

SUMMARY OF THE NATIONAL REPORT ON THE STATE AND PROTECTION OF THE ENVIRONMENT 2010

The National Report on the State and Protection of the Environment is elaborated in accordance with art. 22, par. 1 of the Environmental Protection Act.

This year the Report was prepared in a new structure, including mainly environmental indicators and methodologies applied in the evaluation reports of the European Environment Agency (EEA) in accordance with recommendations for improving the assessments of the environment and a clear identification of trends. The goal, on the one hand, is clear formulation of the questions associated with the interaction between society and the environment, and on the other - providing information on the environment in Bulgaria, comparable to the assessments at pan-European level. An attempt was made to be covered the complex of relationships between sources of environmental impact, impact factors - emissions to air, water and soil, waste, noise impact, ionizing radiation; State of the environment; Impact on ecosystems and environment protection measures.

The Report includes 15 sections that cover key environmental areas. It builds on "key issues" of public interest, described are methodologies and indicators used for evaluation, information sources and reference documents by which answers are sought. Assessment of indicators is made for appropriate time periods and trends and conclusions are outlined that form the "key messages" on relevant environmental topics.

In order to achieve better accessibility and easier perception, analyzes are accompanied by numerous figures, charts, graphs and maps. The key messages are reinforced by symbolism, reflecting trends in environmental processes: positive (); negative () and no change ().

The main work on the Report is made in the Executive Environment Agency and the Ministry of Environment and Water. With Order of the Minister of Environment and Water was established inter-institutional group with representatives of MEET, MTITC, MAF, MoH, MRDPW, NSI, NIMH, which has facilitated the exchange of data and information to adequately formulate sectoral key messages.

The most significant sources of adverse environmental impact are energy and natural resources consumption by the economic sectors and emissions of harmful substances in air, water, soil, waste disposal. During the period 2000 - 2010 final energy consumption increased by 5,0% as a result of increased consumption in the sectors "Transport" and "Households" and a reduction in the "Industry". Although the final energy intensity of economy continues declining, it remains the highest among EU countries. The aim of Bulgaria to achieve by 2010 11% share of electricity produced from RES in gross inland consumption of energy is overachieved. According to the MEET, in 2010 the share of electricity produced from RES in gross electricity consumption in the country was 15,1%. Although in 2010 in desulphurisation facilities are harvested 642,6 thousand tons of sulfur dioxide, **energy** remains the largest source of emissions of sulfur dioxide and a major source of emissions of nitrogen oxides. Section "Energy" has a key position in the formation of greenhouse gases (GHGs) – it is the source of 88% of the aggregated GHG emissions for inventory last year - 2010. Bulgaria fulfills the obligations under Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants, which include the achievement by 2010 and thereafter maintain total

annual emissions (national ceilings) for sulfur dioxide (SO₂) - 836 thousand tons / year (kt / y); for nitrogen oxides (NO_x) - 247 kt / y; for volatile organic compounds (NMVOC) - 175 kt / y; ammonia (NH₃) - 108 kt / y. In 2010 emission levels of NO₂, NH₃, NMVOC and SO₂ are lower than the country's commitments for 2010 under Annex I of Directive 2001/81/EC. Obligations are met to achieve a certain limit of the pollutants recorded in the Gothenburg Protocol to the Convention on transboundary air pollution over long distances (CLRTAP) and also the ones born with the National Programme for the limitation of total national emissions of sulfur dioxide nitrogen oxides, volatile organic compounds and ammonia values for 2010 by implementing measures to bring the large combustion plants in compliance with Directive 2001/80/EC - excess below 2%, is observed only in respect of emissions of sulfur oxides – the reported for 2010 emissions amounted to 387 kt, compared to the set in the Program 380 kt.

Domination and constant increase in the share of **road transport** in the transport structure is associated with increased fuel consumption and emissions of harmful substances in air, including greenhouse gases, ozone precursors, particulate matter (PM). Road transport consumed 91,4% of total energy consumption of the sector. The share of biofuels is 0,97% and the set national indicative target of 5.75% biofuel share in total energy consumption in transport for 2010 has not been achieved. The road transport consumed 91,4% of total energy consumption by the sector. For the period 2001 - 2010 emissions of harmful substances from road transport have a clear downward trend, which is mainly due to fleet renewal. Calculated as precursors of ozone emission of nitrogen dioxide, carbon monoxide and methane volatile organic compounds decreased by 40,5%. In 2010 transport emits 14,4% of national emissions of greenhouse gases.

The main air pollutants emitted from agriculture are ammonia (72%) and non-methane volatile organic compounds, respectively 72% and 12% of national emissions. Agriculture is a source of greenhouse gases. The main greenhouse gases emitted by agricultural activities are methane and nitrous oxide. In 2010 emissions from the sector "Agriculture" represent 10,4%¹ of total GHG emissions in Bulgaria. Methane emissions are 28% of total emissions of CH₄, and nitrous oxide 84% of total N₂O emissions in 2010.

Pollutants such as sulfur dioxide, nitrogen oxides, ammonia, methane, volatile organic compounds and PM created the most serious problems for human health and are the main cause of deterioration of ecosystems. In 2010 again PM₁₀ pollution remains a major problem for air quality in all areas of assessment and management of air quality. The percentage of population living in PM₁₀ levels above permissible concentrations remains high, reaching 57% population affected. The highest concentrations for the country were measured in towns of Pernik, Plovdiv and Vratsa. In 2010 Ministry launches review of currently operative municipal programs under Article 27 of the Clean Air Act and take urgent action to update them or adopt new programs. The reason both risky levels of PM in urban areas, and received formal notification from the European Commission of 30.09.2010 to open procedure against Bulgaria in breach of Community law for failure to meet standards for PM₁₀. In terms of nitrogen oxides in Bulgaria percentage of population living in pollution levels above the limit values continues to be high, reaching 22% at a rate of 5,9 percent from Europe. In 2010 percentage of the population affected by excessive levels of sulfur dioxide is reduced in comparison to 2009 from 3% to 0,57% and ozone - from 4% to 0,84%. Still ongoing problems with the levels of lead pollution in Kardjali and cadmium in Plovdiv and Kardjali. Source of the pollution is the activity of enterprises of ferrous metallurgy LZC "Kardjali" and KCM "Plovdiv".

¹ Estimated in CO₂ – equivalent

The trend of **warming - up** that began in the late seventies of the twentieth century continues. 2010 is amongst the 10 warmest years, and the last decade is warmer than the previous one, which is warmer than ten years before. The predominant conclusion of world science is that **climate change** globally is due to the greenhouse gases emissions. As part of the United Nations Framework Convention on Climate Change (UNFCCC), Bulgaria has the obligation to conduct annual inventories of greenhouse gas emissions by sources and sinks, in accordance with approved by the UNFCCC methodology. The inventory for 2010 shows that Bulgaria fulfills the requirements of the UNFCCC and the Kyoto Protocol to reduce greenhouse gas emissions by 8% for the period 2008-2012 compared to 1988. The decrease in 2010 compared to the base 1988 is 47,8%. Emitted total GHG emissions of the country are 61472,06 Gg CO₂-eq., and per capita are decreased from 14,3 t CO₂-eq. in 1988 to 8,2 tonnes of CO₂-eq. in 2010. By this indicator Bulgaria is close to EU average. In Bulgaria two "flexible" mechanisms of the Kyoto Protocol are carried out - International Emissions Trading Scheme, according to Art. 17 and "Joint Implementation" projects under Art. 6 thereof.

Compared to other European countries, Bulgaria is characterized by a relatively significant **fresh water resources**, both in absolute volume and per capita. Through the local grouped water supply systems access to drinking water is provided to 99% of the population. The population living under regime of water supply is reduced – from 22% in 2000 to 1% in 2010. Pressure on water resources, as measured by the National Exploitation Index is below 10%, ie abstraction in Bulgaria does not cause stress to the aquatic ecosystem. However, Bulgaria is at one of the leading places for water abstraction averagely per capita and is among the European countries that rely primarily on surface water - due to significant volumes of water for cooling in energy sector. Annually ca. about 60% of the abstracted water in the country are used for cooling processes in power generation, which after utilization are returned to sources. After 2000 a relative stabilization of the water quantities used and the amount of wastewater generated is noted. Annual ca. in-period 2000 – 2010, 58% of generated industrial water and 72% of municipal wastewater are treated on site or in the local treatment plants (SWWTP). increases the share of treated wastewater with secondary methods and additional purification. Though slowly, the share of population connected to public sewer and SWWTP increases.

During the period 1996 - 2010 the trend observed in recent years to improve the quality of **surface waters** is kept. According to data of hydrobiological monitoring in the period 2009-2010, 80% of monitored river points of the major river flows in Bulgaria are in the range "very good - moderate status." There are still bodies at risk and for those bodies programs of measures are prepared to achieve good ecological status by 2015.

In the period 1996 - 2010 a gradual improvement in the quality of **groundwater** is recorded for most of the indicators. Average concentrations of ammonium and nitrite ions, permanganate oxidation, sulfates and chlorides slightly lower, substantially decrease the average concentrations of total iron and manganese.

The soils in the country are in good ecological status in terms of reserve of nutrients / organic matter. 2010 shows a relatively good reserves of soil nutrients, assessed by measuring concentrations of total nitrogen, organic carbon and total phosphorus and C / N ratio shows favorable conditions for degradation / mineralization of organic matter.

Researching the water erosion processes in recent years in the country, a trend is observed to limit the process, both in terms of area distribution, and in terms of average annual soil loss. Wind erosion remained relatively constant as size of distribution and soil losses. In recent years a trend towards an increase in landslides occurs. The number of landslides, as well as surface area of the affected territories are increasing. For the period 2005 - 2010 in 2,77% (arable land) and 3,27% (grassland) of the total number of points in the country are registered contents above permissible concentrations of heavy metals. The observations confirm the strong positive trends in the management of storages for prohibited and obsolete plant protection products - reducing the number of unsafe storage and the quantities of banned and obsolete pesticides stored in them.

The monitoring of **common birds species** in the period 2005 - 2010 showed a reduction in the number of **all 38 species** by 17%, which is 3% more than the previous assessment for the period 2005 - 2009.

The number of designated **protected areas of the network "Natura 2000"** in Bulgaria, under the Birds Directive, is 114, with a total area of 2,267,624 ha (20,4% of territory) and the number of protected areas designated under the Habitats Directive is 231, with a total area of 3,330,101 ha (30% of territory). The proposed areas for Bulgaria are assessed as adequate in terms of representativeness of species and habitats. Sufficiency index was 94,3%.

The cumulative number of **alien species in Bulgaria** has risen steadily since 1900. As foreign invasive and potentially invasive in Bulgaria were defined 50 types of fern and seed plants, 30 species of animals and 20 species of fungi. The most severe invasion of invertebrates is experienced by the Black Sea ecosystem. Most vulnerable to the introduction and naturalization of alien plant species are man-made habitats, followed by riparian habitats.

For the period 1997 to 2010 the number of **waterfowl** had declined by half. Although in the short term the number of wintering birds in the country for the past 5 years changed in a narrow range and remained relatively constant, in the long run for the last 10 years a reduction of the birds with more than 50% is seen.

For the past 10 years a steady trend towards the increase of **forest area** is noted. The area falling within forest fund of the country in 2010 is 4,138 million ha, of which 3,761 million ha - wooded areas, representing 34% of the country. In comparison with 2000 when forest area is estimated at 3.914 million hectares, Bulgaria and other European countries report a steady increase in the total forest area. For the period 1960 - 2010 the area of forests with special functions (including the protective forests and recreational forests in protected areas) increased from 10,3% to 38,3% of the total forest areas. In 2010 survey of 2396 coniferous and 3173 deciduous trees in 159 sample test areas showed that the majority were those assessed as strong and slightly damaged in terms of defoliation. Internationally, the situation of **forests** in Bulgaria does not differ significantly from the average for Europe (39 countries). With 19,5% of damaged trees in Europe (second to fourth grade), established in Bulgaria were 23,8%, with a significant difference in deciduous (21,9% in Europe and 31,1% in Bulgaria) while coniferous difference is less than 1% (17,6% in Europe, 18,2% in Bulgaria).

During the year there were no increases in specific activity of **natural and technogenic radionuclides** in air, soil and surface waters. Assessment of annual effective dose exceeding the background of the exposure of the population of the activities of the "NPP Kozloduy" and the population in the region of PHRAO – Novi Khan the nearby settlements (villages of Novi

Khan, Krushovitsa and Gabra) shows no deviation from normal radiological status common for the country and is below 0,01 mSv (the limit below which no further measures for radiation protection of the population).

The measured daytime **noise levels** in cities for the period 2000 to 2010, determined as prevailing ranges 68-72 dB (A) and 63-67 dB (A), at the rate of 55-60 dB (A). Unfavorable retain of high levels of noise in large cities, where population density is high, means severe acoustic environment associated with the occurrence of health risk. In 2010 a strategic noise map (SRM) for 89,260 km major road sections in Bulgaria (with traffic of over 6 million annually) and an Action Plan to SRM of Plovdiv was reported to the European Commission. The results of SRM of Sofia and Plovdiv have shown that people exposed to round-the-clock noise in Sofia are 58,92% and 73,98% - in Plovdiv. Night noise exceeding the limits affects 72,23% of the inhabitants of the capital and 73,40% of the residents of Plovdiv. Analysis of SRM for agglomerations shows that the main cause of excess noise is intense traffic.

In the last 3 years the amount of **waste** generated in the country decreases. The waste generated in 2010 amounts 15.241 million tons and represents 2,430 million tons less than in 2009. Over the past 10 years the amount of generated **municipal waste** in the country decreases. Municipal waste for 2010 was 3,091 million tonnes; for recycling are delivered 26 tons of municipal waste and landfilled were 3,041 million tons or 98,38% of generated municipal waste. In 2010 in the Ministry of Environment and Water was developed and approved by the Minister the National Strategic Plan for the gradual reduction of the amount of biodegradable waste going to landfill for the period 2010 - 2020. The plan must ensure fulfillment of the requirements for gradual reduction of biodegradable municipal waste subject to disposal by setting goals for 2010, 2013 and 2020. The construction of 23 regional systems for waste management in the country funded by the Operational Programme (OP) "Environment 2007 to 2013" steadily continues. The systems for separate collection of **packaging waste** cover 5,743,963 inhabitants. Significant drops in the consumption of glass packaging are observed. The share of recycled packaging waste increases. In 2010 Bulgaria has achieved a total of 62% recycled material and 62% recovery of waste packaging. During the year recycling targets for each type of packaging waste have been achieved, ie the overall objectives for recycling of packaging waste are achieved, and general targets for recovery or incineration in installations with energy recovery.

In 2010 **costs of protecting and restoring the environment** at the national level is estimated at 1 273,8 million lev, and their share of gross domestic product was 1,8%. Consolidated expenses covered by the budget of the Ministry for programs on the environment amounted to 557,084 million lev who were around 84,929 million more than 2009. At the end of 2010 funds of OP "Environment 2007-2013" acquired by the beneficiaries are 243 206 511 lev, which is almost two and a half times more than the the ones acquired from the start of the program till the end of 2009. At the end of 2009 there are no completed projects while by 31 December 2010 a total of 9 projects were completed within which are built and put into operation 7 sites.