the regulatory framework to utilise the water, wind and solar power. Below is a list of the documents which were issued / updated in 2009 and 2010:

- Regulation on the licensing of activities in the energy sector, adopted by Decree No 124 of the Council of Ministers of 10 June 2004 (promulgated SG No 53, 22.6.2004; amended: No 78, 30.9.2005; No 11, 5.2.2008; No 93, 24.11.2009; No 58, 30.7.2010), providing that licences for the construction of renewable energy installations should be issued on a non-competitive basis;
- Regulation on the issuing of certificates of origin for electricity produced from renewable energy sources (promulgated: SG No 10, 6.2.2009; amended: No 85, 29.10.2010). This Regulation lays down the terms and procedure for issuing certificates of origin for electricity produced from renewable sources, the format and content of certificates, the terms and procedure for registration in the public register kept in accordance with the Regulation, the details to be included and the manner of obtaining information from the register. The Regulation also introduces a certification system guaranteeing the origin of the electricity and minimising any possibility of fraud;

- Decision No Ts-03 of 16 March 2009 of the State Energy and Water Regulatory Commission (DKEVR) setting a preferential price for electricity produced through the indirect use of biomass from vegetable or animal substances;
- Decision No Ts-04 of 30 March 2009 of the DKEVR setting a preferential price for electricity produced by hydropower plants, wind generators, photoelectric modules and through the direct incineration of biomass;
- Decision No Ts-14 of 12 May 2009 of the DKEVR setting a preferential price for electricity produced by low-head run-of-river hydropower plants;
- Decision No Ts-15 of 12 May 2009 of the DKEVR setting a preferential price for electricity produced by low-head axial-flow hydropower plants;
- Decision No Ts-30 of 7 September 2009 of the DKEVR setting a preferential price for electricity produced through the indirect use of energy from household waste;
- Decision No Ts-31 of 7 September 2009 of the DKEVR setting a preferential price for electricity produced through the indirect use of energy from municipal sewage sludge;
- Decision No Ts-018 of 31 March 2010 of the DKEVR setting a preferential price for electricity produced by hydropower plants, wind generators, photoelectric modules, through the direct incineration of biomass (industrial and waste wood, agricultural crops and energy crops), through the indirect use of energy from household waste and municipal sewage sludge and through the indirect use of biomass from vegetable or animal substances;
- Decision No Ts-038 of 27 September 2010 of the DKEVR setting a preferential price for electricity produced through the direct use of biomass from forest clearing, pruning and trimming of trees, in particular wood scrap and other by-products obtained as a result of the management and operation of forests, by power plants of more than 5 MW capacity.

- Progress in the evaluation and improvement of administrative procedure in order to remove regulatory and non-regulatory barriers to the production and use of biofuels in the transport sector

The policy and measures relating to transport are significantly more complex, taking into account the technical factors involved, both in terms of the organisation of infrastructure and of the quality of the vehicle fleet and the monitoring system. The State authorities focused their efforts on this area after it was reported that the use of biofuels was substantially lower than expected and was not increasing at a rate which would ensure the achievement of the 10 % target by 2020.

Bulgaria introduced the compulsory blending of biofuels with petroleum-derived liquid fuels in order to ensure that the national indicative target for promoting the use of biofuels and other renewable fuels in the transport sector was achieved.

In 2009, it was found out that the statutory requirements relating to the compulsory blending of petroleum-derived liquid fuels with biocomponents were not being implemented in practice, so that no progress was being made towards the achievement of the national indicative target.

Analysis showed that the reasons for the non-compliance with the ZVAEIB as regards the compulsory blending of conventional fuels with biofuels were complex. The main reasons cited by stakeholders were as follows:

- difficulties were encountered in meeting the requirements of the EN 228 standard in the case of blends of bioethanol with petrol;
- no accredited laboratories were available to check the quality and composition of biofuels

and to determine with sufficient accuracy the biocomponent content in a given blend;

➤ producers and importers of liquid fuels needed time to implement the investment programmes relating to the technical preparation of the distribution systems (to bring them into line with the Renewable and Alternative Energy Sources and Biofuels Act as regards the process of blending of biofuels with petroleum-derived fuels);

➤ problems were encountered in exercising control over the quality of pure biofuels and of blends of biofuels with petroleum-derived liquid fuels offered on the market, as well as in imposing penalties in the case of non-compliance with the statutory blending requirements;

➤ no tax incentives were implemented in practice for the placing on the market of pure biofuels and blends of biofuels with petroleum-derived liquid fuels.

In order to address these problems, the National Assembly in December 2009 adopted an Act amending the Renewable and Alternative Energy Sources and Biofuels Act, introducing the following changes:

➤ requirements were laid down for the phased compulsory blending of petrol and petroleum-derived diesel fuels with biofuels. The scheme implemented took into account the need of producers and final distributors to acquire the technical capacity for blending and for complying with the quality specifications for blended diesel fuels;

➤ the monitoring authority was clearly designated;

➤ coercive administrative measures were introduced and the amount of the penalties was increased;

➤ equivalence of the terms used in the applicable legislation such as the Renewable and Alternative Energy Sources and Biofuels Act, the Clean Ambient Air Act (ZChAV) and the Excise Duties and Tax Warehouses Act (ZADS) was ensured in order to achieve greater clarity and consistency in the designation of obligated parties;

➤ testing equipment for pure biofuels was provided to the State Agency for Metrology and Technical Control, financed by the national budget;

➤ the State Agency for Metrology and Technical Control took the necessary measures in accordance with its powers as a monitoring authority. As a result of the inspections carried out in 2010 of the facilities distributing liquid fuels in Bulgaria and the non-conformities found with the quality requirements for liquid fuels as regards their biocomponent content, the non-compliant fuels were removed from distribution and mandatory prescriptions for their withdrawal from the market were issued;

➤ a reduced rate of excise duty for blends of biofuels with liquid fuels with a biocomponent content 4 to 5 % entered into force on 24 November 2009.

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

The Renewable and Alternative Energy Sources and Biofuels Act (ZVAEIB) and the Energy Act (ZE)¹⁹ laid down the rules governing the national policy on the promotion of the use of renewable energy for the period 2009-2010. The following incentives for the promotion of

¹⁹ ENERGY ACT, promulgated: SG No 107, 9.12.2003; amended: No 18, 5.3.2004; No 18, 25.2.2005; No 95, 29.11.2005; No 30, 11.4.2006; No 65, 11.8.2006; No 74, 8.9.2006; No 49, 19.6.2007; No 55, 6.7.2007; No 59, 20.7.2007; No 36, 4.4.2008; No 43, 29.4.2008; No 98, 14.11.2008; No 35, 12.5.2009; No 41, 2.6.2009; No 42, 5.6.2009; No 82, 16.10.2009; No 103, 29.12.2009; No 54, 16.7.2010; No 97, 10.12.2010; No 35, 3.5.2011; No 47, 21.6.2011.

renewable electricity generation were provided for in these Acts:

- obligatory connection;
- purchase obligation;
- feed-in tariffs;
- the owners of transmission and distribution networks were required to assume a greater part of the costs for connection of renewable energy facilities (producers only covered the costs incurred within the boundaries of the energy site);
- the supplement to preferential prices could not exceed by more than 5% that in the previous calendar year.

The allocation of the costs for connection of energy facilities for the production of renewable electricity was a most controversial issue. The ZVAEIB in effect in the period 2009-2010 provided that:

"Article 15

(1) The costs for connection of energy facilities to the relevant network, up to the boundary of the energy site, shall be borne by the producer.

(2) The costs for connection of energy facilities to the relevant network, beyond the boundary of the energy site up to the point of connection, shall be borne by the relevant transmission or distribution company, while the producer shall only cover the direct costs incurred by the transmission or distribution company in respect of his connection, calculated in accordance with the regulation under Article 36(3) of the Energy Act.

(3) The costs for expansion and reinforcement of the transmission and/or distribution network incurred in respect of the connection of the energy facilities of the producer referred to in Article 13(2) shall be borne by the relevant transmission or distribution company and shall not be included in the price for connection payable by producers of electricity from renewable energy sources."

The cost-sharing methodology thus established was highly favourable to producers, who only had to cover the direct costs incurred within the boundaries of the site. In certain cases, this created difficulties for both parties because the owners of transmission and distribution networks had to make investments which had not been planned in advance.

Between 2009 and 2010, difficulties were also encountered with the connection of wind farms as a result of the fact that these were largely concentrated in the eastern part of the country and their construction was not coordinated with the electricity system development plans. Network owners had to deal with problems on a case-by-case basis and in the absence of financial resources to draw upon. In some cases, the owners provided the financing required for the connection of these installations, which the transmission or distribution company had to pay off in instalments.

The new Renewable Energy Act (ZEVI) will ensure the balanced development of renewable electricity in accordance with the 10-year transmission network development plan and distribution network development plans. To this end, it provides that the construction of new installations should be made subject to the integration capacity of the network, which will be assessed by the transmission network operator. The latter will also submit to the Minister for the Economy, Energy and Tourism and to the State Energy and Water Regulatory Commission information on the estimated capacities that can be connected to the transmission and distribution networks in a one-year period. These capacities will be allocated by region and voltage level. These estimates will be consistent with the targets set out in the National Renewable Energy Action Plan and take into account the following:

- preliminary agreements concluded;

- reported and estimated electricity consumption;
- transmission capacity of the networks;
- the need to ensure a balanced development of the electricity system.

The plan for development of the electricity transmission network for the period 2010-2020 (www.tso.bg), drawn up in accordance with the requirements of the ENTSO-E, takes into account the increasing demand for new generation capacities and highlights the need to create conditions for the accelerated development of the electricity transmission network through the establishment of effective economic mechanisms and an adequate regulatory framework.

Due to the large number of projects, NEK EAD plans to implement a large-scale investment programme in the period until 2020.

North-Eastern Bulgaria has a considerable untapped renewable energy potential, where wind farms of over 2 000 MW capacity can be constructed. In the period 2009-2010, a 110 kV transmission line with wide cross-sectional dimensions (2x3xACO 400) and a separate line to the Kaliakra Wind Power Farm were constructed. The existing AC 185 conductors were replaced by conductors with increased transmission capacity, thus reinforcing the transmission capacity of the Kavarna-Varna ring to a total of 100 MW in order to accommodate the production from wind farms in the region.

In order to ensure the expansion, reconstruction and modernisation of the transmission grid in the north-eastern part of Bulgaria, NEK EAD intends to construct a number of new 110 kV power lines, two switching stations, two 400 kV substations and related equipment by 2016. Investments in the rehabilitation of the high-voltage network amount to approximately BGN 250 million (EUR 130 million).

At the same time, the electricity system operator intends to make wider use of information and communication technologies (ICT) and to improve the automatic relay protection systems, performance characteristics of interconnectors, voltage control systems and the overall system management in order to integrate a number of new installations with intermittent load.

The network thus rehabilitated will be able to accommodate around 2 100 MW of WPP installed capacity from the Varna-Dobrich region.

At present, there are no other bottlenecks in the electricity transmission network, limiting the production from renewable energy sources.

In the period under review, the electricity distribution companies also followed an ambitious grid development policy in compliance with the Renewable Energy Act and Directive 2009/28/EC.

E.ON Bulgaria Mrezhi AD, responsible for electricity distribution in North-Eastern Bulgaria, reconstructed a number of switching stations, constructed new switchgear equipment, modernised and constructed transformers for the connection of new renewable energy installations, constructed new medium-voltage cable lines, installed remote measuring and control devices for electricity distribution, etc. The above investments amounted to BGN 5.539 million in 2010. (In 2009 the investments related to the connection and distribution of electricity produced from renewable sources formed part of the overall investments in the development and reinforcement of the network in the respective regions and were not reported separately). The company intends to continue its investment policy in coordination with ESO.

CEZ Bulgaria EAD, responsible for Western Bulgaria, and EVN Bulgaria Elektrorazpredelenie AD, responsible for South-Eastern Bulgaria, did not experience the same difficulties on account of new RES projects but these companies also made investments in the adequate accommodation of new generation capacities.

As regards the costs of construction of connection facilities, the new ZEVI provides that the renewable electricity producer should bear the costs of connection incurred up to the boundary of

the energy site. The costs of construction of facilities for connection of the producer to the relevant network incurred beyond the boundary of the site up to the point of connection, as well as the costs of development, including reconstruction and modernisation of the network in relation to this connection, should be borne by the network owner.

Upon concluding a preliminary connection agreement, the renewable electricity producer should make an advance payment to the transmission or distribution company.

This advance payment forms part of the price for connection of the energy site, which is calculated on a case-by-case basis and covers the costs of construction of connection facilities and the planned development, including reconstruction, modernisation and management of the electricity network in relation to this connection. This price is determined in accordance with the methodology adopted by the State Energy and Water Regulatory Commission pursuant to the Ordinance on regulating the prices of electricity under the Energy Act. In this way, the new approach to the allocation of connection costs adopted in the ZEVI, envisaging that costs should initially be borne by investors and later recovered to them through the feed-in tariffs, ensures financing and programmed development of electricity networks in Bulgaria.

The new Act streamlines the procedures for exploiting the renewable energy potential of the country by energy facilities of up to 30 kW installed capacity located in residential buildings and facilities of up to 200 kW installed capacity located in industrial buildings. It also introduces tax incentives for energy facilities using biomass of up to 1 MW installed capacity intended to be constructed in urban areas, agricultural holdings or production areas.

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)

Energy from renewable sources in Bulgaria is supported through a system of measures – administrative, financial, regulatory and awareness-raising – which place it outside the real market conditions until it develops sufficiently to participate on the market.

Administrative measures

This group includes various mechanisms aimed at promoting a certain course of action or a procedure in support of renewable energy development. The most important administrative measure is the setting up of the Agency for Sustainable Energy Development, which takes on a number of tasks which were previously carried out by the Ministry of the Economy, Energy and Tourism and the State Energy and Water Regulatory Commission. The Agency will implement the national policy on promoting the production and consumption of energy from renewable sources, develop plans and programmes, collect, store and manage information on renewable sources, provide assistance for the development of municipal programmes and municipal procedures, as well as raise public awareness of the benefits of using renewable energy in households and small and medium-sized enterprises and biofuels in private and public transport, etc. The Executive Director of the Agency is expected to organise the overall process of issue, transfer and revocation of guarantees of origin for energy produced from renewable sources (see the information provided under section 5), as well as to manage the planned statistical transfers of assigned amount units from Bulgaria to other Member States and vice versa.

The second most important administrative measure, implemented by the new ZEVI, is the establishment of a mechanism for coordination of the concluded preliminary connection agreements with the transmission and distribution network development plans. This measure will help to reconcile the differences between investors and owners of electricity networks and, at the same time, will help to ensure the reliability of the electricity system in certain regions with a high renewable energy potential. It aims to achieve smooth development of the transmission and distribution network and easy accommodation of renewable energy installations in strict compliance

with the sustainability and safe management criteria.

The measures in this group also envisage the provision of testing equipment for pure fuels, improvement of the administrative competence of the staff, development of methodological manuals, etc.

Financial measures

The financial measures currently in place are the following:

- feed-in tariffs;
- financing provided under EU programmes;
- credit facilities.

Feed-in tariffs apply to electricity only. In the period 2009-2010 and in the first half of 2011, feed-in tariffs were determined on the basis of two components in accordance with the ZVAEIB. Tariffs were reviewed by 31 March each year and were valid for one year. The feed-in tariffs valid in the period 2009-2011 are shown in the table below. The feed-in tariffs applicable from 31 March 2011 until 1 July 2011 were determined on the basis of two components:

- BGN 75.84/MWh, which was 80% of the final supplier's average selling price, which was BGN 94.80/MWh in 2010;
- plus a supplement set by the DKEVR.

Feed-in tariffs for electricity from RES, BGN/MWh

No	Types of RES depending on the type of primary energy source	Preferential prices excluding VAT (BGN/MWh)			
		2009	2010	2011-1	2011-2
1	Micro HPPs of up to 200 kW installed capacity		110.79	222.9	227.43
2	Low-head run-of-river HPPs of up to 5 MW capacity		200.09		
3	Low-head axial-flow HPPs of up to 5 MW capacity		152.59		
4	Low-head run-of-river HPPs, diversion HPPs, reservoir HPPs and diversion HPPs with a yearly compensating basin with net head of up to 30 metres and installed capacity of 200 kW up to 10 000 kW	105		213.09	222.83
5	Medium-head diversion, reservoir and diversion HPPs with a yearly compensating basin with net head of 30 up to 100 metres and installed capacity of 200 kW up to 10 000 kW	105		178.68	186.87
6	High-head diversion, reservoir and diversion HPPs with a yearly compensating basin with net head of more than 100 metres and installed capacity of 200 kW up to 10 000 kW	105		171.18	179.04

No	Types of RES depending on the type of primary energy source	Preferential prices excluding VAT (BGN/MWh)			
		2009	2010	2011-1	2011-2
7	Diversion tunnels with a yearly compensating basin of up to 10 000 kW installed capacity			253.48	265.05
8	Micro HPPs with pumps			112.48	112.1
9	Hydropower plants of less than 10 MW capacity, placed in service before 19 June 2007			112.48	
10	WPPs with up to 2 250 full-load hours	189	190.59	188.29	191.00
11	WPPs with more than 2 250 full-load hours	172	174.44	172.95	173.06
12	WPPs with an asynchronous cage rotor generator	145	148.79	148.58	137.06
13	PvPPs of up to 5 kWp capacity	823	792.89	760.48	
14	PvPPs of more than 5 kWp capacity	755	728.29	699.11	
15	PvPPs of up to 30 kWp capacity, installed on roofs and facades				605.23
16	PvPPs of more than 30 kWp up to 200 kWp capacity, installed on roofs and facades				596.5
17	PvPPs of more than 200 kWp up to 1 000 kWp capacity, installed on roofs and facades				583.77
18	PvPPs of up to 30 kWp capacity				576.5
19	PvPPs of more than 30 kWp up to 200 kWp capacity				567.41
20	PvPPs of more than 200 kWp capacity				485.6
21	PPs of up to 5 MW capacity, using waste wood, etc.	217	217.19	252.73	255.51
22	PPs of up to 5 MW capacity, using waste wood, etc., with combined cycle generation			288.04	282.15
23	PPs of more than 5 MW capacity, using waste wood, etc.				227.2
24	PPs of up to 5 MW capacity, using agricultural crop residues	166	168.74	167.53	195.03
25	PPs of up to 5 MW capacity, using energy crops	187	188.69	186.49	185.99
26	PPs of up to 150 kW capacity, indirectly using biomass from vegetable or animal substances		199.05	425.02	432.81
27	PPs of more than 150 kW up to 1 MW capacity, indirectly using biomass from				405.61

No	Types of RES depending on the type of primary energy source	Preferential prices excluding VAT (BGN/MWh)			
		2009	2010	2011-1	2011-2
	vegetable or animal substances				
28	PPs of more than 1 MW up to 5 MW capacity, indirectly using biomass from vegetable or animal substances				335.19
29	PPs of more than 1 MW up to 5 MW capacity, indirectly using biomass from vegetable or animal substances, with combined heat and power generation				348.61
30	PPs of 150 kW up to 500 kW capacity, indirectly using biomass from vegetable or animal substances		183.56	398	
31	PPs of 500 kW up to 5 MW capacity, indirectly using biomass from vegetable or animal substances		168.08	302.73	
32	PPs of up to 150 kW capacity, indirectly using energy from household waste		272.29	265.91	263.83
33	PPs of more than 150 kW up to 1 MW capacity, indirectly using energy from household waste				253.03
34	PPs of more than 1 MW up to 5 MW capacity, indirectly using energy from household waste				243.86
35	PPs of 150 kW up to 500 kW capacity, indirectly using energy from household waste		261.84	255.98	
36	PPs of 500 kW up to 5 MW capacity, indirectly using energy from household waste		251.39	246.05	
37	PPs of up to 150 kW capacity, indirectly using energy from municipal sewage sludge		150.69	150.39	158.05
38	PPs of more than 150 kW up to 1 MW capacity, indirectly using energy from municipal sewage sludge				132.05
39	PPs of more than 1 MW up to 5 MW capacity, indirectly using energy from municipal sewage sludge				119.27
40	PPs of 150 kW up to 500 kW capacity, indirectly using energy from municipal sewage sludge		136.44	136.85	
41	PPs of 500 kW up to 5 MW capacity, indirectly using energy from municipal		119.34	120.6	

No	Types of RES depending on the type of primary energy source	Preferential prices excluding VAT (BGN/MWh)			
		2009	2010	2011-1	2011-2
	sewage sludge				
42	PPs of more than 5 MW capacity, directly using biomass from forest clearing, pruning and trimming of trees, etc.			218.6	

Source: DKEVR (<http://www.dker.bg/>)

Pursuant to the ZEVI, which entered into force on 3 May 2011, the DKEVR sets feed-in tariffs from 1 July 2011, taking into account the type of renewable source, the type of technology, the installed capacity of the relevant facility, the site and method of installation of the facilities, as well as the following:

- investment costs;
- rate of return;
- capital and investment structure;
- output of the installation depending on the type of technology and resources used;
- costs of better environmental protection;
- costs of raw materials for energy generation;
- costs of transport fuels;
- wage and labour costs;
- other operating costs.

Financing provided under EU programmes

Three operational programmes provide financing for renewable energy projects:

- Operational Programme "Development of the Competitiveness of the Bulgarian Economy" 2007-2013

The programme is managed by the Ministry of the Economy, Energy and Tourism. In 2009 and 2010, financial support was provided for renewable energy and energy efficiency improvement measures in small and medium-sized, as well as in some large enterprises, under different actions of the programme.

Within the framework of Priority Axis 1: "Development of a knowledge-based economy and innovation activities", several procedures for providing grant assistance were launched, which are now in different phases of implementation. These include:

- "Support for the setting up and development of innovative start-up enterprises";
- "Support for the implementation of innovative products and processes in production and provision of innovative services";
- "Innovation development by start-up enterprises";
- "Setting up new and developing existing technological centres".

Under Priority Axis 2: "Increasing efficiency of enterprises and promoting a supportive business environment", several procedures for providing grant assistance were launched, which are now in different phases of implementation. These include:

- "Modernisation of technologies in enterprises";

- "Modernisation of technologies in small and medium-sized enterprises";
- "Modernisation of technologies in large enterprises";
- "Achieving compliance with internationally recognised standards";
- "Achieving compliance with internationally recognised standards and implementing management systems in enterprises".

The total budget allocated to Area of Intervention 2.3: "Introducing energy-saving technologies and using renewable energy sources" under Priority Axis 2 was BGN 293 374 500, while the underlying operations are expected to be implemented in the period 2012-2015. It aims to provide support to Bulgarian SMEs for investment in energy-efficiency, renewable energy, energy-saving and low-carbon technologies, as well as in energy efficiency improvement measures in production processes.

A procedure for providing grant assistance with reference BG161PO003-2.3.01: "Investments in Green Industry" was launched in November 2011, which will be implemented in 2012. The total amount of the aid allocated under this procedure is BGN 78 233 200.

- Operational Programme "Regional Development" 2007-2013

The programme is managed by the Ministry of Regional Development and Public Works and provides support for renewable energy projects mainly under Priority Axis 1: "Sustainable and integrated urban development". Under this axis, investments in renewable energy fall within the framework of renovation projects for public and multi-family residential buildings as a horizontal measure, the potential beneficiaries of which are public institutions and associations of building owners.

9 grant schemes for energy efficiency projects were launched under the programme by March 2011. 237 agreements, amounting to BGN 503 million, were concluded for the repair, reconstruction and implementation of energy efficiency measures in public educational, social or cultural establishments. Over 100 buildings were renovated as a result of completed projects.

Of these, 58 agreements, amounting to BGN 105 million, were concluded under two energy efficiency grant schemes: BG161PO001/1.1-09/2010 "Support for the implementation of energy efficiency measures in the municipal educational infrastructure of urban agglomerations" and BG161PO001/4.1-03/2010 "Support for the implementation of energy efficiency measures in the municipal educational infrastructure of 178 small municipalities".

Under grant scheme BG161PO001/1.1-09/2010 "Support for the implementation of energy efficiency measures in the municipal educational infrastructure of urban agglomerations", 23 agreements were concluded, the total amount of the aid provided being BGN 78 million.

Under grant scheme BG161PO001/4.1-03/2010 "Support for the implementation of energy efficiency measures in the municipal educational infrastructure of 178 small municipalities", 35 agreements were concluded, the total amount of the aid provided being BGN 27 million.

Financing was also provided for the performance of energy efficiency audits; implementation of energy efficiency measures, including heat insulation, joinery replacement, local installations and/or connections to the heat and gas supply systems; and installation of facilities using alternative and renewable energy sources.

Two energy efficiency schemes were included in the indicative annual work programme for 2011 under Operation 1.2: "Housing policy" of Priority Axis 1: "Sustainable and integrated urban development".

- Scheme "Support for the provision of modern social housing to accommodate vulnerable, minority and socially disadvantaged groups and other disadvantaged sections of the population"

The scheme focuses on social integration and aims to raise the standard of living and improve the overall quality of the housing stock for people from disadvantaged and vulnerable groups in 86 municipalities within urban agglomerations. The financial resources earmarked for interventions in social housing for marginalised groups under the programme are BGN 16 million.

These interventions may include renovation of existing buildings or construction of new dwellings for marginalised groups.

- Grant scheme "Support for energy efficiency measures in multi-family residential buildings"

The scheme focuses on the implementation of energy efficiency measures in multi-family residential buildings. 86 municipalities are included in the territorial scope of eligible activities. The total cost of the scheme is nearly BGN 63 million.

Eligible activities under the scheme are: performance of energy efficiency audits and implementation of energy efficiency and renewable energy measures in multi-family residential buildings; renovation of the common parts in multi-family residential buildings and repairs to the main components of the building structure (roof, façade, façade joinery, stairwell, exterior and interior corridors, entrance doors and stair landings, lifts) and vertical installations (water supply, sewerage, electricity, heating and telecommunications, fire hydrants) of the building.

- Operational Programme "Environment" 2007-2013

The programme provides financing for the construction of electricity generation installations using gas (methane) emissions generated by municipal landfill sites under Priority Axis 2: "Improvement and development of waste treatment infrastructure".

- Rural Development Programme 2007-2013

The programme is managed by the Ministry of Agriculture and Food. One of the priorities of the programme is the production and use of renewable energy, as well as the implementation of energy efficiency measures for the achievement of the objectives of the new EU energy policy. The production and efficient use of energy from renewable sources, the improvement of energy efficiency of agricultural holdings and enterprises in the food processing sector, forestry sector and rural areas, the combined heat and power generation by municipalities are important *precursors* to the sustainable development of rural areas.

In 2010, the European Commission released additional EUR 33.15 million to Bulgaria under the European Economic Recovery Plan (EERP), subject to a 10% national co-financing requirement.

Of these financial resources, 35% will be spent on renewable energy, and in particular on:

- facilities for the production of energy from RES;
- facilities for the production of bioenergy through the processing of primary and secondary vegetable or animal biomass;
- creation of plantations of perennial energy crops;
- renewable energy installations/facilities using biomass and other RES (solar, wind and geothermal energy).

Several measures under axis 1 and axis 3 are in support of the production and consumption of renewable energy:

Measure 121: "Modernisation of agricultural holdings" provides support to agricultural holdings for investments in bioenergy production for their own needs (biogas production from organic agricultural residues; electricity or heat generation from biomass). The capacity of the installations should not exceed the energy demand of the holding. In case of combined heat and

power generation, the capacity of the installations should be based on the useful heat demand of the holding (Directive 2004/8/EC²⁰). Support is also provided for investments in the construction or renovation of biomass warehouses, planting and/or replanting of fast-growing shrubs and trees for bioenergy production, as well as for energy efficiency improvements in agricultural holdings.

On the basis of the EERP, the amount of financial assistance is increased by 10% for the following investments:

- investments directly related to milk production;
- investments in buildings and equipment leading to energy efficiency improvements in agricultural holdings;
- investments in biogas production from organic residues from agricultural activities or from local production;
- investments in electricity or heat production through biomass processing for the own needs of agricultural holdings, including the construction or renovation of biomass warehouses;
- investments in the planting and/or replanting of fast-growing shrubs and trees for bioenergy production;
- investments in water-saving technologies, including water storage and waste water treatment facilities of agricultural holdings;
- investments in relation to the implementation of Directive 91/676/EEC.

Measure 123: "Adding value to agricultural and forestry products" provides support to enterprises in the food processing sector for investment in renewable energy production for their own needs and the sale of energy generated by processing products (raw materials) listed in Annex I to the Treaty establishing the European Community, irrespective of the fact whether the end products are included in the Annex or not.

On the basis of the EERP, the amount of financial assistance is increased by 10% for the following investments:

- investments in the milk and dairy sector, except for the production, processing and/or marketing of products resembling/substituting milk and dairy products;
- investments in buildings and equipment for energy generation through the processing of primary and secondary biomass from vegetable and animal products included in Annex I to the Treaty;
- investments in buildings and equipment for energy generation from renewable energy sources for the own needs of enterprises;
- investments in buildings and equipment for industrial waste water treatment;
- investments in buildings and equipment leading to energy efficiency improvements in enterprises.

Under *Measure 311: "Diversification into non-agricultural activities"*, support is provided to agricultural producers in rural areas for investments in the production and sale of renewable energy (solar, wind energy, etc.), except for biofuel production, and bioenergy generated by processing raw materials from their own agricultural holdings.

On the basis of the EERP, the amount of financial assistance is increased by 10% for the following investments:

²⁰ Directive 2004/8/EC of the European Parliament and of the Council of 11 February 2004 on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC.

- investments in buildings and equipment for the production and sale of bioenergy generated by processing biomass (raw materials) from their own agricultural holdings;
- investments in the production and sale of energy from other renewable energy sources.

Measure 312: "Support for the creation and development of micro-enterprises" provides support to micro-enterprises in rural areas for investments in bioenergy production for their own needs, production and sale of energy generated by processing products (raw materials) not included in Annex I to the Treaty and production and sale of energy from other renewable energy sources (solar, wind, water, geothermal energy, etc.).

On the basis of the EERP, the amount of financial assistance is increased by 10% for the following investments:

- investments in buildings and equipment for the production and sale of energy from renewable energy sources, except for those listed in Annex I to the Treaty.

The capacity of the installations under measures 311 and 312 should not exceed 1 MW.

Under *Measure 321: "Basic services for the rural population and economy"*, the potential beneficiaries of which are municipalities, non-profit legal entities, and community centres, grant assistance is provided for investments in infrastructure and equipment, including installations for heat and/or power generation from RES in municipal and/or public-sector buildings and construction of biofuel or heat/power distribution networks generated from biomass or other RES. In the case of combined heat and power generation, the capacity of the installation should be consistent with the useful heat demand in public buildings (Directive 2004/8/EC).

Projects supported in 2009 and 2010 under individual measures of the Rural Development Programme 2007-2013

Name and description of the measure	Activity	2009 number of approved applications	2010 number of approved applications	Number of approved applications	Support provided in BGN
<i>Measure 311: Diversification into non-agricultural activities</i>	Energy generation from RES: solar, wind and water energy	6	83	89	33 082 364
<i>Measure 312: Support for the creation and development of micro-enterprises</i>	Energy generation from RES: solar, wind and water energy	0	0	200	80 884 986

Credit facilities

- Energy Efficiency and Renewable Sources Fund (EERSF)

The fund provides low-interest loans mainly for energy efficiency projects. Projects totalling BGN 30 000 to BGN 3 000 000 with a payback period of up to 5 years are eligible for financing.

The financial resources for the initial capitalisation of the EERSF were provided by the

International Bank for Reconstruction and Development, the Bulgarian government, the Austrian government and private donors. By the new Renewable Energy Act, it was renamed to Energy Efficiency and Renewable Sources Fund.

➤ In the period 2009-2011, financial resources totalling BGN 2 557 920 were provided for renewable energy projects.

Most of these projects are now successfully completed.

A total of 29 energy efficiency projects were financed in 2009 through the loan and guarantee portfolio of the fund. The total project costs were BGN 13 156 000, while the loans extended by the fund were BGN 5 104 000.

The expected annual energy savings resulting from the implementation of energy efficiency improvement projects in the industry sector approved by the end of 2009 are as follows:

- electricity: 777.27 GWh/year;
- heat: 247.25 GWh/year;
- total energy savings: 1 024.52 GWh/year.

In 2010, 10 projects totalling BGN 3.9 million were implemented under an ESCO financing scheme.

- Energy Efficiency and Renewable Energy Credit Line (EERECL)

The facility was set up in 2004 by the European Bank for Reconstruction and Development in close cooperation with the Ministry of Energy and Energy Resources in order to provide support for the implementation of energy efficiency and small RES projects in private industrial enterprises.

The facility totalling EUR 155 million provided funds to seven local banks: OBB, UniCredit Bulbank, MKB Unionbank, DSK Bank, Raiffeisen Bank, Postbank and Piraeus Bank. In order to be eligible, projects had to comply with the national environmental and safety legislation. Officially, the programme reached its end in June 2011 but is expected to be extended until the middle of 2013.

Since the facility was launched in 2004 until August 2010, it extended loans of EUR 104 million and provided grants of EUR 18 million to 203 sustainable energy projects. Incentive grants of 15% to 20% of the loan amount were provided to borrowers if the projects were successfully completed. The applicants also received free advisory services.

Projects in the following fields were supported:

- new HPPs of up to 10 MW installed capacity;
- new and second-hand wind-energy generators of up to 5 MW capacity;
- electricity generation installations using biomass of up to 5 MW installed capacity;
- as regards heating plants using biomass with a thermal input exceeding 10 MWth, a special authorisation from the EBRD was required;
- solar installations for heat generation;
- geothermal installations;
- biogas installations.

With the support of the facility, 4 renewable energy projects totalling EUR 5 538 000 were completed in 2009, namely: 2 projects for micro HPPs, 1 project for wind energy generation and 1 project for photovoltaic energy generation. The loans provided under the facility totalled EUR 4 508 000.

In 2010, 13 renewable energy projects totalling EUR 22 143 000 were completed: 6 projects

for micro HPPs, 5 projects for wind energy generation, 1 project for solar energy generation and 1 project for photovoltaic energy generation. The loans provided under the facility totalled EUR 12 646 000.

In 2011, 3 projects for micro HPPs totalling EUR 11 118 000 were completed with funds from the facility totalling EUR 5 530 000.

- Residential Energy Efficiency Credit Line (REECL)

The European Bank for Reconstruction and Development provides loans to households and associations of building owners for the implementation of energy efficiency and RES projects through a network of participating banks. In addition to loans, the facility also provides free technical assistance and grants of up to 35% of the loan amount. Loans will be extended until 31 July 2014.

- Energy Efficiency Programme (EEP) of the European Investment Bank and the Kozloduy International Decommissioning Support Fund

The programme aims to improve energy efficiency and promote the development of renewable energy in Bulgaria and is mainly designed for municipalities and other public or private organisations. The programme combines low-interest loans from the EIB, grants by the KIDS Fund (20% of the loan amount in case of renewable energy investments) and free technical assistance. The loans are provided by participating banks.

Projects for the construction of small combined heat and power generation plants using renewable energy sources, electricity generation installations using wind power, photovoltaic systems and thermal solar collectors, hydropower plants and geothermal power plants are eligible for financing under the programme.

- Enterprise for the Management of Environmental Protection Activities (EMEPA)

The enterprise is managed by the Ministry of the Environment and Water and was set up under the Environmental Protection Act. Financing is provided for environmental protection projects, including projects for the construction of small hydropower plants, in the form of interest-free 5-year loans to enterprises, amounting to 70% of the total project costs but not exceeding BGN 1.5 million.

No renewable energy projects were financed in 2009 and 2010.

Tax incentives

The Excise Duties and Customs Warehouses Act (promulgated: SG No 91, 15.11.2005; last amended: SG No 99, 16.12.2011) reduced the excise duties on motor fuels with a biofuel content of at least 4 % by volume. For unleaded petrol with the above bioethanol content, the rate was decreased from BGN 710 to BGN 688 per 1 000 litres. Accordingly, the rate of excise duty on diesel fuel with a biodiesel content of at least 4 % was decreased from BGN 630 to BGN 596 per 1 000 litres.

In accordance with the Local Taxes and Levies Act (promulgated: SG No 117, 10.12.1997; last amended: SG No 39, 20.05.2011), buildings put into use before 1 January 2005 which have been granted a class A certificate under the Energy Efficiency Act are exempted from taxation for a period of 7 years. This period is extended to 10 years if renewable energy measures are implemented to meet the energy demand of the building. Buildings which have been granted a class B certificate are exempted from taxation for 3 or 5 years, depending on whether renewable energy sources are used.

Regulatory measures

The regulatory measures lay down the rules governing the production, transmission and distribution of energy from renewable sources. Pursuant to the ZEVI, the measures concerning

different energy carriers are as follows:

- Electricity from renewable energy sources

In compliance with the security criteria, electricity from renewable sources is promoted through the following measures:

- guaranteed access to the transmission and distribution network;
- guaranteed renewable electricity transmission and distribution;
- construction of the necessary infrastructure and capacities for system control;
- priority dispatching;
- off-take of the electrical output for a specified period depending on the type of source.

- Heating and cooling from renewable energy sources

The production of heating and cooling from renewable sources is promoted by soft measures:

- support for and implementation of projects for the construction of renewable heating transmission networks in settlements;
- support for and implementation of projects for the construction of small-scale decentralised heating and/or cooling systems;
- connection of heat generation facilities using renewable sources to the transmission network and off-take of the heat output of such facilities by the heat transmission company.

- Gas from renewable energy sources

As regards gas produced from renewable sources, the Renewable Energy Act provides for the following measures:

- guaranteed access to the transmission and distribution networks;
- guaranteed gas transmission and distribution;
- non-discrimination in the charging of transmission and distribution fees on gas from renewable sources;
- making public the connection tariffs of network operators;
- obligation to purchase gas produced from renewable sources of guaranteed quality and pressure on the basis of agreements with the public supplier and/or public retailers at preferential prices set by the DKEVR.

- Level of support

In order to calculate the level of support to promote the development of renewable energy, the following procedure was used:

1. a reference power plant was selected, which used a well-known modern technology and indigenous fuel;
2. the costs of the power plant for electricity production were determined;
3. the difference between these costs and those of any renewable energy technology was calculated per unit of energy generated;
4. the difference thus established was then multiplied by the amount of electricity expected to be generated from renewable sources by the relevant technology.

In the procedure above, the most probable alternative was used; i.e. a new, condensation reference power plant was selected, fired with indigenous lignite and using state-of-the-art

environment-friendly technologies for electricity generation. The price of electricity produced by such power plants was estimated to be around BGN 120/MWh. Taking into account that the price of a tonne of carbon dioxide under the National Investment Plan 2013-2020 (adopted by the Council of Ministers on 28 September 2011 and submitted together with Bulgaria's application for derogation from Article 10c of Directive 2003/87/EC of the European Parliament and the Council) was 15 EUR/tCO₂ and that the emissions generated in the production of 1 MWh of electricity by the reference plant were approximately equivalent to 1 tCO₂, then the total price of 1 MWh of electricity became approximately BGN 150/tCO₂.

The calculation was made on the basis of the estimated electricity production from renewable sources in 2011 as projected in the National Renewable Energy Action Plan, also taking into account the differences in preferential prices in the first and second quarter and the second half of the year. The results are shown in the tables below.

Table 3: Support schemes for renewable energy

Support schemes for renewable energy, 2011		Per unit support, BGN/MWh	Total (M€)
Wind power plants			
Preferential price	RES obligation/quota (%)	n.a.	n.a.
	Penalty/Buy-out option/Buy-out price (€/unit)	n.a.	n.a.
	Average green certificate price	n.a.	n.a.
	Tax exemption/refund	n.a.	n.a.
	Investment subsidies (capital grants or loans) (€/unit)	n.a.	n.a.
	Production incentives	n.a.	n.a.
	Feed-in tariffs	31	16.14
	Feed-in premiums	n.a.	n.a.
	Tendering	n.a.	n.a.
Total annual estimated support in the electricity sector			16.14
Total annual estimated support in the heating sector			-
Total annual estimated support in the transport sector			-
Photovoltaic power plants			
Preferential price	RES obligation/quota (%)	n.a.	n.a.
	Penalty/Buy-out option/Buy-out price (€/unit)	n.a.	n.a.
	Average green certificate price	n.a.	n.a.
	Tax exemption/refund	n.a.	n.a.
	Investment subsidies (capital grants or loans) (€/unit)	n.a.	n.a.
	Production incentives	n.a.	n.a.
	Feed-in tariffs	506	12.94

Support schemes for renewable energy, 2011		Per unit support, BGN/MWh	Total (M€)
	Feed-in premiums	n.a.	n.a.
	Tendering	n.a.	n.a.
Total annual estimated support in the electricity sector			12.94
Total annual estimated support in the heating sector			-
Total annual estimated support in the transport sector			-
Hydropower plants of less than 1 MW capacity			
Preferential price	RES obligation/quota (%)	n.a.	n.a.
	Penalty/Buy-out option/Buy-out price (€/unit)	n.a.	n.a.
	Average green certificate price	n.a.	n.a.
	Tax exemption/refund	n.a.	n.a.
	Investment subsidies (capital grants or loans) (€/unit)	n.a.	n.a.
	Production incentives		
	Feed-in tariffs	33	0.03
	Feed-in premiums	n.a.	n.a.
	Tendering	n.a.	n.a.
Total annual estimated support in the electricity sector			0.03
Total annual estimated support in the heating sector			-
Total annual estimated support in the transport sector			-
Hydropower plants of 1 up to 10 MW capacity			
Preferential price	RES obligation/quota (%)	n.a.	n.a.
	Penalty/Buy-out option/Buy-out price (€/unit)	n.a.	n.a.
	Average green certificate price	n.a.	n.a.
	Tax exemption/refund	n.a.	n.a.
	Investment subsidies (capital grants or loans) (€/unit)	n.a.	n.a.
	Production incentives	n.a.	n.a.
	Feed-in tariffs	59	15.81
	Feed-in premiums	n.a.	n.a.
	Tendering	n.a.	n.a.
Total annual estimated support in the electricity sector			15.81
Total annual estimated support in the heating sector			-
Total annual estimated support in the transport sector			-
Biomass-fired power plants			

Support schemes for renewable energy, 2011		Per unit support, BGN/MWh	Total (M€)
Preferential price	RES obligation/quota (%)	n.a.	n.a.
	Penalty/Buy-out option/Buy-out price (€/unit)	n.a.	n.a.
	Average green certificate price	n.a.	n.a.
	Tax exemption/refund	n.a.	n.a.
	Investment subsidies (capital grants or loans) (€/unit)	n.a.	n.a.
	Production incentives	n.a.	n.a.
	Feed-in tariffs	21	0.55
	Feed-in premiums	n.a.	n.a.
	Tendering	n.a.	n.a.
Total annual estimated support in the electricity sector			0.55
Total annual estimated support in the heating sector			-
Total annual estimated support in the transport sector			-

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)²¹

In 2009, the regulatory framework set preferential prices only for 3 biomass categories: wood waste, agricultural residues and energy crops. These types of waste are not included in the table above.

In 2010, the categories benefiting from preferences increased considerably and became 12, including various types of waste – wood, animal, agricultural, municipal waste and waste water – while the corresponding tariffs depended on the type of processing installation.

In 2011, of the 21 biomass categories included, 17 preferential tariffs were applicable to installations using vegetable and animal waste as raw materials.

In the two-component tariff system existing in 2009 and 2010, the incentive supplement was determined by the DKEVR on the basis of common, non-discriminatory criteria applicable to all types of RES: type of technology, installed capacity and availability of the primary energy source (Article 19a (1) and (4) of the Ordinance on regulating the prices of electricity). In addition to these technical criteria, account was also taken of the necessary investment costs, production costs and rate of return on capital employed, taking into consideration the specific risks involved in the supply of biomass: collection, transport, preliminary processing.

With the adoption of the Renewable Energy Act, the State Energy and Water Regulatory Commission is required to adjust each year the preferential price for electricity produced from biomass with a certain coefficient to account for variations in the pricing-forming components, including raw material costs, transport costs and wage and labour costs.

²¹ Each Member State shall submit a report to the Commission on progress in the promotion and use of energy from renewable sources by 31 December 2011, and every two years thereafter. The sixth report, to be submitted by 31 December 2021, shall be the last report required.

As regards the production and consumption of biofuels, the Renewable Energy Act stipulates that, when providing financial support, priority should be given to projects for the production of biofuels from waste, residues, non-food cellulosic material and ligno-cellulosic material. Currently, no separate support scheme is applied.

Under *Measure 123: "Adding value to agricultural and forestry products"* of the Rural Development Program 2007-2013, support is given to enterprises in the food processing and forestry sector for investments in renewable energy generation for their own needs and the sale of energy generated by processing products (raw materials) included in Annex I to the Treaty establishing the European Community.

Financial assistance is provided for the implementation of projects contributing to the achievement of the objectives of environmental protection (including pollutant emission reductions and waste reduction).

On the basis of the European Economic Recovery Plan, the amount of financial assistance is increased by 10 % for the following investments:

- investments in the milk and dairy sector, except for the production, processing and/or marketing of products resembling/substituting milk and dairy products;
- investments in buildings and equipment for energy generation through the processing of primary and secondary biomass from vegetable and animal products included in Annex I to the Treaty;
- investments in buildings and equipment for energy generation from renewable energy sources for the own needs of enterprises;
- investments in buildings and equipment related to industrial wastewater treatment;
- investments in buildings and equipment leading to energy efficiency improvements in enterprises.

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

The origin of electricity from renewable energy sources is guaranteed by issuing certificates of origin for the electricity sold to the public supplier (NEK) and public retailers (CEZ, EON, EVN).

The system has been defined in the Renewable and Alternative Energy Sources and Biofuels Act and further elaborated in the Regulation on issuing certificates of origin adopted by the Council of Ministers upon a proposal from the DKEVR.

The Regulation lays down:

- the terms and procedure for issuing certificates of origin for electricity produced from renewable energy sources;
- the format and content of certificates;
- the terms and procedure for registration in the public register kept in accordance with the Regulation of the details which should be included and the manner of obtaining information from the register.

In accordance with it, certificates of origin are defined as official non-transferable documents showing the producer, the quantity of electricity produced from renewable energy sources, the period of production, the power plant and its capacity, and are issued by the DKEVR.

The Regulation includes a detailed description of the procedures, certification periods, necessary documents, information and obligations of stakeholders: producers, network operators

and the competent public authority.

Renewable electricity producers are required to submit to the DKEVR an application for the issue of a certificate of origin within one month after the expiry of the period for which the relevant certificate is requested. Each producer is also required to file a separate application for each power plant operated by him.

The application should contain detailed information about the certificate requested.

In particular, it should include:

- information on the quantity of electricity produced by the different facilities of the power plant;
- where the power plant uses different energy sources, information on the quantity of electricity produced from renewable energy sources;
- copies of the invoices issued for the sale of the relevant quantity of electricity;
- a document showing that the fee has been paid;
- information on the location of commercial meters and control recorders.

This information should be presented in a statement drawn up in accordance with the model approved by the Regulatory Commission.

The DKEVR checks the application submitted and the annexes to it for compliance with the Regulation. Certificates of origin are issued to approved producers and show the quantity of electricity produced from renewable energy sources in the course of one calendar year in the case of producers of up to 1 MW capacity, or in the course of six months in the case of producers of more than 1 MW capacity.

The conditions under which registration is refused or a certificate invalidated are also set forth in the Regulation.

The DKEVR sets up and maintains a register of the certificates of origin issued, which is made available on its website and is regularly updated. Registration in the register is based on an official decision of the Regulatory Commission. The register includes the names of producers of electricity from renewable energy sources, the certificates issued or invalidated, and the certificates issued in other EU Member States recognised by the regulatory authority.

The new Renewable Energy Act introduces improvements in the certification system, which will be implemented in 2012. Pursuant to it, certificates of origin will be replaced by guarantees of origin for energy produced from renewable sources. It provides that such guarantees should also be issued for heating and cooling from renewable sources. This process has been further outlined in the Regulation on the terms and procedure for the issue, transfer, cancellation and recognition of guarantees of origin for energy produced from renewable sources.

Guarantees of origin will be issued by the Agency for Sustainable Energy Development on application by the producer, irrespective of the fact whether or not he is subject to licensing under the Energy Act. One guarantee of origin will be issued for a standard quantity of 1 MWh of renewable energy produced in the course of one calendar month.

If it is found out that the application or the annexes to it do not comply with the requirements, or that the fee for examination of the application has not been paid, the applicant will be notified to remedy the irregularities within 7 days. If the irregularities are not remedied within this period, the case-file is closed by resolution of the Executive Director of the ASED and the applicant will be notified thereof.

In order to ensure protection against fraud, the ASED may carry out official checks for compliance of the information provided, details declared and documents submitted in relation to the

case-file and may also perform on-the-spot inspections. The issue, transfer and cancellation of guarantees of origin will be supervised by the Minister for the Economy, Energy and Tourism.

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)

Wood biomass

Forests are the main source of wood for energy purposes in Bulgaria. They cover approximately 32.5 % of the territory of the country or, in other words, around 3.6 000 000 ha. The amount of timber harvested and marketed from forest areas, which falls within the categories of "firewood" and usable "tops", suitable for energy purposes, was 2 937 000 solid m³ in 2009 and 3 305 000 solid m³ in 2010. Wood harvesting in 2010 remained within the range of the optimal annual quantities envisaged in the forest management plans. The legal annual use of wood for energy purposes only from the state-owned forest areas amounted to 2 250 000 000 m³.

The data about the biomass resources used in the reporting period are shown in Table 4. Wood biomass, supplied both directly and indirectly, is mainly used in heating, in the form of "firewood". Together with coal, it is used in domestic heaters – stoves – with low energy efficiency and substantial energy losses.

The initial investment required for the use of biomass resources is a serious obstacle and, in spite of the short buy-out period, financial measures are needed to promote this technology. The possibilities to expand and diversify the effect of these measures are currently examined. One of the possibilities has already been explored – the Renewable Energy Act provides that the Energy Efficiency Fund should cover more extensively renewable sources and should change its name to Energy Efficiency and Renewable Sources Fund.

Biomass from agriculture

The energy potential of agriculture is estimated at approximately 5 million tonnes of solid waste, 1 million tonnes of liquid waste, 500 million m³ of biogas, 60 000 tonnes of biofuels, 2 million tonnes of energy crops (National Strategic Rural Development Plan 2007-2013, January 2008).

Currently, this potential is partially exploited, mainly by individual households in rural areas or for the small-scale production of briquettes from straw.

Residual biomass from agriculture, in spite of its considerable potential, has not been extensively used so far. The reasons for this are the still underdeveloped process of collection of the source material – agricultural residues – the market developments and the lack of coordination at the time the plants are harvested. More powerful equipment for collection and processing is required, which leads to higher investment costs and increases the price of the final product: briquettes or chips.

The table below shows the areas and the output of key agricultural crops, which could be used for energy purposes in the period 2009-2010:

Product	Areas grown (ha)		Output (in tonnes)	
	2009	2010	2009	2010

Product	Areas grown (ha)		Output (in tonnes)	
	2009	2010	2009	2010
Wheat	1 254 151	1 148 797	3 976 852	4 094 597
Corn	303 881	360 046	1 600 707	2 360 964
Triticale	6 101	11 320	17 227	29 443
Rye	11 156	12 171	18 858	17 511
Millet	3 938	4 122	4 262	5 597
Barley	264 689	256 864	858 679	833 271
Oats	21 231	26 018	30 723	42 045
Sorghum	764	3 729	1 813	8 612
Sunflower	687 209	734 314	1 317 979	1 536 321
Rapeseed	112 238	220 253	235 490	544 841
Soya	455	725	400	1 647
Silybum	1 385	1 494	542	694
Lucerne	93 145	86 920	274 539	450 367
Potatoes	14 002	13 805	231 745	251 205

Source: Ministry of Agriculture and Food, Agricultural Statistics Department

Energy crops

The cultivation of energy crops is insignificant. In 2009, support was provided for energy crops in accordance with Regulation (EC) No 1782/2003.

In 2010, this support was cut off. Nevertheless, production continued to increase but remained at low levels.

Wood residues

New pellet technologies open up new possibilities for the production of wooden materials, shaped materials, furniture, veneer and plywood sheets from residues from the wood processing industry.

These developments find expression in the considerable difference in the amount of biomass used in 2009 and 2010. The energy balance sheets show that the amount of wood residues used in 2009 was 60 ktOE, while in 2010 it was 150 ktOE.

According to the Forestry Executive Agency, the amount of residues such as wood shavings and chips was 420 000 m³ in 2010.

The use of pellets as an energy carrier is expected to increase with the expansion of the financial measures supporting the initial investment.

The production and marketing of wood chips is in a similar situation.

Support under various financial mechanisms to overcome the obstacles related to the initial investment is needed for the development of the market and the use of biomass in individual and local heating systems.

Waste

Particular attention should be paid to municipal waste, which is already posing difficulties in some cities. According to NSI data, the annual quantity of waste generated is around 400 kg/citizen.

Several studies of the composition of urban waste have been carried out, and contracts for the construction of energy recovery systems have already been signed. The biodegradable fraction of waste slightly exceeds 80%²². A detailed study²³ indicates that the energy content of municipal waste shows a seasonal variation – lowest in summer – and ranges between 0.2 and 0.4 ktoe/t.

Installations for the use of biomass energy through incineration and capturing of the gas emitted are expected to be implemented in large landfill sites. In small landfill sites, biogas will be captured and torch-burnt.

The possibilities for the use of sewage sludge are also examined. The total quantity of dry substance from the large waste water treatment plants was 36 737 tons in 2009 and 52 893 tons in 2010.

At the end of 2009, the first installation of 3 MW capacity for the indirect use of sewage sludge was put into service, using biogas from sludges from the waste water treatment plant in the city of Sofia.

Information on the use of biomass resources is given in Table 4 and Table 4a.

²² Sofia Consulting Group, Long-term management strategy for municipal waste of the Sofia City Municipality, Sofia, March 2007.

²³ ALARA 2000 OOD, Analysis of the quantities and the composition of waste generated by typical representatives of neighbourhoods of varying density of development, including aggregated data, 2008.

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)	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Biomass supply for heating and electricity:												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings, etc.)**	7668502	8312307	697	756	0	0	0	0	0	0	0	0
Indirect supply of wood biomass (residues and co-products from wood industry etc.)**	244039	651577	60	160	0	0	0	0	0	0	0	0
Energy crops (grasses, etc.) and short rotation trees												
Agricultural by-products / processed residues and fishery by-products **												
Biomass from waste (municipal, industrial, etc.)**	0	0	0	0	0	0	0	0	0	0	0	0
Others	393711	366096	9	9	0	0	0	0	0	0	0	0
Biomass supply for transport:												
Common arable crops for	29066	86517	7	14	0	0	0	0	0	0	0	0

* Amount of raw material if possible in m3 for biomass from forestry and in tonnes for biomass from agriculture and fishery and biomass from waste.

** The definition of this biomass category should be understood in line with table 7 of part 4.6.1 of Commission Decision C (2009) 5174 final establishing a template for National Renewable Energy Action Plans under Directive 2009/28/EC.

	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)	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
biofuels												
Energy crops (grasses, etc.) and short rotation trees for biofuels												
Others												

Source: National Statistical Institute

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

Types of agricultural land use	Surface (ha)	
	2009	2010
1. Land used for common arable crops (wheat, sugar beet, etc.) and oilseeds (rapeseed, sunflower, etc.)	3 122 516*	3 162 526*
2. Land used for short rotation trees (willows, poplars).	-	1 5350**
3. Land used for other energy crops such as grasses (reed canary grass – <i>Phalaris arundinacea</i> , switch grass – <i>Panicum virgatum</i> , <i>Miscanthus</i>), sorghum.	-	-

Source: Ministry of Agriculture and Food, Agricultural Statistics Department

* These data are taken from the BANSIK survey. They include areas sown under cereals (wheat, barley, rye, triticale, oats, maize, rice, etc.), industrial crops (sunflower, rapeseed, tobacco, etc.), vegetables (potatoes, beans, peas, lentils, fresh vegetables, etc.), crops (annual crops, perennial legumes and grasses, etc.) and fallow land.

** Preliminary data from the census of agricultural holdings in 2010.

7. Please provide information on any changes in prices of commodities based on biomass and on 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)

The increased interest in biofuels has led to an increase in the areas sown under industrial oilseed plants. The table below provides information about the changes in the areas under certain cereals in the preceding few years.

Arable land in the period 2006-2010, ha

Land use	2005	2006	2007	2008	2009	2010
Wheat	1 134 354	979 925	1 120 510	1 114 427	1 254 151	1 095 703
Barley	276 472	192 539	193 840	223 004	264 689	250 640
Maize	340 847	386 772	408 880	348 402	303 881	360 046
Sunflower	653 371	785 064	686 692	723 962	687 209	734 314
Industrial oilseed plants	13 094	22 012	59 389	102 899	115 013	209 347
Other industrial crops	44 217	35 325	39 954	48 824	60 629	74 536
Fallow land	348 118	436 508	291 751	229 471	196 336	207 616
ARABLE LAND	3 128 210	3 089 531	3 057 740	3 060 543	3 122 516	3 162 526

Source: Ministry of Agriculture and Food, Agricultural Statistics Department

The drastic increase in the areas down to industrial oilseed plants and other industrial crops is probably due to the increased interest in the production of biodiesel. At the same time, the cultivation of potential raw materials for the production of ethanol – wheat, maize, barleys – remains constant. A slight decrease in orchards and areas under vines is observed during the period 2009-2010.

This process is accompanied by an increase in the prices of all agricultural crops, as shown in the table below.

Producer price index by year

Indicators	2005	2006	2007	2008	2009	2010
Cereals	100.0	112.6	201.1	208.1	141.1	162.0
Wheat	100.0	109.8	205.0	217.1	140.7	160.4
Soft wheat	100.0	109.2	204.3	216.5	139.7	160.0
Maize	100.0	128.2	224.4	204.4	142.4	191.7
Oilseeds	100.0	96.4	145.1	152.6	105.4	150.6
Rape or turnip rape seeds	100.0	112.2	138.1	201.5	180.6	181.2
Sunflower seeds	100.0	95.9	145.7	152.4	103.8	150.3
Other industrial crops	100.0	103.4	130.9	162.7	162.3	165.9
Fibre plants	100.0	100.6	105.2	105.0	105.9	106.3
Other industrial crops, others	100.0	104.0	132.7	167.0	166.0	170.9
Agriculture, total	100.0	108.2	135.8	151.8	120.4	134.0
Agriculture, fruit and vegetables excluded	100.0	103.8	138.3	150.5	121.4	135.2

Source: National Statistical Institute (www.nsi.bg)

Prices changed over the years due to different factors – changes in raw material output, external market developments, etc. However, there is a sustained upward trend in the price index. A considerable difference is observed between the increase in the prices of cereals and those of general agricultural products. This difference is even more noticeable in the prices of oilseeds, while the areas under such crops have increased several times at the expense of other crops.

A brief look at the developments on the domestic vegetable oil market²⁴ over the past eleven years (1999-2010) shows that it was relatively stable by the middle of 2007, when an upward trend was registered. The price of oil increased by 78 % in 2007, and in the period May 2007-May 2008, by 107 %. In the first five months of 2009, the downward trend in the wholesale price of oil continued. In the period January-December 2010, it increased by 44 %. Until the end of 2010, it went steadily up but remained below the levels of 2008.

Sugar production in Bulgaria relies almost entirely on imported raw materials and prices on the domestic market usually follow international market trends. Besides external factors, prices are frequently influenced by purely domestic factors, which for example kept the wholesale price of sugar at a low level in 2009. This was due to the low demand, the excess supplies of raw materials bought at lower prices and the higher prices kept in 2008 when the international prices slumped after the abrupt rise in 2006, associated to a great extent with the competition between sugar beet and sugar cane processing companies and bioethanol producers. In 2011 the domestic sugar market remained stable.

In 2010, sunflower oil was the commodity which was traded most actively.

8. Please describe the development and share of biofuels made from wastes, residues,

²⁴ Source: Analysis of the wholesale price developments of commodities traded on commodity markets in 2010, State Commission on Commodity Exchanges and Markets.

non-food cellulosic material, and lingo-cellulosic material. (Article 22(1)(i) of Directive 2009/28/EC)

Table 5: Production and consumption of biofuels under Article 21(2) of Directive 2009/28/EC (ktoe)

Biofuels under Article 21(2)²⁵	2009	2010
Production – Fuel type X		
Consumption – Fuel type X		
Total production of biofuels under Article 21(2)		
Total consumption of biofuels under Article 21(2)		
Percentage share of biofuels under Article 21(2) from total RES-T		

In 2009 and 2010 these technologies were not sufficiently developed and their output was insignificant.

9. Please provide information on the estimated impacts of the production of biofuels and bioliquids for the transport sector 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)

In accordance with the requirements of the Bulgarian environmental legislation and Decision No 1 EO-1/2009 of the Minister for the Environment and Water, a report on the environmental impacts of the National Renewable Energy Action Plan (<http://www.mi.government.bg/bg/discussion-news/obshtestveno-obsajdane-na-nacionalniya-plan-za-deistvie-za-energiyata-ot-vazobnovyaemi-iztochnici-i-negovi-164-m270-a1-1.html>) was drawn up and made available for comments to the public.

The above report examined the possible impacts of the implementation of these renewable energy technologies, including technologies for the production of biofuels – bioethanol and biodiesel – for the transport sector, on the components of the environment.

The following project stages were considered in respect of each type of technology:

- pre-installation stage consisting in feasibility studies, construction and transport of the facilities;
- installation stage consisting in site preparation, installation of the main facilities and construction of related infrastructure;
- operational stage consisting in the use of the facilities for the production of electricity, heating and cooling, along with their maintenance;
- post-operational stage consisting in the dismantling of the facilities and their transport (or leaving them where they were).

In respect of each technology and each component of the environment, the source of impact, the process and the receptor of the impact were examined, and the effects themselves were classified in accordance with the following criteria:

²⁵ Biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material.

- **assessment:**

- positive – positive impact on receptors (+);
- neutral – no impact (0);
- negative – negative impact on receptors (-);

- **duration:** the period of time during which effects continue to operate on receptors:

- short-term - 1-2 years;
- medium-term - 3-8 years;
- long-term - over 8 years;

- **frequency:**

- periodic – effects occur regularly at a certain interval of time;
- one-time – effects occur only once;
- continuous – effects occur once but continue to operate for a long time;

- **territorial scope:**

- local – effects occur within a very small area (e.g. on the site of the proposed investment project);
- regional – effects occur within a given geographical area but do not cover the entire territory of Bulgaria (e.g. a river basin district or a planning region);
- national – effects take place on the greater part of the territory of Bulgaria;
- cross-border (international) – effects are expected to reach the territory of neighbouring countries and/or have world-wide consequences.

The following assessments were made:

Climatic factors and air quality

The contribution of biofuels to greenhouse gas emission reductions is negligible for the moment.

Water resources

No effects on this component of the environment were identified.

Soil and subsoil

The growing of energy crops in monoculture for biofuels leads to a high degree of environmental load, while the excessive use of mineral and organic fertilisers and pesticides, to soil damage and impoverishment, contamination and erosion.

Landscape

No effects on this component of the environment were identified.

Biodiversity

- Damaging or destroying habitats, fauna and flora species during the installation of cogeneration facilities

The estimated negative effects on habitats, plants and animals from the construction of bioethanol and biodiesel installations are negligible.

- Damaging Natura 2000 protected areas and areas of conservation or the ecological relations between them

There is no evidence of damage to protected areas and areas of conservation falling within the Natura 2000 network or to the ecological relations between them.

- Loss of biodiversity due to the cultivation of energy crops in monoculture

No data on the type of land on which energy crops have been grown so far in monoculture are available; that is why, it is difficult to assess whether the biofuels sector has led to the conversion of natural habitats into intensely cropped land. If such processes take place, their impact for the moment is most likely negligible.

- Loss of biodiversity due to the use of genetically modified energy crops

According to the Ministry of the Environment and Water, no GMOs were released in Bulgaria by the end of 2009.

- Risks to fauna resulting from the excessive use of fertilisers and chemicals

Up to now, the growing of energy crops is most likely accompanied by the use of substantial quantities of fertilisers and chemicals. Their estimated impact is negligible.

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)

Biofuels

The greenhouse gas emission reductions due to the use of biofuels and bioliquids were calculated using the default values for the entire production chain.

Pursuant to Article 19(3) of Directive 2009/28/EC, a simplified method may be employed to calculate greenhouse gas emission savings by using the default values in part A of Annex V for biofuels and the disaggregated default values for cultivation in part D of Annex V for biofuels and bioliquids under certain conditions. One of these conditions specifies that the total greenhouse gas emissions from cultivation of raw materials should be lower than or equal to the emissions reported under the heading "Disaggregated default values for cultivation". The report on the greenhouse gas emissions from the cultivation of agricultural raw materials for the production of biofuels, drawn up by the Ministry of the Environment and Water and the Ministry of the Economy, Energy and Tourism in 2011, points out that the greenhouse gas emissions from the cultivation of rapeseed (raw material for biodiesel) in all six NUTS level 2 areas do not exceed the values for cultivation set out in the table entitled "Disaggregated default values for cultivation" in part D of Annex V of Directive 2009/28/EC.

Greenhouse gas emission reductions mean the percentage reduction in emissions of greenhouse gases achieved by using biofuels and bioliquids instead of fossil fuels.

To calculate savings, the following formula was used:

$$E_S = (E_F - E_B) / E_F * 100,$$

where:

- E_S is emission savings, %;
- E_F - total emissions from the fossil fuel comparator, gCO₂eq/MJ;
- E_B - total emissions from the biofuel or bioliquid, gCO₂eq/MJ.

For biofuels, for the purposes of these calculations, the value used for the fossil fuel comparator E_F (due to the lack of information on the actual emissions from the fossil part of petrol and diesel fuels) was 83.8 gCO₂eq/MJ²⁶.

²⁶ Directive 2009/28/EC, Annex V, part D "Disaggregated default values for biofuels and bioliquids" – Total for cultivation, processing, transport and distribution and Annex V, part C (19).

For bioliquids used for heat production, the fossil fuel comparator E_F was 77.0 gCO₂eq/MJ.

The net reductions (emission savings) were calculated as a difference between the quantities of emissions that would have been generated by burning equivalent amounts of fossil fuels and biofuels.

To determine the life-cycle emissions of biofuels, the disaggregated default value of 52 gCO₂eq/MJ²⁷ for cultivation, processing, transport and distribution of rape seed diesel was used.

The results from the calculations of the greenhouse gas emission savings achieved as a result of the use of biofuels in blends with fuels of mineral origin are unimpressive – less than 0.1 % for both years, owing to the still limited use of biofuels.

Electricity

In order to estimate the net greenhouse gas emission savings resulting from the use of electricity from renewable sources, a carbon emission factor for electricity was used, calculated on the basis of the types of fuels, their calorific values and shares in the annual electricity output for 2009 and 2010.

The emission factor values for 2009 and 2010 were as follows: 2009 - 0.580 tCO₂eq/MWh and 2010 - 0.632 tCO₂eq/MWh.

The net greenhouse gas emission savings resulting from the increased share of energy from renewable sources in electricity production reached 2 333 148 tCO₂eq in 2009 and 2 819 460 tCO₂eq in 2010.

In percentage terms, these savings amounted to 9.38 % in 2009 and 9.69 % in 2010, registering only a slight increase.

Heating and cooling

For the calculation of the greenhouse gas emission savings due to the use of heating from renewable sources, the EU wide fossil fuel comparators for electricity and heat as set out in the Report on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling²⁸ were used.

Greenhouse gas emission savings from the use of solid biomass instead of fossil fuels in heat production were calculated according to the following formula:

$$\text{Savings} = (EC_{F(h)} - EC_h) / EC_{F(h)},$$

where:

EC_h - total emissions from heat production;

$EC_{F(h)}$ - total emissions from the fossil fuel comparator for heat production.

In this case, the value used for the fossil fuel comparator $EC_{F(h)}$ was 87 gCO₂eq/MJ. Usually, biomass in Bulgaria comes from wood included in the first row of the table in Annex II of the report above, the typical and default values for which are 1 gCO₂eq/MJ. The values thus calculated are shown in Table 6.

The comparative calculations were made by using the values for the share of fossil fuels in heat production under two scenarios (in the table below) in order to calculate the greenhouse gas

²⁷ Directive 2009/28/EC, Annex V, part D "Disaggregated default values for biofuels and bioliquids" – Total for cultivation, processing, transport and distribution.

²⁸ REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling, Annex 1 - Methodology for calculating greenhouse gas performance of solid and gaseous biomass used in electricity, heating and cooling, it. 17

emissions resulting from their replacement by biomass. The percentages are relative to the RES consumption set out in Table 1a.

Share of fossil fuels in total heat production

Sources for replacement	Scenario I, %	Scenario II, %
Coal	40	45
Methane	30	25
Electricity	15	20
Oil	15	10
Total	100	100

The results from the calculations of the greenhouse gas emissions in the ratios specified above show that the fossil fuel comparator $EC_{F(h)}$ will be 81.95 gCO₂eq/MJ in the first scenario and 85.168 gCO₂eq/MJ in the second scenario.

The greenhouse gas emission savings from the use of biomass in heating registered a moderate increase in 2010 as compared to 2009. These savings amounted to 17.16 % in 2009, while in 2010 they reached almost 20 % (19.90 %).

The estimated net GHG emission savings are set out in Table 6.

As is evident from the table, the use of biomass in heating generated the biggest GHG emission savings, followed by the use of renewable sources in electricity production.

At present, the use of biofuels is weak, which accounts for the insignificant reduction in emissions from the transport sector.

Table 6: Estimated GHG emission savings from the use of renewable energy (t CO₂eq)

Environmental aspects	2009	2010
Total estimated GHG emission savings from using renewable energy ²⁹	5 124 705	6 167 301
- Estimated GHG emission savings from the use of renewable electricity	2 333 148	2 819 460
- Estimated GHG emission savings from the use of renewable energy in heating and cooling	2 779 700	3 323 398
- Estimated GHG emission savings from the use of renewable energy in transport	11 857	24 443

11. Please report on (for the preceding 2 years) 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

²⁹ The contribution of gas, electricity and hydrogen from renewable sources should be reported depending on their final use (electricity, heating and cooling or transport) and only be counted once towards the total estimated net GHG savings.

and/or third countries, as well as estimated potential for joint projects until 2020. (Article 22(1)(l, m) of Directive 2009/28/EC)

Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/imported from other Member States and/or third countries in Bulgaria (ktoe)^{30, 31}

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total energy from renewable sources, ktoe		120	80	168	202	353	386	481	420	471	411	341

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

Bulgaria did not make use of any statistical transfers, joint projects and joint support schemes during the period 2009-2011. As is evident from the projections in the National Renewable Energy Action Plan, Bulgaria has the potential to achieve its renewable energy targets by implementing national support schemes to promote the production and use of renewable energy. Nevertheless, the national legislation, and in particular the Renewable Energy Act, allows for the implementation of the cooperation mechanisms provided for in Directive 2009/28/EC. The decisions whether or not to apply these mechanisms will be based on a comprehensive analysis of the financial and non-financial benefits, as well as of the costs and risks associated with their implementation. The choice of a scheme will depend on the specific advantages and disadvantages of each mechanism.

12. Please provide information on how the share of 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)

The estimated share of biodegradable waste in waste used for producing energy is based mainly on the data made available by the NSI. According to that data, the total quantity of waste generated was around 129 million tonnes in 2009, and around 163 million tonnes in 2010.

The NSI data on waste are divided into two groups: industrial waste and municipal and C&D waste. In recent years, industrial waste has accounted for 97-98 % of the total quantity of waste.

Each year, the National Statistical Institute makes available information relating to industrial waste, broken down by economic group and type of waste (in tonnes). For the calculation of the share of biodegradable waste, data relating to the types of waste, which includes information on the quantities of each type of waste (e.g. metal, glass, plastic, wood, textile wastes, etc.), as well as on the quantities to be recovered, deposited or exported, were used. This information made it possible to calculate the quantities of biodegradable waste.

The projections for 2015 and 2020 are based on the assumption that the share of biodegradable waste in total industrial waste will remain unchanged. In absolute terms, however, its quantity will vary in line with GDP and the impact of EU (Directive 2008/98/EC on waste) and national policies on the prevention, re-use and recycling of waste, in line with the waste

³⁰ Please use actual figures to report on the excess/deficit production 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.

³¹ When filling in the table, for deficit production please mark the shortage of production using negative numbers (e.g. -x ktoe).

management hierarchy.

As regards municipal waste, the NSI provides data on the annual quantities of waste produced, collected and deposited in landfill sites. The estimated quantities of biodegradable waste are based on the quantities of waste deposited in landfill sites, which were 3 421 tonnes in 2009 and 3 041 tonnes in 2010, respectively. A study on the quantity and composition of waste commissioned by the Municipality of Sofia³² showed the quantities of waste – broken down by type (waste food, paper and cardboard wastes, plastic wastes, etc.) – generated by a number of neighbourhoods in the capital city. This study was used to determine the share of biodegradable waste in the total waste landfilled.

The projections for 2015 and 2020 are based on the assumption that the share of biodegradable waste in total municipal waste will remain unchanged. In absolute terms, however, its quantity will vary according to the projected population size and the impact of EU (Directive 2008/98/EC on waste) and national policies on the prevention, re-use and recycling of waste, in line with the waste management hierarchy.

The estimated quantities of waste for energy purposes are based upon the assumption that a certain part of the biodegradable waste generated by the largest cities in Bulgaria with a combined population of around 3 million people will be used. To calculate the amount of energy produced by incinerating waste, data from the above study³³ relating to the moisture content and calorific value of each type of waste were used.

³² ALARA 2000 OOD, Analysis of the quantities and the composition of waste generated by typical representatives of neighbourhoods of varying density of development and population, including aggregated data, 2008.

³³ ALARA 2000 OOD, Analysis of the quantities and the composition of waste generated by typical representatives of neighbourhoods of varying density of development and population, including aggregated data, 2008.