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REPUBLIC OF BULGARIA

MINISTRY OF ECONOMY AND ENERGY

Report on the Achievement of the National Indicative Targets for Consumption of Electricity Produced from Renewable Energy Sources in 2008

March 2009, Sofia

LIST OF ABBREVIATIONS

RES	Renewable energy sources
HPP	Hydro power plant
WPP	Wind power plant
SG	State Gazette
SEWRC	State Energy and Water Regulatory Commission
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
Commission	European Commission
EC	European Community
EU	European Union
SHPP	Small hydro power plant
MEE	Ministry of Economy and Energy
MOEW	Ministry of the Environment and Waters
CM	Council of Ministers
KIF	Kozloduy International Fund
NSI	National Statistical Institute
PSHPP	Pumped storage hydro power plant
TPP	Thermal power plant
PPP	Photovoltaic power plant

UNITS OF MEASUREMENT

GWh	Gigawatt-hour
kWh	Kilowatt-hour
MW	Megawatt
toe	Ton of oil equivalent

This report on the achievement of the national indicative targets for consumption of electricity produced from renewable energy sources has been drawn up in compliance with Article 5(1)(2) of the Renewable and Alternative Energy Sources and Biofuels Act (promulgated, SG No 49 of 19 June 2007; amended, SG No 98 of 14 November 2008; effective as from 14 November 2008).

Under 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 in the internal electricity market, Member States shall publish, for the first time not later than 27 October 2003 and thereafter every two years, a report which includes an analysis of success 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 commitments.

In pursuance of the obligations of the Republic of Bulgaria under Directive 2001/77/EC, the report on the achievement of the national indicative targets for consumption of electricity produced from renewable energy sources adopted by the Council of Ministers will be submitted to the European Commission.

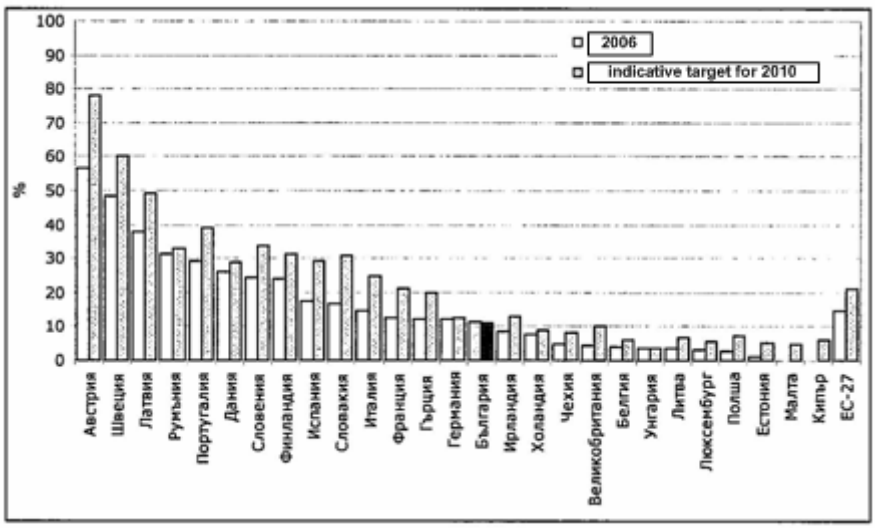
I. EU POLICY ON THE DEVELOPMENT OF RENEWABLE ENERGY SOURCES

I.1. Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market

Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market imposes on Member States the obligation to increase the use of renewable energy within the Community and sets the indicative target of a 21% share of electricity produced from RES in the gross electricity consumption for 2010.

The Directive lays down national indicative targets for each Member State which have to be achieved by 2010. The implementation of appropriate incentives and measures to encourage the consumption of electricity produced from RES is the way to achieve the indicative targets.

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



Austria	Sweden	Latvia	Romania	Portugal	Denmark	Slovenia	Finland	Spain	Slovakia	Italy	France	Greece	Germany	Bulgaria	Ireland	The Netherlands	The Czech Republic	United Kingdom	Belgium	Hungary	Lithuania	Luxembourg	Poland	Estonia	Malta	Cyprus	EU-27

Figure 1: *Share of electricity produced from RES in the gross domestic electricity consumption in 2006 and indicative targets of the Member States for 2010 and in total for the EU-27*

Source: *EU energy and transport in figures, a publication of the European Commission, 2007-2008*

The Directive requires Member States to ensure that guarantees of origin are issued for electricity produced from RES. Such guarantees of origin should be mutually recognised by Member States.

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

I.2. Proposal for a Directive on the promotion of the use of energy from renewable sources

In the beginning of 2008, the European Commission presented its energy and climate change package, which included a proposal for a Directive on the promotion of the use of energy from renewable sources, adopted at first reading by the European Parliament on 17 December 2008. The proposal for a Directive establishes an overall framework for the promotion of the use of energy from renewable sources and introduces obligatory national targets:

- for the total share of energy from renewable sources in the gross final consumption of energy;
- for the share of energy from renewable sources in transport.

Each Member State is expected to develop and adopt a national action plan for energy produced from renewable sources, including targets for the production of electricity, heating, cooling and biofuels by 2020. The targets will be achieved by implementing adequate policies and measures to promote electricity generation from renewable sources and taking account of the impact of improving energy efficiency and implementing energy efficient technologies. A key feature is the use of biomass and the search for new sources, which may be used, will continue.

For the purpose of meeting the national targets, each Member State may take advantage of the statistical pass-through mechanism, the implementation of joint projects and support schemes between Member States and with third countries.

Member States shall ensure that administrative procedures are streamlined and expedited, that there is good coordination and precise deadlines for all stages of the investment process, as well as that they take into account the particularities of individual renewable energy technologies. This is particularly important for the implementation of small decentralised projects in which simplified procedures will have a vital role to play in their implementation.

As regards biofuels and bioliquids, sustainability criteria have been introduced, aiming to avoid and prevent adverse effects on the environment in the course of their extraction, processing and consumption.

I.3. National obligatory target for Bulgaria by 2020

Annex No 1 of the proposal for a Directive sets out the obligatory national overall targets for each Member State. The target set for Bulgaria is a 16% share of energy from renewable sources in the final consumption of energy by 2020, which also includes the obligatory target of a 10 % share of energy from renewable sources in the final consumption of energy in transport.

II. NATIONAL POLICY ON THE DEVELOPMENT OF RENEWABLE ENERGY SOURCES

II.1. Obligations of the Republic of Bulgaria with regard to RES

With the national indicative targets set in Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market, Member States assume the obligation to increase the share of energy produced from RES by 2010. The target set for Bulgaria is an 11% share of electricity produced from RES in the gross domestic consumption of electricity provided that the climatic factors are favourable and allow the achievement of this target and taking account of the existence of limitations on the use of water resources applicable in the country and arising under the EU environmental laws.

II.2. Renewable and Alternative Energy Sources and Biofuels Act

The 40th National Assembly adopted in 2007 the Renewable and Alternative Energy Sources and Biofuels Act (promulgated, SG No 49 of 19 June 2007; amended, SG No 98 of 14 November 2008; in force as from 14 November 2008). With its enactment, incentives and obligations for players in the market of electricity from RES were introduced, namely:

- priority connection of producers of electricity from RES to the transmission and/or distribution network;
- obligatory purchase of the electricity produced from RES with the exception of hydro power plants (HPPs) with an installed capacity of more than 10 MW;
- preferential prices for the purchase of produced electricity with the exception of HPPs with an installed capacity of more than 10 MW;
- time limit for connection not exceeding the time limit notified by the producer for putting the energy facility into operation;
- allocation of funds for the development of networks related to the promotion of electricity produced from renewable energy sources in the investment programmes of the transmission and distribution companies.

The preferential prices are set by the State Energy and Water Regulatory Commission ('SEWRC') not later than 31 March every year.

At the end of 2008, the Act was amended with respect to the period of validity of long-term agreements, as follows:

- the period of validity of the agreements with producers of electricity from geothermal and solar energy was increased from 12 to 25 years;
- the period of validity of the agreements with producers of electricity from other types of RES was increased from 12 to 15 years.

The time limits for obligatory purchase in respect of existing producers of electricity from RES, with the exception of HPPs with an installed capacity of more than 10 MW, start to run after renegotiation but not later than 31 March 2009. The time limits for obligatory purchase in respect of new producers of electricity from RES, with the exception of HPPs with an installed capacity of more than 10 MW, enter into force from the starting date of electricity generation but not later than 31 December 2015.

II.3. Ordinance on issuing guarantees of origin of electricity produced from renewable energy sources

The Ordinance on issuing guarantees of origin of electricity produced from renewable energy sources (adopted by Decree No 18 of the Council of Ministers of 28 January 2009; promulgated, SG No 10 of 6 February 2009) establishes the terms and procedure for issuing guarantees of origin of electricity produced from RES.

Guarantees of origin shall be issued by the SEWRC and shall be official non-transferable documents certifying the amount of electricity produced from RES for a period of 6 months in respect of producers with a capacity of more than 1 MW and for a period of 12 months in respect of producers with a capacity of up to 1 MW.

It is envisaged that a register of the guarantees of origin issued by the SEWRC will be established and kept. Guarantees of origin issued in another Member State shall be recognised and serve as proof of the accuracy of the facts and circumstances contained therein.

II.4. National long-term programme for the promotion of the use of RES (2005-2015)

In pursuance of its obligations under Directive 2001/77/EC and Directive 2006/108/EC, a national long-term programme for the promotion of the use of RES (2005-2015) was adopted by a Decision of the Council of Ministers of 19 October 2006, which sets the indicative target of an 11% share of electricity produced from RES in the gross domestic consumption in 2010.

The programme is in conformity with the overall objective of the development of renewable energy in the country, the established indicative targets for electricity generation from RES and the way to achieve them. The programme lays down measures and policies to

promote the use of RES in the energy balance of the country, having assessed:

- the current use of RES in the country;
- the necessity of accelerating the use of RES in the next ten-year period;
- the mutual impact of improving energy efficiency and increasing the use of RES in the country with a view to achieving sustainable energy development.

II.5. Incentive measures

II.5.1. Preferential prices

In accordance with the requirements of Article 9(5) of the Renewable and Alternative Energy Sources and Biofuels Act, electricity generation from RES is encouraged by setting a preferential price for the purchase of energy produced from RES and alternative energy sources.

By 31 March every year, the SEWRC sets preferential prices for the sale of electricity produced from renewable or alternative energy sources, with the exception of energy produced by HPPs with an installed capacity of more than 10 MW.

The preferential prices of electricity produced from RES, set by SEWRC Decision No • -015/31.03.2008, are given in Table 1.

Table 1: *Preferential prices of electricity produced from RES (with the exception of HPPs with an installed capacity of more than 10 MW)*

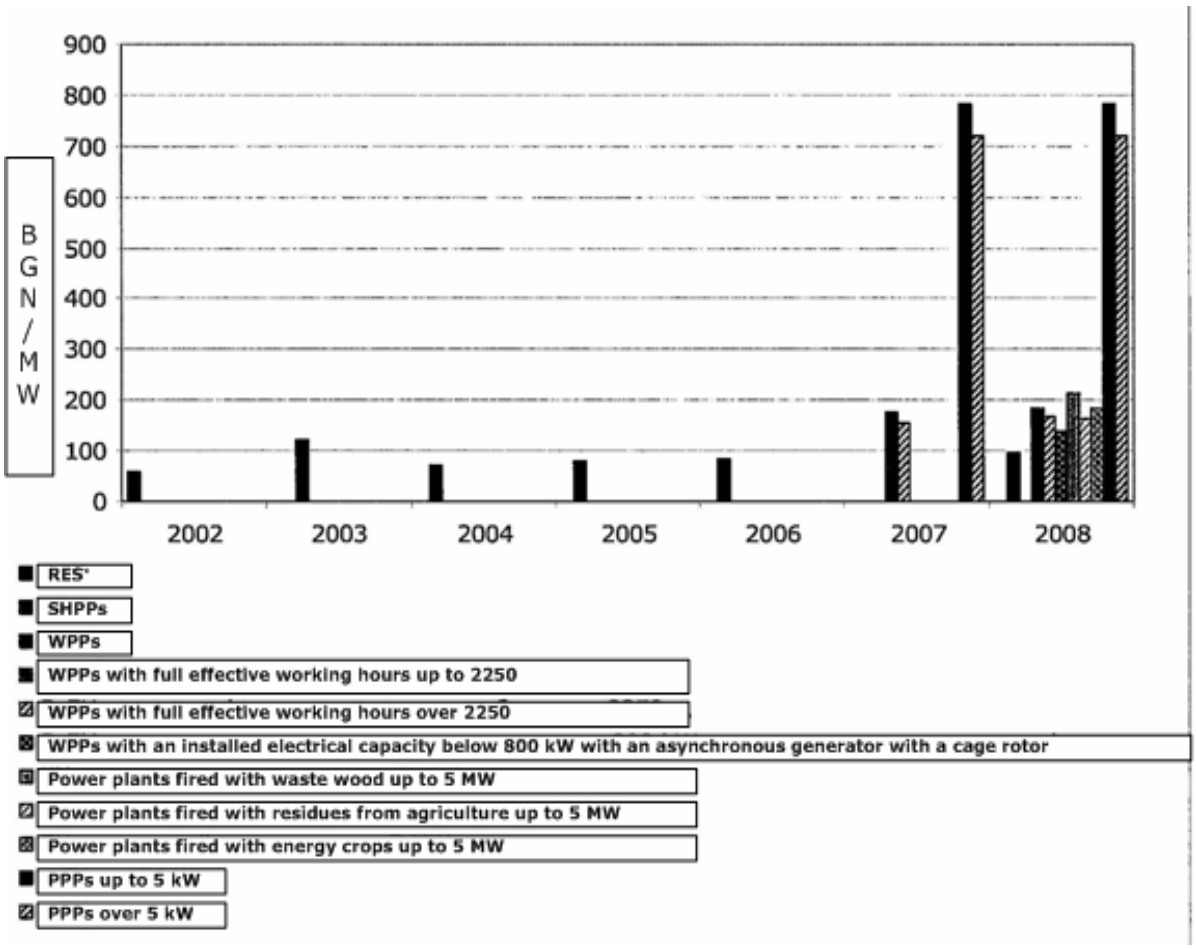
Types of RES	Preferential price, BGN/MWh
HPPs with an installed capacity of up to 10 MW	97.12
Wind power plants:	
with full effective annual working hours of up to 2 250 and with an installed capacity of 800 kW and more	185.95
with full effective working hours of more than 2 250 and with an installed capacity of 800 kW and more	167.90
with an installed capacity below 800 kW with an asynchronous generator with a cage rotor	139.96
Photovoltaic installations:	
with an installed capacity of up to 5 kWp	782.00
with an installed capacity of more than 5 kWp	718.00
Biomass boilers and stoves with an installed capacity of up to 5 MW:	
waste wood	215.00
residues from agriculture	162.00
energy crops	184.00

Source: SEWRC Decision No • -015/31.03.2008. The above preferential prices do not include VAT and are effective as from 1 April 2008.

The purchase prices of electricity produced from RES in the country are subject to development and take account of the particularities of the various sources used and the individual technologies employed, the amount of investment costs, the rate of inflation and the amount of operating expenses.

Prices of electricity produced from RES started to be set in 2002 with the fixing of the price of 60 BGN/MWh for producers of electricity from RES (Figure 2). In 2003, the price of 120 BGN/MWh was fixed for electricity produced by wind power plants. In 2004, 2005 and 2006, the selling price fixed for small HPPs was increased from 70.24 to 85.19 BGN/MWh.

By SEWRC decisions in 2006, preferential prices were set for electricity produced from wind and solar energy sources, effective as from 1 January 2007.



** Translator's note: I think that the author means HPPs instead of RES.*

Figure 2: *Developments in prices of electricity produced from RES from 2002 to 2008.*

Source: SEWRC decisions from 2002 to 2008, www.dker.bg

Preferential prices for power plants fired with waste wood, residues from agriculture and energy crops were introduced on 1 July 2007.

The preferential prices are a key factor for generating and boosting investments and creating a favourable business environment to encourage the construction of power plants for electricity generation from RES. In the period 2007-2008, new small HPPs and WPPs with a total installed capacity of 6 MW and 72 MW, respectively, were constructed. By setting preferential prices of electricity produced by photovoltaic power plants, investments in this type of high-tech and, at the same time, expensive for the Bulgarian conditions installations have also been boosted.

I. Support schemes for projects for construction of power plants utilising RES

In 2004, the energy efficiency and renewable energy credit facility was launched with the support of the EBRD and KIF, which functions successfully and provide grants to the amount of 20% of the principal amount of the loan for renewable energy projects. As at October 2008, 71 renewable energy projects have received grant assistance totalling EUR 91.0 million, extended loans of EUR 56.7 million and grants amounting to EUR 11.3 million. Upon completion and putting into operation of all renewable energy projects that have received grant assistance so far, the expected annual average reduction in carbon dioxide emissions will be 362.7 thousands of tonnes. A new credit facility is being developed, opened in 2007 with the support of the EIB and KIF.

The utilisation of the potential of local renewable energy sources has also been laid down as a priority in the National Strategic Reference Framework 2007-2013. Individual operations have been included in the Operational Programmes “Development of the Competitiveness of the Bulgarian Economy” and “Regional Development”, as well as in the “Rural Development Programme (2007-2013)”.

The Enterprise for Management of Environmental Protection Activities under the Ministry of the Environment and Waters provides funds to companies in the form of interest-free loans for the construction of small HPPs. The loans amount to 70% of the total project value.

In order to support the implementation of renewable energy projects, Bulgaria makes use of the Joint Implementation mechanism under Article 6 of the Kyoto Protocol, two renewable energy projects with the Republic of Austria and the Kingdom of the Netherlands having already been approved.

The Vacha Cascade project is the first JI project in the country. Part of this project is Tsankov Kamak Plant. The forecast reduction in the emissions released from TPPs upon completion of the Vacha Cascade, following the commissioning of Tsankov Kamak Plant and the rehabilitation of the other plants of the cascade, is 230 thousands of tonnes of carbon dioxide per year.

Organisations, companies and research institutes in Bulgaria actively make use of the opportunities in support of research and development activities and technological innovations, as well as development of policies, programmes and strategies, including raising public awareness in the field of renewable energy within the framework of the EU energy programmes in which Bulgaria takes part, namely: the Seventh Framework Programme and Intelligent Energy - Europe.

III. ELECTRICITY GENERATION FROM RES IN BULGARIA

A large amount of the electricity output from RES is produced by four hydro power cascades with a total installed capacity of 2 480 MW. In recent years, the utilisation of the hydro power potential of the country is focused on the construction of small HPPs and, last year, small HPPs with a total installed capacity of 6 MW were put into operation.

The wind potential of the country continued to be utilised in 2008 as well and, in most cases, single generators are put into service with an installed capacity from 150 kW to 2 500 kW. The first wind farm with an installed capacity of 35 MW has been put into operation, with which the share of WPPs has reached a 3.7% share of the total installed capacity of RES in the country.

***Table 2**: Installed capacities for electricity generation from RES in Bulgaria*

	Measurement	**2005**	**2006**	**2007**	**2008**
HPPs	**MW**	1 344.4	1 348.4	1 341.30	1 330.4
SHPPs	**MW**	164.3	175.7	197.70	205.0
WPPs	**MW**	7.5	25.5	40.70	112.6
PPPs	**MW**	0.0	0.0	0.03	0.1
Total, RES	**MW**	**1 516.2**	**1 549.6**	**1 579.7**	**1 648.2**
PSHPPs, generating capacity	**MW**	**1 399.0**	**1 399.0**	**1 399.0**	**1 399.0**

Source: MEE

Investors take a significant interest in the construction of wind farms and, to date, written applications for the connection of new WPPs of 4 200 MW to the transmission system and new WPPs of 1 000 MW to the distribution systems have been submitted.

In February 2009, the SEWRC issued licences for electricity generation prior to the construction of the energy facilities to three companies which intend to invest in the construction of wind farms with an installed capacity of 317 MW and expected annual output of 663 GWh, to be put into operation by 2010, according to data based on SEWRC decisions.

In 2008, a few small photovoltaic power plants with an installed capacity of 87 kW were connected to the grid.

Electricity generation from RES is based almost entirely on the utilisation of the hydro

potential of the country. For this reason, it is heavily reliant on the amount of rainfall throughout the year and varied from 1 733 GWh to 4 338 GWh within the period 1997-2008 (Figure 3).

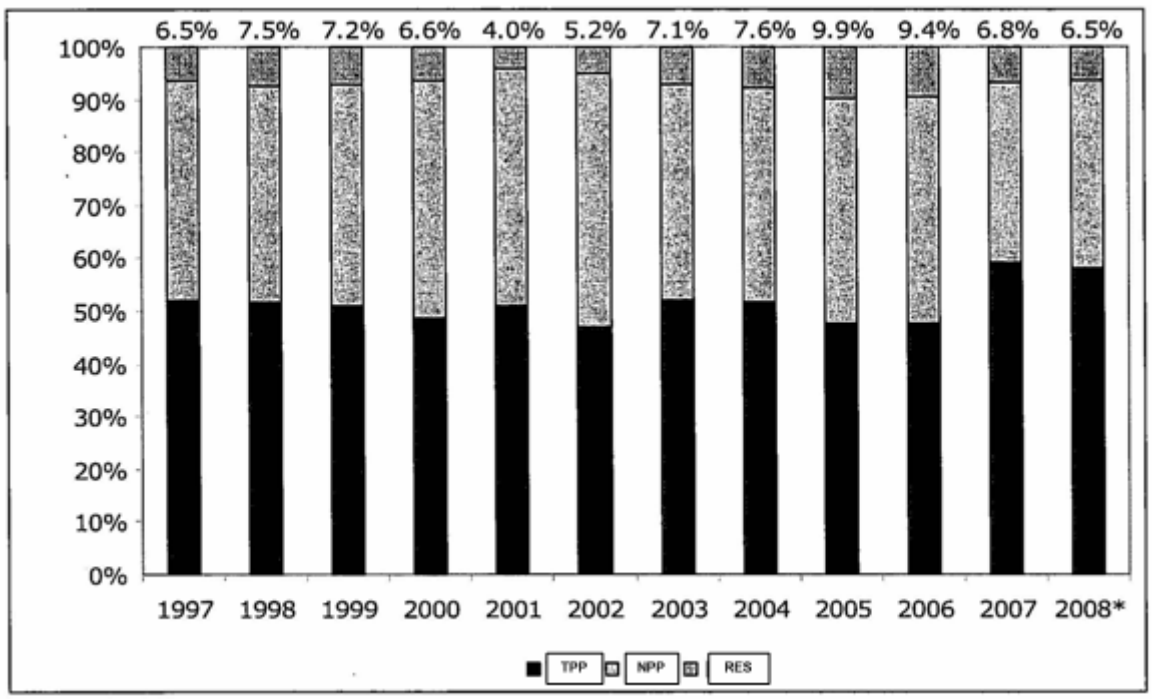


Figure •: *Changes in the structure of gross electricity generation within the period 1997-2008 in the Republic of Bulgaria*

Source: Energy balances of the NSI for the period 1997-2006. Data for 2008 are based on the fuel-energy balance of the MEE.

In 2008, the electricity output from RES (pumping excluded) was 2 891.9 GWh and had a 6.5% share in the gross electricity generation in the country (Figure 4).

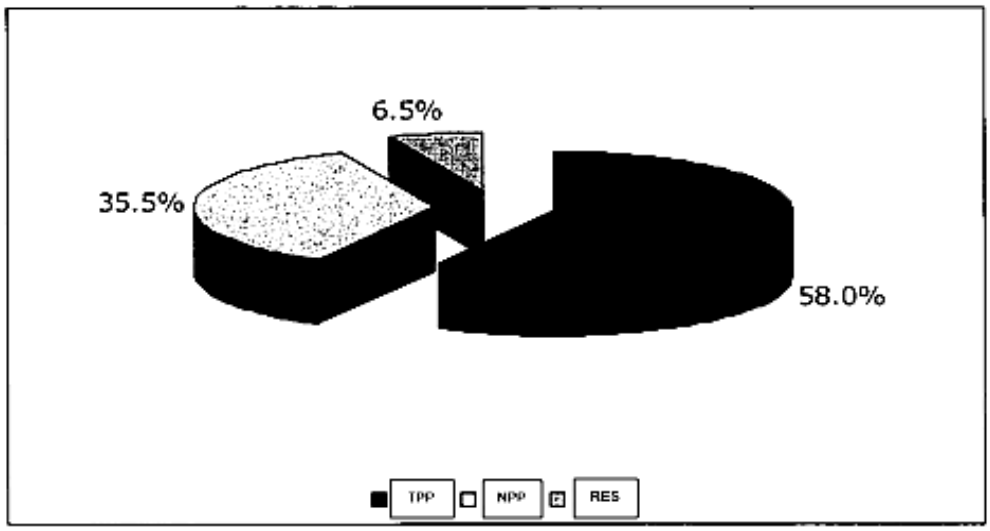


Figure 4: *Structure of the gross electricity generation* (pumping excluded) *for 2008 in the Republic of Bulgaria*

Source: 2008 fuel-energy balance of the MEE

In 2008, around 96% of the electricity output from RES was produced by hydro power plants. In recent years, as a result of the commissioning of new wind power capacities, the output from WPPs is following a constant upward trend and, in 2008, it increased more than 2 times as compared to 2007 (Table 3).

Table 3: *Electricity output from RES, 2005-2008*

	Measurement	**2005**	**2006**	**2007**	**2008**
HPPs	GWh	3 788.3	3 718.1	2 367.8	2 242.2
SHPPs	GWh	548.2	520.1	504.5	527.3
WPPs	GWh	4.5	19.8	46.8	122.2
PPPs	GWh	0.0	0.0	0.1	0.2
Total, RES	**GWh**	**4 341.0**	**4 258.0**	**2 919.1**	**2 891.9**

Source: 2005, 2006 and 2007 energy balances of the NSI and 2008 fuel-energy balance of the MEE

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

Bulgaria has an indicative target of an 11% share of electricity produced from RES in the gross domestic consumption of electricity in the country under favourable climatic conditions. A characteristic feature of electricity generation from RES, which is based almost

entirely on hydro power plants, is its heavy reliance on the hydrological conditions in a given year. This is the reason why the indicative target of an 11% share of electricity produced from RES was achieved in 2005 and 2006 (Table 4). In 2007 and 2008, by reason of the decline in the electricity output from HPPs with an installed capacity of more than 10 MW, a 7.4% and 7.3% share of electricity produced from RES in the gross domestic consumption of electricity in the country was achieved, respectively.

Table 4: *Share of RES in the gross domestic consumption of electricity*

	Measurement	**2005**	**2006**	**2007**	**2008***
Electricity output from RES (pumping excluded)	GWh	4 341.0	4 258.0	2 827.1	2 891.9
Gross domestic consumption of electricity	GWh	36 394.0	37 759.0	38 461.1	39 643.5
Indicative target	**%**	**11.9%**	**11.3%**	**7.4%**	**7.3%**

Source: 2005, 2006 and 2007 energy balances of the NSI and 2008 fuel-energy balance of the MEE

For the purpose of achieving the indicative target in 2010, an increase in the electricity output from RES is expected, taking account of the commissioning in 2010 of Tsankov Kamak Plant with an installed capacity of 80 MW and average annual output of 158 GWh. The rest of the electricity output from RES will be ensured by the wind farms under construction which will be connected to the grid.

Projects for the construction of small HPPs are also in a process of implementation. One of these projects is Sreden Iskar Cascade, which includes the construction of nine small HPPs with a total installed capacity of 25 MW and average annual output of 142 GWh. The project is expected to be completed by the beginning of 2011.

In the implementation of projects for the construction of wind farms on the territory of Bulgaria, the following international environmental agreements should be complied with:

- the Berne Convention on the conservation of European wildlife and natural habitats: investors' intentions to construct wind farms often fall in the Via Pontica flyway in the regions of Kaliakra and Balchik.
- Natura 2000: a pan-European network of protected areas; most of the regions where investors intend to construct wind power plants fall within the areas under the 'birds' Directive, included in Natura 2000.

The indicative target of an 11% share of electricity produced from RES in the gross domestic consumption of the country in 2010 has been set on the basis of the forecast made by NEK EAD (Table 5).

Table 5: *Forecast of the share of RES in the gross domestic consumption of electricity*

	Measurement	**2008***	**2009**	**2010**
NPP	GWh	15 765	12 450	12 350
TPP	GWh	25 773	25 610	29 740
RES[1] (pumping excluded)	GWh	2 892	4 060	4 800
Gross electricity generation	**GWh**	**44 430**	**42 300**	**46 890**
Gross electricity consumption	**GWh**	**39 644**	**40 070**	**41 390**
Share of RES in the gross electricity consumption	**%**	**7.3**	**10.1**	**11.6**

Note: *2008 fuel-energy balance of the MEE

According to the forecast made, electricity generation from RES is expected to reach 4 800 GWh in 2010, taking account of the investments to be made in the construction of plants utilising RES.

If the intentions of investors are realised, the share of electricity produced from RES is expected to reach 11.6% of the gross domestic consumption of the country in 2010.

On the basis of the data presented above and upon implementation of the envisaged projects, the indicative target of an 11% share of electricity produced from RES in the gross domestic consumption of the country set for 2010 is expected to be achieved provided that favourable climatic conditions exist.

It can be seen from the presented report that, in order to meet the indicative target of an 11% share of electricity produced from RES in the gross domestic consumption, Bulgaria almost entirely relies on HPPs with an installed capacity of more than 10 MW. By reason of its heavy reliance on climatic conditions, electricity generation by HPPs cannot fully ensure that the target will be achieved. For this reason, the contribution of other renewable energy sources such as biomass, wind, solar and geothermal energy will be needed to meet the 11% target in 2010 and to achieve the obligatory target of a 16% share of energy from RES by 2020.

[1] *Translator's note: Perhaps, the author means HPP.*