

## **Purpose and Scope of the Second National Action Plan on Climate Change**

The Bulgarian Government has clearly demonstrated strong commitment and willingness to join the international efforts in mitigating climate change by ratifying the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol to the Convention (KP). The Second National Plan on Climate Change (Second NAPCC) is a governmental plan to streamline and guide the efforts of the Bulgarian government in mitigating climate change. The Second NAPCC includes mainly measures that do not require significant financial support from the state because the present economic situation in Bulgaria does not allow for the allocation of extensive government funding for implementing climate change related policies and measures.

In the short run the implementation of climate change policies and measures is hardly needed. According to the target of Kyoto Protocol, the country has significant reserve of emission reduction. The advantages of adopting the NAPCC however are numerous. It contributes to:

1. Meeting the requirements from UNFCCC and the Kyoto Protocol in regard to greenhouse gas emissions monitoring, evaluation and reporting;
2. Preparing for a situation of increased economic growth above the expected trend, making sure that the GHG emissions growth trend can be decreased compared to the economic growth rate;
3. Enabling Bulgaria to benefit from taking part in the so-called 'Kyoto flexible mechanisms' – a set of market-driven tools enabling countries to fulfil their obligations with minimization of costs. Attracting financing from those sources will stimulate investments in the country and increase the competitiveness of the Bulgarian economy;
4. Meeting the requirements of the EU Acquis Communautaire;
5. Anticipating the requirements of a future international climate regime, which is likely to include emission reduction obligations beyond the first commitment period 2008-2012.

The Bulgarian government will implement several actions to benefit from participation in the international climate change mitigation process. In addition, these actions will help further and more extensive implementation of climate change related policies and measures, especially when it comes to securing financing for implementation.

For the implementation of Joint Implementation (JI) in Bulgaria the operational guidelines for JI are developed, as well as the governmental capacity to control and monitor JI projects. Also, the legal framework for JI and Emissions Trading has been elaborated and the dissemination of information and training for project proponents and funding bodies have been improved.

The implementation of the EU Emissions Trading Scheme also requires considerable attention in the coming years. Tasks that will be completed include the evaluation of experiences in the new Member States of the EU and clarification of the functions and management of the emissions trading system and the necessary amendments of financial, tax, environmental and other legislation.

In order to improve the financing of the policies and measures, establishment of the Green Investment Scheme (GIS) is planned that will require further elaboration of the basic conditions and of the design of the GIS. At present Bulgaria cannot dedicate extensive funding from the state budget for implementation of climate change policies and measures. Subsidies are not envisaged at all. When it comes to financing investments, the sources will come mostly from funds outside the government. Such funds can be either domestic or international.

Donor funds from multilateral financing institutions such as EBRD and the World Bank can be instrumental in financing credit lines for investments in energy efficiency or renewable energy. In addition, funding for general improvements in infrastructure can be obtained from EU structural funds such as ISPA. Also the EU ETS can provide a financial stimulus for larger industrial emitters to reduce their emissions. Other financial sources will be directly linked to the Kyoto mechanisms as for example establishing on a national scale a Green Investment Scheme filled by earnings from selling excess emissions through International Emissions Scheme.

GHG emissions in Bulgaria are well below the target for the first commitment period. The country now faces the challenge to control and limit the expected future increase in emissions resulting from economic growth. Reducing or maintaining CO<sub>2</sub> emissions may be done as "no regret" at minimal costs now because in the years to come the marginal costs of future reduction measures will increase. The best approach for Bulgaria to maintain GHG emissions levels low is by avoiding carbon-intensive economic growth to the extent possible. Furthermore, climate change issues need to be considered when formulating and implementing the national economic development policies.

The NAPCC shows the importance of the Kyoto instruments for the realization of Bulgaria's objectives in climate change. The NAPCC provides the key elements and defines the actions to be taken to further increase the use of these instruments in Bulgaria. It sets the basic preconditions to bring additional investments and economic benefits to the country, decreasing the carbon intensity of the Bulgarian economy, while increasing its competitiveness.

## **Sectoral policies and measures for reducing GHG emissions in Bulgaria**

### **1.1.1. Energy sector**

The Bulgarian Energy Strategy was adopted by the Council of Ministers on May, 11th, 2002 and the National Assembly adopted it with Decision №39/2002. The strategy outlines the national energy policy and the main reforms envisaged for this sector. The Bulgarian energy sector will continue to be based on two major pillars in the future: nuclear energy and local extraction of lignite coal as a leading priority for the development of a competitive energy market. All other priorities are directly related to:

- Security of supply;
- Competition at the energy market;
- Environmental protection.

These priorities fully match the priorities of the EU energy policy.

- **Improvement of the operation of nuclear power plant Kozloduy (NPP-K)**

Kozloduy units 1-4 gradually are put out of operation (units 1 and 2 in 2002, and units 3 and 4 in 2006). To preserve the share of nuclear energy in the overall production of electricity in the country measures have been implemented to modernize units 5 and 6 and further improve their operation.

- **E2 Accelerated development of hydro energy**

The existing hydropower plants (HPPs) have been rehabilitated as a considerable part of them had outdated equipment. New automation and control systems were introduced. 70 % of the hydro potential is already utilized.

- **Upgrading of cogeneration plants and district heating boilers**

The overall efficiency could be increased to 80-90 %, which is much higher than that of existing cogeneration units or heat boilers. The introduction of new natural-gas combined cycle for replacing capacities at some of the existing thermal power plants and district heating plants forms part of the Implementation Programme for the Directive on Large Combustion Plants for the period after 2007.

- **Electricity transmission and distribution losses**

A reduction of the electricity losses will lead to fewer GHG emissions as a result of lower electricity production in coal-fired plants.

- **Heat transmission and distribution losses**

Losses of heat can be reduced through rehabilitation, modernization and improving the exploitation of the transmission and distribution networks. A reduction of the heat losses will lead to fewer GHG emissions as a result of lower heat production in heat boilers.

- **Biomass for electricity and heat production**

The assessment of the theoretical potential resulted in the following figures: firewood – 7.7 PJ per year; waste paper - 0.3 PJ per year; agricultural solid waste - 77.1 PJ per year; waste from live-stock breeding -11.3 PJ per year; municipal solid waste - 12.5 PJ per year and industrial waste wood - 0.4 PJ per year.

The Second National Plan on Climate change envisages an annual potential for CO<sub>2</sub> emission reduction of 3.3 mil. tons per year from the overall modernization of the heating companies in the country, 2 mil. tons – from heating loss reduction, 6.8 mil. tons from natural gas supply to household.

### **1.1.2. Industry**

The industry policy aiming at transition to market economy, abolishment of subsidies and liberalization of the energy market has led to sharp reduction of the share of industry in GDP – from 61 % in 1987 to 29 % in 2002. The policy towards fast privatization resulted in almost complete privatization of the industrial plants. As a consequence, the most inefficient industries were closed.

The growth of industrial production is quite unsteady. At some enterprises the years of production growth are followed by years of reduction. Under these conditions the baseline development scenario for industry includes maintenance of liberalization and market principles without subsidies and preferences. Energy efficiency measures with pay-back period less than 2 years are also included in the baseline scenario. The implementation of these measures is possible at own expenses and limited loans from bank institutions under the conditions of unstable production programme. These measures will result in an average annual growth of energy consumption in industry of 1.7 % at 3.9 % GDP growth. This corresponds to a comparatively good rate of efficiency increase at the absence of designated state subsidies in this field.

- **Reduction of thermal losses in industry**

The use of heat in the form of steam and hot water is an important part of the industrial energy consumption. Reduction of heat losses can be achieved through thermal insulation, redesign and replacement or updating of heat exchangers leading to reduction of fuel consumption for its production.

- **Natural gas supply to the industry by development of gas infrastructure**

Industry is a large consumer of energy. Substituting liquid fuels with natural gas will lead to the reduction of the GHG emissions and higher efficiency.

- **Introduction of monitoring systems for energy consumption**

One way to achieve improvement of the efficiency of production processes is the establishment of systems for monitoring and control of energy consumption at different technological stages. This enables companies to have better insight in their energy

consumption in various parts of the process, showing where measures could be taken for increase of efficiency.

- **Upgrading of steam and heat generation and compressed-air plants**

In the light industry, food processing industry, machine building and metalworking, electrical and electronic industry can all reduce about 20 % of their energy consumption. This can be done through modernization of steam and compressed-air installations, regulation of the heat energy systems, energy management and control and introduction of small-scale co-generation at the relevant enterprises.

- **Reduction of fuel consumption in production of building materials**

Cement industry is a key GHG emissions source. Production of structural ceramics and quicklime consumes large amounts of fuels (both liquid and solid) as well. The energy use in this sector can be reduced by replacing part of the fuel by combustible waste such as car tires.

### **1.1.3. Policies and Measures for Residential and Commercial/Institutional Buildings**

Considerable progress in energy saving was achieved by national programmes on the improvement of thermal insulation of the existing buildings, on the replacement of incandescent lamps with compact luminescent lamps, and on the introduction of automated control of street lighting.

The analysis of options for RES utilization in households and services revealed a practicable potential for GHG emissions reduction through implementation of measures in the following directions (reported by the Energy Efficiency Agency and municipalities):

- Solar collectors at public buildings;
- Introduction of hybrid installations for hot water at nurseries, schools and hospitals.

- **Gas supply to households**

The Gas Supply Program for Residential and Servicing sector plans for 720000 additional households to be connected towards 2020, which should lead to a reduction of 6.9 Mton CO<sub>2</sub> eqv. Assuming annual new connections varying between 20,000 households in 2004 till 60,000 in 2010, about 290,000 additional households will be supplied towards 2010, leading to an emission reduction of 2.3 Mton.

- **Solar collectors**

The geographical situation of the country provides for a substantial solar energy potential. The solar collectors transform solar energy in useful thermal energy. Due to the relatively low single capacities these panels are suitable for installation at institutional buildings and private homes.

- **Hybrid and other hot water installations**

RES potential studies have shown a potential for hot water installations using renewable energy such as hybrid systems combining solar collectors and biomass boilers, as well as hot water installations using only biomass.

### **1.1.4. Transport**

The governmental investment policy in transportation is based on development of the country's transport infrastructure as an integrated part of the overall European transport network. The transport infrastructure will be reconstructed and updated in accordance with the international requirements and standards. The most important objectives of the National Government are the liberalization of the transport market, finalization of the legislative and institutional restructuring of the transportation sector and the provision of beneficial conditions for development of private transport companies and renewing of the mobile park.

- **Transports dispatching system**

A considerable part of the return trips of freight vehicles is done without cargo. Both from an economic and environmental point of view, this is not very efficient. The implementation of

central information dispatching system for the loads will lead to a decrease of empty or semi-loaded return trips of Lorries and trains.

- **Railway transport power dispatching system**

Supply of electricity to the electrified sections of the railway network and reduction of electricity losses require introduction of an automated system for collecting information and dispatching control. It will lead to an increase of the security of the electricity supply and, as a consequence, to a decrease of the emissions.

- **Modernization of Railways**

The consumption of residual oil and electricity for transportation of one cargo unit or passenger at a given distance by train is much lower than that in the road transportation. There are technical solutions that, if applied, can lead to additional reduction of the consumption of oil and electricity. The proposed measures have direct and indirect effects on the increase of the passengers and load flows in the railway transport as well as on GHG emissions reduction.

- **Improving the public transportation, reducing transportation flows in cities and renewing the transport park**

The improvement of public transportation and the reduction of private transportation in cities might contribute to lower GHG emissions from transportation. However, an increasing share of the public transport in total transportation activities can only be achieved if policies are accompanied by instruments which make the use of cars less attractive (e.g. increased fuel or road taxes, introduction of parking taxes, introduction of car-free zones in city centres). The strengthening of the control and quality of the periodical technical examinations will lead to the renewing of the transport park.

- **Introduction of biofuels**

The implementation of this measure will lead to reduction of GHG emissions. Bulgaria has the possibility to produce a substantial amount of biomass. Production of biofuels has a positive effect on employment in the agricultural sector.

### **1.1.5. Agriculture**

The Government will carry out a uniform national strategy focusing on sustainable development of the agricultural sector in compliance with the general agricultural EU policy, taking into account the specificity of nature in Bulgaria.

- **Manure management**

Manure is one of the most considerable methane sources in agriculture. The modern manure management practices are not applied in Bulgaria.

Transportation tanks, underground disposal at cattle-breeding farms and poultry-farming sites, separation of manure into liquid and solid fraction at pig-breeding farms, etc. are used in liquid manure management.

- **Fertilization and irrigation**

During the last years fertilization was conducted in an uncontrolled manner. The amounts of nitrous fertilizers applied to soils often exceeded the recommended ones. The requirements for quality of production and lower prime costs grew strict due to expanded import of agricultural goods from the neighbouring countries.

### **1.1.6. Waste Management**

The measures for reduction of GHG emissions to be implemented in this sector are related to management of municipal solid waste.

Landfill sites are widely used in the country. The typical amount of waste to be disposed at regional landfill sites varies between 50,000 and 100,000 ton per year. The governmental policy in this field is directed towards building up a system of 54 regional landfill sites and closing down those landfills which do not meet the legal requirements. With the setting up of

these regional landfill sites the environmental friendly waste treatment of all waste generated in the country will be secured.

- **Utilization of the captured methane for production of electricity**

At this moment the energy generated during the flaring of the captured methane is not used. The captured methane can be utilized for electricity generation in piston gas motors. Due to the presence of mixtures in methane, a comparatively low efficiency is accepted for this type of machines (30 %). The received electrical energy from the burning of one ton captured methane will be about 4.2 MWh under the assumption that the diesel-generators operate 6 000 hours per year. This utilization of equipment for electricity production means an installed capacity of 19,517 kW.