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REPUBLIC OF BULGARIA

MINISTRY OF THE ECONOMY AND ENERGY

REPORT OF THE REPUBLIC OF BULGARIA TO THE EUROPEAN COMMISSION ON THE IMPLEMENTATION OF DIRECTIVE 2001/77/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 27 SEPTEMBER 2001

June 2008, Sofia

TABLE OF ABBREVIATIONS

AES	alternative energy sources
BSS	Bulgarian state standard
RES	renewable energy sources
HPP	hydropower plant
WPP	wind power Plant
SG	State Gazette
SEWRC	State Energy and Water Regulatory Commission
EBRD	European Bank for Reconstruction and Development
EEEP	Energy efficiency and environment protection
EIB	European Investment Bank
EC	European Community
EU	European Union
SHPP	small hydropower plant
MEE	Ministry of the Economy and Energy
MEW	Ministry of the Environment and Water
CM	Council of Ministers
KIF	Kozloduy International Fund
NSI	National Statistical Institute
PSHPP	pumped-storage hydropower plant
TPP	thermal power plant

UNITS OF MEASUREMENT

GWh	gigawatt hour
kWh	kilowatt hour
MW	megawatt
toe	tonne of oil equivalent

TABLE OF CONTENTS

		Page
I.	EUROPEAN POLICY FOR THE DEVELOPMENT OF RENEWABLE ENERGY SOURCES	5
	I.1 Directive 2001/77/EC	5
	I.2 Energy-Climate Package of 23.01.2008	6
II.	NATIONAL POLICY FOR THE DEVELOPMENT OF RENEWABLE ENERGY SOURCES	7
	II.1 Obligations of the Republic of Bulgaria in the area of renewable energy sources	7
	II.2. Law on Renewable and Alternative Energy Sources and Biofuels	7
	II.3 Long-term national programme for promotion of the use of renewable energy sources 2005-2015	8
	II.4 Promotion mechanisms	8
	II.4.1 Preferential prices	8
	II.4.2 Funding schemes for RES plant construction projects	9
III.	PRODUCTION OF ELECTRICITY FROM RENEWABLE ENERGY SOURCES IN BULGARIA	11
IV.	ACHIEVEMENT OF THE NATIONAL INDICATIVE TARGET FOR CONSUMPTION OF ELECTRICITY PRODUCED FROM RENEWABLE ENERGY SOURCES	14
V.	CONCLUSION	16

In accordance with Article 3(3) of Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources (RES) in the internal electricity market Member States are required to publish, for the first time not later than 27 October 2003 and thereafter every two years, a report which includes an analysis of the progress in meeting the national indicative targets taking account, in particular, of climatic factors likely to affect the achievement of those targets and which indicates to what extent the measures taken are consistent with the national climate change commitment.

I. EUROPEAN POLICY FOR THE DEVELOPMENT OF RENEWABLE ENERGY SOURCES

I.1 Directive 2001/77/EC

The key document concerning electricity produced from RES is Directive 2001/77/EC on the promotion of the use of electricity produced from renewable energy sources in the internal electricity market. The purpose of the Directive is to promote an increase in the contribution of renewable energy sources to electricity production in the internal market for electricity and to create a basis for a future Community framework therefor.

The Directive requires Member States to take the necessary measures to promote an increase in the consumption of electricity produced from RES in accordance with the indicative targets set for each Member State in the Annex to the Directive. As regards the contribution of electricity production from RES to total electricity consumption until 2010, the Directive provides for national indicative targets to be set for each Member State. The overall indicative target for the EU is 13.2% of gross domestic energy consumption by 2010 and a 21% indicative share of electricity produced from RES in total electricity consumption by 2010 (in accordance with Directive 2006/108/EC, adapting Directive 2001/77/EC by reason of the accession of Bulgaria and Romania to the EU).

Figure 1 shows the indicative targets set for individual Member States for 2010 and the share of RES electricity in gross national electricity consumption achieved in 2006.

Key
[Left-hand side, from top to bottom]
% 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0

[Right-hand side, from top to bottom]
2006
Indicative target by 2010

[X-axis, from left to right]
Austria, Sweden, Latvia, Romania, Portugal, Denmark, Slovenia, Finland, Spain, Slovakia, Italy, France, Greece, Germany, Bulgaria, Ireland, the Netherlands, Czech Republic, United Kingdom, Belgium, Hungary, Lithuania, Luxembourg, Poland, Estonia, Malta, Cyprus, EC-27

Figure 1 Share of electricity produced from RES in gross national electricity consumption in 2006 and indicative targets of Member States and EU-27 for 2010

Source: EU Energy and Transport in Figures, 2007/2008 edition, European Commission.

The Directive requires Member States to guarantee the possibility of issuing certificates of origin to be issued for electricity produced from RES. Member States have an obligation to further ensure the mutual recognition of guarantees of origin.

Member States are required to take the necessary measures to ensure that transmission system operators and distribution system operators in their territory guarantee the transmission and distribution of electricity produced from RES. The operators may also provide for priority access to the grid system of electricity produced from RES. When dispatching generating installations, transmission system operators are to give priority to generating installations using RES insofar as the operation of the national electricity system permits.

I.2 Energy-Climate Package of 23.01.2008

At the beginning of 2008 the European Commission presented the Energy and Climate Package, proposing as one of its elements, a directive setting out a general framework to promote the use of energy produced from RES and establishing common mandatory targets with regard to the percentage share of energy produced from RES in total energy consumption. The Directive sets out mandatory targets for the percentage share of energy produced from RES in total energy consumption and the percentage share of energy produced from RES in transport.

The European Council confirmed the Community's long-term commitment to the development of RES across the European Union after 2010 and, having regard to the different prevailing conditions, initial state of development and potential of each Member State, announced the following targets:

- Mandatory target to increase the share of RES in overall EU energy consumption to 20% by 2020;
- Mandatory target for all Member States to increase, in an economically effective manner, the minimum biofuel component in petrol and diesel fuel used in the EU transport sector to 10% by 2020.

The national target set for Bulgaria is a 16% share of energy produced from RES in the final energy consumption by 2020, including the minimum mandatory target of a 10% share for biofuel consumption in the transport sector.

II. NATIONAL POLICY FOR THE DEVELOPMENT OF RENEWABLE ENERGY SOURCES

II.1 Obligations of the Republic of Bulgaria concerning RES

Within the framework of implementing its energy policy, Bulgaria lays the necessary emphasis on the promotion of the use of electricity produced from RES in the general context of environmental protection and the security of energy supplies. The technical adaptations to the Treaty on the Accession of the Republic of Bulgaria to the European Union, Part A "General" (ADD 13 – Adaptations required by reason of the accession) adopted by Directive 2006/108/EC, supplement Directive 2001/77/EC on the grounds of the country's accession to the EU. The national indicative target for Bulgaria for 2010 is an 11% share of electricity produced from RES in gross national electricity consumption, providing favourable climatic factors allow this target to be achieved and taking into consideration the limits to the utilization of water resources under national legislation and pursuant to the relevant EU environmental legislation.

II.2 Law on Renewable and Alternative Energy Sources and Biofuels

In accordance with EU legislation, the commitments undertaken in the framework of accession negotiations and the recommendations of the European Commission, the Republic of Bulgaria developed and adopted a Law on Renewable and Energy Alternative Sources and Biofuels (promulgated in SG No 49 on 19.06.2007).

The Law regulates public relations with regard to the promotion of the production and consumption of electrical and thermal energy and/or energy for cooling produced from renewable energy sources and alternative energy sources and the production and consumption of biofuels.

With a view to promoting electricity produced from RES, the Law requires that priority access to the transmission/distribution grid system be given to producers of electricity produced from RES. There is

an obligation to purchase, at preferential prices, electricity produced from RES in respect of which a certificate of origin has been issued, except in the case of hydropower plants of more than 10 MW installed capacity. These prices are set by the State Energy and Water Regulatory Commission (SEWRC) for each category of RES, for generating capacity put into operation by 31 December 2010.

In accordance with §3 of the Transitional and Final Provisions (TFP) of the Law, the Minister for the Economy and Energy is required to develop a market mechanism for the promotion of electrical and thermal energy produced from RES and to submit it for approval to the Council of Ministers not later than 31 December 2011.

II.3 Long-term national programme for the promotion of the use of RES 2005-2015

In accordance with the obligations laid down in Directive 2001/77/EC and Directive 2006/108/EC, the Long-term national programme for the promotion of the use of RES 2005-2015 (LTNPPURES, adopted by a decision of the Council of Ministers of 19.10.2006) sets an indicative target of an 11% share of electricity produced from RES in gross national consumption by 2010. The programme is fully aligned with the overall concept of RES development in Bulgaria, the indicative targets for electricity produced from RES and the means to achieve these targets. Formulating measures and policies to promote the use of RES within the energy balance of the country, the Programme further evaluates:

- the current state of RES utilization in Bulgaria;
- the need to accelerate the penetration of RES in the next ten-year period;
- the combined impact of improvements in energy efficiency and increased use of RES in Bulgaria with a view to achieving sustainable development in the energy sector.

II.4 Promotion mechanisms

II.4.1 Preferential prices

In accordance with the requirements laid down in Article 9(5) of the Law on Renewable and Alternative Energy Sources and Biofuels (LRAESB), electricity produced from RES is promoted by setting preferential purchase prices for the energy produced from renewable and alternative energy sources.

The preferential prices for the sale of electricity produced from renewable or alternative energy sources, excluding electricity generated by hydropower plants of more than 10 MW installed capacity, are set annually, not later than 31 March, by the State Energy and Water Regulatory Commission (SEWRC).

Table 1 shows the preferential prices for electricity produced from RES as set in SEWRC Decision •-015 of 31.03.2008.

Table 1 Preferential prices for electricity produced from RES (excluding electricity generated by hydropower plants of more than 10 MW installed capacity)

RES types	Preferential price BGN/MWh
Hydropower plants of up to 10 MW installed capacity	97.12
Wind Power Plants	
up to 2 250 full effective annual work hours and 800 kW or more installed	185.95

capacity	
more than 2 250 full effective annual work hours and 800 kW or more installed capacity	167.90
less than 800 MW installed capacity and asynchronous cage rotor generator	139.96
Photovoltaic plants	
up to 5 kWp installed capacity	782.00
more than 5 kWp installed capacity	718.00
Biomass plants of up to 5 MW installed capacity	
Forestry waste	215.00
Waste from agricultural crops	162.00
Energy crops	184.00

Source: SEWRC Decision •-015 of 31.03.2008. The prices shown do not include VAT and came into effect on 1 April 2008.

The purchase price of electricity produced from RES within the country changes over time and reflects the specificity of the sources and technologies used, the investment costs and the level of inflation and operational costs. These play an important role in attracting and increasing investor interest and creating a favourable business environment, which encourages the building of plants for the generation of electricity produced from RES. Over the period 2006-2007, new small hydropower plants (SHPP) of 22 MW installed capacity and wind power plants (WPP) of 18 MW installed capacity were built. Preferential prices for electricity generated by photovoltaic power plants (PVPP) have contributed to increased investment in these high-technology installations which, however, remain an expensive alternative in Bulgaria.

II.4.2 Funding schemes for RES plant construction projects

With a view to supporting the initial investments in technologies for the production of electricity from RES, specialist loan facilities have been set up under the public-private partnership scheme, partially financed by funding available from the Kozloduy International Fund (KIF), the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB). The EIB/KIF loan facility was set up in 2007 and is currently being developed. The EBRD/KIF energy efficiency and RES loan facility (EERESLF) was set up in mid-2004 and has been operating successfully for more than three years to date. The agreement in respect of the KIF grant of EUR 25.2 million disbursed in support of EERESLF, further generates an EBRD loan facility of 105 million EUR. As at 31.12.2007, a total of 102 projects had been approved, including 64 RES projects of EUR 73.386 million (incl. a loan of EUR 49.792 million and a grant of EUR 9.958 million). Upon completion and commissioning of all RES power plants built under the projects financed to date, a saving of electricity and heat of, respectively, 579 MWh and 62 524 GJ/per annum, as well as a reduction in CO_2 emissions of 329 802 tonnes per annum are expected to be made. The total amount of the grant is calculated as a percentage of the principal on the loan, or 15% of the total project amount with regard to energy efficiency and 20% with regard to renewable energy sources. The utilization of the potential of indigenous RES is one of the stated priorities of the National Strategic Reference Framework 2007-2013. Individual operations are included in several of the operational programmes – Competitiveness of the Bulgarian Economy, Regional Development and Rural Development Programme 2007-2013.

The Enterprise for Management of Environmental Protection Activities under the Ministry of the Environment and Water provides interest-free loans to companies for the construction of small HPPs. The loans may cover up to 70% of total project costs.

With a view to supporting RES projects, Bulgaria uses the "joint implementation" mechanism under Article 6 of the Kyoto Protocol and so far has concluded seven agreements (with Austria, the Netherlands, Sweden, Japan, Switzerland, Denmark and the Prototype Carbon Fund of EBRD) for the implementation of joint RES utilization projects.

Support for the implementation of projects aiming to promote RES utilization is also available under two programmes of which the Republic of Bulgaria is a beneficiary – the European Economic Area Financial Mechanism and the Norwegian Cooperation Programme for Economic Growth.

Bulgarian organisations, companies and scientific research institutes actively use existing opportunities to benefit from support available for scientific research and development and technological innovations, as well as for the development of policies, programmes and strategies, including those aimed at increasing public awareness and knowledge of RES within the framework of the energy programmes of the European Community in which Bulgaria participates, inter alia the Seventh Framework Programme (FP7) and Intelligent Energy - Europe.

III. GENERATION OF ELECTRICITY PRODUCED FROM RENEWABLE ENERGY SOURCES IN BULGARIA

The main renewable energy source used to generate electricity in the country is hydropower. Over recent years, building plants utilizing the potential of wind and solar energy to generate electricity has commenced. Table 2 presents data on installed capacities for the production of electricity from RES in the Republic of Bulgaria.

Table 2 Installed capacities for the production of electricity from RES in the Republic of Bulgaria

RES type	Unit of measurement	2005	2006	2007
HPP	MW	2 743.40	2 747.40	2 740.30
Small HPP	MW	164.30	175.70	197.70
WPP	MW	7.50	25.50	40.70
PhPP	MW	0.00	0.00	0.03
Total	MW	2 915.20	2 948.60	2 978.73

Source: Ministry of the Economy and Energy (MEE)

Wind power plants still have a very small share of only 1.4% of the total built capacity producing electricity from RES. Nevertheless, over the period 2005-2007 installed capacities of WPPs have increased more than fivefold. In the future, this trend is expected to continue in view of the applications for more than 2 200 MW of capacity to be connected to the Bulgarian electricity grid system.

The preferential price for electricity produced from photovoltaic energy set at the end of 2006 caused investor interest in building photovoltaic power plants to rise quickly, and the first photovoltaic power plant (PhPP) has already become a reality. Applications have been received from investors for 197 MW of PhPP installed capacity to be connected to the national electricity grid system.

Electricity produced from RES is almost fully based on utilizing the country's hydropower potential. It is highly dependent on total annual rainfall, therefore, varying between 1 733 GWh and 4 338 GWh in the period 1997-2007 (see Figure 2).

Key

[Left-hand side vertical line of chart, from top to bottom]

100%, 80%, 60%, 40%, 20%, 0%

[Top horizontal line of chart, from left to right]

6.5%, 7.5%, 7.2%, 6.6%, 4.0%, 5.2%, 7.1%, 7.6%, 9.9%, 6.6%

[X-axis, from left to right]

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007

- NPP
- TPP
- RES

Figure 2 Change in the structure of gross electricity production in the Republic of Bulgaria over the period 1997-2007

Source: Energy balance sheets of the National Statistical Institute (NSI) for the period 1997-2006. Data for 2007 as per the Fuel-Energy balance sheet of the Ministry of the Economy and Energy (MEE).

The lowest share of electricity produced by RES plants in the gross electricity production (4%) in Bulgaria was registered in 2001. Considerable rainfall caused this share to reach 9.9% of gross annual electricity production in 2005. The average annual quantity of electricity produced from RES over the period 1997-2007 was approximately 2 977 GWh.

In 2007, the electricity produced from RES (including by pumped storage hydropower plants) in Bulgaria amounted to 2 827.1 GWh, equal to a share of 6.6% of gross electricity production (Figure 3).

Key

- TPP (59.1% share)
- NPP (34.3% share)
- RES (6.6% share)

Figure 3 Structure of the gross production of electricity in the Republic of Bulgaria in 2007

In 2007, large hydropower plants had the highest share of electricity produced from RES, generating 80.5% of total electricity produced from RES in the country. Small hydropower plants of less than 10 MW installed capacity had a share of 17.8%. Although wind power plants supplied only 1.7% of the electricity produced from RES, in comparison to 2005 WPP electricity generation had increased more than tenfold (Table 3).

Table 3 Electrical power produced from RES in 2005, 2006 and 2007

RES type	Unit of measurement	2005	2006	2007
Hydropower plants (including pumped storage HPPs)	GWh	3 788.3	3 718.1	2 275.7
Small HPPs	GWh	548.2	520.1	504.5

WPPs	GWh	4.5	19.8	46.8
PVPPs	GWh	0.0	0.0	0.1
Total	GWh	4 341.0	4 258.0	2 827.1

Source: 2005 and 2006 energy balance sheets of the National Statistical Institute and 2007 Fuel-Energy balance sheet of the Ministry of the Economy and Energy (MEE).

IV. ACHIEVEMENT OF THE NATIONAL INDICATIVE TARGET FOR CONSUMPTION OF ELECTRICITY PRODUCED FROM RES

The indicative target set for Bulgaria is an 11% share of electricity produced from RES in gross national consumption, given favourable climatic conditions. In 2005 and 2006 annual rainfall was considerable and, respectively, 11.9% and 11.3% shares of RES electricity in gross national electricity consumption* were achieved. In 2007, due to a reduction in the electricity produced by hydropower plants, a 7.3% share of RES electricity in gross national consumption was achieved.

Table 4 Share of RES in gross national electricity consumption

	Unit of measurement	2005	2006	2007
Electricity produced from RES (including Pumped storage HPPs)	GWh	4 341.0	4 258.0	2 827.1
Gross domestic electricity consumption	GWh	36 394.0	37 759.0	38 663.1
Indicative target	%	11.9	11.3	7.3

Note: The respective shares of electricity produced from RES in the grosselectricity consumption achieved in 2005 and 2006 are due to the unusually high rainfall levels during the stated period.

In order to achieve the indicative target in 2010, the expected increase in electricity produced from RES must be taken into consideration, including the commissioning of the Tsankov Kamak Hydropower Plant in 2010. The installed capacity of the plant will be 80 MW, with an average annual production capacity of 158 GWh. The remaining share of electricity produced from RES will be generated by several wind power plants that are currently being built and will be connected to the Bulgarian electricity grid system.

In addition, several projects for the construction of small hydropower plants are currently under way. Within the framework of one of these projects – the construction of the Sreden Iskar Cascade - nine small hydropower plants with a total installed capacity of 25 MW and a total average annual production capacity of 142 GWh will be built. The project is expected to be completed by the beginning of 2011.

With regard to the implementation of projects for the construction of wind farms within the territory of Bulgaria, compliance must be ensured with the following international environmental agreements:

* Gross national electricity consumption – national electricity production, including autoproduction, plus imports, minus exports.

- The Bern Convention on the Conservation of the Natural Habitats of Migratory Birds – in the area of Balchik and Kaliakra the wind farm locations chosen by investors often lie on the Via Pontica bird migratory route.
- NATURA 2000 – the EU-wide network of protected areas – most of the proposed wind power plant locations chosen by investors are within sites designated under the Birds Directive and fall within the NATURA 2000 network.

The achievement of the indicative target of an 11% share of electricity produced from RES in gross national electricity consumption in 2010 is measured against the forecast developed by NEK AED (Table 5).

Table 5 Forecast share of electricity produced from RES in gross national electricity consumption in 2010

	Unit of measurement	2007	2008	2009	2010
Nuclear power plants (NPP)	GWh	14 643	12 450	12 450	12 350
Hydropower plants (HPP)	GWh	25 211	23 310	25 610	29 740
RES Plants	GWh	2 827	3 630	4 060	4 800
Gross electricity production	GWh	42 681	39 390	42 300	46 890
Gross electricity consumption	GWh	38 663	38 900	40 070	41 390
RES share in the gross electricity consumption	%	7.3	9.3	10.1	11.6

On the basis of the above forecast, electricity produced from RES is expected to reach 4 800 GWh in 2010, relying upon the electricity production output of RES plants to be built as per stated investor intentions.

As a result of the completion of investment projects, the share of electricity produced from RES in 2010 is expected to reach 11.6% of Bulgaria's gross national consumption.

On the basis of the data presented above, the completion of intended projects and favourable climatic conditions permitting, the indicative target for 2010 of an 11% share of electricity produced from RES in gross national consumption is expected to be achieved.

V. CONCLUSION

There is a direct link between the increase in electricity production from RES and environmental protection, as RES cause no pollution or damage to the environment but, on the contrary, even allow for the use and reprocessing of waste for power production. One of the important impacts of RES penetration is the reduction in the amount of greenhouse gases entering the atmosphere, which contributes to Bulgaria meeting its obligations under the Kyoto Protocol.

By achieving the indicative target set, Bulgaria will be able to fulfil its obligations with respect to climate change and contribute towards reaching common EU targets.

The utilization of renewable and alternative energy sources is a means to achieve sustainable development in the energy sector and minimise the harmful impacts of energy-sector activities on the environment.