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PUBLIC FUNDING FOR GREEN ENERGY IN A CONTEXT OF CRISIS

Country report (Bulgaria)

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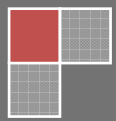

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1. Introduction

After some years of increasing investment interest, Bulgaria is a country with growing sector of the renewable energy sources (RES). This development was supported by the favourable legal and institutional framework, introducing different support measures for the RES projects. The development of the renewable energy sources (RES) in Bulgaria is a subject of significant changes and societal interest in the recent months of 2012. The legal and regulatory changes introduced in the country in 2011 - 2012 aimed at the limitation of the financial stimuli for the investment in windmills or solar parks. The current debate opposed the views of the supporters of the development of the traditional energy arguing that they allow the low price electricity for the industry and population (electricity prices are politically sensitive in Bulgaria, where power bills eat away a huge part of monthly incomes, especially during winter months) and the supporters of RES arguing that the country requires a diversification of the energy supply in order to comply with the environmental-friendly policy and to limit the dependence from Russian imports of petrol, gas and nuclear technologies.

The main objective of this report is to analyse the development of the renewable energy sources in Bulgaria in the context of the current economic and financial crisis. The report is prepared in the framework of a European International Project “Public Funding for Green Energy in a context of crisis”, commissioned by ETUI and coordinated by ISTAS. The report is prepared following an agreed common structure for country reports, established by the lead partner of the Consortium follows. The first part of the report investigates the renewable energy deployment in the country. The second part presents the main trends of the development of the RES sector. The third part consists of an overview of available renewable energy support schemes before the crisis. The following part is dedicated on the economic crisis effects in financing renewable energies. The fifth part focuses on the social debate about RE and represents the views of social partners and the state. The report conclusions and key messages are presented in the last part.

The information is gathered on the basis of desk research of available information (EU and national public sources, articles from the specialised media, etc.) and interviews with representatives of the administration, the trade unions and the employers[1].

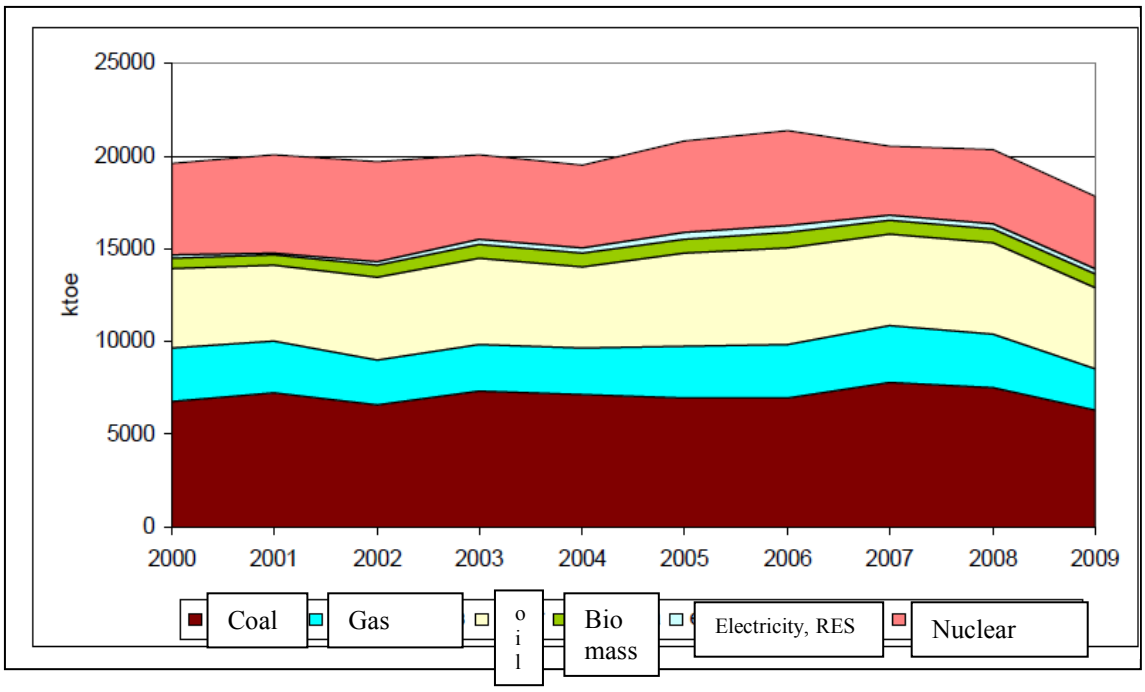
[1] I would like to express my gratitude to all my respondents for their availability and for the rich information provided in the course of the interviews and the discussions.

2. Renewable energy deployment

2.1. General energy data

After the considerable fall during the 1990s, primary energy consumption (PEC) in Bulgaria has been increasing since 1999. Consumption per capita is 2,2 toe, with electricity accounting for about 3.700 kWh (3,2 toe/cap in 1990, 2,3 toe/cap in 2000 and 2,2 toe/cap in 2010). However in the years 2009 and 2010 the consumption started to decrease, because of the negative impacts of the crisis. The PEC decreases in absolute terms from 19,218 ktoe in 2000 to 17,482 ktoe in 2009. The change of the PEC for the period 2000 – 2009 is shown on the fig. 1.

Figure 1 Primary Energy Consumption according to the types of fuels 2000 – 2009

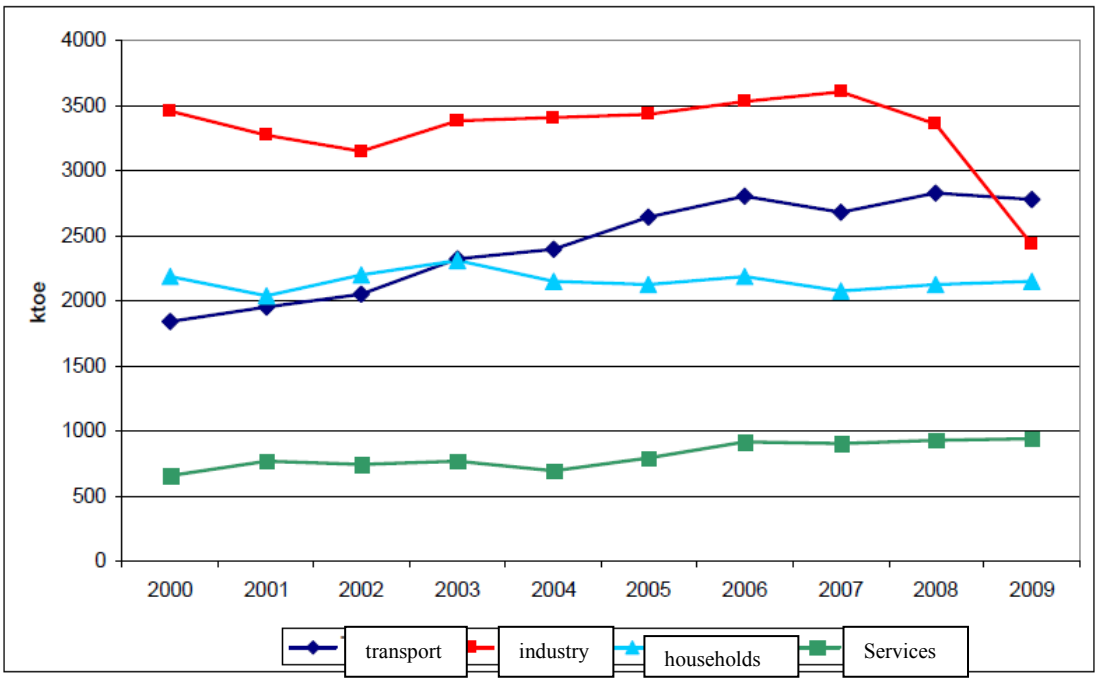


Source: National Statistical Institute (NSI) (www.nsi.bg)

Coal and lignite represent the most important energy source, accounting for 36% of primary consumption in 2009. The use of nuclear energy decreases from 4,9 Mtoe in the year 2000 to 3,9 Mtoe in 2009 and the share of nuclear energy decreases from 25 % to 22 % in the total PEC in this period. The share of the natural gas is about 14-15 % of the PEC. The share of petrol in the PEC increases from 21,5 % in 2000 to 24,5 % in 2009.

The final energy consumption (FEC) followed similar trends as primary energy consumption. In 2009 the FEC was 8,475, a small increase, compared to the FEC in 2000 - 8,436 Mtoe. Oil is the main energy source consumed (31% of consumption). The weight of coal is decreasing compared to gas (5% and 14%, respectively). The share of electricity in final energy consumption is rising (29% in 2010 compared to 21,5% in 2000).

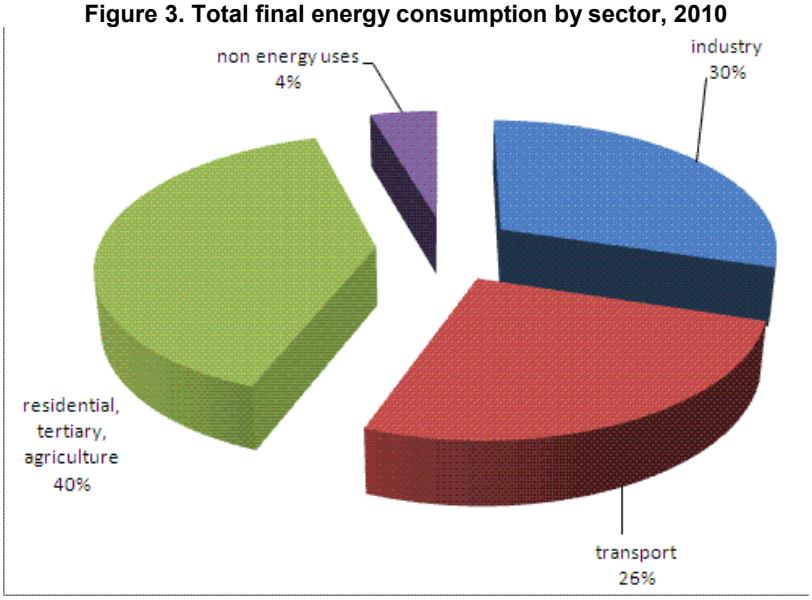
Figure 2. Final Energy Consumption by Sectors (2000 - 2009)



Source: NSI

In Bulgaria the industry was still the largest consumer of energy (about 35% including non-energy uses) till 2009, followed by transport (26%) and the residential sector (26%); services accounted for 12% of final energy consumption in 2010. The share of the industry decreases from 41 % in 2000 to 28,6 % in 2009. The share of households in the FEC is relatively stable – about 25-26% in the period 2000 – 2009. However the data from other sources (as shown in table 3) is not the same as the one from the official statistics. This is not the only discrepancy and it is important to have in mind those different indications from different sources while analysing the energy sector in the country.

Figure 3. Total final energy consumption by sector, 2010



Source: http://www.enercee.net/bulgaria/energy-demand.html

The share of renewable energy in the gross final energy consumption is continuously increasing during the last years (except for 2005 and 2007 as it could be seen in the table 1).

Table 1 Share of renewable energy in gross final energy consumption (in %)

	2004	2005	2006	2007	2008	2009	2010
Share of renewable energy in gross final energy consumption	9,6	9,5	9,6	9,3	9,8	11,9	13,8

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

The energy intensity of Bulgaria was traditionally high but falling down during the last years (except for the year 2009) (see table 2). According to the statistics, Bulgaria's energy intensity is still among the highest in EU (the second highest with 0,22 koe/$05ppa in 2010, or nearly double the EU average).

Table 2. Energy Intensity of the Economy

	2004	2005	2006	2007	2008	2009	2010
toe per 1000 euro GDP (2000 = 100)	1.106	1.100	1.066	0.972	0.903	0,840	0,855

Source: NSI

The share of electricity from RES is increasing in the gross national electricity consumption, from 8,9% in 2004 to about 15,1% in 2010 (see table 3).

Table 3. Share of electricity from RES in gross national electricity consumption

	2004	2005	2006	2007	2008	2009	2010
Share of electricity from RES in gross national electricity consumption	8,9	11,8	11,2	7,5	7,4	9,8	15,1

Source: NSI

Due to its location in the centre of the Balkan peninsula, Bulgaria has mainly interconnections to its neighbouring countries in South-eastern Europe, such as Greece (GR), Macedonia (MK), Romania (RO), Turkey (TR) and Serbia (RS). The country is traditional exporter of electricity in the market of South-Eastern Europe. As shown in the table below, Bulgaria is a large exporter of electricity. In 2010, it has exported 8.1 GWh net, i.e. circa 26% of its overall consumption. However experts consider that the future closure of nuclear capacity could impact negatively its exports.

Table 4. Bulgarian Exports of electricity in 2010

GWh (2010)	GR	MK	RO	RS	TR	Total	% of consumption
Export	3453	2953	677	1794	401	9278	29,42%
Import	1	0	1106	58	13	1178	3,74%
Net	3452	2953	-429	1736	388	8100	25,68%
Total flows	3454	2953	1783	1852	414	10456	33,15%

Source: Physical exchanges in Bulgarian interconnected operation (Source: ENTSO-E 2011) (in RES-INTEGRATION – Country Report Bulgaria, p. 18)

2.2. Renewable energy in electricity, heat and transport

According to the First Progress Report on the Promotion and Use of Energy from Renewable Sources for Bulgaria[2] (Art. 22, p. 4) the use of the RES is increasing for the period 2009 – 2010 in the domain of heat, almost stable in the domain of electricity but it is still marginal in the domain of transport (see Table 5).

Table 5. Shares of Energy from renewable sources by sector (heating and cooling, electricity and transport) and overall share of energy from renewable sources

	2009	2010
RS for heating and cooling (%)	17.4%	20.1%
RS for Electricity (%)	11.4%	12.0%
RS for Transport (%)	0.3%	0.6%
Overall Share of RS (%)	11.0%	12.6%
Incl. Share of Energy from RS acquired through the mechanisms for cooperation (%)	0.0%	0.0%
Surplus that can be used in cooperation mechanisms (%)	0.0%	0.0%

Source: MIET, First Progress Report on the Promotion and Use of Energy from Renewable Energy Sources for Bulgaria, 2011

[2] MIET, First Progress Report on the Promotion and Use of Energy from Renewable Sources for Bulgaria, December 2011

2.3. Power capacity, production and technologies

According to the European Commission, in the year 2007 Bulgaria was approaching its RES target for 2010 (namely 11%)[3].

Large-scale hydro power was and is still the main source of RES in the country, but according to various experts, its technical and economic potential is already fully exploited.

The share of RES in the production of this primary energy in 2010 (without the large hydro plant *Chaira*) was 4.8% compared to 3.3% in 2009 and 2.5% in 2008.

The RES share in the overall heat energy in 2010 and 2009 was respectively In the 0.4% and 0.3%.

In this way the production of electricity from RES in 2010 is with 21% more than the set objectives (the goal is 11% share of the electricity RES in the gross consumption and the real situation is that the gross production of electricity from RES contributes to 15% of the gross consumption of electricity).

The share of RES for heating/cooling in the gross final energy consumption for 2010 equals 20,1% (17.4% for 2009). The electricity from RES in the gross final consumption of energy in 2010 is 12% (11.4% in 2009). The RES energy in transport in 2010 and 2009 is respectively 0.6% and 0.3%.

According to the NSI, the sectors of renewables in Bulgaria is recording continuous growth during the last years – from 975 thousand tonnes of oil equivalent in 2007 to 1317 in 2010 (the last data available). The main contributors to this production are the Hydro energy (exl. pumped) (435 thousand tonnes of oil equivalent in 2010) and the Wood, Wood Wastes and Other Solid Wastes (755 thousand tonnes of oil equivalent in 2010). Still the solar energy or the wind energy represent smaller amount of the country's production.

The share of renewable energy in gross final energy consumption is increasing –from 9,6% in 2004 to 13,8% in 2010 (see www.nsi.bg - http://www.nsi.bg/otrasalen.php?otr=37).

The data presented by the Ministry of Economics, Energy and Tourism (MIET) (table 6) also supports the growing role of RES in terms of capacity and production. According to the Eurobserv'er data, the share of electricity produced by wind power plants is increasing and amounts to 538 MWe in 2011 (336 MWe en 2010)[4]. For three years of active construction of PV power stations (which started in 2007), in 2010 the total installed capacity reached 32,3 MWp in 2011 132,7 MWp.

Table 6: Total real contribution (expressed as installed power or gross electricity production) of each technology for production of renewable sources in Bulgaria for achieving the aims of 2010 and the indicative curve for the shares of energy from renewable sources in the electricity

	2009		2010	
	MW	GWh	MW	GWh
Hydro power plants	2156	3598	2188	3709
Solar PV power plants	2	3	25	15
Wind power installations (onshore)	333	412	488	722
Biomass	3	4	3	16
TOTAL	**2494**	**4017**	**2704**	**4461**

Source: MIET, First Progress Report on the Promotion and Use of Energy from Renewable Sources for Bulgaria, 2011

[3] ec.europa.eu/energy/energy_policy/doc/factsheets/renewables/renewables_bg_en.pdf
[4] http://observer.cartajour-online.com/barosig/Fichiers/BAROSIG/Valeurs_indicateurs/W_Bulgaria-ang.htm

3. Renewable energy sector

3.1. Economic aspects: size of companies, contribution in terms of % total GDP, imports/exports, R+D+I, impact on electricity prices,

Bulgaria has good potential in RES. Thus, according to the EC, such good opportunities exist for biomass, since 60% of land consists of agricultural land, and about 30% is forest cover. A total wind energy capacity of around 2 200 – 3 400 MWe could be installed. Solar potential exists in the East and South of Bulgaria, and 200 MWe could be generated from geothermal sources[5]. According to some sources, due to the limited hydro-potential of the country (excluding the Danube), the importance of hydro power is limited.

Currently there is a difficulty to provide comprehensive data about the RES size and players in Bulgaria. Currently, there is about 12,668 MW of installed capacity in Bulgaria including thermal, nuclear, and hydroelectric resources[6]. The existing generation assets in Bulgaria have been sufficient to supply domestic demand and have created a significant export market for electricity.

There is not comprehensive data available about the number and size of the players in this RES Bulgaria.

There are different estimations of the number of the active hydropower plants.

According to one of them, there are currently 87 hydro power plants in use, with a combined capacity of 1,980 MW, most of them being located in the Southern and South-western mountainous parts of Bulgaria.

There is no data available about the employment in subsector of hydro-energy, neither for its annual sales.

According to the study[7] launched by the Bulgarian specialised magazine of the power industry “Energy review”, the solar subsector is relatively new, but quickly developing in the period 2007 – 2010.

According to the data provided by the Ministry of Economy, Energy and Tourism, the peak of RES energy production was reached in 2010 (last data available) - it amounts to 5,509 GWh and contributes to the increase of the production of all RES power plants. The active construction of photovoltaic power stations started in 2007 and for three years, as of 2010, the total installed capacity reached 21.4 MW. In 2010 the reported increase in terms of capacity was four times bigger than the capacity observed in the previous year – 2009. The PV capacities installed in Bulgaria by mid 2011 equals 28 MW. Some of them are constructed on recultivated fields and others – on former agricultural lands. One MW of installed capacity needs on the average about 2,5 ha, i.e. the total built-up area of all the solar parks in Bulgaria at present is about 70 hectares.

Wind energy plants in Bulgaria also recorded spectacular growth during the last years. According to a recent interview with the president of the Bulgarian producers of wind energy, the capacity of the country for the moment is fully utilised[8]. The reason for this is that the current state of the electrical grid of the country could take no more than 1800 MW of new power. In the same time, according to the Association, there are about 1100 MW in existing or in construction wind plants and plans for 1700 Mw new projects.

[5] http://ec.europa.eu/energy/energy_policy/doc/factsheets/renewables/renewables_bg_en.pdf
[6] See http://www.energymarketsgroup.com/RomBulEnergyBul.html
[7] See http://energy-review.bg/energy-statiieng.aspx?br=64&rub=628&id=98
[8] http://www.dnevnik.bg/biznes/2011/11/03/1195260_vuzmojnostite_za_viaturni_parkove_v_bulgariia_sa/

According to Eurobserv'er, the turnover of the companies in the wind sector in Bulgaria was 70 millions of Euro in 2009 and 240 million in 2010[9]. The same source indicates that the turnover from PV sources was 15 million Euro in 2009 and twice as much – 30 million in the year 2010.

3.2. Employment aspects

Some data about the employment in the RES is provided by the reports of Eurobserv'er[10]. According to them the direct employment in the wind energy subsector was 900 in 2009 and 3000 in 2010. The direct jobs created in the PV subsector were 130 in 2009 and 350 in 2010. This data allows to conclude that the role of the RES increases but still this employment is marginal.

Data about the employment effects of the RE in Bulgaria are not available from national sources. It is clear that the overall effect of the development of RES will impact the job creation but there are no estimations about the extent of this impact. Even in strategic national documents, such as the National Action Plan for Employment (NPDZ) 2011, are stated very general phrases such as: *"The effect of the increase of the RES share in the final gross energy consumption will be the job creation*" (NPDZ 2011, p. 23).

Some of the branch actors tried to make estimations about the employment in the respective subsectors. For example according to some of the sectoral associations, for example the wind producers, on each 5 new Mw of wind production is created one job[11]. According to the same association, the employed in this subsector are about 350 and there is a forecast of significant job creation in the following years – for jobs such as technicians, managers, engineers, guards, etc.

There is no data found about the employment generated in the subsector of solar energy or wind energy but the estimations of stakeholders is that the number of these jobs is limited.

3.3. Environmental and others aspects

The development of the Bulgarian industry in the socialist years provoked many negative consequences to environment. According to some sources, specific priority environmental problems include: water, air and soil pollution; nuclear waste from mines and the power plant; solid waste management; air and water pollution coming into Bulgaria from Romania and the former Yugoslav countries; and high levels of industrial contamination rendering certain cities uninhabitable[12]. From this perspective the introduction of RES is supposed to address important environmental issues but there is no comprehensive data of the effects up to now.

In the MIET (First Progress Report on the Promotion and Use of Energy from Renewable Sources for Bulgaria, 2011, p. 53) it is mentioned that the net decrease of the emission of CO2 because of the increase of the share of RES in the production of electricity reach the value of 2,333,148 tCO2eq for 2009 and 2 819 460 tCO2eq for 2010. In percentage this decrease corresponds to 9.38 % in 2009 and 9.69 % in 2010.

[9] http://www.eurobserv-er.org/pdf/barobilan11.pdf , p. 123
[10] http://www.eurobserv-er.org/pdf/barobilan11.pdf
[11] See http://www.economynews.bg/%D0%B2%D1%8F%D1%82%D1%8A%D1%80%D0%BD%D0%B0-%D0%B5%D0%BD%D0%B5%D1%80%D0%B3%D0%B8%D1%8F-%D0%B3%D0%BE%D0%BB%D1%8F%D0%BC%D0%B0-%D0%B7%D0%B0%D0%B5%D1%82%D0%BE%D1%81%D1%82-%D0%BC%D0%B0%D0%BB%D0%BA%D0%BE-co-2-news21086.html
[12] http://www.enercee.net/bulgaria/renewable-energies-the-environment.html

Table 7 Estimation of the decrease of the CO2 emissions because of the use of RES energy (t CO2 eq)

	2009	2010
General	5,124,705	6,167,301
Electricity from RES	2,333,148	2,819,460
Heating and cooling from RES	2,779,700	3,323,398
Transport	11,857	24,443

Source: Source: MIET, First Progress Report on the Promotion and Use of Energy from Renewable Energy Sources for Bulgaria, 2011

The indicators in the Second National Energy Efficiency Action Plan of the Republic of Bulgaria show that the realisation of the National Programme for Renewal of the Housing in Bulgaria 2006-2020 (http://ares.bg/File/Nac_prog.pdf) would prevent the annual pollution with 523,000 toe CO2.

However RES do not have only beneficial effects for the environment – some projects were put in place in some environmental sensitive areas and are dangerous for the wild fauna, for example birds population[13].

[13]See the case of Kaliakra at https://wcd.coe.int/com.instranet.InstraServlet?command=com.instranet.CmdBlobGet&InstranetImage=1682371&SecMode=1&DocId=1646438&Usage=2

4. Overview of available renewable energy support schemes before the crisis

4.1. Types of support schemes and relevant policy and legal framework

As mentioned, till 2020 the share of RES in the gross final consumption in Bulgaria should reach 16% and the energy efficiency to be increased with 25%[14]. The Renewable and Alternative Energy Sources and Biofuels Act (ERSA) was adopted in Bulgaria in 2007. This legal act allowed the development of the RES in Bulgaria. It transposed the requirements of the EC Directive 2001/77. Since then the legal environment evolves in order to align with EU norms and to allow the increase the share of RES energy. Till the transposition of the Directive 2009/28/EO in 2011 it is the main document for the promotion and consumption of RES in Bulgaria. In 2010 was adopted the Law for the Energy from Renewable sources. The vision about the development of the sector is developed in two important strategic documents – the Energy Strategy of the Republic of Bulgaria till 2020 (adopted in June 2011)[15] and National Action Plan for the Energy from Renewable Sources[16].

According to Ministry of Economics, Energy and Tourism (MIET), the RES in Bulgaria is supported though a system of measures – administrative, financial, regulatory and informational, through which the produced energy is 'treated' outside the market conditions till the moment it will be developed and able to compete.

The Renewable and Alternative Energy Sources and Biofuels Act (ERSA) was the statutory basis for the feed-in tariff, which is the main element of the Bulgarian support system. In 2007 Bulgaria introduced new feed-in tariff for Renewable Electricity. The State Energy and Water Regulatory Commission assumed the commitment to purchase alternative energy at a higher tariff and for the specific duration (12 years or 15 years, according to the legal modifications). Suppliers refusing to accept renewably-produced electricity would be fined up to 500 000 (euros) in response to renewable power producers' reports of difficulty in grid connection. The ERSA also establishes an obligation to purchase and dispatch electricity from renewable sources.. The feed-in tariff applies to producers of electricity from renewable sources who export their electricity to the public grid. System operators are contractually entitled against the grid operator to the purchase and transmission of all electricity from renewable sources supplied (§ 18 par. 1 item 2 ERSA). The amount of tariff is determined annually by the State Energy and Water Commission (regulatory authority) (art. 32 par. 1 ERSA). In general, all renewable energy generation technologies are eligible for the tariff. However, some inefficient system types are ineligible for support.

The promotion of the RES was realised also through financial instruments developed by the public authorities, such as the Structural funds (e.g. the Operational Programme Competitiveness[17], see more in the next paragraph)[18] or financial lines from external sources – e.g. Bulgaria is currently implementing the Bulgarian Energy Efficiency and Renewable Energy Credit Line (BEERECL). RES projects are eligible for a 20% grant. Loans worth more than EUR 12.8 million have already been granted. Other financial

[14] http://www.minfin.bg/bg/pubs/1/5878
[15] http://www.mi.government.bg/files/useruploads/files/epsp/22_energy_strategy2020_.pdf
[16] www.mi.government.bg/library/index/download/lang/bg/fileId/221
[17] http://www.capital.bg/biznes/vunshni_analizi/2012/05/16/1828717_evropeiski_subsidii_za_energiina_efektivnost/
[18] See all the existing measures in the MIET, First Progress Report on the Promotion and Use of Energy from Renewable Sources for Bulgaria, 2011, pp. 9-18

schemes supporting RES are the Fund "Energy Efficiency"[19] (http://www.bgeef.com/display.aspx) and the Programme Energy Efficiency of the EBRD (www.ebrd.com) and the International Fund Kozlodouy.

4.2. Expenditures for promoting the RE deployment: total volume of resources and by type of technology

In Bulgaria there is no comprehensive data available about the exact expenditures in total or by type of technology made in the framework of RES support schemes. Some indications for particular measures could be found by the MIET report from 2011. This document indicates the amounts represented by the preferential prices for the energy produced by wind, solar or hydro sources in 2011 (MIET, ibid., pp. 33 - 40). According to them the hydro plants (1-10 MW) energy totalled 15.81 million of Euros (MEuros), of wind energy – 16.14 MEuros, and solar energy – 12.94 MEuros.

There is some data about the subsidies in concrete budget lines – e.g. for the measures 311 and 312[20] of the National Programme for the Development of Rural Regions are contracted in total more 57 million Euro (MIET, ibid., p. 34).

In the framework of the structural funds in Bulgaria (see more on www.eufunds.bg) for the period 2007 – 2013 are envisaged about 66,5 million Euro for RES projects (about 2,1% of the overall budget for Bulgaria for the period)? The subsidy for public entities is up to 100%, for companies it varies from 50% to 70% according to the company size.

Under the Bulgarian Energy Efficiency and Renewable Energy Credit Line (BEERECL). RES projects are eligible for a 20% grant. In 2009 were completed 4 projects in the domain of RES for a total value of 5,53 million Euro. In 2010 were finalised 13 projects totalling 22,1 million Euro. In 2011 were completed 3 projects of a total value of 5,5 million Euro (the contribution of the credit line if for a part of this investments).

There are also other financial opportunities for investment in RES and energy efficiency. The national company PUDOSS could provide financial support for micro-projects aiming at better environment. In the domain of RES PUDOSS supports the construction of small hydro plants through the 0% interest rate for maximum 5 years and up to 750 000 Euro where the value of a KW constructed is less than 1250 Eur/kW. However in the period 2009 – 2010 there were no RES projects supported by PUDOSS.

The Fund "Energy Efficiency" (http://www.bgeef.com/display.aspx) has financed RES project totalling 2,6 million Bulgarian leva (about 1,3 million Euro) for the period 2009 – 2011. There is no data about the projects financed in the framework of the Programme Energy Efficiency of the EBRD (www.ebrd.com) and the International Fund "Kozlodouy"[21].

[19] The Energy Efficiency and Renewable Sources Fund (EERSF) was established through the Energy Efficiency Act adopted by the Bulgarian Parliament in February 2004. The initial capitalization of EERSF is entirely with grant funds, its major donors being: the Global Environment Facility through the International Bank for Reconstruction and Development (the World Bank) - USD 10 million; the Government of Austria - Euro 1.5 million; the Government of Bulgaria - Euro 1.5 million and several private Bulgarian companies.

[20] Measures 311 and 312 of the National Programme for the Development of Rural Regions are focused on the development rural regions in the country. The projects to be financed are PV, wind and hydro plants with a power up to 1 MW that are to be constructed on the territory of the respective rural municipality (about 2 thirds of all the municipality in Bulgaria). The beneficiaries for the measure 312 could be microenterprises (with 9 employees maximum) that are established in the respective municipality. The measure 312 aims the diversification of agricultural producers with non-agricultural activities.

[21] http://www.mi.government.bg/en/themes/mejdunaroden-fond-kozlodui-mfk-905-348.html

4.3. Effectiveness evaluation in terms of meeting the renewable energy targets

The goal of Bulgaria's National Programme on Renewable Energy Sources (2005 - 2015) is to significantly increase the share of non-hydroelectric RES in the energy mix in order to attain 16 % in 2020 (the mandatory targets set by the Directive on the Promotion of the use of energy from renewable sources 16 % share of RES on the final consumption of energy in 2020 and at least 10% share of renewable energy in final consumption of energy in transport by 2020).

In general the renewable energy targets for the country seems to be realistic, both concerning 2010 and 2020 targets, according to the interviewed representative of MIET (see more in part 6). The Energy Strategy of Republic of Bulgaria (from 2011[22]) examines two scenarios for the progress towards meeting the RE targets. The first scenario is called Basic, according to it the 16% share of RES in the FEC will not be fulfilled and this share will reach only 13 % in 2020. The second scenario, called the Goal oriented, implies the reach of the target with more than 18% share in 2020.

[22] http://www.mi.government.bg/files/useruploads/files/epsp/22_energy_strategy2020_.pdf

5. The economic crisis effects in financing

5.1. General description about the economic crisis in the national economy

Bulgaria was severely hit by the current financial and economic crisis. Many sectors that were at the origin of growth in the period 2003 – 2008 – for example real estate, construction, and financial services – were negatively impacted by the crisis.

The industrial production was also hit by the crisis. According to NSI data (http://www.nsi.bg/otrasal.php?otr=3), the turnover of industrial enterprises (manufacturing) started to decrease from 50,1 biilion of leva in 2008 to 38,6 in 2009 and to 43,1 in 2010.

The overall production of energy in Bulgaria was 9953 (thousand of petrol equivalent tones) in 2008, 9588 in 2009 and 10234 in 2010 (last data available from NSI). From this perspective the crisis has only short term negative impact which was followed by increase of the production. The consumption of electricity decreased slowly in the years 2009 and 2010 (compared to 2008) in order to increase on a level beyond 2008 level in 2011.

Table 8. Net internal consumption of electricity 2008 – 2011 (in GWh)

Year	Months of the year												Total
			III	IV	V	VI	VII	VIII	IX	X	XI	XII	GWh
2008	3865	3348	2988	2648	2484	2428	2592	2620	2538	2748	3050	3375	34684
2009	3686	3148	3177	2472	2355	2355	2537	2471	2355	2674	2864	3319	33413
2010	3568	3156	3123	2528	2363	2325	2476	2584	2304	2812	2650	3323	33212
2011	3630	3268	3286	2601	2380	2450	2595	2577	2446	2837	3246	3425	34741

Source: NSI (own calculations)

The trend in continuous job creation in Bulgaria was reversed at the end of 2008 and unemployment levels which from the autumn of 2008 started to rise from 6.18% (still 2.30 percentage points lower than the EU average) to about 10% by the end of the year 2009. The unemployment continue to increase and reached 12,3% in mid 2012 (NSI).

5.2. The impact of the crisis in the RE sector between 2008-2012

The modifications of the framework of the RES in Bulgaria were numerous in the last 2-3 years. In 2010 the country adopted new legislation about the renewable, changing the conditions for the support of the sector in terms of preferential prices, terms and introduction of guarantee payments. The explanation of this policy could be seen in the MIET report (MIET, p. 19). The evaluation of MIET is that the introduced with the 2007 law support measures for the RES – preferential prices, compulsory buying, long term contract, etc. led to very high interest about the production of RES based electricity. This causes several problems such as: the announcement of too much investment intentions for solar and wind parks, not in compliance with the capacity of the energy

system of the country; the cases of RES projects in preserved or other sensitive areas without the necessary authorisations; The need to change the statute of agricultural lands and the fact that many potential investors were not prepared to fully support their investment. However very probably another part of the explanation is related to the crisis and the fact that public spending for RES should be considered.

According to the experts of the RES-Integration project, “The new RES Act now abolishes the priority access to the grid for RES producers completely. The law places renewable energy behind all other kinds of energy. The law envisages to stop the application of the support mechanism after the indicative target for Bulgaria is achieved. This measure is in direct violation of EU directives. Another serious barrier is the fact that RES investors will find out the price at which they will be selling their energy only after the construction of their power generating facilities is completed”.

Table 9. Prices For Electricity From Renewable Energy Sources – Bulgaria 2010 (without value added tax)

SOURCE	PRICE
Hydro-up to 10 MW installed capacity	112 BGN per MWh (56 euro)
Prices for wind power plants with installed capacity of 800 kW and over: up to 2250 full effective annual working hours over 2250 full effective annual working hours	 188 BGN per MWh (97 euro) 173 BGN per MWh (89,5 euro)
PV power generation: With installed capacity up to 5 KW With installed capacity over 5 KW	 760 BGN per MWh (393 euro) 699 BGN per MWh (362 euro)
Price of electricity produced from power plants fired with wood waste up to 5 MW – 217.00 Euro / MWh:	252.00 BGN per MWh

Source : http://www.resbulgaria.com/2011/05/feed-in-tariff-fit-for-2011/

In 2011 the prices for the feed-in tariff in Bulgaria were comparable to those in many other EU countries. This favourable environment attracted many foreign and local investors as reported by different media (see more in Annex).

On 14 September 2012 the feed-in tariff (FIT) rates for the obligatory purchase of solar generated electricity have been cut by over 50 percent in Bulgaria. The cuts concerned also the wind sector (with 22 percent). These changes came effect on July 1 2012, together with the increase of the consumer electricity prices (by 13 percent). See table below:

The retroactive grid usage fee introduced for all RES plants connected to the grid since 2010 which has to be paid by RES plant operators to the grid operator in charge:

- **For hydro power plants,** the grid usage fee amounts to 5 % of the respective feed-in tariff.
- **For plants using biomass or biogas**, the grid usage fee amounts to 10 % of the respective feed-in tariff .
- **For wind power plants,** the grid usage fee amounts to 10 % of the respective feed-in tariff .
- **For PV installations** commissioned in 2010 and 2011, the fee amounts to 20 % of the feed-in tariff. For PV installations commissioned in the first half of 2012, the fee amounts to 39 % of the feed-in tariff. If put into operation between 1 July and 31 August 2012, the fee is 5 %; and after 1 September 2012, 1 % of the respective feed-in tariff.

Source: RES LEGAL, 2012.

The reasons for this were related to the decreasing prices of RES production and the need to find a balance between the RES development and the ‘just’ price of electricity

and households. In the Energy Strategy of Republic of Bulgaria (from 2011[23]) it is said that the 'existing mechanisms' of supporting RES and energy efficiency for the period 2012-2018 will contribute to the overproduction of RES energy beyond the established for the country indicative curve and probably this also was among the reasons to make the support mechanisms less attractive. It is also important to remind that the country already reach 12% of the electricity from RES which makes the attainment of the 2020 target easier (16% target in 2020).

The data presented in the table 9 gives idea about the development of the support measures in the last two years according to the types of RES projects. It could be seen that in general the support is decreasing gradually for all types of RES.

[23] http://www.mi.government.bg/files/useruploads/files/epsp/22_energy_strategy2020_.pdf

Table 10 – Overview of retro-active tariff reductions (15.09.2012) (BGN/MWh)

	30.03.10.-30.03.11	30.03.11-30.06.11	01.07.11-31.12.11	01.01.12-30.06.12	01.07.12-01.09.12	01.09.12-...
wind						
<2250 LFH	190.59 – 19.06	188.29 – 18.83	191.00 – 19.10	191.00 – 19.10	148.71 – 14.87	148.71 – 14.87
>2250 FLH	174.44 – 17.44	172.95 – 17.30	173.06 – 17.31	173.06 – 17.31	132.71 – 13.27	132.71 – 13.27
photovoltaic						
<5 kWp	792.89 – 158.58	760.48 – 152.10				
>5 kWp	728.29 – 145.66	699.11 – 139.82				
<30 kWp			576.50 – 115.30	576.50 – 224.84	268.68 – 13.43	193.42 – 1.93
<200 kWp			567.41 – 118.48	567.41 – 221.29	260.77 – 13.04	188.10 – 1.88
<10 MWp			485.60 – 97.12	485.60 – 189.38	237.03 – 11.85	171.57 – 1.71
>10 MWp			485.60 – 97.12	485.60 – 189.38	236.26 – 11.81	169.85 – 1.70
roof & facade						
<5 kWp						381.18 – 3.81
<30 kWp			605.28 – 121.05	605.28 – 236.04	400.70 – 20.04	289.96 – 2.90
<200 kWp			596.50 – 119.30	596.50 – 232.64	394.90 – 18.45	285.72 – 2.27
<1 MWp			583.77 – 116.75	583.77 – 227.67	316.11 – 15.81	206.34 – 2.06

-10% -10% -10% -10% -10%

-20% -20%

-20% -39% -5% -1%

-20% -39% -5% -1%

Source: http://www.dker.bg/files/DOWNLOAD/res-tseni-dostap-VI-proizv.pdf

The Bulgarian regulator also raised prices for consumers, increasing them by 13 percent from the 1st of July 2012. It said that a large part of the increase was because of the growing proportion of more expensive green energy.

There was a strong reaction of the producers of RES to these decrease of the FIT rates. "What we see is not a policy, but improvisation with a final aim to stop the development of wind and solar energy in Bulgaria," Velizar Kiriakov, head of the Association of Producers of Ecological Energy, according to Reuters agency[24]. During the last months many photovoltaic projects or other RES projects have been placed in jeopardyThe 'severity' of the cuts surprised investors. Some investors will try to find means to appeal the government's decision or just cancel their projects (see more information in Annex). The branch organisations in the sector protested arguing that this new legislation is a barrier to the construction of new solar or wind parks. The main elements that fear investors are that the late fixing of the preferential prices for buying the energy produced and the decrease of the period for preferential acquisition from 15 to 12 years. According to the new rules, the preferential price for buying of the electricity will be fixed at the finishing of the construction but this means that the investment project should be made without a clear idea of the return expected[25].

[24] Read more: http://www.pv-magazine.com/news/details/beitrag/bulgaria-unveils-sharp-pv-cuts_100007578/#ixzz26GP1wENc

[25] http://www.economynews.bg/%D0%B2%D1%8F%D1%82%D1%8A%D1%80%D0%BD%D0%B0-%D0%B5%D0%BD%D0%B5%D1%80%D0%B3%D0%B8%D1%8F-%D0%B3%D0%BE%D0%BB%D1%8F%D0%BC%D0%B0-

The comparison of the new and old FITs, presented in table 6 give a full idea of the decrease of the support.

Table 11. Comparison of Previous and New FITs

Rooftop/BIPV			Ground-mounted			Term (years)
Size	New incentive (Lev/kWh)	Previous incentive (Lev/kWh)	Size	New incentive (Lev/kWh)	Previous Incentive (Lev/kWh)	
<30 kWp	0.33192	0.60523	<30 kWp	0.26868	0.57650	15
30 – 200 kWp	0.3003	0.59650	30 – 200 kWp	0.26077	0.56741	15
200 kWp – 10 MWp	0.28449	0.58377	200 kWp – 10 MWp	0.23705	0.4856	15
>10 MWp				0.23626		

Read more: http://www.pv-magazine.com/news/details/beitrag/bulgaria-unveils-sharp-pv-cuts_100007578/#ixzz26GT2XCQC

There are also different support measures that are not part of the specific RES legislation and which are still valid, namely those programmed in the Operational programmes (2007 - 2013) (see below in table 11).

Table 12. Selected support measures still in use

Source	Type of measure				
Operative Programme "Development of the Competitiveness of the Bulgarian Economy 2013"	Financial[26] (overall available)	Electricity production from renewable sources	Investors	Existing	Beginning 2010 End 2013
Programme for Development of Rural Areas, 2007-2013	Financial	Electricity production from renewable sources	Investors	Existing	Beginning 2010 End 2013
Operative Programme "Regional Development	Financial	Electricity production from renewable sources	Investors, population	Existing	2007 2013
Operative Programme „Environment"	Financial	Electricity production through the usa of individual gas emissions (methane) from waste depots	Municipalities	Existing	2007 – 2013

Source: Source: MIET, First Progress Report on the Promotion and Use of Energy from Renewable Energy Sources for Bulgaria, 2011

As mentioned, the recent changes of the energy prices and the introduced taxes for 'reservation' of power provoked protests in the sector. However the position of the State Commission of Energy Regulation (SCER) from the end of September 2012 is

%D0%B7%D0%B0%D0%B5%D1%82%D0%BE%D1%81%D1%82-%D0%BC%D0%B0%D0%BB%D0%BA%D0%BE-co-2-news21086.html

[26] Those measures have financial resources that are distributed on a competitive principle among the participating companies, for more information see the respective web sites of the Operational programmes – such as http://www.opcompetitiveness.bg. The approved projects are partially financed by the beneficiary and partially by the Operational programme (itself financed by the EU and by the Bulgarian Government).

that those new regulations will not be changed[27]. However at a press conference the President of the SCER declared that the situation could be changed when the overall information about the installed RES and the expenses of the System Operator and the distribution companies for their 'balancing'. According to him the country has already more than 780 MW of photovoltaic power which represents more than the country engagement for the EU. The actual calculations about the yearly expenses for RE is that they are about 280 million of Bulgarian leva (about 140 million of Euro) and on this basis was established the temporary price for access. The logic of the different prices according to the data of the access to the grid follows the different expenses associated – e.g. because of the boom of new projects in the first part of 2012, the prices for this period is the higher.

5.3. The future of the RE sector by 2020

There future of the RE sector by 2020 depends on the continuous development of RE projects. The estimations of the Bulgarian authorities (MIET) are that in the years 2010 – 2020 there will be constant excess of production of renewable energy compared to the indicative trajectory (see the following table).

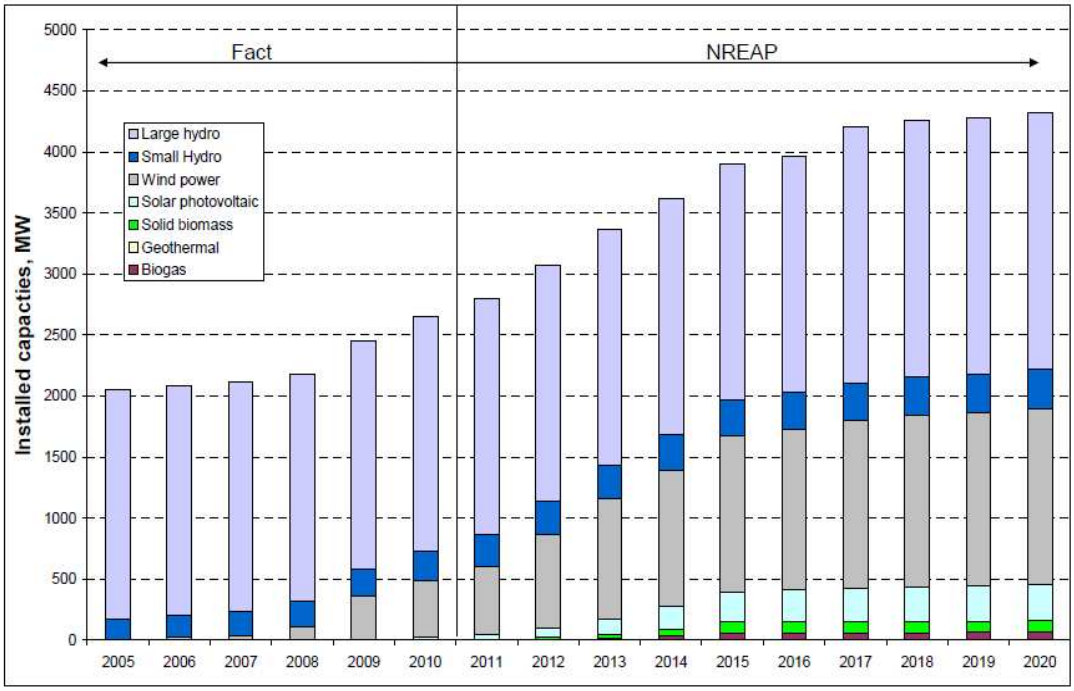
Table 13. Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be to/imported from other Member States and/or third countries in Bulgaria (ktoe)

	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

Source: Source: MIET, First Progress Report on the Promotion and Use of Energy from Renewable Energy Sources for Bulgaria, 2011.

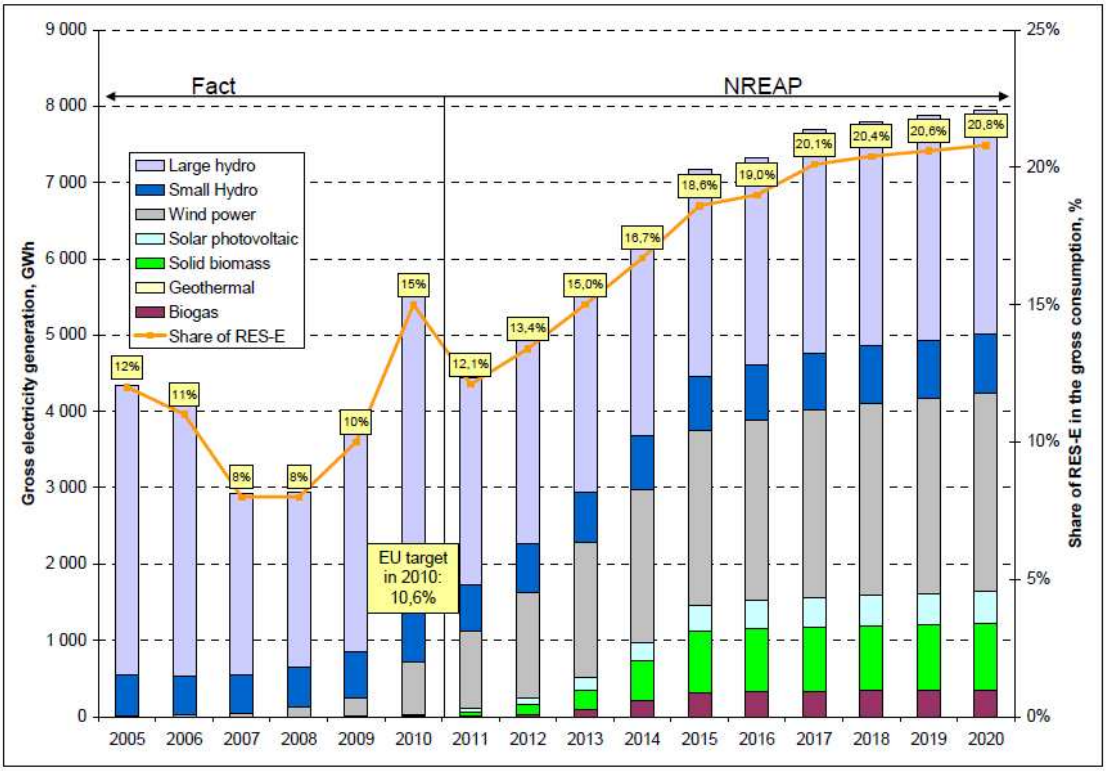
[27] http://www.capital.bg/politika_i_ikonomika/2012/09/25/1913051_energiiniiat_regulator_niama_da_otmeni_cenata_za/?ref=embedfp&source=www.dnevnik.bg

Figure 2: Installed RES-E capacities between 2005-2020, MW[5]



The installed RES-E capacity is expected to increase continuously during the following years (see the figure above). While in the year 2010 the installed capacity was a bit more than 2500 MW it is expected to be almost 4500 MW (or almost the double) in 2020.

Figure 3: RES-E gross electricity generation between 2005-2020, GWh



The share of RES in the gross consumption is complying with the EU targets – for example in 2010 the RES contributed to 15% of the electricity generation exceeding largely the 10,6% EU target. However, these figures should be treated with caution. The relatively high target as well as the present RESE production level reflects traditionally strong hydropower production: close to 90% of this impressive figure can be attributed to the high production of old hydropower plants. The forecast is that this share will gradually increase in order to reach more than 20% in 2020 (see fig. above).

Targets, opportunities and potential

- *The RES-E indicative target by 2020 is 20.8 % (the present share is 15%) according to the National Renewable Energy Action Plan (NREAP). The majority of RES-E production in 2020 will be based on hydro and wind, the rest coming from solar and biomass.*
- *The medium term wind potential is estimated to be at around 3 GW and the government is seeking to reach around 1.4 GW by 2020. Over half of the increase of renewable capacities planned between 2010 and 2020 is expected to be based on wind. Numerous wind projects that have final or guaranteed preliminary contracts provide an opportunity for those investors who prefer ready-to-build projects that have all permits including the final grid connection contract.*
- *The solar potential is significant: 300 MW of new solar capacity is expected to be built by 2020. A number of large solar PV projects have been proposed, especially in the South, but the government's preference is clearly to shift the development of photovoltaic parks to industrial areas, rooftop and facade wall installations, and smaller projects are desired.*
- *Bulgaria is an agricultural country with a large biomass potential, but limited growth is planned for biomass based electricity generating capacity, with around 150 MW of new capacity by 2020. Growth is much more pronounced in the heating sector (about 350 MW of thermal capacity). There is a clear preference for biomass and biogas projects on behalf of the government (increased feed-in tariffs), but until now not many such projects have been realised.*
- *Bulgaria's huge hydro potential is exploited to a large extent. Taking into account the pressing modernization needs of operating hydro power plants, it is not realistic to expect a significant capacity increase. In the NREAP a modest development of around 300 MW of capacity is envisaged between 2010 and 2020. The Bulgarian FIT for small hydro installations (with capacity below 5 MW) is highly preferential.*

Source: 2012 Cambridge Programme for Sustainability Leadership

As mentioned, Bulgaria has god potential for the development of RES[28]. Bulgaria has good wind resources especially in the North-East, along the Black Sea coast and in the South West. Until the end of 2011 about 500 MW of wind capacity had been developed by local and foreign private investors. Mid-term potential is estimated to be around 3 GW and the government is seeking to reach around 1.4 GW by 2020. Over half of the increase in energy capacity planned between 2010 and 2020 is expected to be sourced via wind power. Already, numerous projects with final or guaranteed preliminary contracts are providing opportunities for investors who prefer ready-to-build projects that have all permits including the final grid connection contract. Solar potential is significant: for most of the country solar radiation is 20% higher than for Germany. 300 MW of new solar capacity is expected to be built by 2020 according to the NREAP. There are large solar PV projects proposed, especially in the South, but the government's preference is clearly to shift the development of PV parks to industrial areas, rooftop and façade wall installations, and smaller capacities. The simplified licensing procedure for these rooftop and façade wall installations and no need of grid connection (much less front-end risk) create an easy entry to this market.

[28] See more on the country's targets on: http://www.renewablepowernews.com/archives/2158; http://www.schoolofpolitics.org/eng/index.php/news/173-zelena-konferentsij; http://pubs.iied.org/pdfs/G03223.pdf

6. Social debate about the renewable energies

This paragraph presents the view of social partners in Bulgaria. Before presenting the information collected in the interviews, it is important to remind the representation in the sector.

There are 4 trade unions federations in the energy sector, two belonging to the CITUB (http://www.knsb-bg.org/) and two belonging to the CL "Podkrepa" (http://www.podkrepa.org). However the interviewed structure of CITIB declares not to have members from the RES sector and very probably there all the RES subsector is not unionised. The only enterprises where there is collective bargaining are those belonging to the State *NEK*.

Within the employers' organisations that have the statute of nationally representative also there is no specific structure representing the employers in RES. The Branch Chamber of the Energy producers (http://www.bbce.org) within BIA does not have members in the RES segment. However some of the RES organisations are members of nationally representative employers' associations such as BCCI[29] or AIKB[30], but they are business associations and the examination of their goals does not allow to conclude that they have any interest in the social dialogue.

There are some organisations in RES subsector such as wind or solar energy. Among them we could mention the Bulgarian Photovoltaic Association, established in 2009 (with about 100 members at present, according to its website[31]) aiming at the establishment of a favourable environment in this subsector[32]. The Association of the producers of ecological energy Association of Producers of Ecological Energy was established in August 2004 by 16 companies willing to invest in ecological power plants in Bulgaria. The Association took the challenge to help and protect the private initiative of the Bulgarian and international investors, representing their economic and branch interests to the state authorities and other organizations[33]. The Coalition "Alliance of the producers of ecological energy – BG" was established in 2007 and claims to unite the interests of 32 producers of hydro or solar energy with total capacity of 200 MW.

The interviewed persons (face-to-face or written answers) are Tz. Myhaylova, MIET, K. Jeliazkov, BIA and E. Arnaudova/G. Petrov CITUB.

Role of social partners in the development of RES

According to the interviewed trade union representatives, they are not consulted in the elaboration of strategic documents related to the development of the RES. The nationally representative employers' organisations have been consulted and they usually express their opinion about the RES development (e.g. the various declarations and position papers of the Bulgarian Industrial Association, etc.[34]). The sectoral associations argue that the first RES legislation (in 2007) was subject of large consultation among stakeholders but not the second one (in 2011)[35].

[29] www.bcci.bg
[30] bica-bg.org
[31] http://www.bpva.org/
[32] http://www.bpva.org/bg/articles/article533.html
[33] http://apee.bg/en/
[34] See http://www.bia-bg.com/
[35] See for example http://apee.bg/%D0%BD%D0%B5-%D0%BF%D0%BE%D0%BB%D0%B8%D1%82%D0%B8%D1%86%D0%B8%D1%82%D0%B5-%D0%B0-%D1%85%D0%BE%D1%80%D0%B0%D1%82%D0%B0-%D1%89%D0%B5-

Renewable energy situation

The opinion of the interviewed respondents about the situation concerning the renewable in Bulgaria is not unanimous. According to the interviewed trade union respondent, the development of the RES is at the expense of the development and modernisation of the conventional energy and from this perspective it is not evaluated positively. According to the employers' representative, the development of the RES should be based on a long term strategic plans and not and a frequent changes of the rules. The renewable energy targets are very ambitious, according to the trade union representatives. The initial target for 2020 was 20%, after that reduced to 16% was not realistic. Bulgaria started from 5%-6%, not like other countries starting from 12% - 13%. Because of the climate change the hydro resources diminish and some of the existing capacities such as *Chaira* are only partially used. However the examined trade union federation has never formulated positions about the RES.

According to the interviewed representative of the administration, the set by the European Commission compulsory goal for Bulgaria to reach 16% share of the RES energy till 2020 (which includes 20.8 % share of the RES in the final gross consumption of electricity in country, 23.8 % share in the energy for heating and 10,8% share of the energy from RES in the transport) is realistic and could be achieved. The reason for this statement are the potential of RES in Bulgaria and the current legislation promoting the exploitation of this potential. The respondent states that the production of primary energy satisfies about 55% of the gross internal consumption of energy in a relatively constant situation during the last years.

Support Schemes

According to the interviewed representative of the State administration, in order to reach its objectives for 2020 the Bulgarian state elaborates mechanisms to support the effective energy production from RES. At present in the country are in force different measures for the support of the production or consumption of RES. Part of the measures are regulatory: in 2011 the Law for RES energy establishes preferential feed-in tariffs, compulsory buy-out and long term contracts as well as priority access to the energy and gas distribution networks for RES. The preferential prices are updates annually or more often, depending on the evolution of the price-forming factors.

The interviewed trade union representatives were not informed in detail about all the support schemes used in the country. However they express the opinion that the support measures for the RES have been too generous and there is a need to support the conventional energy production. Bulgaria should not be compared to countries that could afford to invest public resources in the RES. There is also negative impact of the RES to the electrical transport system – because all the obligations are for the State or the grid operator and to for the investors. Something more, the put in use of the RES requires the existence of replacement power because the wind or the water or the sun are not guaranteed. The role of RES should be put in the context of long term forecasts. The environmental goals are important but somebody needs to pay for them. There are contracts for the construction of RES, about 2000 MW, at a very preferential price. Probably that is why there was such an interest by the investors. According to the respondent probably RES are also among the factors for the bad situation of the state owned NEK. "*Probably this is the future, but there is a lot of money and everyone is defending his interests*".

According to the interviewed representative of the employers the country needs a clear strategy in terms of development of the RES in order to develop concrete schemes.

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This clear strategy should be based on the forecast for economic development and energy consumption, the limitation of the CO2, the related measure for a low-carbon development of the industry, the need of decrease of the energy efficiency of the country, etc. The opinion of the representative of the sectoral organisations could be examined in their statements and they are extremely critical to the new changes in the legislation and prices (see for example the statement of the APPE representative[36]).

The interviewed explain how the support schemes and public funding were decreased in the context of the current economic crisis and impossibility of the energy system to absorb the new projects. According to the sectoral organisations, the non-fixed tariff creates uncertainty and makes the financement of solar projects or other RES almost impossible. The branch associations consider that the annual adaptation of this tariff could stay in force but for new projects, not for those already in use.

About the future, the interviewed respondents point out the need to rely on the market mechanisms and to ensure that support measures are transparent and equal for the potential investors. Employers' claim that the generous measures for support are attracting speculative capital and they will impact negatively the competitiveness of the Bulgarian economy and the living standards of the population. There is also a need to simplify the complex administrative procedures, especially for small RES projects such as roof installations. The nationally representative employer's organisation interviewed claims for support measures that take into account the competition between technologies and the lower public expenses. There is also a need to support of the decentralised production for the own's need when the transport losses are eliminated.

Already when the new legislation adopted in 2011 was discussed, BIA claimed that all producers of electricity, including from RES, should pay to connect to the grid and not to continue to practice free of charges connection at the expense of the investment capacity of the electricity system

BIA considers that there is a need of large societal consensus about the main directions of the RES development that ensure sustainable development and competitive energy prices for the industry and the households.

The recommendations of the trade union respondents are that the price for the RES should be acceptable for the consumers. Bulgaria needs to have balance, to develop coal production and to invest those money for RES for the improvement of the coal technologies, for ecology. RES should be developed but to compete on the market, not to have preferences. Bulgaria has good positions on the energy market and it is good that the government decided to stop the generous preferences. It is also not sure to what extent are environmental friendly. For Bulgaria it is important to develop gas sources and nuclear energy.

According to the interviewed State expert, one of the problems till now is that the existing support measures have promoted the investments in expensive technologies for the RES production of electricity, e.g. the preferential tariffs for the photovoltaic installations. And this contributes to high prices for the consumers and the society as a whole. In the context of the crisis the support measures have not been changes, but the legislation evolved in order to better align with the EU norms and to address the negative consequences of the previous, too liberal conditions of RES support. In order to balance the interests of producers, consumers and the capacity of the energy distribution system, were introduced advance payments and guarantee taxes concerning the reserved powers for energy production. The idea of the current changes

[36] http://apee.bg/%D0%BD%D0%B5-%D0%BF%D0%BE%D0%BB%D0%B8%D1%82%D0%B8%D1%86%D0%B8%D1%82%D0%B5-%D0%B0-%D1%85%D0%BE%D1%80%D0%B0%D1%82%D0%B0-%D1%89%D0%B5-%D0%BF%D0%BB%D0%B0%D1%89%D0%B0%D1%82-%D1%86%D0%B5%D0%BD%D0%B0%D1%82/

and in the context of the development of RES technologies, is to make a transition from non market to market mechanisms of their support. In addition the Bulgarian state envisages to promote innovations related to RES.

Employment in RES

Interviewed respondents have difficulties to develop the question about the employment evolution in the RES. According to the interviewed representative of the state the main employment generated by RES is in the process of the production of the installations. But it requires qualification of the labour force that is in progress in Bulgaria. The construction of RES includes the employment of non qualified labour force but also some qualified, engineers, technicians ensuring maintenance, etc. The exploitation of RES does not create many jobs.

According to the trade union representatives the employment in RES is really limited and it is not a possible way out of the crisis. The good employment in quality of work is existing in the conventional energy production in Bulgaria, it is not sure that it will be the case in the RES. Trade union representatives share that there is no precise data about the employment levels. An example is given that 8 employees work in a large wind park from the neighbouring village.

Representation and social dialogue

The jobs created in the RES are generally not unionised. There is no data about the quality of work in the RES, but according to the unions, it is less important than in the conventional energy sector. The interviewed trade union representatives state that in most of the RES there are few employees on open ended labour contracts, all the other employees are on civil contracts (fro service provision) or belonging to subcontracting support companies. There is no collective bargaining in the RES.

7. Conclusions and key messages

The Bulgarian sector of the RES experienced important development since 2007. Bulgaria succeeded to reach the RE targets for the year 2010 and seems to pursue well the targets for 2020.

Various measures, such as prioritary connection to the grid, subsidised FITs, financial stimuli for the construction of RES, etc. were put in place. Since 2007 Bulgaria has a differentiated feed-in tariff (FIT) support regime in place with obligatory purchase of RES-E, priority connection of RES generation to the grid, long-term power purchase agreements and limited annual feed-in tariff adjustments. Due to the previous attractive regulatory framework and lucrative feed-in tariffs a flood of investments was seen in 2008, with 450 MW of new wind and solar capacity coming on line by 2010, and 12 GW, partly speculative, in applications. In this way the share of RES in the total production rose to 16 %. Additional support measures were planned within the operational programme of Bulgaria for the period 2007 – 2013.

The government response to unexpected interest from investors was a new, rather restrictive Renewable Energy Act passed in April 2011. A quota for the renewables' grid connection is to be introduced and will be allocated according to presently unknown rules. The eligibility period for feed-in tariffs for wind and solar Photovoltaic (PV) was reduced. The main driver behind this policy shift was the fear of the high cost of renewable support systems and grid development, and the falling cost of renewables, especially solar. In this way during 2011 and 2012 the new changes of the RES legislation and regulation led to a significant decrease of the support for RES. These developments, some of them retroactive, provoked a strong protest from investors complaining about changing rules, lack of transparency and problems for their investment.

The outcomes of the initial support measures were very clear – the level of RES in the country increased significantly in terms of projects, power installed and employment generated. However the newest legal changes seem to contribute to slow down the investors' interest in the sector but it is too early for definitive conclusions.

In other words the main barrier to RES-E development in the short run in Bulgaria is erratic market support. Bulgaria had generous feed in tariffs that led to a huge surge in RES applications. However new renewable policy is more restrictive, aiming to limit investment (and renewable support) to the level needed to fulfil the mandatory target set by the European Union.

The government currently sets an overall limit to RES promotion: when the mandatory target set by the National Renewable Energy Action Plan (NREAP) is met, no further projects can apply for the preferential prices and mandatory purchase agreements signed between renewable producers, and NEK or public suppliers. It is therefore likely that growth across Bulgaria's RES sector will slow down in the short term relative to recent years.

The employment in RES in Bulgaria is still limited and the employed are not unionised. There is no collective bargaining. Social partners have difficulties to address the RES developments issues. Unions claim the need to support conventional energy development and modernisation. National employers' consider the need of equal conditions for all the investors.

8. Annexes: additional information, figures and tables

Annex 1 - The Bulgarian electricity system

As a whole, the electricity sector in Bulgaria is managed and supervised by the State Energy Regulatory Agency. National Electrical Company (Nationalna Elektricheska Kompania - NEK) was split into six independent generators, a national transmission system operator, and seven regional distribution system operators. Three distribution regions in Western Bulgaria (including the Sofia region) are owned and operated by Czech CEZ, two distribution regions in North-eastern Bulgaria are owned and operated by German E.ON , and two distribution regions in Southeast Bulgaria are owned and operated by Austrian EVN. Currently, most of the thermal electricity generation capacity is privatised (the hydropower and nuclear plant are still state owned), all of the electricity distribution companies are privatised, and the district heating companies are still primarily owned by the State or municipalities.

Annex 2 – Main companies in the RES

The largest Hydro Cascades are: "Belmeken-Sestrimo"- 700 MW, "Dospat-Vacha"-670 MW, "Batashki Vodnosilov Pat"-220 MW. Important hydro plants on the Arda river are: "Kardzhali"-106 MW; "Ivailovgrad" - 104 MW and "Studen Kladenets" - 60 MW. Some of the existing hydroplants are owned and managed by the state-owned NEK, others by local or foreign private companies[37]. Three major Hydroelectric power plants are under construction: "Gorna Arda" - 160 MW; "Sreden Iskar" - 93MW, (€60 million investment); "Tsankov Kamak"- 90MW, (investment totalling €220 million), together with several small projects of private investors. *Energo-Pro Bulgaria EAD*[38] is the biggest private producer of electricity from hydro power plants (HPPs) in Bulgaria. With a total installed capacity of 103 MW and average annual production of 255,000 MWh.

Among the main projects in use or to be connected soon we could mention an 80 MW PV park in Apriltsi, near Pazardzhik (should be operational by 2014). In May 2011, the company *Phoenix Solar* secured the project rights for ten 5 MW PV parks near the city Kazanlak. The company had secured rights for 20 MW in 2009 but succeeded to raise the capacity to 50 MW. Another example is the French *Schneider Electric* which in April 2012, was awarded the construction, network connection and operation of two solar power plants in Bulgaria, with a total capacity of 39 MW at Letnitsa and Vratsa. The plants should be operation in 2012[39]. (http://www.enercee.net/bulgaria/renewable-energies-the-environment.html)

Concrete examples of certain large wind parks that are planned to be commissioned in 2012-2013, such as the Spasovo wind park (General Toshevo), developed by *CPC Bulgaria* and which will consist of up to 54 turbines rated 3 MW each (up to 162 MW). *Varna Green Energy* is also developing two wind parks, 60 MW *Prolez* (9MW commissioned in 2010) and 51 MW *Gorichane*, to be completed in 2012. A 150 MW wind park is under development by *DIV Wind* near Balchik in North-eastern Bulgaria[40]. In the same time the interviewed expert argues that in order to fulfil the EU 2020 goals, Bulgaria should put in use 3600 Mw of wind power in the following years

[37] Around 63 small and micro Hydro Power Plants were located on the National Energy Company's (NEK) property, most of which have been privatized, see http://www.investbulgaria.com/BulgarianEnergySector.php
[38] http://www.energo-pro.com/?Template=OurGroupView&RecordID=1&LanguageID=1
[39] http://www.enercee.net/bulgaria/renewable-energies-the-environment.html
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