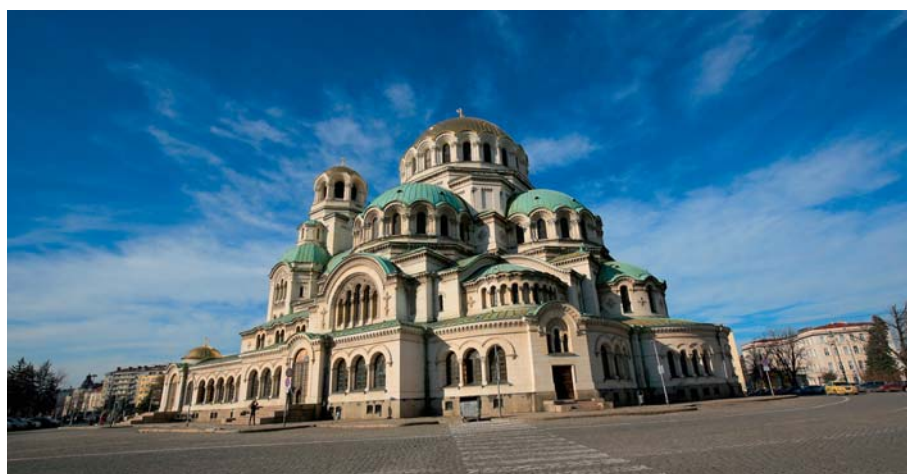


Bulgaria

Environmental Performance Reviews

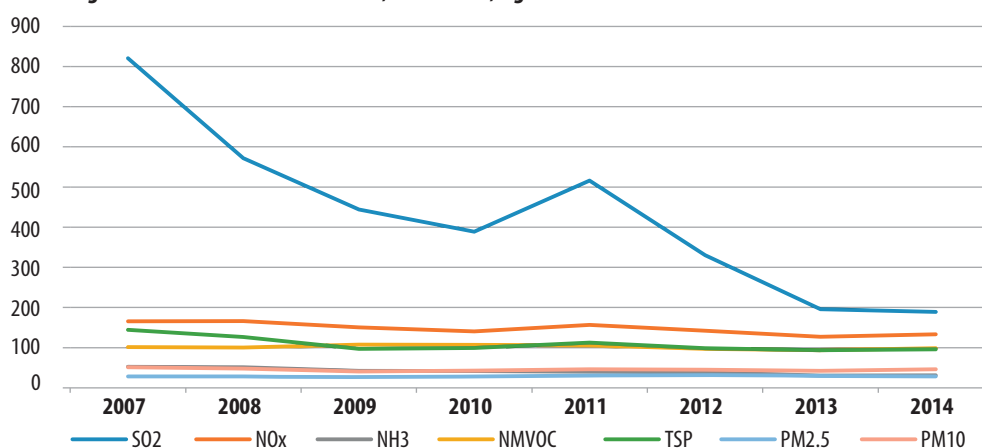
Third Review – Highlights



Environmental conditions and pressures

Annual emissions of sulphur dioxide dropped from 821 Gg in 2007 to 189 Gg in 2014 – a substantial 76.98 per cent decrease. Nitrogen oxide emissions diminished from 166 Gg in 2007 to 133 Gg in 2014. Emissions of total suspended particles decreased by 33.40 per cent, from 144.2 Gg in 2007 to 96.0 Gg in 2014.

Figure 1: Total air emission trends, 2007-2014, Gg



Source: Executive Environment Agency, 2016.

The volume of water abstraction has been in steady decline since 2007. The total volume of water abstracted in 2014 was 5,375 million m³, 13.32 per cent less than in 2007. Total water losses diminished by 28.67 per cent.

Estimated wastewater generation in 2014 was 768.49 million m³ – 3.86 per cent less than in 2007. In 2014, the major proportion of wastewater (76.33 per cent) was treated before discharge.

The number of functioning urban wastewater treatment plants (WWTPs) rose from 68 in 2008 to 89 in 2014. However, the number of plants using secondary treatments increased from 52 to 56 and the number of plants capable of tertiary treatment rose from 1 to 24. In 2014, 74.9 per cent of the population was connected to a wastewater collection system but only 56.8 per cent of the population was connected to a plant.

Bulgaria has extensive land areas in agricultural use and under forest. In 2012 around 52.6 per cent of land was either agricultural cropland (32 per cent) or pasture grassland (20.6 per cent), while 37.7 per cent was under forest and 6.1 per cent was shrubland. Built-up and artificial areas took up less than 2 per cent and water about 1 per cent of the land area.

At the end of 2015 there were 1,012 protected areas, covering 584,530 ha. This was 6.90 per cent more than at the end of 2006. Although the number of protected areas is vast, the share of the total land area of the country designated as protected area was only 5.27 per cent in 2015 – one of the smallest shares among EU countries.

The generation of municipal solid waste decreased by 23.48 per cent during the review period, from 4,172,000 tons in 2007 to 3,192,500 tons in 2014. While the number of municipal waste landfill sites has quickly reduced from 435 sites in 2007 to 147 in 2014, the share of the population served by municipal waste collection systems has increased from 92.51 per cent to 99.56 per cent.



Legal and policymaking framework and its practical implementation

Bulgaria has strengthened its legal framework for environmental protection and sustainable development. Nevertheless, since 2007, the European Commission has opened 54 infringement procedures against Bulgaria, for 3 of which the country was taken to the European Court of Justice for not sufficiently implementing and enforcing the environmental legislation. Up to the end of May 2016, 44 infringements had been closed.

The 2005 Genetically Modified Organisms Act is in line with the EU legislation, and some parts of it even set stricter conditions. In 2010 Bulgaria adopted an official ban on GMO cultivation. Non-governmental organizations were one of the key drivers behind the current ban on GMOs in Bulgaria.

Since 2007, Bulgaria has strengthened its policy framework for integration of environmental concerns with social and economic concerns. The country adopted the National Development Programme Bulgaria 2020 (NDP BG 2020), the National Reform Programme and the Government Programme for Stable Development for the period 2014–2018.

Bulgaria has continuously strengthened its legal framework to promote its transition towards a green economy. The NDP BG 2020, the National Reform Programme and the Government Programme for Stable Development provide, to some degree, long-term strategic guidance for the transition towards a green economy in Bulgaria.

Sectoral policy approaches to a green economy in Bulgaria are not sufficiently integrated due to the lack of coordination on development, implementation and monitoring of the policies and initiatives to promote a green economy. There are no specific coordinating mechanisms for green economy policies in place.

The Ministry of Environment and Water is the main authority in charge of funding for green economy initiatives through the OP “Environment” and its two subordinated project financing institutions, the Enterprise for Management of Environmental Protection Activities and the National Trust Eco Fund. The Enterprise support for green initiatives in the period 2003–2015 amounted to more than 2,600 contracts worth over six million leva. The Fund has implemented four major programmes to promote green initiatives since 2007.

SEA has been implemented since July 2004. The Environmental Protection Act establishes the general regulatory framework for SEA. The SEA Ordinance further specifies the SEA system.

Bulgaria has established a single environmental ex-ante quality assurance system by integrating Natura 2000-appropriate assessment procedures, as well as coordinating Integrated Pollution Prevention and Control permitting process and integrating the Seveso process of chemical safety in the EIA procedures.

In 2008, the Liability for Prevention and Remedying of Environmental Damage Act was adopted. The law has transposed the 2004 Directive 2004/35/EO on environmental liability with regard to the prevention and remedying of environmental damage.





Bulgaria successfully implements the Regulation (EC) No 1221/2009 on the voluntary participation by organizations in a Community eco-management and audit scheme (EMAS). The number of valid ISO 14001 certificates was 6 in 2001 and reached 1,761 in 2014.

Recommended measures¹:

- Ensure systematic monitoring of implementation of environmental policy documents;
- Ensure timely adoption or revision of the key overarching environmental policies;
- Promote the application of the EU Ecolabel scheme among Bulgarian producers and Community eco-management and audit scheme (EMAS).

Economic instruments for environmental protection and the financing of environmental expenditures

Bulgaria has made progress in the use of economic mechanisms for pollution management, but the polluter-pays principle is applied only partially. A water pollution tax has been introduced, but it is not differentiated according to the type and characteristics of pollutants. Moreover, the uniform charge rates are very low, which raises doubts about their environmental effectiveness.

The main economic instrument for pollution management continues to be sanctions for exceeding established threshold values for the quantity of air, water and soil pollutants discharged into the environment. This was, however, a blunt instrument for many years, given that the low rates of fines provided little, if any, incentives for changes in the behaviour of polluters.

In the area of waste management, Bulgaria applies enhanced producer responsibility (EPR) schemes, which aim at internalizing environmental externalities. These schemes are associated with quantitative recovery and recycling targets and a landfill tax. There is little transparency as regards the recovery fees charged by each of the recovery organizations and competition among the organizations in the market for a given product group is not regulated. There is also no information on the extent to which EPR schemes cover the costs related to the management of these waste streams.

Charges for water abstraction were increased in 2012, but the extent of cost recovery is still low. In a similar vein, fees for irrigation water are not cost reflective, and the bill collection rate is also low. The authorities have started to introduce incentive tariffs for the use of water-saving irrigation technologies. In the face of insufficient mobilization of financial resources, the irrigation infrastructure has deteriorated significantly.

¹ Note: The sections entitled "Recommended measures" represent an abridged version of selected recommendations from the EPR report and are provided for information purposes only. Please consult the text of the report for the full text of recommendations as adopted by the UNECE Committee on Environmental Policy.

In the water supply and sewerage services sector a range of problems exist.

These include high proportions of non-revenue water due to technical losses and low bill collection rates, which is depressing the revenues of water companies. In general, tariffs allow for the recovery of operating costs only.

Recommended measures:

- **Establish municipal waste collection fees based on volume of waste generated;**
 - **Eliminate existing cross-subsidies in the irrigation sector;**
 - **Diminish or end the water supply revenue losses caused by low collection rates and high levels of technical water losses;**
 - **Develop adequate social support policies and measures to ensure the affordability of higher tariffs for low-income households;**
 - **Diminish the tax reductions granted to older cars.**
-

Environmental monitoring, information and education

Air quality monitoring in Bulgaria has been significantly modernized and upgraded since 2000.

The most noteworthy change has been a shift from a system that was largely based on manual sampling (52 stations reported in 2000) to automatic sampling stations (16 stations reported in 2000). This has improved the quality and regularity of air quality measurements and data as well as ensuring that comprehensive statistics on air quality are automatically analysed and published.

Bulgaria has operationalized a national system for noise monitoring to prevent adverse health and environmental effects from the impact of noise.

In 2014, the national system on noise carried out monitoring activities in 710 locations across the country and data from the national system for noise monitoring covers noise levels in 35 cities.

The present biodiversity monitoring system was developed between 2004 and 2006 and, based on experience and activities between 2007 and 2015, was updated and upgraded in 2016.

Moreover, as a part of developing Bulgaria's monitoring system, a practical guide was made available on monitoring and assessment methodologies by biological groups and for particular species.

Bulgaria has a long history and tradition of forest management, which includes large-scale monitoring.

The Executive Environment Agency maintains a network of permanent sampling plots where data have been actively and manually collected over long periods. This network provides the long-term data needed for analyses, assessments and forecasts to support the preservation and protection of Bulgarian forests.

The present water monitoring systems consist of 500–600 points to monitor the physical and chemical status of surface water, 372 points for groundwater and 700–800 points for hydro-biological monitoring of surface water.

Seawater quality is also checked at monitoring stations located on the coast and at the mouths of





the rivers flowing into the Black Sea and there are at present 24 automatic monitoring stations for surface water that provide early warning of pollution.

Due to insufficient financial capacities, the Executive Environment Agency has been dependent on project-based funding to support parts of its biodiversity monitoring system. This has resulted in a shortage of scientific data as regards certain species and habitats covered by the system.

As a consequence of lacking financial resources the register of polluted areas has also been delayed. The national database on soil quality is not upgraded and an online system with services that makes pertinent data on soil quality publicly available has not yet been created.

Recommended measures:

- **Provide comprehensive, accurate and publicly accessible information and data on air quality;**
- **Focus additional monitoring attention on species/habitats of national importance that are not being monitored;**
- **Ensure regular training for teachers on sustainable development and environment-related topics.**

Implementation of international agreements and commitments

Bulgaria became party to the vast majority of global and regional multilateral environmental agreements (MEAs) prior to its accession to the EU in 2007.

After 2007 the country became party to very few agreements, including the 2003 Protocol on Pollutant Release and Transfer Registers, in 2010; and the 2010 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization and the 2015 Paris Agreement, in 2016.

Implementation of MEAs is a priority for the Ministry of Environment and Water and other governmental institutions. Good efforts are applied and clear criteria for prioritization of meetings exist to ensure the participation of Bulgaria in all important meetings under MEAs, given financial constraints. National implementation reports are generally submitted on time and focal points are appointed for all MEAs to which the country is a party.

The implementation and compliance cases against Bulgaria in various MEAs indicate some systemic issues with MEA implementation, e.g. for biodiversity treaties, such an issue is the rapid development of wind energy in the absence of strong nature protection legislation.

Bulgaria ensures public participation in the development of the Bulgarian position for decision-making in the framework of MEAs and in implementation of MEAs.

Consultations with NGOs have been organized prior to and after important MEA meetings, representatives of NGOs have been included in national delegations to MEA meetings. In many cases, draft national reports are published with an invitation to the public to submit comments. However, in general there is no systematic policy on how to involve the public and NGOs in development of the Bulgarian position for decision-making in the framework of MEAs and in implementation of MEAs.

Recommended measures:

- **Ensure the participation of Bulgaria in the meetings and activities under multilateral environmental agreements;**
- **Bring the legislation into line with the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters regarding access to justice;**
- **Raise awareness of judges and prosecutors and their capacity to deal with environmental cases.**

Climate change

Bulgaria is particularly vulnerable to climate change and to related extreme events, such as flash floods and droughts. Climate-related risks are expected to increase in the next decades.

Although warming generally has a negative impact on agriculture in the country, rising temperatures allow the cultivation of early agricultural products outdoors or in greenhouses, where energy costs decrease.

In general, Bulgaria's transport system was designed, built and operated on the basis of the country's own specific geographic conditions, including those related to climate factors. Because of the diverse peculiarities of the weather in the different parts of the national space, the transport system is relatively flexible, recognizing both the normal atmospheric conditions and local characteristics and manifestations of extreme meteorological phenomena that directly or indirectly affect the functioning of the transport sector.

Emissions from the energy sector decreased by 37.17 per cent from 83,081 Gg CO₂ eq. in the base year 1988 to 51,072 Gg CO₂ eq. in 2011. The main source of emissions in the energy sector is fuel combustion of solid fuels, which is responsible for 65.8 per cent of the emissions.

The 2012 Third National Action Plan on Climate Change for the period 2013–2020 outlines the framework for action to combat climate change. Bulgaria focuses its efforts on actions leading to reduction of the negative impacts of climate change and implementation of the commitments undertaken under the UNFCCC and the Kyoto Protocol.





As a party to the Kyoto Protocol Bulgaria is committed to developing a national adaptation strategy. The same commitment also arises from the Climate Change Mitigation Act. The Ministry of Environment and Water initiated a process towards developing a national adaptation strategy, which should comprise the period up to 2030.

Bulgaria successfully participated within the framework of the Joint Implementation mechanism. Twenty-eight projects have been approved in Bulgaria, 21 of which have already been achieved and have verified emission reductions. The execution of those projects led to GHG emission reductions of around 8 million tons of CO₂ eq. for the period 2008–2012.

Recommended measures:

- Adopt and implement a national adaptation strategy to climate change.

Water management

In the period 2010–2014, 23 new and modernized urban WWTPs were put into operation with a total capacity of 1,116,000 PE. In 2014, 89 urban WWTPs were operating, of which 56 had secondary treatment and 24 had more stringent treatment than secondary.

Table 1: Population and water supply, 2000, 2007-2014

	2000	2007	2008	2009	2010	2011	2012	2013	2014
Population connected to public water supply	98.6	99.0	99.0	99.0	99.1	99.2	99.3	99.3	99.3
Population connected to drinking water purification plants	41.2	44.7	45.5	46.0	46.3	47.3	47.6	47.9	48.1
Population with water supply regime of which:	21.8	6.3	4.6	3.3	1.0	3.0	4.5	2.9	0.6
Seasonal (less than 180 days)	18.3	4.3	4.6	3.2	0.9	3.0	4.3	2.8	0.5
All year (more than 180 days)	3.5	2.0	0.1	0.1	0.1	0.0	0.2	0.2	0.2

Source: National Statistical Institute, 2016.

By European standards, Bulgaria has a high rate of access to piped water (99 per cent of the population). More than 5,000 towns and villages are covered by centralized water supply systems, with a total pipe length of more than 75,000 km. Only two districts in Bulgaria have less than full coverage from centralized piped water.

In 2013, Bulgarian tap water quality generally met the requirements for safe drinking water. For the larger drinking water zones, typically with more than 5,000 inhabitants or more than 1,000 m³ of water supplied per 24 hours, Bulgaria meets the tap water quality criteria in more than 95 per cent of cases for microbiological, physical, chemical and organoleptic indicator parameters. Notwithstanding this success, there are quality issues in some, mainly smaller, drinking water zones, where microbiological non-compliance exceeds 5 per cent.

Bulgaria has one of the highest rates of water abstraction per capita and relies mainly on surface water sources due to the large volumes of water used for cooling in energy production. A continuing trend towards improving the quality of surface waters is reported. Likewise, a gradual improvement in groundwater quality, on most indicators, is being observed.

The current water monitoring regime has more of an informative nature and there is no analysis of reasons, causes, sources or measures for solving the problems. The results from the current monitoring show that, in practice, this monitoring does not provide the necessary volume of information to definitively determine the status of water bodies.

Bulgaria has adopted the Black Sea Strategic Action Plan. In order to reduce the pressure on the littoral and territorial waters for the period 2016–2021, additional measures are planned, linked mainly to reducing the introduction of waste from land-based sources.

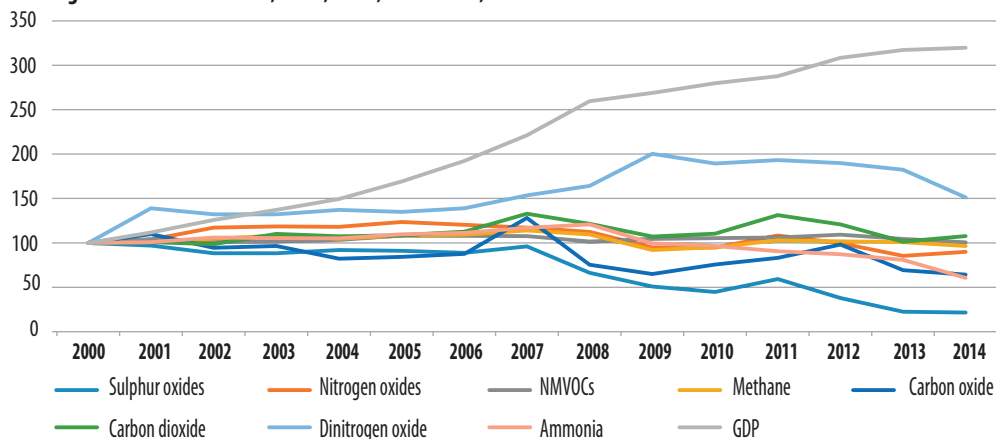
Recommended measures:

- Reinforce the monitoring of water bodies;
- Improve efficiency of water supply systems and reduce water losses;
- Implement the measures related to flood risk prevention and management.

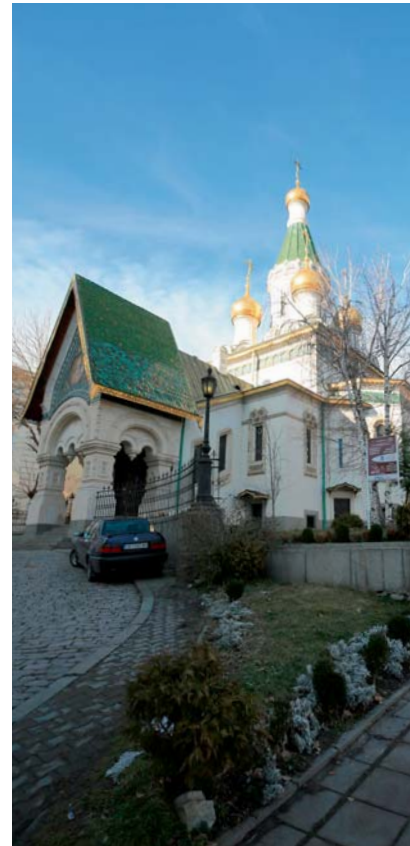
Air protection

Significant reductions have been achieved in recent decades for most emissions of air pollutants. Emissions from large industrial sources have been reduced by more than 80 per cent for SO₂ and halved for NO_x. This is partly the result of the shutting down of obsolete industrial installations, and predominantly the result of applying modern emission abatement techniques and control measures to reduce emissions.

Figure 2: Emission trends, 1990, 2000, 2005-2014, kt



Source: European Monitoring and Evaluation Programme DAB reports to 2013.
Source for 2014 and for CH₄ and CO₂: National Statistical Institute, 2016.





For some pollutants, the levels of air pollution in urban areas in Bulgaria are exceeding the national and European standards for shorter and longer periods.

The levels of NO_x, lead, CO, benzene, nickel and arsenic are below the air quality limits. For cadmium and SO₂, only a small number of local exceedances have occurred, and for ozone and PAHs the number of exceedances is limited. The overall trend for all pollutants shows a decrease in their levels.

Table 2: Exceeding of limit value for daily averages, Sofia, 2005-2009

	2005	2006	2007	2008	2009
Total Resident Population	1148 429	1154 010	1156 796	1162 898	1165 503
Number of days PM ₁₀ concentrations exceed 50 µg/m ³	162	167	195	199	160

Source: Urban Audit City of Sofia.

Table 3: Exceeding of limit value for daily averages, Plovdiv, 2005-2009

	2005	2006	2007	2008	2009
Total Resident Population	341 873	343 662	345 249	347 600	348 465
Number of days PM ₁₀ concentrations exceed 50 µg/m ³	149	165	204	208	175

Source: Urban Audit City of Sofia.

The European Environment Agency has estimated that 100 per cent of the inhabitants of urban areas in Bulgaria were exposed to levels of PM₁₀ above the EU standards for air quality over the period 2009–2011.

The National Statistical Institute reports that air quality limits are exceeded on half the days of the year in the two largest cities in Bulgaria. This is suspected to have serious impacts on public health.

The causes of urban air pollution are not fully identified in the country.

Domestic heating with solid fuels is suspected to be the largest source of emissions of particulate matter during winter in urban areas. The Ministry estimates that domestic heating is the predominant cause of high levels of PM₁₀ in the winter in Bulgarian cities, in combination with unfavourable weather conditions.

Air pollution by particulate matter is exceeding the limit values for air quality during the winter period.

Most of the occurring high levels of pollution are caused by a combination of an unfavourable meteorological situation and high levels of emissions of PM during winter. Particulate matter, especially PM₁₀ and PM_{2.5}, can have a severe impact on public health. However, information on the costs for society of the impact of air pollution on public health is not easily available in Bulgaria.

Recommended measures:

- Raise the awareness of the population of the impact of air pollution on health and of the costs induced to health care due to bad air quality;
- Promote the use of better heating appliances and the switch to clean fuels;
- Improve thermal insulation of houses.

Waste management

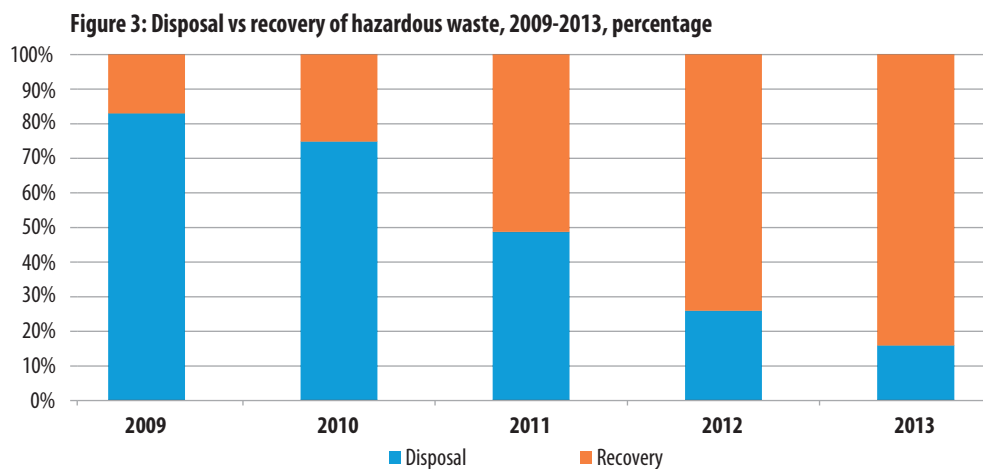
The total amount of municipal waste generated decreased from close to 5 million tons in 2000 to slightly more than 3 million tons in 2014. The amount of waste generated per capita decreased accordingly, from more than 600 to 442 kg/capita/year. The number of settlements and inhabitants served by collection services increased substantially. Nowadays, 99.6 per cent of the population is covered with waste services.

The formal system of separate collection of packaging waste was introduced in Bulgaria in 2004. At that time, only slightly more than one third of the generated packaging waste was recycled, and by 2014 this proportion had reached 61.7 per cent.

Bulgarian policy on organic waste is to reduce landfilling, especially of biodegradable organic waste. Construction of regional sanitary landfills is the first step to reducing the environmental burden of such waste (preventing contamination of the soil and groundwater and reducing methane emissions). Bulgaria has a target to reduce biodegradable waste on landfills to 35 per cent of the total quantity of organic waste generated in 1995 until 2020. The Ministry of Environment and Water has set a target of 25 per cent separate collection of municipal biowaste in 2016, 50 per cent in 2020 and 75 per cent in 2025.

The fourth National Waste Management Plan for the period 2014–2020 aims at discontinuing the link between economic growth and waste by preventing the generation of waste and by setting specific quantitative targets for preparation of reuse, recycling and other forms of recovery for specific wastes. For the first time, within the scope of development of the Plan, a National Waste Prevention Programme has been developed.

As a means of deterrent against waste disposal, a landfill tax was introduced for municipal waste in 2011. The level of the landfill tax is doubled for the disposal of waste in non-compliant landfills.





Recommended measures:

- Facilitate the establishment of waste treatment facilities;
- Reconsider the collection system for packaging waste;
- Align policies on recycling with the European initiatives.

Biodiversity and national ecological networks

There has been a 43 per cent increase in the number of protected areas, from 858 in 2004 to 1,012 in 2014, and a 25.56 per cent increase in the area covered by protected areas, from 544,394.9 ha in 2004 to 584,530 ha in 2015. At the end of 2015, the protected areas network included three national parks, 11 nature parks, 55 reserves and 35 managed reserves, 564 protected sites and 344 nature monuments.

Bulgaria is still among the EU countries with the lowest percentage of terrestrial and marine areas that are nationally designated protected areas.

This ambivalence is rooted in the state policy, which was directed towards expanding the network of protected areas, mostly by the designation of “protected sites” and “nature monuments”. These sites, although large in number, are usually very small in area.

In 2015, Bulgaria reviewed its entire UNESCO Biosphere Reserve Network (16 sites), which was established in the 1970s. Fifteen of the biosphere reserves are strict reserves and one (Srebarna) is a managed reserve; both categories are quite strict and do not allow human activities related to sustainable use of natural resources to be performed within their boundaries. Consequently, none of the 15 strict reserves correspond to the zoning and functional requirements of the UNESCO Seville Strategy and Statutory Framework of the World Network of Biosphere Reserves, and thus a revision of the biosphere reserve status is under way.

The biological richness of Bulgaria’s flora and fauna creates opportunities as well as challenges for the national conservation strategies. Bulgaria is among the European countries with the highest territorial share of Natura 2000 sites. Whereas the average across the EU is 18 per cent coverage, Bulgaria has 34.4 per cent of its territory inscribed on the list. The total area of the network is more than 4 million ha, of which 56.47 per cent is forests, 32.35 per cent agricultural land and the rest is other types of land.

Due to the country’s abundance of biological diversity and hosting of a large proportion of species that are threatened at European level, Bulgaria has a particular responsibility for biodiversity conservation. A large proportion of the natural diversity, e.g. 20.5 per cent of the vascular plants, is threatened by various negative factors, such as deterioration, fragmentation and loss of habitats due to infrastructure development, competition with invasive alien species and intensive land use.

Recommended measures:

- Finalize the new National Biodiversity Strategy and Action Plan;
- Strengthen the status, value and role of protected areas;
- Develop appropriate administration, communications and management capacities for the Natura 2000 sites.

Energy and environment

Bulgaria's energy dependence for the last few years is significantly lower than the average of EU member countries. It was made possible thanks to the measures undertaken in the last few years to stimulate energy efficiency, increased energy generation from renewable energy sources (from 12.2 per cent in 2009 to 19 per cent in 2013) and projects realized by the new capacities of local coal have shown a positive reflection in the energy dependence indicator.

Table 4: Energy dependence, 2009-2013, percentage

	2009	2010	2011	2012	2013
Average EU-28	53.7	52.8	54.0	53.4	53.2
Bulgaria	45.1	39.6	36.0	36.1	37.8

Source: Bulletin on the State and Development of the Energy Sector in the Republic of Bulgaria, 2015.

The major local energy resource of Bulgaria is lignite coal. It is dominant in the coal production structure, accounting for 93.0 per cent in 2014. Lignite coal is followed by brown coal at 7.0 per cent and black coal at 0.001 per cent (or 300 tons).

Table 5: Coal, 2007-2014, thousand tons

	2007	2008	2009	2010	2011	2012	2013	2014
Primary production of which:	28 633	29 050	27 279	29 427	37 128	33 427	28 624	31 300
Production of Lignite	28 418	28 748	27 148	29 379	37 111	32 512	..	29 100
Consumption	33 529	33 145	30 206	32 601	40 166	35 215	30 478	..
Imports	5 115	5 523	2 853	2 846	3 362	2 323	..	..
Exports	2	33	14	90	125	116	..	..

Source: <https://knoema.com/EIAIES2015Jun/international-energy-statistics-january-2016>, accessed on 1 June 1, 2016.





Table 6: Electricity, 2007-2015, GWh

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gross production	42 875	44 423	42 789	46 011	50 330	47 406	44 040	47 193	48 416
Net production	38 991	40 028	38 486	41 659	45 401	42 904	40 055	42 939	43 934
Import	3 057	3 097	2 662	1 166	1 450	2 353	3 351	4 319	4 250
Export	7 534	8 441	7 735	9 613	12 110	10 661	9 532	13 773	14 697
Used for the internal market	34 514	34 684	33 413	33 212	34 741	34 596	33 874	33 485	33 487

Source: <http://www.nsi.bg/en/content/5027/production-and-deliveries-electricity>, accessed on 1 June 1, 2016.

The extraction of natural gas in Bulgaria is on a decreasing trend: 278 million m³ in 2013, 179 million m³ in 2014 and 82 million m³ in 2015. Oil is produced in insignificant amounts and oil demand is mostly covered by import.

Electricity production also peaked in 2011, was decreasing during 2012–2013

Table 7: Energy efficiency of the economy, 2009-2013, kgoe/€1,000 €

	2009	2010	2011	2012	2013
Average EU-28	149.0	151.7	143.9	143.4	141.6
Bulgaria	661.4	668.8	705.5	669.9	610.6

Source: Bulletin on the State and Development of the Energy Sector in the Republic of Bulgaria, 2015.

and then trended upward again in 2014–2015. The structure of electric power generation is dominated by thermal power plants using coal, followed by Kozloduy nuclear power plant. Major sources for the generation of electrical power are local coal and nuclear fuel.

As to the energy intensity of its economy Bulgaria ranks last among the 28 EU member countries, having the highest energy intensity rate of 610.6 kgoe/€1,000 (according to comparable prices for 2005). The average European intensity is 141.6 kgoe/€1,000. However, the different parity purchasing powers within the EU mitigate this dramatic contrast without eliminating it.

Table 8: Electricity from renewables, 2007-2012, MWh

	2007	2008	2009	2010	2011	2012
Total renewable electricity net generation	2 897.00	2 952.53	3 675.40	5 730.24	3 893.74	5 305.83
Hydroelectricity net generation	2 841.00	2 788.00	3 427.00	4 999.00	2 876.00	3 205.00
Wind electricity net generation	47.00	122.00	237.00	681.00	861.00	1 221.00
Solar, tide and wave electricity net generation	..	..	3.00	15.00	101.00	814.00
Biomass and waste electricity net generation	6.00	15.53	7.40	35.24	55.74	65.83

Source: <http://www.nsi.bg/en/content/5027/production-and-deliveries-electricity>, accessed on 1 June 1, 2016.

In 2004, Bulgaria's share of renewables in gross final energy consumption amounted to 9.6 per cent. Since then the country made remarkable progress and by 2012 had already achieved its 2020 renewable energy target: the share of renewables in gross final energy consumption stood at 16.3 per cent, against a target of 16 per cent for 2020.

In the last decade, Bulgaria managed to substantially reduce the total amount of emissions of the main pollutants into atmospheric air from power stations and industrial fuel combustion. For example, emissions of sulphur oxides were reduced more than fivefold: from 795,071 tons in 2007 to 139,860 tons in 2014. This remarkable achievement was reached by modernization of old TPPs and installation of desulphurization equipment. Emissions of nitrogen oxides were reduced by half, thanks to improvements of the burning processes.

Recommended measures:

- Reduce emissions of the main pollutants into atmospheric air from thermal power stations;
- Improve the electronic grid capacity to accommodate the increase of generation of wind energy.



Bulgaria

Environmental Performance Reviews

Third Review - Highlights

The United Nations Economic Commission for Europe (ECE) Environmental Performance Review Programme assesses progress made by individual countries in reconciling their economic and social development with environmental protection, as well as in meeting international commitments on environment and sustainable development.

The third Environmental Performance Review of Bulgaria was carried out in 2016, and recommendations to the country on how it can improve its environmental governance were adopted by the ECE Committee on Environmental Policy in January 2017. The third review examines the progress made by Bulgaria in the management of its environment since the second review in 2000. It covers legal and policymaking framework and its practical implementation, economic instruments for environmental protection and the financing of environmental expenditures, environmental monitoring, information and education, implementation of international agreements and commitments. It addresses climate change issues, air protection, water management, waste management, biodiversity and national ecological networks areas and discusses integrating environmental concerns into energy sector. It makes suggestions for strengthening efforts towards a comprehensive and systemic response to sustainable development challenges.

The Highlights of the third Environmental Performance Review of Bulgaria draw attention to the key findings of the review to inform and guide policymakers and representatives of civil society, as well as the international community, in their efforts to improve environmental management and to further promote sustainable development in Bulgaria.

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