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Serbia
Environmental Performance Reviews
Third Review





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SERBIA

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The United Nations issued the second Environmental Performance Review of Serbia (Environmental Performance Reviews Series No. 26) in 2007.

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Foreword

The United Nations Economic Commission for Europe (ECE) has been engaged in the third cycle of Environmental Performance Reviews (EPRs) since 2011 when the Environment Ministers from the ECE region reaffirmed their support to the EPR Programme during the Seventh "Environment for Europe" Ministerial Conference (Astana, Kazakhstan). The third cycle places a stronger emphasis on environmental mainstreaming in priority sectors and on the enhancement of international environmental cooperation. Also, the third cycle EPRs address policy frameworks for greening the economy and describe specific green economy initiatives

This is the third EPR of Serbia published by ECE. The review takes stock of progress made by Serbia in the management of its environment since the country was reviewed for the second time in 2007. It assesses the implementation of the recommendations made in the second review. This third EPR also covers issues of specific importance to the country related to legal and policy frameworks, the financing of environmental policies, greening the economy, climate change mitigation and adaptation, and integrating environmental concerns into selected sectors, in particular water and waste management.

The timing of this publication coincides with the international debate on the post-2015 development agenda and the expected sustainable development goals. The regional commissions are actively engaging in discussions on the implementation and monitoring of progress in the achievement of goals and targets as well as on the peer review mechanisms that could be put in place. The United Nations Secretary-General in his 2014 Synthesis Report on the Post-2015 Agenda supports incorporating and building on the experiences of existing mechanisms, such as the EPRs carried out by ECE.

I trust that this third EPR will serve as a powerful tool to support policymakers and representatives of civil society in their efforts to improve environmental management and to further promote sustainable development in Serbia. I also hope that the lessons learned from the peer review process in Serbia will benefit other countries throughout the ECE region and facilitate the achievement and monitoring of the future sustainable development goals.

Christian Friis Bach

Executive Secretary
Economic Commission for Europe

Preface

In 1993, the second Environment for Europe Ministerial Conference (Lucerne, Switzerland) mandated ECE to carry out EPRs for those ECE member States that are not members of the Organisation for Economic Co-operation and Development (OECD). Subsequently, the ECE Committee on Environmental Policy decided to make them part of its regular programme. Since then, the environment ministers affirmed their support for the EPR Programme, decided in 2003 that the Programme should continue with a second cycle of reviews, and formally endorsed the third cycle of reviews in 2011.

Through the peer review process, EPRs also promote dialogue among ECE member States and the harmonization of environmental conditions and policies throughout the region. As a voluntary exercise, an EPR is undertaken only at the request of the country concerned. The studies are carried out by international teams of experts from the region working closely with national experts from the reviewed country. The teams also benefit from close cooperation with other organizations in the United Nations system and outside.

The third EPR of Serbia began in November 2013 with a preparatory mission. During this mission, the structure of the review report was agreed upon and the time schedule established. A team of international experts took part in the review mission on 25 March- 1 April 2014.

The draft EPR report was submitted to Serbia for comment and to the ECE Expert Group on EPR for consideration in August 2014. During its meeting on 1 – 2 October 2014, the Expert Group discussed the report with expert representatives of the Government of Serbia, focusing in particular on the conclusions and recommendations made by the international experts.

The EPR recommendations, with suggested amendments from the Expert Group, were then submitted for peer review to the nineteenth session of the Committee on Environmental Policy on 30 October 2014. A high-level delegation from Serbia participated in the peer review. The Committee adopted the recommendations as set out in this report.

The Committee and the ECE secretariat would like to thank the Government of Serbia and its experts who worked with the international experts and contributed their knowledge and assistance. ECE wishes the Government of Serbia further success in carrying out the tasks involved in meeting its environmental objectives, including the implementation of the recommendations in this third review.

ECE would like to express its appreciation to Sweden for its financial contribution through the Swedish International Development Cooperation Agency, to Portugal for having delegated its experts for the review, and to UNDP for its support of the EPR Programme and this review. ECE would also like to thank Austria, the Netherlands, Norway and Switzerland for their financial support to the EPR Programme.

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Page

CONTENTS

Page

PART II DOMESTIC–INTERNATIONAL INTERFACE

Chapter 5: Implementation of international environmental agreements

Chapter 6: Climate change mitigation and adaptation

PART III ENVIRONMENTAL MAINSTREAMING IN PRIORITY SECTORS AND PROMOTION OF SUSTAINABLE DEVELOPMENT

Chapter 7: Water management

Chapter 8: Waste management

ANNEXES

LIST OF TABLES

Page

Page

LIST OF FIGURES

LIST OF MAPS

LIST OF BOXES

LIST OF PHOTOS

PHOTO CREDITS

Photo I.1: Marko Risovic
Photo 1.1: Djordje Novakovic
Photo 2.1: UNDP Serbia
Photo 3.1: Marko Risovic
Photo 4.1: SEPA
Photo 5.1: SEPA
Photo 6.1: Djordje Novakovic
Photo 7.1: Petar Bakic
Photo 8.1: Aleksandar Mijailovic

Cover page photos: Vlasina Lake, Southeast Serbia (Djordje Novakovic), Drina River (Djordje Novakovic), Sunrise, Belgrade (Djordje Novakovic), West Serbia (Djordje Novakovic), Lazar's cave, Serbia (Marko Risovic).

KEY ABBREVIATIONS

EBRD	European Bank for Reconstruction and Development
EIA	environmental impact assessment
ELV	emission limit value
EU	European Union
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
GMO	genetically modified organism
IPPC	integrated pollution prevention and control
MEA	multilateral environmental agreement
NGO	non-governmental organization
ODS	ozone-depleting substance
OSCE	Organization for Security and Co-operation in Europe
PM	particulate matter
PPP	purchasing power parity
PSUPCEP	Province Secretariat for Urban Planning, Construction and Environmental Protection (Vojvodina)
PUC	public utility company
SEA	strategic environmental assessment
SEPA	Serbian Environmental Protection Agency
UNFCCC	United Nations Framework Convention on Climate Change

SIGNS AND MEASURES

..	not available
-	nil or negligible
.	decimal point
$	dollar
cap	capita
eq.	equivalent
g	gram
Gg	gigagram
GWh	gigawatt-hour
ha	hectare
kg	kilogram
km	kilometre
km^2	square kilometre
km^3	cubic kilometre
kt	kiloton
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
l	litre
m	metre
m^2	square metre
m^3	cubic metre
Mg	Megagram
MW	megawatt
PJ	petajoule
ppm	parts per million
t	ton (1,000 kg)
toe	ton of oil equivalent
TWh	terawatt-hour

CURRENCY CONVERSION TABLE

Year	Dinar per Euro	Dinar per US$
2007	80.1	58.2
2008	81.6	55.8
2009	94.1	67.6
2010	103.6	78.6
2011	101.9	72.9
2012	113.6	88.0
2013	113.0	84.9
2014	117.4	89.1

Source: ECE common database (accessed February 2015).

Executive summary

The second Environmental Performance Review (EPR) of Serbia was carried out in 2007. This third review intends to assess the progress made by Serbia in managing its environment since the second EPR and in addressing new environmental challenges.

Environmental conditions and pressures

The country's economy is export dependent – in 2012, exports of goods and services made up 40.3 per cent of GDP. GDP per capita measured by current purchasing power parity (PPP) was US$11,070 in 2010, or 34.6 per cent of the EU-28 average. This was lower than the GDP per capita of neighbouring Montenegro (US$13,086) but higher than that of Bosnia and Herzegovina (US$7,793).

There has been no change in sulphur dioxide emissions since 2007. In 2012, emissions were at 287,300 tons, or 39.9 kg per capita, considerably higher than the EU's 2010 average of 11.9 kg. Nitrogen oxides emissions grew over the comparison period by 6.48 per cent, to 208,700 tons in 2012, while ammonia emissions diminished by 12.6 per cent, from 101,800 tons in 2007 to 89,000 tons in 2012.

Heavy metal emissions demonstrated a positive trend between 2007 and 2011. Lead emissions diminished by 54.98 per cent and mercury emissions by 13.32 per cent between 2007 and 2011, whereas cadmium emissions were reduced by only 3.58 per cent.

Between 2007 and 2010, total GHG emissions measured in CO_2 decreased by 12.04 per cent, from 52,251 kt to 45,962 kt. The consumption of ozone-depleting substances dropped 87.37 per cent, from 63.80 tons of ozone-depletion potential in 2007 to 8.06 tons in 2013.

In 2007, only about 225 million m^3 (or 8.1 per cent) of 3,158 million m^3 of wastewater was treated. In 2013, this had dropped to 183 million m^3 (or 4.53 per cent) of 3,795 million m^3. The situation had deteriorated in both absolute and relative terms.

The connection rate to public sewers went up from 48.64 per cent of the population (or 3.59 million people) connected in 2007 to 57.8 per cent of the population or 4.14 million people connected in 2013. This increase hides the fact that most of the new connections were simply to the sewers, without subsequent treatment. The level of the population connected to sewers but whose wastewater was not treated rose from 2.9 million in 2007 to 3.4 million in 2013.

The country's ecosystem is rich and comprises a vast number of diverse species. Serbia is home to 39 per cent of European vascular flora species, 51 per cent of European fish fauna, 49 per cent of European reptile and amphibian fauna, 74 per cent of European bird fauna and 67 per cent of European mammal fauna.

Currently, 1,760 wild species of plants, animals and fungi are strictly protected and 853 are protected by law. A special form of protection relates to the species that can be endangered due to exaggerated and uncontrolled collection from nature. Currently, controlled use is allowed for 97 species.

Forest fellings increased by 26.1 per cent from 2,247,000 m^3 in 2007 to 2,833,000 m^3 in 2011. During the same period, forest damage increased by 66.7 per cent, from 40,576 m^3 to 67,635 m^3.

The 1999 Red List contains 171 plant taxa (species and sub-species), making up about 5 per cent of the total flora in Serbia. Of that number, 4 taxa have been irreversibly lost because they were endemic only in Serbia; 46 taxa have been exterminated in Serbia, but can still be found in neighbouring countries or in ex situ conditions (botanic gardens); and 121 species are highly endangered, with high probability of disappearing from the region in the near future.

There are 474 protected areas with a total area of 531,279 ha. An additional 117 areas are within the protection procedure. The ecological network consists of 101 areas of ecological importance and ecological corridors of

national and international importance, including Emerald Network and Natura 2000 sites. Serbia has selected 61 candidate areas for the Emerald Network.

Legal and policymaking framework and its practical implementation

Since 2007, Serbia has worked further to enhance its legal and policy framework on environment and sustainable development. An important package of environmental laws was adopted in May 2009. On the basis of these laws, more than 300 subsidiary regulations have been adopted.

The 2009 Law on Genetically Modified Organisms (GMOs) introduces the obligation of informing the public and organizing public consultations in connection with applications received. The Law does not prescribe GMO labelling.

The 2009 Law on Air Protection requires the development of a six-year air protection strategy and action plan as key national policy documents. The 2013 amendments to the Law extended the deadline for adoption of the air protection strategy from 2011 to 2015.

The main strategic document envisaged by the 2009 Law on Chemicals – the Integrated Chemicals Management Programme – was not developed. Five draft national plans for specific waste streams were prepared but have not yet been adopted.

The provisions of the 2008 National Strategy for Sustainable Development are integrated into other programmes and strategies, including sectoral ones. A number of its measures have already been implemented, although with some delays. No assessment of the Strategy's implementation has taken place since the 2010 second progress report on its implementation.

The 10-year 2010 National Environmental Protection Programme is not accompanied by a five-year action plan. Furthermore, its implementation reports had to be submitted every two years; however, no reporting took place.

Contrary to many other strategic documents, the 2010 National Waste Management Strategy for the period 2010–2019 includes a list of indicators and an action plan for the period 2010–2014. However, despite the requirement of the Law on Waste Management to prepare annual reports on implementation of the Strategy, no such reports were prepared.

Compliance and enforcement mechanisms

The legal basis for environmental impact assessment (EIA) has seen further development. The 2004 Law on EIA was updated in 2009. Implementing legislation was further developed in 2008. The Regulation establishing the list of projects for which an environmental impact assessment is mandatory and the list of projects for which EIA can be requested clarified the EIA scope and aligned it with EU requirements.

Serbia is reorienting its traditional approach to water quality regulation, predominantly based on environmental quality standards (EQS), to a more preventive one aimed at mitigating pollution closer to its source, by introducing emission limit values and providing for stricter measures if EQS in the receiving water bodies are not met (the so-called "combined approach").

Placing leaded gasoline on the market was banned, and the use of petrol containing a maximum 13 mg/l of lead was allowed up to 31 July 2013. Amendments in 2013 further toughened the requirement, allowing the placing on the market of only petrol that corresponds to the European Standard EN 228 (maximum 5 mg/l of lead).

The National Pollution Sources Register, maintained by the Serbian Environmental Protection Agency (SEPA) has been fully operational since 2012, with more than 1,200 operators already providing data regularly. In May 2014, this public register contained 1,659 permits.

The first Integrated Pollution Prevention and Control (IPPC) applications were received in early 2010. Of the current 185 IPPC units, 162 operators (87 per cent) submitted permit applications and only nine permits have been issued so far.

The register of waste management permits issued by all competent authorities is publicly available on SEPA's website. As of April 2014, the list of waste management permit holders included 1,759 legal entities.

The Chemicals Registry is established for the purpose of creating a comprehensive database of chemicals placed on the market. As of September 2014, 2,511 companies reported data on chemicals produced or imported, and data on 46,708 chemicals (substances and mixtures) are reported to the Registry. Its data are used for the preparation of inspection campaigns.

Since 2007, progress in compliance promotion and voluntary schemes has been mixed. There are no enterprises certified according to the EU Environmental Management and Audit Scheme. Government action on promoting compliance has apparently focused on providing financial support to the regulated community. Financial support to companies that aim to improve their environmental results is higher in Serbia than the EU average.

The National Cleaner Production Centre was established in 2007. It offers advice on resource efficiency measures, as well as support services related to administrative procedures.

In its overall design, the system of inspection largely follows Recommendation 2001/331/EC providing for minimum criteria for environmental inspections in the EU Member States. In 2007, a unified planning method, reporting and record-keeping on inspections were introduced at all levels. Guidelines and instructions for inspections are available.

Economic instruments and environmental expenditures for greening the economy

Charges for air pollution from stationary sources have been collected for sulphur dioxides, nitrogen oxides and particulate matter (PM). To prevent an erosion of rates by cumulative inflation, they have been adjusted by the annual percentage changes in the consumer price index.

A charge for the import or domestic production of plastic (polyethylene) bags was introduced in autumn 2010 and applied as from 2011. Those subject to the tax are the legal persons that import or produce these bags in the domestic economy. The tax base is the weight in tons of the bags placed on the domestic market.

The system of pollution charges was enlarged in 2010 by the introduction of charges on products that, after use, become special waste streams. They comprise motor vehicle tyres, products containing asbestos, batteries and accumulators, mineral and synthetic oils and lubricants, electric and electronic products, and motor vehicles.

The current system of water pollution charges does not explicitly take into account the effective discharge of water pollutants. The rates for wastewater discharge are very low, creating no incentives for investments in wastewater treatment. And these rates are also far below those that would be required to ensure the financial viability of modern wastewater treatment plants.

The economic and financial context for environmental policy has deteriorated significantly in the aftermath of the global financial crisis in 2007/2008. The earmarking of revenues from pollution charges was abolished in 2012. In this context, the operation of the Environmental Protection Fund was also terminated.

The financial implications for the environmental sector were broached in the 2011 National Environmental Approximation Strategy. The costs of upgrading and extending the environmental capital infrastructure could amount to approximately €10.5 billion. Total costs correspond to some €1,400 per capita, which is some 20 per cent higher than estimated for other countries in the region that have joined the EU in recent years. The reason for these higher expenditures is the low level of existing infrastructure and standards of services.

Overall, general government expenditures on environmental protection have been on a rising trend in recent years. They corresponded to some €135 million or 0.45 per cent of GDP in 2012, up from a recent low of 0.29 per cent in 2009.

Serbia has benefited from development assistance provided by multilateral institutions. Total cumulative disbursements of development assistance for the sector "environment protection" amounted to €106 million during the period 2007–2013. Annual disbursements corresponded to some 0.05 per cent of GDP. Some 95 per cent of funds were provided in the form of grants; the remainder (some €6 million) was concessional loans.

Environmental monitoring, information and education

All the 40 stations are equipped with analysers to measure SO_2, CO and $NO/NO_x/NO_2$ concentrations. At 10 stations, PM_{10} concentration is measured, as well as benzene toluene xylene and volatile organic compounds. Data from the stations on the measured substances are available in real time on the website of SEPA.

Serbia has a network consisting of 13 stations to sample allergenic pollen. One station (Kamenicki Vis) is equipped to measure the transboundary air pollution in accordance with the requirements of the Convention on Long-range Transboundary Air Pollution and its European Monitoring and Evaluation Programme (EMEP).

Surveillance water quality monitoring is performed at 51 measuring stations; operational monitoring is the monitoring performed at 84 measuring stations. Due to budgetary insufficiencies, not all the defined parameters are monitored at the required frequency of one year at all the surveillance monitoring locations. In respect of groundwater, quality monitoring is carried out at 64 points where piezometers are available.

There is no regular soil monitoring. However, certain collection of data takes place on an ad hoc basis at regional or local levels and through pilot projects with the involvement of donors.

Noise measurement is based on attended periodical measurements, conducted according to local methodology. The monitoring is done at a community level and depends on the budget available.

A routine monitoring programme is in place to measure ambient gamma dose rate equivalent in the air, radionuclides content in the air, solid and liquid precipitation, surface and drinking waters, and food, as well as to examine the level of exposure to naturally occurring ionizing radiation in residential and work environments. Also, radionuclides content is measured at locations affected by depleted uranium.

There has been no programme for biodiversity monitoring developed so far. Monitoring is therefore mainly done on species and habitats prioritized for monitoring as per annual budget available.

Serbia established a national laboratory for air, water, sediments and soil sample analysis, with the latter to be started in the future. The laboratory is fully integrated into the structure of SEPA. Serbia also established a laboratory for calibration of the analysers installed at the stationary stations for monitoring air quality. Institutes of public health operate laboratories accredited on some 25 standards for analysing drinking water quality. There are also several laboratories accredited for radioactivity analysis.

Data reporting, including self-monitoring activities to collect data in the first place, is imposed on enterprises. Data are stored in the National Register of Pollution Sources, which is managed by SEPA.

In 2010, Serbia adopted a list of 81 environmental indicators in 12 thematic areas. Notwithstanding, the indicators were already in use. The necessary data for the calculation of the indicators are available in various institutions at national and local levels, and shared with SEPA, which is in charge of managing the indicators.

Serbia produces its state of the environment report annually. This frequency can be questioned, in particular because in such a short period of time it is impossible to observe visible changes in trends and impacts for the majority of thematic areas assessed in the report. Furthermore, this period of time may be insufficient to implement some of the actions recommended in the previous report.

Environmental information of public importance, except for information defined by law as restricted, is freely available at no cost to the public. Furthermore, access to information that concerns a threat to or protection of public health and the environment cannot be restricted by the authorities.

Implementation of international environmental agreements

Since 2007 Serbia joined a number of global multilateral environmental agreements, including the Stockholm Convention on Persistent Organic Pollutants (POPs) in 2009, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade in 2009.

Since 2007, Serbia has joined the remaining four UNECE regional multilateral environmental agreements. The country ratified the Espoo Convention on Environmental Impact Assessment in a Transboundary Context in 2007, the Convention on the Transboundary Effects of Industrial Accidents and the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters in 2009, and the Convention on the Protection and Use of Transboundary Watercourses and International Lakes in 2010.

Since 2007, Serbia has designated four more Ramsar sites. As of April 2014, Serbia has 10 sites designated as wetlands of international importance, with a total area of 63,919 ha.

Since 2007, Serbia has inscribed one more property on the World Heritage List and submitted six properties on the Tentative List. As of April 2014, Serbia has four properties inscribed on the World Heritage List and 11 properties submitted on the Tentative List.

Progress since 2007 was noted in implementation of the Convention on Biological Diversity (CBD). In 2011, the Biodiversity Strategy and Action Plan for the period 2011–2018 were adopted. Also in 2011, the Serbian biodiversity portal was established as part of the global information exchange network set up by the CBD. The portal serves as the national clearinghouse mechanism.

Since 2007, Serbia has filled the gaps in the legislation with regard to the provisions of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal by adopting the Law on Waste Management and a number of by-laws regulating transboundary waste shipments. The import of hazardous waste for the purpose of its disposal or recovery for energy purposes is forbidden. The import of hazardous waste may be permitted only if there is a facility for the treatment of such waste, for the operation of which a permit has been issued.

Serbia has made progress on all the indicators with regard to the country's commitments on the Millennium Development Goals. The country managed to reduce pollution and started to reorient itself towards energy efficiency and the use of cleaner energy. More households in Serbia now enjoy access to clean water and improved sanitation.

Climate change mitigation and adaptation

Analyses of the period 1950–2004 show an increase in mean annual temperatures in most parts of Serbia. Temperature rise was higher in northern Serbia than in the south. Mean annual precipitation did not follow a clear trend: it increased in the west and north of Serbia, but decreased in other parts of Serbia. However, the number of days with intensive precipitation did increase.

The main impacts from these changing temperature and precipitation patterns are increasing risks of droughts, reduced water resources (mainly during vegetation seasons), extreme temperatures (both heat and cold waves) and floods. The risk of fire is also increasing as a consequence of hot and dry summers.

The energy sector, including transport, is responsible for around 75–78 per cent of GHG emissions and therefore is a key sector for mitigation. In 2010, the emissions from fuel combustion arose mostly from electricity and heat production (66 per cent), followed by the transport (14 per cent), manufacturing industries and construction (12 per cent) and residential (7 per cent) sectors.

The Serbian economy is very energy intensive, with an energy intensity of 0.22 toe per unit of GDP in 2010, while that of OECD-Europe was 0.13 and the world average was 0.19 toe. These figures indicate that there is potential for reducing energy consumption by improving efficiency and thus reducing CO_2 emissions.

Serbia has no national strategy on climate change. However, climate change is listed as one environmental risk factor in the 2008 National Strategy for Sustainable Development. The 2011 National Strategy for Protection and Rescue in Emergency Situations also lists climate change as one important factor with influence on emergency situations.

The 2005 Agriculture Development Strategy did not mention climate change. The 2010 National Environmental Protection Programme states that the agricultural sector may suffer huge damage and be one of the sectors most affected by climate change. The Strategy for Agriculture and Rural Development for the period 2014–2024 recognizes the importance of climate change impacts on agricultural production or the sector's vulnerability to changed climate conditions.

Serbia adopted the target of saving 9 per cent in final energy consumption by 2018 in comparison with 2008. However, the measures planned in the First Energy Efficiency Action Plan for the period 2010–2012 were either not implemented at all or only partly implemented because of delays in the adoption of the Law on Efficient Use of Energy and the accompanying by-laws, as well as lack of funding.

Numerous projects related to climate change took place in recent years at national or regional level. They included the elaboration of adaptation and mitigation strategies for subsectors, as well as increasing efficiency or awareness and preparing adaptation measures.

Serbia was successful in using the Clean Development Mechanism (CDM) by swiftly installing the Designated National Authority and necessary procedures after ratification of the Kyoto Protocol. In 2010, the National Strategy for Incorporation of the Republic of Serbia into the Clean Development Mechanism was elaborated. Serbia successfully registered seven CDM projects before 2012, which related to renewable energy (several wind farms), energy efficiency and the waste sector.

Water management

In 2013, the raw water for drinking purposes comes from groundwater (67 per cent) and surface waters (33 per cent). Around 70 per cent of the population is connected to public water supply systems, around 12 per cent is connected to rural water supply systems and around 10 per cent is connected to individual systems, while the remaining population is supplied from wells and pumps.

Of the 300 million m^3 of wastewater discharged in 2013, 71.4 per cent was from households, 14.6 per cent from industry and 14 per cent from other sectors. Only 16.8 per cent (50.4 million m^3) was treated, including 2.4 per cent with primary treatment, 11.8 per cent with secondary treatment and 2.5 per cent with tertiary treatment.

River water quality is relatively good in Serbia, particularly that of the Danube, Sava and Tisza Rivers and a number of small rivers. However, the situation with regard to national rivers is often worse, above all that of the Velika Morava River, and especially of small rivers whose riverbanks are occupied by large urban centres.

At national level, monitoring of drinking water quality is conducted by the network of 24 institutes of public health under the Ministry of Health. In the period 2007–2012, in urban areas, approximately 60,000 drinking water samples were analysed each year. Average microbiological and chemical non-compliance of drinking water were 4.9 per cent and 15.4 per cent of samples, respectively.

In the period 2007–2012, monitoring of drinking water quality was conducted on about 2,198 water supply systems in rural areas. Approximately 18,800 drinking water samples were analysed each year. Average microbiological and chemical non-compliance of drinking water from water supply systems in rural areas were 22.9 per cent and 50.5 per cent of samples, respectively.

In the period 2007–2012, drinking water from an average 4,600 individual water supply facilities (public standpipes, schools, health centres, facilities for food production and restaurants with their own water sources) were analysed. Approximately 7,900 drinking water samples were analysed each year. Average microbiological and chemical non-compliance of drinking water from individual water supply facilities were 24.1 per cent and 35.5 per cent of samples, respectively.

Serbia has a General Plan for Flood Protection for the period 2012–2018 and adopts annual operational plans for flood protection. The present state of flood protection infrastructures can be assessed as satisfactory.

Serbia lacks an appropriate framework on the water sector to achieve a sustainable approach to water and wastewater management policies. No programme for "efficient use of water" has been implemented and neither is there an innovative solution on a national scale.

The prices of water are not economic prices but social prices. From 2006 until 2012, the Government controlled them and approved any changes, limiting their increase to the projected inflation rate for a given year, but this control was abolished with the adoption of the Law on Communal Utility Activities and the Law on Public Enterprises.

Waste management

Waste management started a new era when the country developed a modern legislative framework. There is a trend towards regionalization of waste management services, which is providing opportunities for private sector involvement. However, development of the necessary infrastructure lags behind expectations, mainly due to insufficient sources of local financing and dependence on funding by foreign donors.

Organized collection of municipal solid waste (MSW) was estimated to cover about 80 per cent of generated waste in 2013. Collection is organized mainly in urban areas, while rural areas are less well covered.

Serbia currently recycles about 14 per cent of collected MSW: glass, wood, paper, plastic and metal. The private sector is involved in municipal separation schemes, but its main role is the purchase and processing of materials gained from separation. While in 2009 only 200 companies were registered for collection and recycling of waste, currently their number exceeds 2,200.

MSW is disposed to landfills and dumps. Considering the development of modern landfills, it is estimated that 25 per cent of MSW is disposed to sanitary landfills, 45 per cent is delivered to registered municipal dumpsites and 30 per cent ends up in uncontrolled dumpsites. About 70 per cent of all active dumpsites do not meet basic operational standards and are not stipulated through spatial planning documents, and no EIA of them has been developed; nor do they have the necessary permits.

The total amount of industrial waste is strongly affected by the mining sector, which represents 88 per cent of reported waste, and by energy generation, which adds 10.5 per cent. The share of manufacturing waste is only 1.5 per cent.

The existing health-care waste management system is focused on the treatment of infectious waste. It consists of a network of 31 central treatment points and 24 local treatment points where infectious health-care waste is treated by steam sterilization in autoclaves.

The 2003 National Waste Management Strategy for the period 2003–2008 was evaluated in the process of preparation of the 2010 National Waste Management Strategy for the period 2010–2019. This evaluation shows that achieved results are behind targets set in the 2003 Strategy. Most of the planned measures were not implemented, implemented only locally as a result of municipal initiative, or delayed for several years.

The National Waste Management Strategy for the period 2010–2019 aims to achieve compliance with EU waste management targets. Long-term objectives envisage completion of the waste management network by developing an additional 12 regional centres for waste management, increasing the recycling of packaging waste to 25 per cent, and providing capacities for incineration of industrial and health-care waste.

Introduction

ENVIRONMENTAL CONDITIONS AND PRESSURES

I.1 Demographic and socioeconomic context

Geography

Serbia, located in South-Eastern Europe in the heart of the Balkan Peninsula, shares a border with eight neighbouring countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Montenegro, Romania and the former Yugoslav Republic of Macedonia. Serbia has a diverse landscape, ranging from plains to high mountains. The climate is continental with cold winters and hot summers but the varied topography, with the large Pannonian Plain, high mountain ranges and proximity of the Adriatic Sea, shape the country's local climates.

Population

Serbia's population indicators have been very been stable and the changes since 2007 are practically insignificant. The total population, which was 7.38 million in 2007, decreased by 2.5 per cent to 7.2 million in 2012. During the same period, the life expectancies of male and female populations increased by 1.5 and 2 years (respectively) and the total fertility rate increased slightly to 1.45 – the same as the European Union (EU) average.

The only exception to the almost constant figures was the infant mortality rate, which declined from 7.1 per 1,000 live births in 2007 to 6.2 per 1,000 in 2012 – a 12.68 per cent drop.

The main cities include the capital, Belgrade (pop. 1,639,000); the commercial centre, Novi Sad (pop. 335,000); the transport and industrial centre, Niš (pop. 258,000); and the manufacturing centre, Kragujevac (pop. 178,000).

Economic and social development

Serbia's gross domestic product (GDP) grew 5.4 per cent in 2007 but growth eased off to 3.8 per cent in 2008. The recession of 2009 hit hard and GDP went 3.5 per cent negative. Recovery from the recession was lacklustre, with real GDP growing by 1 per cent in 2010 and 1.6 per cent in 2011. Growth returned to negative figures in 2012 when real GDP contracted by 1.7 per cent. All in all, real GDP grew from 2007 to 2012 by only 1 per cent. According to the latest available figures from the Statistical Office, 2013 was more positive, with 2.5 per cent growth.

GDP per capita measured by current purchasing power parity (PPP) was US$11,070 in 2013, or 37.4 per cent of the EU-28 average. This was lower than the GDP per capita of neighbouring Montenegro (US$14,281) but higher than that of Bosnia and Herzegovina (US$8,243).

The unemployment rate has been high since 2007. There was a noticeable drop in unemployment from 18.1 per cent in 2007 to 13.6 per cent in 2008, but the figure was back to 16.6 per cent in 2009 and a continuous rise brought it to 23.9 per cent in 2012 – the highest level since the year 2000. The level of personal remittances from Serbians working abroad has fluctuated somewhat since 2007. In 2012, the value of received remittances was significant, bringing in an important 7.4 per cent share of the country's GDP.

The country's economy is export dependent – in 2012, exports of goods and services made up 40.3 per cent of GDP. Serbia's main export partners in 2011 were Germany (11.29 per cent) and Italy (11.06 per cent). Main importing countries were the Russian Federation (13.36 per cent) and Germany (10.82 per cent). Exports in 2012 were mostly metals (worth US$2.6 billion) and machinery (US$1.6 billion), while imports mostly comprised mineral products (US$4.3 billion) and machinery (US$3.3 billion).

The current account deficit reached 21.76 per cent of GDP in 2008. After contracting sharply to 7.13 per cent in 2009, the deficit started to expand again and reached 10.67 per cent of GDP in 2012, while real GDP contracted by 1.7 per cent. However, according to the Economist Intelligence Unit's estimations, the expansion of the automotive and oil export-oriented branches of industry, combined with weak domestic consumption, led the current account deficit in 2013 to narrow to about 5.5 per cent of GDP.

Inflation, measured by the Consumer Price Index (CPI), has fluctuated since 2007. It was relatively moderate in 2007 at 6.4 per cent, but jumped to 12.2 per cent in 2008.

Photo I.1: Ostrovica Mountain

It then decreased to close to 6 per cent in 2010 before jumping to 11.1 per cent in 2011. The latest inflation figure, for 2013, was 7.7 per cent. Average annual inflation from 2007 to 2013 was 8.44 per cent.

The Serbian dinar has depreciated against both the euro and the United States dollar (US$) since 2007. The trade-weighted dinar per euro exchange rate depreciated 10.9 per cent from 2011 to 2012, and long-term depreciation against US$ PPP between 2007 and 2012 was 26.5 per cent.

Measured by the United Nations Development Programme (UNDP)'s Human Development Index (HDI), Serbia belongs to the high human development country group. In 2007, it attained an HDI score of 0.76; in 2012, this was slightly higher at 0.769, ranking the country 64th of the 186 countries compared.

In 2008, the share of the Serbian population below the national poverty line was at its lowest at 6.1 per cent. In the previous year the figure had been 7.9 per cent.

This downward development reversed in 2009, however, and in 2010 the figure had reached 9.2 per cent. According to the latest figures of the World Bank, 24.6 per cent of the population was living on income below the national poverty line in 2012.

Gender

Serbia is committed to the principles and aims declared in the Beijing platform. It has a comprehensive legal framework in place. Serbia acceded to the Convention on the Elimination of All forms of Discrimination against Women in 2001. Serbia has submitted its reports to the Convention Committee – the first report in 2007, and the combined second and third report in July 2013.

The 2006 Constitution of Serbia endorses the equality of women and men and the policy of equal opportunities, in its article 15. A national strategy for improvement of the position of women and for gender equality was adopted in 2008 and the law on equality of the sexes and the law against discrimination were adopted in 2009.

The latest available figures, for 2010, show that women held 32.7 per cent of the available legislator, senior official and manager positions. The proportion of female parliamentarians has been on the rise, increasing from 20.4 per cent in 2007 to 33.2 per cent in 2013. Women also have an important role in the country's economic life, forming 43.1 per cent of the non-agricultural workforce in 2013.

Serbia has attained gender parity in primary and secondary school enrolment, with a female-to-male ratio of 1.0 in 2012. However, female enrolment is

significantly higher in tertiary education, where the female-to-male ratio was 1.3 in 2012.

The UNDP Gender Inequality Index is not available for Serbia due to a lack of relevant data. The World Economic Forum's Gender Gap Report for 2012 placed Serbia in 50th position of 135 countries, with a score of 0.7037.

I.2 Key environmental trends

Air and climate change

Air

There has been no change in sulphur dioxide (SO_2) emissions since 2007. In 2012, emissions were at 287,300 tons, or 39.9 kg per capita, considerably higher than the EU's 2010 average of 11.9 kg. According to the latest UNSTATS figures, only 14 countries in the world have higher per-capita SO_2 emissions. Almost all (91.61 per cent) of Serbia's SO_2 was emitted from combustion of fossil fuels in the energy and transformation industry.

Nitrogen oxides (NO_x) emissions grew over the comparison period by 6.48 per cent, to 208,700 tons in 2012, while ammonia (NH_3) emissions diminished by 12.6 per cent, from 101,800 tons in 2007 to 89,000 tons in 2012. The energy sector produced 56.24 per cent of the NO_x emissions in 2012, while mobile sources (the transport sector) were the source of 39.28 per cent of NO_x emissions in 2012.

Heavy metal emissions demonstrated a positive trend during the review period. Lead (Pb) emissions diminished by 54.98 per cent and mercury (Hg) emissions by 13.32 per cent between 2007 and 2011, whereas cadmium (Cd) emissions were reduced by only 3.58 per cent.

Greenhouse gas emissions

Serbia's 2010 Initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) covers the country's greenhouse gas (GHG) emissions up to the year 2000, which is outside this review's evaluation period. The World Bank has data on emissions which give a general view of GHG emissions in Serbia from 2007 to 2010 or 2011, depending on the data series.

Official data in regard to GHG emissions for the period 1990–2013 are expected to be available in 2015, when the Second National Communication will be published.

Between 2007 and 2010, total GHG emissions measured in CO_2 decreased by 12.04 per cent, from 52,251 kt to 45,962 kt. Despite the overall decrease in emissions, the combined emissions of CH_4, N_2O, HFC, PFC and SF_6 measured in CO_2 increased 15.22 per cent, from 18,549 kt in 2008 to 21,371 kt in 2010. From 2007 to 2010, the energy intensity of the Serbian economy diminished – which can be seen from the decreasing use of energy per unit of GDP produced. In 2007 the economy emitted 1.9 kg of CO_2 per US$ – in 2010, this had dropped by 13.06 per cent to 1.65 kilograms of CO_2 per US$.

Over the three-year comparison period from 2008 to 2010, the emission trends were clear. While total CO_2 emissions were falling and the CO_2 from methane (CH_4) emissions diminished by 2.04 per cent, the other GHGs were increasing very rapidly. The CO_2 emissions from nitrous oxide (N_2O) increased by 30.34 per cent and hydrofluorocarbon (HFC) by 20.07 per cent from 2008 to 2010.

The World Bank's sectoral emission data series extends to 2011. The highest share of GHGs, 68.24 per cent of the total emissions in 2011, was generated by the electricity and heat production sector. The manufacturing and construction sector emitted 12.35 per cent and the transport sector 11.49 per cent of GHGs in 2011.

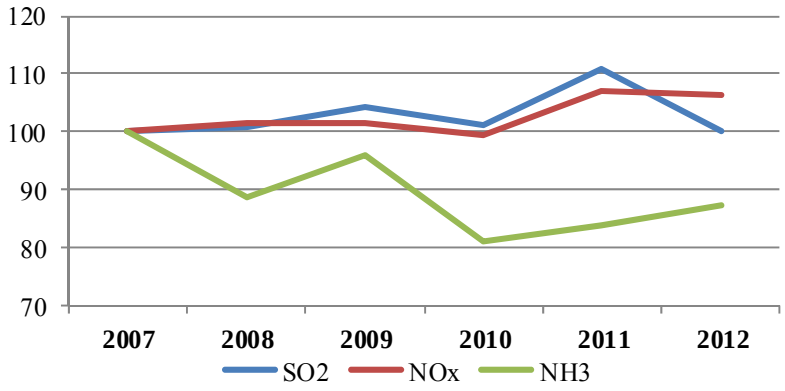
Sectoral emission development has been somewhat differentiated. The electricity sector's emissions increased by 10.69 per cent and its share of the total grew from 61.80 per cent to 68.24 over the comparison period. The emissions of the manufacturing and construction sector almost halved from 2008 to 2009 and, although they have been rising since then, the sector ended 28.48 per cent lower in 2011 than in 2007. Transport sector emissions have fluctuated over the period but ended slightly higher in 2011 than at the beginning of the review period.

The consumption of ozone-depleting substances (ODSs) dropped 87.37 per cent, from 63.80 tons of ozone depletion potential (ODP) in 2007 to 8.06 tons in 2013.

Surface water and groundwater

Serbia has substantial surface water resources. The three large transboundary rivers, Danube, Sava and Tisza, with some other smaller transboundary rivers, account for 90 per cent of the country's total surface water resources. These rivers provide some 162 billion m^3 of water per annum.

Figure I.1: Air emissions, 2007=100



Source: Statistical Office, 2014.

Table I.1: Main sector emissions, 2007–2011, CO_2 million tons

	2007	2008	2009	2010	2011
Electricity and heat production	30.69	30.32	31.74	30.89	33.97
Manufacturing industries and construction	8.60	8.09	4.50	5.45	6.15
Other sectors, excluding residential buildings and commercial and public services	1.86	0.48	0.87	1.06	1.37
Residential buildings and commercial and public services	3.02	2.79	1.93	2.03	2.57
Transport	5.49	6.77	6.30	6.34	5.72
Total	**49.66**	**48.45**	**45.34**	**45.77**	**49.78**

Source: World Bank. World Databank, accessed 15.5.2014.

Groundwater resources come from different types of aquifers. Most of the groundwater resources (56 per cent) are in alluvial aquifers, followed by karst groundwater (18.1 per cent), while 17 per cent are situated in the deep aquifers of the Autonomous Province of Vojvodina and the remainder (about 8.8 per cent) in Neogene aquifers. There was a change in the available total renewable water resources, which amounted to 151.7 billion m^3 in 2007 and 197.1 billion m^3 in 2013.

Abstraction and use

The annual total water abstraction diminished by 4.91 per cent, from 3,958 million m^3 in 2007 to 4,152 million m^3 in 2013. The water exploitation index for 2013 (i.e. water abstraction/renewable freshwater resources) is at a very low level – only 2.1 per cent of the available water is abstracted. In 2013, 88.5 per cent of the abstracted water was surface water and the rest (11.5 per cent) came from groundwater sources.

Water use in the manufacturing industry decreased by 46.2 per cent over the period, while agricultural use, although increasing once more, was still 11.7 per cent below the 2007 level. Total water use increased by 4.9 per cent.

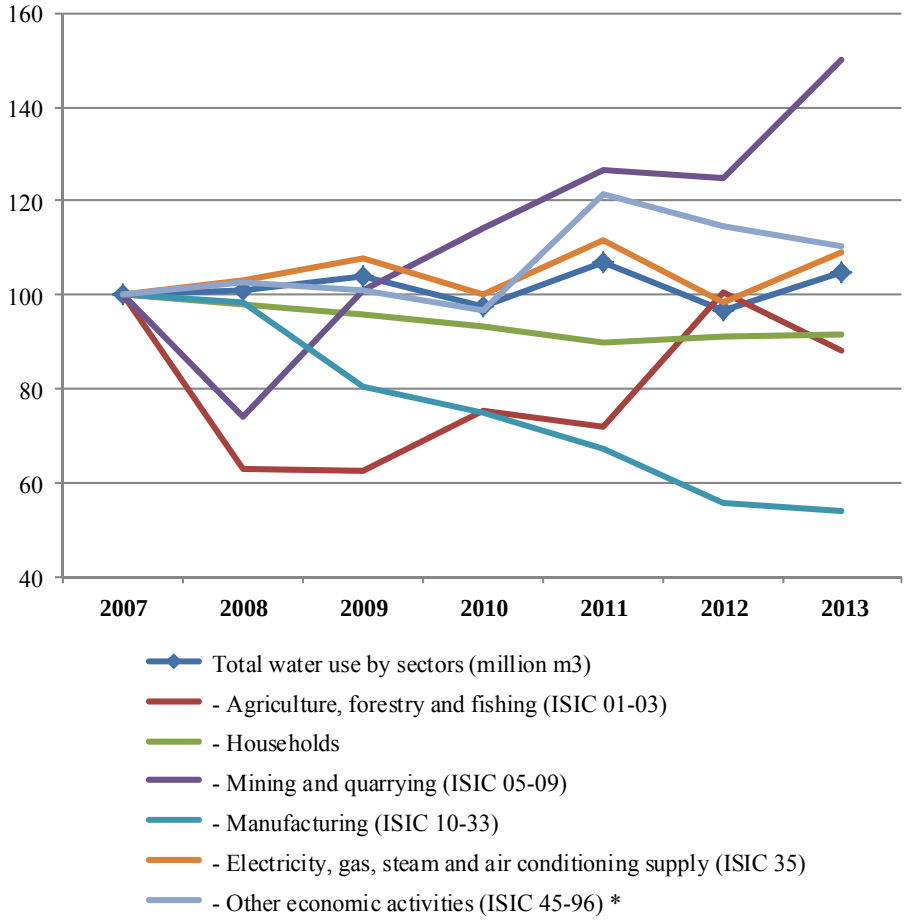
Wastewater discharges

Between 2007 and 2013, total wastewater discharges diminished by 20.2 per cent. The negative changes in treatment of wastewater, however, were noticeable. Total treated wastewater diminished by 32.6 per cent, primary treatment by 43.2 per cent and secondary treatment by 9.5 per cent. Tertiary treatment was the only treatment type to improve; while it increased markedly, by 112.79 per cent, this did not have an effect on the generally deteriorating situation.

In 2007, only about 225 million m^3 (or 8.1 per cent) of 3,158 million m^3 of wastewater was treated. In 2013 this had dropped to 183 million m^3 (or 4.53 per cent) of 3,795 million m^3. The situation had deteriorated in both absolute and relative terms.

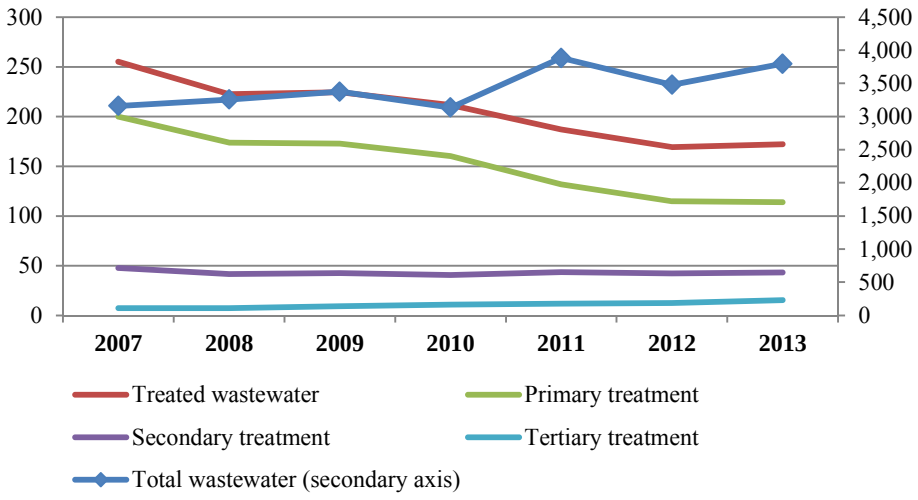
The connection rate to public sewers went up from 48.64 per cent of the population (or 3.590 million people) connected in 2007 to 57.8 per cent of the population or 4.140 million people connected in 2013. This increase hides the fact that most of the new connections were simply to the sewers, without subsequent treatment. The level of the population connected to sewers but whose wastewater was not treated rose from 2.9 million in 2007 to 3.4 million in 2013.

Figure I.2: Water use by sector, 2007=100



Source: Statistical Office, 2014.

Figure I.3: Wastewater discharge and treatment, 2009-2013, million m^3



Source: Statistical Office, 2014.

Water quality

Surface water

The river water quality is relatively good, particularly that of the Danube, Drina, Sava and Tisza Rivers. This is an outcome of the measures undertaken in upstream countries, and reduced industrial activity in both Serbia and the region. The self-purification capacity of the Serbian rivers is considerable; e.g. the Danube River has the same water quality (measured by the basic water quality parameters such as BOD_5) at its entry point into the country at Bezdan as at its exit point at Radujevac.

The water quality of some smaller rivers running within Serbia's borders is often worse, above all that of the Velika Morava River, but also some small rivers running through large urban centres.

The Danube–Tisza–Danube Canal and the secondary irrigation and transport canals are polluted in Vojvodina Province due to discharges of untreated industrial and municipal wastewaters and run-off waters from agriculture (table 7.2).

Groundwater

The quality of groundwater from alluvial aquifers depends on surface river water quality. Water from karst aquifers is of exceptional quality, but even within the karst environment there are some problems with turbid waters in hydrological maximum periods, as well as unfavourable conditions for protection against pollution. The water layers of spring water deposits are mainly situated at depths of 150–250 metres.

The quality of groundwater in Vojvodina ranges from acceptable to requiring high levels of treatment. Groundwater chemistry is characterised by an elevated content of organic substances, arsenic (map 7.1), iron and manganese.

Land

Land and soil cover

Three principal soil types characterise Serbian soil. The plains and tablelands of Vojvodina Province are characterised by organically rich black earth soils (chernozems). In the forested hills and mountains south of the Danube River, the soils tend to be less fertile and weakly acidic brown podzolics. In cultivated areas these have been enriched by the incorporation of nutrients from fodder crops and animal manures. Infertile podzol soils predominate in the mountains.

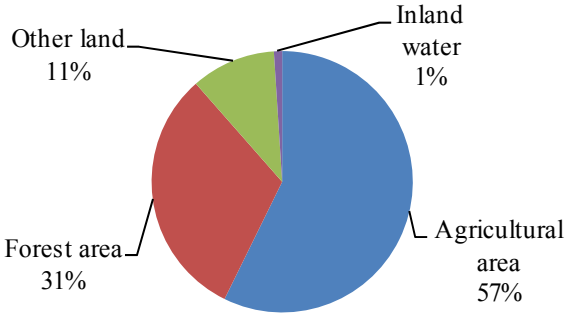
Land use

In 2011, agricultural land covered most (57 per cent) of Serbia's land area. Forests occupied the second largest area (31 per cent) and the remainder was divided between other land (11 per cent) and inland water (1 per cent). Temporary crops took up almost two thirds (60 per cent) of the agricultural area, while permanent meadows and pastures covered 29 per cent. There was virtually no change in the land use pattern between 2007 and 2011.

Soil erosion

The latest data from the Statistical Office states that 89.36 per cent of the total land area is eroded. This figure was given for the whole review period from 2007 to 2013 and is based on the available data from the last version of the erosion map of 1983. All erosion categories were included in this figure and there were no specific statistics for agricultural land erosion.

Figure I.4: Land use in 2011, per cent of land area



Source: FAO (http://faostat.fao.org/site/377/DesktopDefault.aspx?PageID=377#ancor), accessed 28.5.2014.

Biodiversity

The country's ecosystem is rich and comprises a vast amount of diverse species. Serbia is home to 39 per cent of European vascular flora species, 51 per cent of European fish fauna, 49 per cent of European reptile and amphibian fauna, 74 per cent of European bird fauna and 67 per cent of European mammal fauna.

Currently, 1,760 wild species of plants, animals and fungi are strictly protected and 853 are protected by law (Rulebook on the proclamation and protection of strictly protected and protected wild species of plants, animals and fungi (OG 5/10, 47/11)). A special form of protection relates to the species that can be endangered due to exaggerated and uncontrolled collection from nature. Currently, controlled use is allowed for 97 species. Among them are 63 plant species (2 fern species and 61 seed bearer species), 15 fungi species and 9 animal species (2 reptile species, 3 amphibian species and 4 invertebrate species).

Forests

Forest fellings increased by 26.1 per cent over the review period, from 2,247,000 m^3 in 2007 to 2,833,000 m^3 in 2011. During the same period, forest damage increased by 66.7 per cent, from 40,576 m^3 to 67,635 m^3. The main causes of forest damage have changed considerably over the years. In 2007 and 2008, illicit fellings were the biggest cause of forest damage (28.3 per cent and 31.1 per cent respectively) while natural inclement conditions caused 42.2 per cent of the damage in 2009 and 39.2 per cent in 2010. In 2011, illicit fellings and forest fires caused almost as much damage (36.4 per cent and 36.3 per cent respectively).

Flora and fauna

Serbia developed its first Red List in 1999, which contains 171 plant taxa (species and sub-species), making up about 5 per cent of the total flora in Serbia. Of that number, 4 taxa have been irreversibly lost because they were endemic only in Serbia; 46 taxa have been exterminated in Serbia, but can still be found in neighbouring areas or in ex situ conditions (botanic gardens); and 121 species are highly endangered, with high probability of disappearing from the region in the near future.

The second Red Book was published in 2003 and pertains to Serbian butterflies, analysing 57 species that represent 34 per cent of Serbian butterflies.

Protected areas

There are 474 protected areas in Serbia. The total protected surface is 531,279 ha. An additional 117 areas are within the protection procedure. The ecological network consists of 101 areas of ecological importance and ecological corridors of national and international importance, including Emerald Network and Natura 2000 sites.

Serbia has selected 61 candidate areas for the Emerald Network. These areas, which are particularly important for the protection and conservation of wild plant and animal species and their habitats, cover 1,019,269 ha, (11.54 per cent of the country's territory).

Other areas of international importance are 42 Important Bird Areas (IBAs), 62 Important Plant Areas (IPAs) and 40 Prime Butterfly Areas. Ten areas have been recognized and included in the list of wetlands of international importance (Ramsar areas), and they cover a surface of 63,919 ha. The Nature Park Golija was designated within the UNESCO programme Man and Biosphere (MAB) in 2001, together with the surroundings of Studenica Monastery, as the biosphere reserve Golija–Studenica. In 2013, the Serbian part of the future cross-border biosphere reserve Mura–Drava–Danube was nominated to UNESCO.

Table I.2: Threatened species according to IUCN and SRBIUCN status

	Number	IUCN	Serbian IUCN
Mammals	100	11	8
Aves	360	11	117
Reptilians	25	3	13
Amphibians	23	0	14
Pisces	110	12	12
Insects	..	8	79

Source: Statistical Office. Fourth Report to the United Nations Convention on Biological Diversity, 2010.

Waste

Total industrial waste generation increased by almost two and half times during the review period. The generation of 22,392 thousand tons in 2008 mushroomed to 58,390 thousand tons in 2013. The growth rate over the five-year period was 160.8 per cent.

Municipal

Municipal waste grew at the lowest rate of all waste categories, by 26.57 per cent, from 2007 to 2012. The bulk of the increase in municipal waste generation took place from 2007 to 2008 when waste generation jumped 23.19 per cent. Such a large increase was probably due to the increase in scale and quality of local government reporting on municipal waste. After 2008 and up to 2012, the growth rate was only 2.75 per cent. The amount of municipal waste collected in 2007 was 2,070 thousand tons and in 2012, 2,620 thousand tons.

Non-hazardous industrial

Almost three quarters (71.29 per cent) of all Serbian waste in 2013 was non-hazardous industrial waste. In 2008, annual generation was almost 14,065 thousand tons and in 2013, 41,628 thousand tons.

Hazardous

Over one quarter (28.70 per cent) of all waste in 2013 was hazardous waste. Hazardous waste generation expanded rapidly during the review period, increasing by 101.28 per cent, from 8,327 thousand tons in 2008 to 16,762 thousand tons in 2013. It is not clear whether this increase was caused by better reporting or was a real increase in the amount of waste.

Map I.1: Map of Serbia

Source: United Nations Cartographic Section, 2014.
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

PART I: ENVIRONMENTAL GOVERNANCE AND FINANCING

Chapter 1

LEGAL AND POLICYMAKING FRAMEWORK AND ITS PRACTICAL IMPLEMENTATION

1.1 Introduction

Since 2007, Serbia has worked further to enhance its legal and policy framework on environment and sustainable development. An important package of environmental laws was adopted in 2009 (annex IV). The package included the Law on Air Protection; Law on Nature Protection; Law on Protection from Environmental Noise; Law on Waste Management; Law on Packaging and Packaging Waste; Law on Chemicals; Law on Biocidal Products; Law on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction; Law on Non-ionizing Radiation Protection; Law on Ionizing Radiation Protection and Nuclear Safety; and Law on the Protection and Sustainable Use of Fish Stocks. It also included amendments to the Law on Environmental Protection and Law on Environmental Impact Assessment. On the basis of these laws, more than 300 subsidiary regulations have been adopted.

The country went through several major changes in its institutional framework for environmental protection. The latest occurred in April 2014 when a new Government was put in place and the Ministry of Agriculture and Environmental Protection was set up on the basis of the former Ministry of Agriculture, Forestry and Water Management and former Ministry of Energy, Development and Environmental Protection.

Serbia also went further on the path towards European integration. In March 2012, the country was granted EU candidate status. In June 2013, the European Council decided to open accession negotiations with Serbia. In September 2013, the EU–Serbia Stabilisation and Association Agreement entered into force.

1.2 Legal framework

Environment and sustainable development

Law on Environmental Protection

The 2004 Law on Environmental Protection (OG 135/04, 36/09, 72/09, 43/11) outlines principles of environmental protection and sets the framework for the system of environmental protection. For most areas covered by the Law, detailed special laws and regulations have been adopted.

The Law prescribes a strategic framework for environmental protection. It requires the development and adoption by the Government of a 10-year National Strategy for Sustainable Use of Natural Resources and Goods and of plans and programmes for every individual natural resource. It also requires the adoption of plans and programmes for the management of natural resources and goods by the Autonomous Province of Vojvodina and local self-government units. The Law prescribes the adoption by the Government of a 10-year National Programme of Environmental Protection with an Action Plan, as well as the adoption by the Autonomous Province and local self-government units of programmes and plans for environmental protection for their territories.

This strategic framework is still developing in Serbia, with the 2010 National Programme of Environmental Protection and the 2012 National Strategy for Sustainable Use of Natural Resources and Goods. The Action Plan for the National Programme, plans and programmes for individual natural resources, as well as the local plans and programmes for the management of natural resources and goods, still have to be developed. A draft law on amendments to the Law on Environmental Protection regarding environmental information and financing of environmental protection is under preparation.

Nature protection

The 2009 Law on Nature Protection (OG 36/09, 88/10, 91/10) regulates the protection and conservation of nature and biological, geological and landscape diversity, as well as nature protection measures, organization of nature protection, financing, liability, and other issues of importance to nature protection. The Law requires the adoption by the Government of a 10-year National Strategy on Nature Protection and the adoption by the Autonomous Province and local self-government units of 10-year programmes on nature protection.

Photo 1.1: Belgrade centre, Kalemegdan Park

As of March 2014, the National Biodiversity Strategy for the period 2011–2018 (OG 13/11) plays the role of a national strategy on nature protection. No programme on nature protection exists at provincial level. A few local self-government units are in the process of preparation of programmes on nature protection.

The Law also requires the development of nature status reports every five years at the national, provincial and local levels. The first national status report for the period 2010–2014 is expected to be issued in 2015.

In addition, the Law defines categories of protected natural goods, as follows:

- Protected areas (strict natural reserves, special natural reserves, national parks, natural monuments, protected habitats, landscapes of exceptional characteristics, and natural parks);
- Protected species (strictly protected wild species and protected wild species);
- Mobile protected natural documents (e.g. botanical and zoological collections).

The basics of the protection regime are defined for each category and sub-category. The Law requires that all protected natural goods be entered in the register of protected natural goods. This register is maintained by the Institute of Nature Conservation of Serbia.

The Law divides protected areas into first category (protected areas of international or national, i.e. exceptional, significance), second category (protected areas of regional, i.e. high, significance), and third category (protected areas of local significance). National parks can only be proclaimed by law. Other protected areas of the first category are proclaimed by the Government. Protected areas of the second category are proclaimed by the Government or by the competent authority of the Autonomous Province when the protected area is located in its territory. Protected areas of the third category are proclaimed by local self-government units. Every decision on proclamation is preceded by the development of a study by the Institute for Nature Conservation of Serbia or Provincial Institute for Nature Conservation. Each protected area shall have an adopted management plan and an annual management programme. Also, the Law has been amended to introduce the appropriate assessment procedure for plans and projects that are likely to have significant effect on the conservation and integrity of ecologically significant areas, i.e. the future Natura 2000 sites.

The Regulation on the ecological network (OG 102/10) lays down the manner of protecting, managing and funding of the ecological network or ecologically important areas and ecological corridors

of national and international importance, including Emerald and Natura 2000 sites. It covers 101 ecologically important areas of international and national importance. As part of the implementation of the Bern Convention on the Conservation of European Wildlife and Natural Habitats, 61 areas were identified as potential areas of special conservation interest (ASCI), most of which have been granted the status of protected areas at the national level, and a number of them are protected at the international level.

In 2010–2012, the twinning project "Strengthening administrative capacities for protected areas in Serbia (NATURA 2000)" was implemented, focusing on legislation harmonization, developing proposals for Natura 2000, strengthening institutional capacities and communication strategy.

Transboundary movement and trade of endangered species of wild flora and fauna is regulated by the Law on Nature Protection and the Rulebook on the transboundary movement and trade in protected species (OG 99/09, 06/14).

The draft law on amendments to the Law on Nature Protection regarding the ecological network, protection of wild species, transboundary trade of endangered species, financing and other issues is under preparation.

In addition, nature protection is also regulated by the Law on Game and Hunting (OG 18/10), the Law on Environmental Protection, the Law on Forests (OG 30/10, 93/12) and relevant implementing legislation adopted based on these laws, as well as Spatial Plan for the period 2010–2020 (OG 88/10).

Genetically modified organisms

In 2009, the Law on Genetically Modified Organisms (OG 41/09) replaced its 2001 predecessor and introduced a ban on trade, and growing for commercial purposes, of genetically modified organisms (GMOs) and products containing GMOs, in the territory of Serbia.

The Law regulates the use of GMOs in closed systems, deliberate release of GMOs into the environment, and handling and transport of GMOs and GMO products in connection with their use in closed systems and deliberate release. The Law introduces the obligation of informing the public and organizing public consultations in connection with applications received. The Law does not prescribe GMO labelling.

The Law vests responsibilities in the area of policy and regulation on GMOs with the ministry responsible for agriculture (now the Ministry of Agriculture and Environmental Protection). The Expert Council for Biological Safety, appointed by the minister responsible for agriculture, has to provide expert opinion to the Ministry on applications for the use in closed systems, and for deliberate release into the environment, of GMOs and GMO products.

From 2001–2009, there were four approvals of applications for deliberate release of GMOs into the environment. One application for placing GMOs on the market and one application for growing GMOs, submitted after 2009, were rejected because of the ban introduced by the 2009 Law. There are four laboratories accredited for GMO analyses. Control of GMOs at the border is done by border inspectors, and by phytosanitary inspectors inside the country. The Ministry of Agriculture and Environmental Protection keeps a register of GMOs and GMO products; however, the register is empty.

In general, reliable information on the existence of GMOs in the country seems to be lacking; furthermore, opinion is divided on the way forward. On the one hand, there are a number of initiatives to resist the penetration of GMOs into the country. In October 2013, a draft law on amendments to the 2009 Law was submitted to the Parliament, suggesting the prohibition of cultivation, production and sale of GMOs for commercial purposes in Serbia until 2020. On the other hand, in late 2013, the then Ministry of Agriculture, Forestry and Water Management drafted a new law on GMOs which would lift the ban introduced by the 2009 Law.

Until March 2014, the major regulatory responsibilities in the area of GMOs belonged to the then Ministry of Agriculture, Forestry and Water Management. The then Ministry of Energy, Development and Environmental Protection did not have any competence in the area of release of GMOs into the environment. The merging of responsibilities for agriculture and environment in the Ministry of Agriculture and Environmental Protection as of April 2014 may contribute to a more balanced approach towards GMOs. According to the 2009 Law, the Ministry of Health does not have competence in the area of GMOs in food.

Despite the ban on trade and growing for commercial purposes of GMOs prescribed by 2009 Law on GMOs, other laws, such as the Law on Seeds (OG 45/05, 30/10), Law on Forest Reproductive Material (OG 135/04, 8/05, 41/09), and Law on Food Safety

(OG 41/09) regulate the placing of GMOs on the market or trade of GMO products. The Law on Food Safety regulates the placing on the market and labelling of GM food and GM feed, as well as licensing and inspection in these areas. The officials of the Ministry of Agriculture and Environmental Protection explain that the Law on GMOs is considered a *lex specialis* (as a law that specifically regulates the area of GMOs) and therefore the ban on trade and growing for commercial purposes of GMOs and the placing on the market of GMOs and GMO products repeals the articles referring to GMOs in other laws.

Law on Air Protection

The 2009 Law on Air Protection (OG 36/09, 10/13) defines measures for the protection and improvement of air quality. It regulates air quality monitoring, responsibilities and financing in the field of air quality protection. The Law requires the development of a six-year air protection strategy and action plan as key national policy documents. The 2013 amendments to the Law extended the deadline for adoption of the air protection strategy from 2011 to 2015.

The Law requires the adoption of air quality plans for zones and agglomerations where the air is excessively polluted. In 2013, the Air Quality Plan for Bor was adopted (OG Bor 7/13), as Bor has a third category of air quality (sulphur dioxide levels drastically exceed the limit values in the ambient air due to mining activity). The work is ongoing to prepare a local plan for Belgrade. The Law also envisages the development of a national plan for reduction of emissions from existing combustion plants. The work to develop such a plan is expected to intensify following the decisions of the 11th Energy Community Ministerial Council (October 2013).

Relevant bylaws regulate specific requirements such as the establishment of zones and agglomerations on the territory of Serbia, establishment of a national network of air quality monitoring, data quality assurance, emission of air pollutants, etc. (annex IV).

Law on Chemicals

The 2009 Law on Chemicals (OG 36/09, 88/10, 92/11, 93/12) regulates integrated chemicals management; classification, packaging and labelling of chemicals; the placing on the market and use of chemicals; import and export of certain hazardous chemicals; systematic monitoring of chemicals; data availability; supervision; and other issues of importance for chemicals management.

The Law provides for the establishment of the Chemicals Agency as a regulatory organization for the management of chemicals and biocidal products. The Agency, operational since 2009, was abolished in 2012. Its functions were transferred to the Ministry of Energy, Development and Environmental Protection, with staff reduced from 42 to 21 employees by the act on organization and systematization of posts of the Ministry adopted in April 2013. Since April 2014, chemicals and biocidal products management is within the competence of the Ministry of Agriculture and Environmental Protection, where 21 posts are envisaged within the Division of Chemicals (as of April 2014, 14 employees are engaged). This limited capacity responsible for the implementation of ambitious tasks, initially envisaged for the Chemicals Agency, is the major obstacle to full-scale implementation of the Law on Chemicals and the Law on Biocidal Products (OG 36/09, 88/10, 92/11).

In accordance with the Law, the Ministry of Energy, Development and Environmental Protection maintained the Integrated Chemicals Registry, which should now be in the competence of the Ministry of Agriculture and Environmental Protection. The Law provides for the establishment of a joint body for integrated chemicals management, consisting of government representatives, industry, scientific organizations and non-governmental organizations (NGOs), to ensure a strategic approach to and draft policy documents on chemicals management. The joint body was not established.

The main strategic document envisaged by the Law – the Integrated Chemicals Management Programme – was not developed. The main policy documents on chemicals management are the 2006 National Profile for Chemicals Management, updated in 2008, and the 2009 National Implementation Plan for the Stockholm Convention.

The draft law on amendments to the Law on Chemicals regarding the economic instruments, and splitting competences among competent inspections, is expected to be adopted in 2015.

Law on Biocidal Products

The 2009 Law on Biocidal Products regulates procedures for the issuing of the acts on the basis of which biocidal products can be placed on the market; classification, import and safe use of biocidal products; bans and restrictions on the placing on the

market and use of biocidal products; research and development of biocidal products; registry of biocidal products; and other issues. After the abolition of the Chemicals Agency, the capacity to implement this Law remains a challenge.

The draft law on amendments to the Law on Biocidal Products regarding relevant economic instruments, institutional competences, and delineating competences among inspections, is expected to be adopted in 2015.

Law on Waste Management

The 2009 Law on Waste Management (OG 36/09, 88/10) regulates types and classification of waste, waste management planning, responsibilities and obligations in waste management, specific waste streams management, transboundary movement of waste, waste management funding, monitoring and other relevant issues regarding waste management. The Law outlines strategic and planning documents to be enacted in the country, such as the National Waste Management Strategy, national plans for specific waste streams, regional (at the level of two or more local self-government units) and local (at the level of local self-government units) waste management plans.

The National Waste Management Strategy was adopted in 2003 and revised in 2010. Five draft national plans for specific waste streams (health-care waste; waste oil; waste containing asbestos; waste from batteries and accumulators; electrical and electronic equipment waste) have been prepared. The Law gives responsibilities to local self-government units in the area of non-hazardous waste management, including issuing permits for collection, transport, storage, treatment and disposal. It also requires local self-government units to develop local waste management plans and projects for rehabilitation of unregulated landfills. For financing of waste management, the Law prescribes the use of the Environmental Protection Fund (abolished in 2012). According to the National Plan for the Adoption of the *Acquis* for the period 2013–2016, it is planned to adopt a new Law on Waste Management.

Law on Packaging and Packaging Waste

The 2009 Law on Packaging and Packaging Waste (OG 36/09) regulates the management of packaging and packaging waste, reporting on packaging and packaging waste, economic instruments and other issues. In accordance with the requirements of this Law, national goals on packaging waste were established in the plan on the reduction of packaging waste, adopted in 2009 (the Regulation on establishing the plan on the reduction of packaging waste for the period 2010–2014 (OG 88/09)). The Regulation on establishing the plan on the reduction of packaging waste for the period 2015–2019 was adopted in December 2014.

Law on Integrated Environmental Pollution Prevention and Control

The 2004 Law on Integrated Environmental Pollution Prevention and Control (IPPC Law) (OG 135/04) regulates conditions and procedures for granting integrated permits to existing and new installations. The competent authorities for granting the permit are the ministry responsible for environmental protection (as of April 2014, the Ministry of Agriculture and Environmental Protection), and the provincial and local self-government authorities responsible for environmental protection, depending on the level at which the permit or consent for construction and commencement of operation of an installation is issued. The Law provides that permits for existing installations should be obtained by the end of 2015.

In 2005, the Government approved the Regulation on type of activities and installations to be issued an integrated permit (OG 84/05). In 2008, it adopted the Regulation on determination of integrated permit application submission dynamics programme (OG 108/08). The latter defined time periods for applications to be submitted by facilities from those industries which had a plan; by March 2014, all existing installations were to submit applications. As of March 2014, only nine integrated pollution prevention and control (IPPC) permits had been issued (chapter 2).

In 2013, amendments were initiated by the Government to extend the 2015 deadline for existing installations to obtain IPPC permits to 2020. In addition, the amendments refer to harmonization of the provisions related to the commencement of operation of facilities required to obtain the integrated permit with the Law on Planning and Construction (OG 72/09, 81/09, 64/10, 24/11, 121/12, 42/13, 50/13, 54/13).

Law on Waters

The 2010 Law on Waters (OG 30/10, 93/12), replacing its 1991 predecessor, regulates the legal status of waters, integrated water management, the management of water infrastructure, status of water land and financing of water sector activities. There

are seven water districts defined in accordance with both hydrological and administrative boundaries (chapter 7).

The Law defines planning documents to be adopted in the water sector: the water management strategy; water management plans for the Danube River Basin and for each water district; annual water management programme; and plans which address protection against the adverse effects of water, including the flood risk management plan, the general flood defence plan, the operational flood defence action plan, as well as the plan of water protection from pollution and the monitoring programme. Most of these should have been adopted within two years since the entry into force of the Law but are still in the process of elaboration. The same situation pertains for the by-laws, some of which are still to be adopted.

The Law entrusts the ministry responsible for water with input from public water management companies to establish and maintain a water information system, in order to ensure the availability of updated information on water status, water documentation and measures related to water management. The software for the water information system was developed in 2007–2009; however, the system still needs to be enriched in terms of its content, and accessibility of the system to a wider range of users needs to be ensured.

Provisions of the Law reflect on the multiplicity of institutions with responsibilities in the water sector. While the ministry responsible for water has a leading role in developing policy on water management at national level, a number of responsibilities are vested not only with the ministry responsible for environmental protection, the ministry responsible for health, the Hydrometeorological Service (HMS), Serbian Environmental Protection Agency (SEPA) and public water management companies, but also with ministries responsible for internal affairs, for transportation, for tourism affairs, for geological affairs, for science, for financial/taxation issues and for a few other matters. In a number of cases, the Law vests one task in several ministries (e.g. the ministers responsible for water, for environmental protection and for health shall establish, by mutual consent, the criteria for the designation of protected areas in a water district), while, in other cases, a task that could involve several ministries is given only to the ministry responsible for agriculture (e.g. to deliver the water management strategy and monitor its implementation, or to stipulate criteria for the designation of erosion areas). The creation of the Ministry of Agriculture and Environmental Protection in May 2014 can contribute, to a certain degree, to improved coordination in implementation of the Law.

The Law provides for the establishment by the minister responsible for water of a water council as a technical professional advisory body to provide opinions on draft legislation and planning documents, and also the establishment by the Government of a national conference on water, with participation of local self-government units, water users and NGOs, to take part in water management planning. As of April 2014, no water council had been created. A Decision on the establishment of a national conference on water (OG 55/11) was adopted in 2011; however, its members were not appointed.

Law on Ionizing Radiation Protection and Nuclear Safety

The 2009 Law on Ionizing Radiation Protection and Nuclear Safety (OG 36/09, 93/12), replacing its 1996 predecessor, prohibits the import of radioactive waste and spent nuclear fuels of foreign origin, as well as installation of radioactive lightning rods and installation of ionizing smoke detectors with an ionizing radiation source in a gaseous state or an ionizing radiation source whose decay products are in a gaseous state. The Law envisages the establishment of the Serbian Radiation Protection and Nuclear Safety Agency. The Agency became operational in 2009.

The Law requires the adoption by the Government of the Radiation Safety and Security Programme, Radioactive Waste Management Programme, and Nuclear Safety and Security Programme. The latter was adopted in 2014 (OG 39/14).

The programme of additional training and qualification of occupationally exposed persons has not yet been developed. A national emergency plan is in the final phase of adoption.

Law on Non-Ionizing Radiation Protection

Legislative requirements and measures to protect human health and the environment from the harmful effects of non-ionizing radiation were introduced through the adoption of the 2009 Law on Non-ionizing Radiation Protection (OG 36/09), accompanied by six rulebooks (OG 104/09, annex IV). Protection from occupational exposure to non-ionizing radiation sources is not covered by this Law. Supervision over the implementation of the Law and related regulations is done by environmental

inspectors. The Autonomous Province is entrusted to perform inspection of the sources of non-ionizing radiation on its territory. Local self-government units are entrusted with the inspection of the sources of non-ionizing radiation for which a building permit is issued at the local level.

The Rulebook on limits of exposure to non-ionizing radiation (OG 104/09) prescribes exposure limits for non-ionizing radiation, as well as basic and reference threshold values for population exposure to electric, magnetic and electromagnetic fields of different frequencies, based on Council Recommendation 1999/519/EC on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz), and recommendations of the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

SEPA maintains records and prepares a database of sources of non-ionizing radiation of particular interest, which is envisaged to become part of the National Register of Pollution Sources (chapter 4) from 2016.

In 2011, Serbia carried out the programme of systematic testing of non-ionizing radiation in the environment in accordance with the Regulation on the Implementation Programme of systematic testing of non-ionizing radiation in the environment for the period 2011–2012 (OG 102/10). A new programme was approved for 2013–2014 (Regulation on the Implementation Programme of systematic testing of non-ionizing radiation in the environment for the period 2013–2014, OG 35/13).

Environmental Noise

The 2009 Law on Protection from Environmental Noise (OG 36/09, 88/10) envisages measures for the assessment and improvement of the situation concerning environmental noise. The 2010 amendments postpone deadlines for the preparation of strategic noise maps for the first round (major agglomerations, roads, railroads and airports) from mid-2012 to mid-2015, and for the second round (other agglomerations, roads, railroads and airports of stipulated size) from the end of 2017 to the end of 2020. The adoption of action plans for protection against environmental noise for roads, air and railway traffic, as well as for agglomerations and locally permitted IPPC installations, is further postponed to one year after the adoption of strategic noise maps.

In addition, protection from environmental noise is also regulated by, among other instruments, the Regulation on noise indicators, limit values, methods for evaluation of noise indicators, disturbance and adverse effects of environmental noise (OG 75/10), Rulebook on the content and methods of developing strategic noise maps and their display in public (OG 80/10) and Rulebook on the methodology for the development of action plans (OG 72/10).

The Law on Air Transport (OG 73/10, 57/11, 93/12) prescribes measures to reduce noise emissions from aviation. The Rulebook on classification of motor vehicles and trailers, and their traffic technical specifications (OG 40/12, 102/12, 19/13, 41/13) regulates noise emissions in road transport.

Law on the Protection and Sustainable Use of Fish Stocks

The Law on the Protection and Sustainable Use of Fish Stocks (OG 36/09, 32/13) regulates the management of fish resources in fishing waters, fishing, trade in fish, and preservation and protection of fish resources.

Environment-related provisions in sectoral laws

Agriculture

According to the 2009 Law on Agriculture and Rural Development (OG 41/09, 10/13), protecting the environment from the adverse effects of agricultural production fulfils one of the five goals of the agricultural and rural development policy.

The 2013 Law on Incentives in Agriculture and Rural Development (OG 10/13) requires recipients of incentives to comply with regulations governing standards of environmental quality and public health. It provides for incentives for the implementation of agro-environmental measures, incentives for organic production and incentives to compensate for lost income as a result of the implementation of policies to protect the environment.

Energy

The 2011 Law on Energy (OG 57/11, 80/11, 93/12, 124/12) defines the long-term goals of the energy policy in Serbia, including the reliable, safe and high-quality supply of energy, sustainable development of the energy system and provision of conditions for the improvement of energy efficiency. The Law defines basic planning documents in the energy sector: Energy Sector Development Strategy with Programme of Implementation, annual Energy Balance and 10-year National Renewable Energy Action Plan. It regulates licensing and permitting in

the energy sector, as well as energy pricing. The Law envisages the establishment of an Energy Agency as a regulatory body which develops methodology for the pricing of electricity for public supply and issues licences for energy activities. As of March 2014, a new law on energy has been drafted by the Ministry of Energy, Development and Environmental Protection; among other things, it is expected to strengthen the regulation of renewable energy sources (RES).

The 2013 Law on Efficient Use of Energy (OG 25/13) describes the objectives of energy efficiency policy and defines major planning documents in this area. It regulates minimum requirements of energy efficiency in the production, transmission and distribution of energy, as well as financing and incentives for energy efficiency.

The Law requires the adoption on the basis of a national energy sector development strategy of a three-year action plan on energy efficiency. The Law introduces a number of obligations at the local level, e.g. the adoption of three-year local energy efficiency programmes by Vojvodina Province and local self-government units.

The Law envisages the establishment of a budget fund for the improvement of energy efficiency for recording funds earmarked for the financing of energy efficiency activities. The budget fund began to operate from January 2014 according to the Decision on the opening of a budget fund for the improvement of energy efficiency (OG 92/13) and the Programme for Financing of Activities and Measures for the Improvement of Energy Efficiency in 2014 (OG 4/14, 27/14). The Law introduces the concept of an energy service company – a legal entity that delivers energy services in order to improve energy efficiency in a user's facility or premises, and accepts some degree of financial risk related to the repayment of investments through the achieved savings in energy costs. No energy service company has yet been created. A number of companies are interested in becoming specialized in this area.

Law on Tourism

The Law on Tourism (OG 36/09, 88/10, 99/11, 93/12) regulates tourism planning and development. It stipulates the procedure for designation of tourist areas. The proposal for designation of a tourist area should include information about the state of the environment. Any part of a tourist area which at the same time includes a protected area will be subject to the protection regime and interior organization in compliance with legislation on protected areas.

Implementation of laws

The law-making process in Serbia frequently takes place without the simultaneous development of bylaws. The necessary capacities and resources are often not in place to ensure immediate implementation, and time is required for institutional structures to adjust to new responsibilities, especially in the context of frequent institutional reforms. Following delays in the adoption of secondary legislation, and in view of the lack of appropriate guidance and training in some areas (air quality, nature protection, and industrial emissions), further delays in implementation take place at provincial and local levels.

1.3 Policy framework

EU accession process documents

National Plan for the Adoption of the *Acquis* for the period 2013–2016

The 2008 National Programme for Integration with the EU for the period 2008–2012 (NPI) was the first comprehensive programme for the harmonization of Serbian legislation with EU law. The NPI was 88 per cent implemented. In February 2013, a new multi-annual programme was adopted – the National Plan for the Adoption of the *Acquis* for the period 2013–2016 (NPAA). For each negotiating chapter, NPAA describes the status of legislation and potential and planned institutional measures, as well as providing an overview of current and planned financial aid. In the area of environment, NPAA envisages the adoption of new laws on GMOs, on waste management, on mineral exploration and mining, and on biocidal products.

NPAA also envisages the adoption of amendments to the Laws on Air Protection, on Waters, on Nature Protection and on Chemicals. With regard to strategic planning, NPAA foresees the adoption of the action plan for the National Environmental Protection Programme (OG 12/10), the integrated strategy for the establishment of a national system of environmental monitoring, the strategy to combat climate change with an action plan, the water management strategy, the water management plan for the Danube River Basin and plans for specific waste streams.

National Environmental Approximation Strategy

The 2011 National Environmental Approximation Strategy (OG 80/11) sets three goals: full and high-

quality transposition of the EU environmental *acquis*; maintenance of effective and affordable environmental infrastructure and services; and institutional arrangements for efficient approximation. The Strategy describes approximation efforts by sector. Furthermore, the Strategy includes a review of economic instruments and financial mechanisms for environmental protection, which are necessary for domestic and foreign investments. It recognizes the need for institutional reforms, legislation development and strengthening of implementation of environmental legislation at all levels, as well as education and public awareness on environmental issues.

Strategic documents on environment and sustainable development

National Strategy for Sustainable Development

The 2008 National Strategy for Sustainable Development (OG 57/08) (NSSD) defines sustainable development as a goal-oriented, long-term, continuous, comprehensive and synergic process affecting all aspects of life (economic, social, environmental and institutional) at all levels. NSSD identifies five national priorities: membership in the EU; development of a competitive market economy and balanced economic growth; development of human resources and increased employment; development of infrastructure and balanced regional development; and protection and promotion of the environment and achieving rational use of natural resources.

The Action Plan for the implementation of the Strategy for the period 2009–2017 defines in more detail measures and activities, as well as institutions in charge of implementation. It also includes deadlines for implementation, costs and sources of funding, as well as indicators for the monitoring of implementation.

The Strategy is integrated into other programmes and strategies, including sectoral ones. A number of its measures have already been implemented, although with some delays. No assessment of the Strategy's implementation has taken place since the second progress report on its implementation (2010).

Originally, the Strategy was drafted under the auspices of the Office of the Deputy Prime Minister. In accordance with the Strategy, the responsibility for monitoring and coordination of its implementation is vested in the Office for Sustainable Development. As of March 2014, the Office for Sustainable Development of Underdeveloped Areas under the jurisdiction of the Minister without Portfolio had a strong focus on regional development; it did not regularly monitor the Strategy's implementation except for the issues of sustainable development of underdeveloped regions. The Strategy suffers from the absence of an institution clearly in charge of coordinating its implementation and monitoring.

National Environmental Protection Programme

The 10-year 2010 National Environmental Protection Programme (NEPP) includes an assessment of the state of the environment and defines policy objectives, measures for implementation, implementing institutions and needed resources. The development and implementation of the NEPP is based on the following policy principles: sustainable development; preservation of natural resources; compensation of damage to nature; integration of environmental protection into sectoral policies; the polluter-pays and user-pays principles; application of economic and other incentives; subsidiarity; prevention and precaution; awareness-raising; access to information and public participation; liability of polluter or legal successor; right to a healthy environment and access to justice; and approximation with the EU environmental legislation.

Policy objectives of the NEPP include the adoption of strategic and planning documents on environmental protection, integration of environmental policy with economic and other sectoral policies, and strengthening of institutional capacity for development and enforcement of environmental policies. For each environmental protection medium and for sectoral policies, the Programme describes short-term (2010–2014), ongoing (2010–2019) and mid-term (2015–2019) objectives. The Programme envisages profound reforms of regulatory instruments, the monitoring and information system, economic instruments and environmental financing.

While, in some areas (e.g. development of legislation), progress has been made, for some key measures of the NEPP (e.g. strengthening the Environmental Protection Fund) implementation moved backwards. The ministry responsible for environmental protection was supposed to prepare a five-year action plan for the Programme to be adopted by the Government. As of March 2014, no action plan had been prepared. Also, reports on the NEPP's implementation had to be submitted every two years; however, no reporting took place.

National Strategy for Sustainable Use of Natural Resources and Goods

The 2012 National Strategy for Sustainable Use of Natural Resources and Goods defines a framework for the sustainable use and protection of natural resources with the aim of supporting socioeconomic development up to 2020 and beyond. The main goal is to ensure sustainable economic development by the efficient use of natural resources while simultaneously reducing negative impacts on the environment. The Strategy covers mineral resources, RES, forests and their resources, protected areas, biodiversity, landscape diversity, fish, water and land resources. For each area, the Strategy describes the existing legal, strategic and institutional framework, names general and specific policy objectives and states the indicators of achieving their sustainable use. The Strategy is to be implemented through plans, programmes and master plans for each of the natural resources to be adopted by the Government.

Waste

The 2003 National Waste Management Strategy for the period 2003–2008 was revised and adopted in 2010 as the National Waste Management Strategy for the period 2010–2019 (OG 29/10). In the process of revision, assessment of the implementation of priority measures during 2003–2008 was performed. The assessment showed that many institutional and legislative measures from the 2003 Strategy were implemented; however, a number of technical, operational and economic measures, as well as measures on improving public awareness, remained to be implemented.

The 2010 Strategy sets out the following principles: a regional approach to waste management, precaution, the polluter-pays principle, implementation of the best practical environmental options, and producer's responsibility. It also sets 12 short-term objectives (for 2010–2014) and six long-term objectives (for 2015–2019). The implementation of all short-term objectives is still ongoing, including the development of regional and local waste management plans, establishment of 12 regional centres for waste management and improvement of the sanitary conditions of current waste areas. Implementation of some of the long-term objectives has started.

Contrary to many other strategic documents in Serbia, the 2010 Strategy includes a list of indicators and an action plan (for the period 2010–2014). However, despite the requirement of the Law on Waste Management to prepare annual reports on implementation of the Strategy, no such reports were prepared. The Strategy is expected to undergo a revision in 2015 as required by the Law on Waste Management.

Water

The major strategic document in the water sector is the 2002 10-year Water Masterplan (OG 11/02), which is still used. Serbia has a General Plan for Flood Protection for the period 2012–2018 (OG 23/12) and adopts annual operational plans for flood protection. Every year the Government adopts a water management programme. The Water Management Programme for 2014 (OG 24/14) prescribes how funds of the Water Fund are to be used for the improvement of regional water supply systems, pollution prevention, protection from harmful effects of water, preparation of planning documents, implementation of projects and the participation of Serbia in international cooperation on water. The Water Fund does not have direct financing by water taxes and revenues from water pollution fees, since the earmarking of revenues from water pollution fees for financing of water protection measures was abolished in 2012.

The development of the national water management strategy has started. As of March 2014, the draft strategy was undergoing a strategic environmental assessment (SEA). The new strategy will set targets, priorities and measures for the development of the water sector until 2030 and will replace the 2002 Water Masterplan.

It is expected to cover both water management and water supply and sanitation. Other strategic documents envisaged by the Law on Waters, in particular the water management plan for the Danube River Basin, water management plans for seven water districts, flood risk management plan and plan of water protection from pollution, are to be adopted after the strategy. Some deadlines set by the Law on Waters for adoption of the above documents have already passed.

Biodiversity Strategy for the period 2011–2018

The 2011 National Biodiversity Strategy for the period 2011–2018 is one of the main instruments for the implementation of the Convention on Biological Diversity at the national level. The Strategy provides an overview of biological diversity and the system for the protection of biodiversity. It describes basic principles for biodiversity protection, as well as the institutional, legislative and financial framework for the conservation of biodiversity.

The Strategy identifies direct threats to biodiversity and provides detailed analyses of sectoral impacts on biodiversity from agriculture, forestry, water management, transport, mining, fishing and hunting. One of the goals of the Strategy is the integration of biodiversity conservation into other sectors, through integration of the principles of conservation of biodiversity and sustainable utilization into sectoral policies, plans and programmes.

The Strategy and its Action Plan define 11 strategic areas and 28 objectives for protection of biodiversity in line with national needs and capacities, and lists 140 different activities to support the achievement of the objectives. The review of implementation of the Strategy started in 2013 with a questionnaire disseminated by the Ministry of Energy, Development and Environmental Protection to relevant stakeholders. In accordance with decision X/2 of the 2010 Conference of the Parties to the Convention on Biological Diversity, a review of the Biodiversity Strategy has started (chapter 5). In 2014, a multisectoral working group was established to revise the Strategy.

Spatial planning

The 2009 Spatial Planning Strategy for the period 2009–2013–2020 describes the vision, principles and objectives of spatial planning. It places an emphasis on the achievement of sustainable and integrated spatial development, with special attention to nature protection and sustainable use of natural resources. The Strategy makes cross-references to other strategic documents, in particular those on regional development, agriculture, energy, forestry and waste management. The objectives of the 2010 Spatial Plan for the period 2010–2020 (OG 88/10) include balanced regional development and improved social cohesion, promotion of regional competitiveness and accessibility, sustainable use of natural resources and protected areas, and protection and sustainable use of natural and cultural heritage and landscape. The Plan identifies as a strategic priority until 2014 the increase of the total area under protection to 10 per cent of the territory of Serbia, and also forecasts an increase to 12 per cent by 2021. Among its priority projects, the Plan names the identification of areas for Natura 2000. The Plan is implemented through the 2011 Programme of Implementation of the Spatial Plan for the period 2011–2015. The Plan serves as a basis for preparation of local spatial plans.

Environment and health

The draft national environment and health action plan (NEHAP) was developed in 2003 but never adopted. The Children's Environment and Health Action Plan (CEHAP) for the period 2010–2019 (OG 83/09) was adopted by the Government in 2009. It includes measures and activities related to four regional priority goals of the Children's Environment and Health Action Plan for Europe: water and sanitation; accidents, injuries and physical activity; air quality; and chemical, physical and biological substances and occupational health. No financial resources were allocated for implementation of CEHAP. Some measures were eventually implemented but no targeted effort on implementation took place.

Also, no review of implementation has been undertaken. Many problematic areas targeted by CEHAP (e.g. regulating indoor air quality in public buildings) remain highly relevant. Since Serbia has accepted the declarations of the Amsterdam (2009) and Paris (2014) high-level meetings of the Transport, Health and Environment Pan-European Programme (THE PEP), it is envisaged to focus, as a priority activity, on the development of the National Transport, Health and Environment Action Plan; this may include the redrafting of the existing CEHAP.

Strategic documents on economic and social development

The 2003 National Strategy for Poverty Reduction expired in 2009. Although the number of the poor population in Serbia was reduced by half in the period 2002–2007, according to the Office of the Minister without Portfolio in charge of European Integration, more than 500,000 citizens still live below the absolute poverty line. In 2011, the Government prepared the First National Report on Social Inclusion and Poverty Reduction.

The report addressed poverty trends in the period 2008–2010 and highlighted the Government's commitment to adapting the reforms foreseen in the following three years to the new challenges imposed by the economic crises, as well as aligning next steps with the Europe 2020 Strategy goals. As of April 2014, the Second National Report on Social Inclusion and Poverty Reduction for the period 2011–2014 is under development.

Sectoral development with a possible impact on environment

Energy

The 2005 Energy Sector Development Strategy until 2015 (OG 44/05) identified five priorities: continuous technological modernization of the existing energy facilities; economical use of quality energy products

and increase of energy efficiency in the production, distribution and use of energy; new RES and more energy-efficient and environmentally acceptable technologies; investments in new power sources, with new gas technologies (combined gas–steam thermal energy installations); and constructing new energy infrastructure facilities and electric and thermal power sources. The Strategy's implementation is supported by the 2007 Programme of Implementation of the Energy Sector Development Strategy until 2015 for the period 2007–2012 (OG 17/07, 73/07, 99/09).

The 2013 Report on Implementation of the 2005 Energy Sector Development Strategy until 2015, prepared in the process of development of the new Energy Sector Development Strategy for the period until 2025 with projections to 2030, recognizes that the 2005 Strategy was based on many assumptions that did not materialize. Also, it was prepared before Serbia signed the Energy Community Treaty in 2006. There has been very modest progress achieved in the second priority area of the Strategy – increase of energy efficiency in the production, distribution and use of energy. As far as the use of RES and new energy-efficient and environmentally friendly technologies is concerned, some legislation has been introduced and a number of wind and hydropower projects are in progress. The 2005 Strategy recommended the creation of an advisory Energy Council; however, no such body was established.

In 2013, the Ministry of Energy, Development and Environmental Protection started drafting the Energy Sector Development Strategy for the period until 2025 with projections to 2030, to replace the 2005 Strategy. In January 2014, the draft was approved by the Government; adoption by the Parliament is envisaged for 2014. The new Strategy identifies three priorities for the development of the energy sector: provision of energy security, energy market development, and overall transition towards a sustainable energy sector. The third includes improvement of energy efficiency, an increase in RES and promotion of environmental protection in all fields of energy activities. The new Strategy is not expected to be accompanied by an action plan.

The 2013 National Renewable Energy Action Plan (NREAP) is intended to guide the country in reaching the target of 27 per cent of RES in its gross final energy consumption in 2020, agreed through the decision of the Council of Ministers of the Energy Community of October 2012. Pursuant to the Energy Balance for 2011, the share of RES in gross final energy consumption in Serbia amounted to 21.2 per cent. The NREAP sets national goals for the share of energy from RES in transport, electricity, and heating and cooling.

Serbia has had two strategic documents on energy efficiency: the 2010 First Energy Efficiency Action Plan for the period 2010–2012 and the 2013 Second Energy Efficiency Action Plan for the period 2013–2015. A report on implementation of the First Action Plan in 2010–2011 was prepared in 2012. An overall assessment of implementation of the First Action Plan is part of the Second Action Plan. It shows that very few measures were fully implemented because of an insufficient legal framework, the lack of satisfactory financial instruments and the general state of the economy. A chapter on energy efficiency is part of the draft Energy Sector Development Strategy for the period until 2025 with projections to 2030.

Serbia also had a 2010 Biomass Action Plan for the period 2010–2012 (OG 56/10) which became outdated with the adoption in 2013 of the NREAP. No implementation report was prepared for the Biomass Action Plan.

Agriculture

The 2005 Agriculture Development Strategy (OG 78/05) stresses the importance of biodiversity conservation, particularly in relation to the conservation and management of forests, as well as the need for conservation of agro-biodiversity and plant and animal genetic resources. Another strategic document, the Strategy for Agriculture and Rural Development for the period 2014–2024 (OG 85/14), has recently been adopted.

Transport

The development and rationalization of the transport network in Serbia, respecting sustainable development principles, and decreasing the negative impact of transport on the environment, are two of seven general goals of the 2008 Strategy of Railway, Road, Inland Waterway, Air and Intermodal Transport Development for the period 2008–2015. Its Action Plan provides for such measures as a decrease in the negative impact of all transport modes on the environment (i.e. air pollution, noise and causes of global warming), renewal of the rolling stock by stimulation of environmentally acceptable transport technology, and a decrease in energy consumption in transport.

The Waterborne Transport Development Strategy for the period 2015–2025 (3/15) underlines the importance of fleet modernization and river

infrastructure development with an emphasis on common navigation and ecological needs. It recognizes the importance of ship waste management (chapter 8). The Strategy takes into account the national environmental legislation, EU legislation and relevant international agreements, recommendations and guidelines.

Forestry

According to the 2010 Spatial Plan for the period 2010–2020, optimal forestation would be 41 per cent of the territory of the country (currently 29.1 per cent). The 2006 Forestry Development Strategy includes a number of objectives aimed at enhancing the environmental and sustainable development functions of forests. It calls for enhancement of sustainable management of forests in the protected areas; conservation and sustainable use of forest; conservation and improvement of the genetic potential, quantity and quality of game populations; and development of a sustainable and economically efficient wood industry. The Strategy was supposed to be implemented through the development of a national forestry development programme which was to include concrete actions and measures. As of March 2014, no such programme had been adopted, although a draft was prepared by the Ministry of Agriculture, Forestry and Water Management. The budgetary Forest Fund was established by the Law on Forests in 2010.

Subnational policy documents

The Law on Environmental Protection stipulates the obligation of the Autonomous Province and local self-government units to adopt two major categories of policy documents: (i) provincial and local plans and programmes for management of natural resources and goods, in accordance with the 2009 Spatial Planning Strategy and the 2012 National Strategy for Sustainable Use of Natural Resources and Goods; and (ii) provincial and local programmes for environmental protection, namely local action and rehabilitation plans, in accordance with the 2010 National Environmental Protection Programme.

Awareness about these obligations at local level is limited – on the contrary, there is a widespread opinion that local authorities do not have any obligation to adopt local environmental action plans.

Another issue is poor capacity to develop strategic documents at the local level. For example, in Belgrade, where capacity is rather strong (figure 1.2), despite the existence of a number of local sectoral strategies (Energy Sector Development Strategy, Strategy on Afforestation, Trade Development Strategy until 2015, Tourism Development Strategy until 2018, Agriculture Development Strategy until 2015) and of the Development Strategy of Belgrade which includes some environmental aspects, the only strategic document in the area of environment is the Waste Management Plan for the period 2011–2020. The draft programme on environmental protection in Belgrade accompanied by an action plan has been under elaboration since 2012. Five of the 17 municipalities of Belgrade have local environmental action plans; the others decided to refrain from adoption of local environmental action plans until the adoption of the programme on environmental protection of Belgrade. An action plan for the improvement of air quality in Belgrade is under development.

Implementation of strategic documents

The development and adoption of many strategic documents required by respective laws is delayed. Implementation of strategic documents is often difficult to assess, since reports on implementation are lacking. Often, no reporting takes place despite the requirements of respective laws. Sometimes, regular reporting is not envisaged by law. In most cases, strategies are prepared and adopted without the simultaneous development and adoption of action plans, which leads to further delays in implementation. Where action plans are prepared, they often lack sufficient detail and are not accompanied by allocation of adequate resources.

There has been progress in integrating environmental considerations into sectoral strategic and planning documents, although the latter remain not comprehensive in addressing all impacts of individual sectors on the environment. Such integration at a conceptual level was achieved largely through participation of the ministry responsible for environmental protection in the development of sectoral strategic and planning documents. However, the actual integration of environmental considerations within implementation of sectoral strategic and planning documents is not yet the case.

1.4 Strategic Environmental Assessment

Legal framework

Since 2007, Serbia has gained extensive experience in implementing the 2004 Law on Strategic Environmental Impact Assessment (OG 135/04, 88/10). The amended Law requires SEA for all plans, programmes, master plans and strategies in areas listed by the Law that set the frameworks for granting

approval for future development projects as defined by environmental impact assessment (EIA)-related regulations. SEA may also be required for plans and programmes in areas other than those listed by the Law where there is a possibility of significant impact on the environment. The Law does not explicitly include mining in the list of areas where SEA is required. Such a requirement is not prescribed by Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment, but follows for Serbia from the 2003 Protocol on Strategic Environmental Assessment, which includes mining in the list of areas in which SEA is mandatory.

The Law describes three main stages of the SEA procedure:

- The preparation stage (development of the decision on SEA elaboration (so-called screening), including participation of authorities and organisations concerned, and the selection of the SEA developer);
- Development of the SEA report;
- The decision-making procedure (covering the participation of authorities and organizations and the public concerned, and preparation of the report on the results of such participation, evaluation of the SEA report on the basis of criteria set out in Appendix II of the Law, and approval of the SEA report by the competent environmental protection authority).

The Law further specifies that the competent environmental protection authority and other authorities and organizations concerned are to be consulted on the decision about SEA elaboration and on the SEA report. The Law does not specifically name the health authorities as subjects of such consultations, although the Protocol on SEA requires the opinion of health authorities in such cases. In practice, health authorities are consulted as concerned authorities.

The ministry responsible for environmental protection is the competent authority for plans or programmes developed by a ministry, i.e. at national level. For plans or programmes developed by the authorities of Vojvodina, the Provincial Secretariat for Urban Planning, Construction and Environmental Protection (PSUPCEP) is responsible for SEA. For plans or programmes developed by local self-government authorities, the competent authority is the environmental protection authority of the local self-government unit.

The requirements to conduct SEA are included in some other laws (e.g. Laws on Waters, on Nature Protection, and on Ionizing Radiation Protection and Nuclear Safety), which helps to ensure the actual performance of SEA in relevant areas.

Implementation

The 2010 amendments to the Law explicitly included "master plans" and "strategies" as requiring SEA, along with "plans" and "programmes". As of March 2014, SEA has been made for one national strategy – the draft Energy Sector Development Strategy for the period until 2025 with projections to 2030. SEA for the draft water management strategy is in progress. According to the 2014 Serbian report on the implementation of the Protocol on SEA in the period 2010–2012, Serbia does not apply SEA to "policies" because in Serbia the highest level of planning documents are "strategies".

In order to improve implementation, the 2010 amendments also stipulate that the minister responsible for environmental protection should issue the list of plans and programmes for which SEA is mandatory and the list of plans and programmes for which SEA may be required. This would provide guidance to sectoral authorities as to when to initiate an SEA. Draft lists were developed and circulated among other ministries; however, they were never finalized and adopted.

At national level, as of March 2014, four staff in the relevant unit of the Ministry of Energy, Development and Environmental Protection devoted half of their time to SEA-related work. In the period 2011–2013, the Ministry approved 14 SEA reports and issued many opinions on draft decisions on SEA elaboration and on draft SEA reports. There have been no cases of rejection of an SEA report at national level. The evaluation of SEA reports was done by the Ministry itself, meaning that the opportunities to request the opinions of other organizations or experts or organize an expert committee to evaluate an SEA report had never been used. The reasons were not financial; rather, the Ministry was comfortable in evaluating SEA reports with its own resources and expertise, as SEA documentation already contained comments received from other ministries and agencies.

In March 2014, no statistics or analyses were available at the Ministry of Energy, Development and Environmental Protection with regard to SEA procedures conducted at local level. Requests for opinions on plans and programmes planned for adoption at local level came to the Ministry very

rarely, mainly from the City of Belgrade and other big cities.

In general, Vojvodina, Belgrade and a few other large cities have good capacity to deal with SEA; however, small municipalities lack such capacity. In Vojvodina, PSUPCEP is responsible for issuing opinions on SEAs and approvals of SEA reports for plans and programmes at provincial level (table 1.1). Two staff are responsible for both EIA and SEA. The most common cases of SEA application include urban and spatial plans for protected areas. Since SEA is rarely prescribed in sectoral legislation, other sectors often do not consider SEA elaboration. So far, the evaluation of SEA reports has been done by the Provincial Secretariat itself, without requesting opinions of the Ministry of Agriculture and Environmental Protection.

The Provincial Secretariat is the competent environmental authority for granting approval for an SEA report and decides about requesting opinions.

As of March 2014, in Belgrade (table 1.2) there was only one case of rejection of an SEA report. The reason for the low rejection record is that the opinion of the Secretariat for Environmental Protection of Belgrade, given at the stage prior to approval of an SEA report, is usually taken into account in the new version submitted for approval. As of March 2014, all SEAs referred to urban planning, with the exception of one SEA performed for the local waste management plan. Other sectors often prepare plans and programmes without considering the need to conduct an SEA. In some cases, the Secretariat formed expert committees for evaluation of SEA reports.

Public participation in SEA

The Law provides for the obligation of the authority responsible for plan or programme preparation to ensure public participation in consideration of an SEA report prior to submission of the SEA report for approval to the competent environmental protection authority. The public should be provided with the opportunity to submit comments and participate in the public debate on an SEA report. When the law regulating the adoption of a plan or programme provides for public comment and public debate, then public comments and public debate on an SEA report should be organized as part of the process of comment and debate on the plan or programme.

In the event that the law regulating the adoption of a plan or programme does not provide for public comment and public debate, special arrangements should be made to allow the public to submit comments and to organize public debate. A report on the participation of authorities and organizations and the public concerned shall be submitted by the authority responsible for preparation of the plan or programme to the competent environmental authority, along with an SEA report.

Table 1.1: SEA-related decisions taken by the Provincial Secretariat for Urban Planning, Construction and Environmental Protection, 2007-2013

	2007	2008	2009	2010	2011	2012	2013	Total
Opinion given on draft decision to make an SEA	4	3	10	7	9	9	6	48
Opinion given on draft decision not to make an SEA	36	22	29	44	59	52	34	276
Opinion given on SEA report	7	5	5	10	7	11	0	45
Approval of SEA report	0	1	0	0	2	1	0	4

Source: Provincial Secretariat for Urban Planning, Construction and Environmental Protection, 2014.

Table 1.2: SEA-related decisions taken by the Secretariat for Environmental Protection of Belgrade, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	Jan.-Mar. 2014	Total
Opinion given on draft decision to make an SEA	10	20	10	6	7	21	46	1	13	6	140
Opinion given on draft decision not to make an SEA	14	16	11	6	10	18	52	2	3	5	137
Opinion given on SEA report	3	19	15	13	9	12	23	23	26	5	148
Approval of SEA report	0	5	7	6	12	3	9	17	9	3	75

Source: Secretariat for Environmental Protection of Belgrade, 2014.

The Law does not provide opportunities for the public to be consulted at the screening stage or in scoping.

After the adoption of plans and programmes, the competent authority responsible for their preparation shall provide access to the SEA report and results of the participation of the authorities and organizations and public concerned.

The most recent example of public participation in the SEA procedure refers to the draft Energy Sector Development Strategy for the period until 2025 with projections to 2030. Public debate for the draft Strategy was held from 16 August to 11 October 2013. During this period, the draft Strategy was posted on the website of the Ministry of Energy, Development and Environmental Protection with an invitation to submit comments. In addition, six public consultations were organized to discuss the draft Strategy with various stakeholders. These efforts referred to the draft Strategy itself, not to the SEA of the Strategy. Public debate for the draft SEA was held from 30 October to 25 November 2013, when the draft SEA report was posted for comments on the Ministry's website and one public consultation meeting was organized. The draft Strategy was approved by the Government on 6 January 2014.

SEA at transboundary level

In the period 2010–2012, Serbia participated in three transboundary SEAs, namely for the National Energy Programme of Slovenia and the River Basin Management Plan of Croatia, and for the Energy Development Strategy of Montenegro. The only case where Serbia, as a party of origin, notified neighbouring states was in 2013 in relation to the SEA for the new Energy Sector Development Strategy for the period until 2025 with projections to 2030. The Law on SEA requires to be sent, together with notification: the description of plans and programmes, together with all available information on their possible impact; the nature of the decision that may be adopted; and the period within which another state can notify its intention to participate in the decision-making procedure. It does not explicitly require sending the SEA report to other parties, together with notification. In practice, however, Serbia sends the SEA report to notified states as it falls under "all available information". The Law provides that consulted states should be informed of the decision on the granting of approval of an SEA report, including the results of consultations and the reasons on which the decision on approval was based.

1.5 Green economy policy framework

Serbia does not have a strategic or policy document explicitly devoted to green economy. Some frameworks for green economy development are provided in existing policies on economic development, poverty reduction and sustainable development. No governmental institution is explicitly assigned the mandate to develop green economy policies and facilitate green economy initiatives. Some green economy initiatives were undertaken by the Ministry of Economy, the Ministry of Energy, Development and Environmental Protection and other ministries as part of their responsibilities in respective areas.

In 2012, during the preparations for the Rio+20 Conference (June 2012), the Ministry of Energy, Development and Environmental Protection, with the support of UNDP and the United Nations Environment Programme (UNEP), developed the "Study on Achievements and Perspectives towards a Green Economy and Sustainable Growth".

However, the document was not recognized as an official document of Serbia. The study suggested several policy recommendations for developing green economy in Serbia. It recommended considering the development of a national strategic plan/framework for green economy in light of the outcomes of the Rio+20 Conference; however, no national strategic plan/framework was subsequently developed.

In 2013, a Green Economy Scoping Study was prepared under the auspices of UNEP with the involvement of several ministries. It focused on energy demand, energy supply and agriculture, and came up with a number of elements for a sectoral green economy roadmap. This scoping study provides an overview and a starting point for Serbia's transition to a green economy. It presents a macroeconomic profile of the country, a sector-specific review, economic modelling and potential policy-enabling conditions. It is not clear whether the study will trigger any action and policy reforms.

1.6 Institutional framework

Since 2007, the institutional framework for environment and sustainable development in Serbia has changed several times. The Ministry of Environment was constituted in May 2007. In July 2008 it was transformed into the Ministry of Environment, Mining and Spatial Planning. In July 2012, the competences on environmental policy were brought under the same roof as the competences on energy policy when a Ministry of Energy,

Development and Environmental Protection was formed. At that time, certain competences with regard to the system to protect natural values were entrusted to the Ministry of Natural Resources, Mining and Spatial Planning.

Also in 2012, the Chemicals Agency was abolished after three years of operation and its functions were transferred to the Ministry of Energy, Development and Environmental Protection. The Energy Efficiency Agency was also dissolved with its functions transferred to the same Ministry. As part of the same governmental reform, the Environmental Protection Fund was discontinued. Throughout these years, the Ministry of Agriculture, Forestry and Water Management, also responsible for a number of policy tasks on the protection and management of natural resources, remained stable in the institutional sense.

At the end of April 2014, another governmental restructuring took place (Law on Ministries, OG 44/14). The Ministry of Agriculture and Environmental Protection was formed, and assumed the competences of the former Ministry of Agriculture, Forestry and Water Management, all environmental protection competences of the former Ministry of Energy, Development and Environmental Protection, as well as the competences in the field of sustainable development of natural resources and system to protect natural resources of the former Ministry of Natural Resources, Mining and Spatial Planning. A new Ministry of Mining and Energy took over from the former Ministry of Natural Resources, Mining and Spatial Planning the competences on mining and natural resources, in addition to receiving the competences on energy from the former Ministry of Energy, Development and Environmental Protection.

Certain positive aspects can be seen in the 2012 restructuring (e.g. an environmental department was formed in the Energy Sector of the Ministry of Energy, Development and Environmental Protection to strengthen the environmental dimension of energy policy).

While the changes brought about by the 2014 restructuring are still to be digested, constant transformations shaking the environmental sector in Serbia have undoubtedly impacted on the smoothness and continuity of efforts to improve environmental policy and legislation and ensure effective implementation. Overall, the consequences of the restructuring of environmental competences between ministries, and the impacts of institutional reforms in 2012 and 2014, require detailed analysis in order to improve further the institutional framework on environmental protection.

While the process of EU accession has been among the major drivers for improvement of legislation on the environment and a priority for the Government, ministries responsible for approximation of EU environmental legislation lack the numbers of staff needed to develop new laws and secondary legislation.

Ministry of Agriculture and Environmental Protection

The Ministry of Agriculture and Environmental Protection performs public administration and policy development tasks in agriculture and the food industry, the protection and use of agricultural land, GMOs and the use of plant and animal genetic resources for food and agriculture, and the environment. The Ministry has about 1,580 staff, of which 290 are appointed to work on environmental issues in the Ministry and 88 in SEPA (annex V).

Responsibilities for environmental protection are dealt with, primarily, by the Sector for Environmental Protection and Sector for Planning and Management on Environment. Selected tasks are entrusted to the Sector for Financial Management, Sector for Legal and Regulatory Issues and Sector for International Cooperation. On environmental protection, the competences of the Ministry cover the system of protection and improvement of the environment; national parks; air protection; protection of the ozone layer; climate change; transboundary air and water pollution; prevention of water pollution for surface waters and groundwater; protection from chemical accidents, noise and vibration, ionizing and non-ionizing radiation; management of chemicals and biocidal products; and waste management, except radioactive waste.

Public administration authorities within the Ministry include, among others, the Republic Directorate for Water (or Water Directorate), the Forest Administration and SEPA. The Water Directorate is responsible for public administration and technical tasks related to water management policy, multipurpose use of water, water supply, water protection measures, the water regime, international cooperation on water and other activities according to the Law on Waters. The Forest Administration is responsible for public administration and technical tasks related to policy on forests, forest conservation, use of forests, and wildlife and implementation of measures to protect them.

SEPA, established in 2004, is an organization with the status of a legal body within the Ministry of Agriculture and Environmental Protection. The Director of the Agency is appointed by the Government upon the proposal of the minister responsible for environmental protection (as of April 2014, the Minister of Agriculture and Environmental Protection). In March 2014, while still within the Ministry of Energy, Development and Environmental Protection, SEPA had 88 positions, of which 74 were filled full time, plus about 20 contracted staff.

SEPA performs public administration tasks relating to the development and management of the national information system for environmental protection, monitoring of air and water quality, management of the national laboratory, collection and compilation of environmental data and preparation of reports on the state of the environment. It is also in charge of cooperation with the European Environment Agency and the European Environment Information and Observation Network. SEPA does not do permitting and inspection.

The Ministry of Agriculture and Environmental Protection performs inspection supervision in the areas of agriculture; the environment; the movement of plants, seeds and seedlings (Plant Protection Administration); water management (Water Directorate); and forestry and hunting (Forest Administration).

Sectoral ministries

Since April 2014, the Ministry of Construction, Transport and Infrastructure, created by merging the former Ministry of Construction and Urban Planning and the former Ministry of Transport, is responsible, among other matters, for spatial planning, municipal infrastructure and public utilities. The Ministry of Mining and Energy is responsible, among other matters, for exploitation of mineral and geological resources, energy policy, the rational use of energy and energy efficiency, RES, environment and climate change policies in the energy sector, natural resources policy and groundwater reserves. The Ministry of Public Administration and Local Self-Government, created in April 2014 on the basis of the former Ministry of Regional Development and Local Self-Government, is responsible, among other matters, for guidance and support to local self-government units. The Ministry of Education, Science and Technological Development is responsible for governmental policy on education, scientific research and technological development. The Ministry of Health is responsible, among other matters, for the safety of food and consumer goods, ensuring supply to the population of good quality drinking water, and sanitary inspection.

Hydrometeorological Service

The Hydrometeorological Service (HMS) performs public administration activities related to systematic meteorological, climate and hydrological measurements and observations; monitoring, analysis and forecasting of changes in the weather, climate and water; early warning and alerts on the occurrence of extreme meteorological, climatic and hydrological events and transboundary atmospheric transport of radioactive substances; and hydrometeorological support to river navigation. Supervision of the work of the Service is done by the Ministry of Agriculture and Environmental Protection. In March 2014, the Service had 484 staff positions.

In 2011, the responsibilities for air and water quality monitoring were transferred by the 2011 Law on Ministries (OG 16/11) from HMS to SEPA. This transfer was reconfirmed in the 2012 Law on Ministries (OG 72/12, 76/13) and 2014 Law on Ministries (OG 44/14), although it did not yet find its way into the Law on Meteorological and Hydrological Activities (OG 88/10). The Service maintains, on the entire territory of Serbia, the National Hydrometeorological Early Warning System, which is part of the national system for protection and rescue in emergency situations. The Service also keeps a register of the state networks of meteorological and hydrological stations.

Serbian Radiation Protection and Nuclear Safety Agency

The Serbian Radiation Protection and Nuclear Safety Agency was established in accordance with the Law on Ionizing Radiation Protection and Nuclear Safety in 2009. It prepares policy and strategic documents for adoption by the Government, produces rulebooks covering radiation protection and nuclear safety, issues licences for the performance of radiation activities (mostly in medicine, industry and research) and nuclear activities, and performs radioactivity monitoring. The Agency does not perform inspection control. The Ministry of Agriculture and Environmental Protection performs inspection over the implementation of measures for protection against ionizing radiation. The Ministry of Education, Science and Technological Development performs inspection over the implementation of measures on nuclear safety and radioactive waste management.

In March 2014, the Agency had 23 employees against 35 positions planned. From 2012, the Agency

is fully financed from the state budget, as opposed to the previous system of financing through fees for licences.

Institutes for nature conservation

The Institute for Nature Conservation of Serbia, established in 1948, performs professional activities on nature protection and research. Among other tasks, it prepares studies to propose the protection of natural resources, monitors the state of nature and proposes protective measures, determines protection conditions and provides data on protected areas for the development of spatial and other plans. The Institute also provides professional supervision and assistance for the management and development of protected areas.

The Provincial Institute for Nature Conservation is tasked with performing activities on nature protection and the protection of natural goods located entirely on the territory of Vojvodina. Since 2010, the Provincial Institute for Nature Conservation is not part of the Institute for Nature Conservation of Serbia.

Public enterprises

Public Enterprise "Srbijašume" (Serbian Forest), Belgrade, manages state-owned forest assets. It includes 17 forest estates and 67 forest administration units. The system of "Srbijašume" comprises 44 hunting grounds. In addition, "Srbijašume" manages 94 protected areas. It is also entrusted with managing some fishing waters. Public Enterprise "Vojvodinašume" (Vojvodina Forest), Petrovoradin/Novi Sad, includes 4 forest estates and 18 forest administration units.

Public Water Management Enterprise "Srbijavode" is responsible, among other matters, for the management of water resources and harmonization of the water needs of different users; monitoring, maintenance and improvement of the water regime; maintenance and reconstruction of water facilities; organization of flood control; providing water for use; and organization and implementation of measures to protect water from pollution. The activities of the Public Water Management Enterprise "Vode Vojvodine" cover the territory of Vojvodina, whereas the Public Water Management Enterprise "Beogradvode" acts within the territory of Belgrade.

Public enterprises administer the management of five national parks: Djerdap, Fruška Gora, Kopaonik, Šar-planina and Tara. They are responsible for the management of land, organization of research, promotion of national parks, construction and maintenance of buildings on the territories of national parks, and protection and use of game and fish. They also manage forests, which is their main source of income.

Cleaner Production Centre

Since 2007, the National Cleaner Production Centre has been hosted by the Faculty of Technology and Metallurgy, University of Belgrade. It works to enhance local capacity, coordinate national efforts on cleaner production and facilitate cleaner production in Serbia.

Overall organization of local self-government

The competences of local self-government in Serbia are regulated by the Law on Local Self-Government (OG 129/07), Law on Local Self-Government Financing (OG 62/06, 47/11, 93/12), Law Determining Certain Competencies of the Autonomous Province of Vojvodina (OG 6/02, 101/07, 51/09) and Law on the Capital City (OG 129/07).

Altogether, there are 174 local self-government units in Serbia, including 150 municipalities (territorial units, usually above 10,000 inhabitants), 23 towns (economic and administrative centres, usually above 100,000 inhabitants) and Belgrade.

The competences of local self-government units in Serbia are divided into primary and delegated. The primary competences include those on communal activities, such as waste collection, waste disposal and provision of water supply and sanitation. Delegated competences are those that generally belong to the level of the Republic (national level) but have been entrusted by the Republic to the Autonomous Province and to local self-government units. For delegated competences, rights and obligations of the Autonomous Province and the local self-government units shall be prescribed by law. The law should also describe the powers of the Republic to supervise the exercise of delegated competences. The Republic has to provide resources for the implementation of delegated competences to the Autonomous Province and local self-government units.

The delegated competences of local self-government include, among others: issuing approvals of SEA reports and EIA studies; issuing integrated permits; issuing permits and other documents for the collection, transportation, storage, treatment and

disposal of municipal (inert and non-hazardous) waste; issuing permits for the placing on the market and use of particularly hazardous chemicals; issuing permits for stationary sources of air pollution; maintaining local registers of sources of environmental pollution; adopting a programme for monitoring in the territory of the local self-government units; and performing inspection supervision in the areas of environmental protection, water management and forestry, as well as other inspection duties, in accordance with the law.

Provincial level

At the level of the Autonomous Province, environmental issues are dealt with by the Provincial Secretariat for Urban Planning, Construction and Environmental Protection (PSUPCEP), which is part of the provincial government. The Secretariat has existed under this name from April 2011, following the merger of the Provincial Secretariat for Environmental Protection and Sustainable Development and Provincial Secretariat for Architecture, Urban Planning and Construction. From 2007 to 2013, the number of personnel engaged in environmental protection in the provincial authority increased from 33 to 40. Water management, forestry and hunting issues are dealt with by the Provincial Secretariat for Agriculture, Forestry and Water Management.

There are 45 municipalities in the Autonomous Province. The provincial authority plays largely the same role for these municipalities as does the national government for other towns and municipalities. The newest competences of the Autonomous Province, which date from 2009, refer to fishing control (in accordance with the Law on the Protection and Sustainable Use of Fish Stocks) and protected areas (in accordance with the Law on Nature Protection).

City of Belgrade

Belgrade comprises 17 municipalities. Environmental protection is dealt with by the Secretariat for Environmental Protection which is part of the city administration (figure 1.2). The Secretariat has 81 staff. The competences of Belgrade are largely the same as those of the local self-government units, except for the city's wider competence on water resources.

The Secretariat for Environmental Protection implements the following responsibilities, among others:

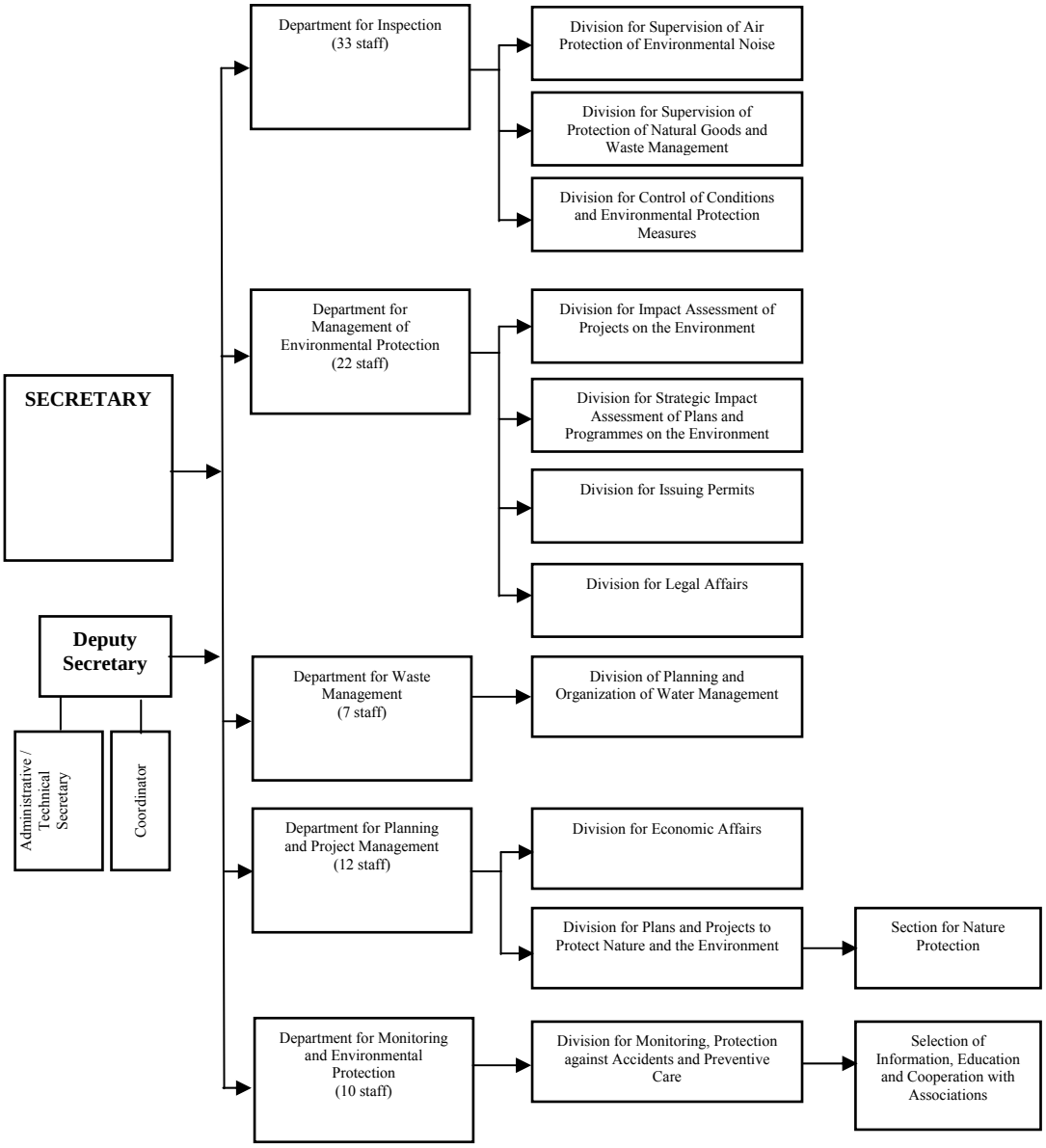
- Monitoring of: air quality at 21 sampling locations at stationary sources and at 10 junctions; water quality in public fountains, rivers, lakes and canals during the whole year and in bathing areas during the summer season; pollution levels in soil; noise pollution at 30 sampling locations; radioactivity levels in air, precipitation, soil, water, food and animal feed;
- Developing and implementing measures for prevention, monitoring and clean-up in the event of chemical and other accidents, protection from ionizing and non-ionizing radiation, and protection from dangerous and harmful substances;
- Establishing environmental protection measures during the spatial planning process;
- Issuing SEA approvals, approvals of EIA studies and IPPC permits;
- Developing and implementing action and rehabilitation plans, and programmes and projects on environmental protection;
- Developing and implementing environmental awareness programmes.

Vertical coordination

While the Law on Local Self-Government provides for a number of mechanisms with the aim to enable vertical coordination, practical implementation of such coordination is far from adequate. In practice, vertical coordination functions mostly through personal contacts between governmental officials rather than through well-established mechanisms.

National authorities exercise supervision over the delegated work of the Autonomous Province and local self-government units by requesting information, records and documents as needed. Although local self-governments are to be involved in the drafting of laws and regulations that affect them and the authorities of Belgrade are often invited to take part in different working groups on the development of legislation, the involvement in decision-making of other, particularly smaller, towns and municipalities is limited. Support and guidance to local self-governments on implementation of their competences in the area of environmental protection are to be provided in a more systematic way. Cooperation between the Ministry of Public Administration and Local Self-Government and the Ministry of Agriculture and Environmental Protection could assist local self-government units in the implementation of their competences in the area of environmental protection.

Figure 1.2: Organizational chart of the Secretariat for Environmental Protection of the City of Belgrade



Source: Secretariat for Environmental Protection, 2014.

The Standing Conference of Towns and Municipalities helps local self-government units in implementing selected competences on environment; however, such assistance is largely dependent on the availability of funds.

In the process of transfer of environmental protection responsibilities from national to local level, local self-government units received new competences but had no opportunities to increase staff resources, especially in small municipalities.

In many cases, there were not enough professionals on environment at the local level, and responsibilities on environmental protection were added to the portfolio of staff responsible for agriculture, utilities or urban planning. The abolition of the Environmental Protection Fund in 2012 further decreased opportunities for support to the environmental protection activities of local self-government units. Another issue is connected with supervision by national authorities over the exercise of delegated competences by local self-government units. For example, national authorities do not have the data on the number of EIA and SEA approvals at the local level since the Autonomous Province and local self-government units are not obliged to send such information to the Ministry of Agriculture and Environmental Protection.

Horizontal coordination

According to the Law on State Administration (OG 79/05, 101/07, 95/10), governmental administration

bodies have a duty to cooperate and exchange information in all matters of mutual interest, as well as to establish joint bodies and project groups for the purpose of performing tasks that demand the participation of several bodies.

In practice, apart from creating interministerial working groups for the drafting of new laws and regulations, Serbia has a limited number of examples of good practice with the mechanisms for horizontal and multi-stakeholder coordination on environmental issues. Efficient horizontal coordination functions mostly through personal contacts among civil servants.

The National Council for Sustainable Development was established in 2003 (Decision on the establishment of the Council for Sustainable Development, OG 103/03, 12/06, 71/08, 94/08, 05/11) as a national-level body responsible for addressing sustainable development issues. The Council was not operational from 2003–2007. In 2007–2008, the Council was reformed. The constituent session of the Council took place in January 2008. Since then it has met four times (the last in December 2011).

A memorandum on establishing the Joint Body for Implementation of the Convention on the Transboundary Effects of Industrial Accidents was signed in 2011 by the ministries responsible for environmental protection, foreign affairs, internal affairs, water management, and occupational health and safety. The Joint Body meets at least twice a year and periodically submits reports to the Government and to the governing bodies of the Convention. As of May 2014, the Joint Body has held five meetings.

The Expert Council for Biological Safety, established in accordance with the 2009 Law on Genetically Modified Organisms, provides expert opinion to the Ministry of Agriculture and Environmental Protection but does not serve the purpose of interministerial coordination on GMO issues.

The 2009 Law on Chemicals requires the establishment of a multi-stakeholder joint body for integrated chemicals management to ensure a strategic approach to and draft policy documents on chemicals management; however, no such body exists.

The 2010 Law on Waters provides for the establishment of a national water conference as a multi-stakeholder body to monitor the implementation of strategic documents and take part in water management planning. A Decision on the establishment of a national conference on water was adopted in 2011; however, no members were appointed.

The 2010 National Environmental Protection Programme suggests the establishment of an environmental protection council to strengthen horizontal coordination of environmental policy and address cross-sectoral issues; however, no such council has been established.

The 2005 Energy Sector Development Strategy until 2015 recommended the establishment of an interministerial energy council as an advisory body to monitor implementation of the Strategy; however, no energy council was established.

The 2011 Biodiversity Strategy for the period 2011–2018 provides for the establishment of an interministerial biodiversity council and a national council for genetic resources; however, no such bodies exist.

The need for a coordination body on environment and health issues was discussed during the 2009 Environment and Health Performance Review; however, such a coordination body does not exist.

Public participation

The 2011 Strategy for the Implementation of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters – the Aarhus Convention (OG 103/11), accompanied by an action plan, aims to improve the dialogue between the public and decision makers on environmental matters. Four Aarhus centres (Kragujevac, Niš, Novi Sad and Subotica) function in the country.

The establishment and legal status of NGOs is regulated by the 2009 Law on Associations (OG 51/09). As of March 2014, there were over 2,000 environmental NGOs registered in Serbia, of which 466 were registered in 2013. About 100 environmental NGOs are active on a regular basis. In 2010, the then Ministry of Environment, Mining and Spatial Planning signed memoranda of understanding (MoUs) with over 100 NGOs.

Several environmental laws directly provide for the possibility of public participation in the preparation of secondary legislation. In 2013, the governmental Office for Cooperation with Civil Society led the process of elaboration of the Guidelines for participation of civil society in law-making procedures, which were adopted in 2014 (OG 90/14). In recent years, the Ministry of Energy, Development

and Environmental Protection used to post draft legislation on its website with an invitation to the public to submit comments.

As of March 2014, within the Ministry of Energy, Development and Environmental Protection there was one staff member responsible for cooperation with NGOs. Since 2013, the Ministry has organized periodic meetings with representatives of NGOs in order to involve them in relevant activities. From the perspective of the Ministry, cooperation with environmental NGOs would have been easier if NGOs were united into large networks. Furthermore, the Ministry is aware of the need to strengthen the environmental NGO community in Central Serbia.

In accordance with the Regulation on the means for funding and co-funding the programmes of public interest implemented by associations (OG 8/12, 94/13), the Ministry provided funding to environmental NGO activities through annual grant competitions. In 2014, the total grant pool is 20 million dinars and the topic of the competition is education and environmental awareness. In 2014, an additional competition with a total pool of 6 million dinars is devoted to activities on implementation of the Aarhus Convention. Previously, support to activities of environmental NGOs was also provided through the Environmental Protection Fund. For example, in 2011, 21.4 million dinars were allocated to NGO projects by the Ministry of Environment, Mining and Spatial Planning, while the Environmental Protection Fund allocated to associations and other civil society organizations an additional 129.4 million dinars.

1.7 Conclusions and recommendations

Since 2007, Serbia has been making progress in improving its legislation on the environment. At the same time, the necessary capacities and resources are often not in place to ensure immediate implementation, and time is required for institutional structures to adjust to new responsibilities, especially in the context of frequent institutional reforms. Following delays in the adoption of strategic documents and secondary legislation at the national level, further delays in implementation take place at the provincial and local self-government levels.

Recommendation 1.1:
The Government should improve the implementation of environmental legislation by ensuring that the necessary implementation capacities are in place, time frames for implementation of specific measures are realistic and relevant resources are available.

Since 2007, Serbia has developed a comprehensive set of strategic and planning documents on environmental protection, as well as in different sectors, which have an impact on the environment. However, many strategic documents required by respective laws were developed and adopted with significant delays, e.g. the 2012 National Strategy for Sustainable Use of Natural Resources and Goods was adopted two years after the deadline. Some strategic documents prescribed by respective laws are still to be developed and adopted, e.g. several documents on water management. In many cases, strategies were prepared and adopted without simultaneous development and adoption of action plans, which leads to further delays in implementation at both national and local levels.

For example, the National Environmental Protection Programme was adopted in 2010 without an action plan, and this still needs to be elaborated. Reports on implementation for a number of strategic documents are lacking, despite the requirements of respective laws to prepare such reports. Implementation of the key strategic document on sustainable development – the 2008 National Strategy for Sustainable Development – has been hindered by the lack of an institution clearly in charge of coordinating its monitoring and implementation.

Although there has been progress in formal integration of environmental considerations into sectoral strategic and planning documents, actual integration of environmental considerations in the implementation of sectoral strategic and planning documents is not yet a reality.

Recommendation 1.2:
The Government should:

- *(a) Improve the quality of strategic environment-related planning by:*
  - *(i) Ensuring timely development and adoption of strategic documents;*
  - *(ii) Preparing action plans for environmental strategies simultaneously with the strategies themselves;*
  - *(iii) Ensuring regular reporting on the implementation of strategic documents;*
- *(b) Ensure the development and adoption of the Action Plan for the National Environmental Protection Programme;*
- *(c) Define the institution responsible for coordination of monitoring and implementation of the National Strategy for Sustainable Development and ensure the*

regular preparation of implementation reports for the Strategy.

Since 2007, practical experience has been accumulated in implementation of the 2004 Law on Strategic Environmental Impact Assessment (SEA). The Law has also been amended in 2010 to reflect upon such experience. The Law does not explicitly include health authorities as subjects of consultations at the screening and scoping stages and during the evaluation of the SEA report, although they are consulted in practice. The Law does not require consultations with the public at the screening and scoping stages. Sectoral plans and programmes, especially at the provincial and local levels, sometimes evade SEA. There is a lack of data at the national level on EIA and SEA approvals issued by the Autonomous Province and local self-government units.

Recommendation 1.3:
The Ministry of Agriculture and Environmental Protection should:

- *(a) In cooperation with the competent environmental authorities at the provincial and local levels, evaluate the implementation of the Law on Strategic Environmental Impact Assessment (Law on SEA) and enhance capacity for its implementation at the provincial and local levels, as needed;*
- *(b) Consider amending the Law on SEA, in particular by:*
  - *(i) Introducing requirements to consult health authorities at the screening and scoping stages and during the evaluation of the SEA report;*
  - *(ii) Providing opportunities for the participation of the public concerned during the screening and scoping stages;*
- *(c) Raise awareness in other sectors, especially at the provincial and local levels, about the requirement to conduct an SEA;*
- *(d) Ensure implementation of the Law on SEA, in particular by strengthening the role of the competent and interested authorities, especially health authorities, during all stages of an SEA.*

Serbia does not have any strategic or policy document explicitly devoted to green economy. Also, no governmental institution is explicitly assigned the mandate to develop and coordinate green economy policies and facilitate green economy initiatives. Two studies on perspectives for green economy were prepared in 2012–2013 with the involvement of some ministries but did not receive the status of governmental documents.

Recommendation 1.4:
The Government should:

- *(a) Designate a governmental institution to develop and coordinate green economy approaches and facilitate green economy initiatives;*
- *(b) Integrate green economy considerations when revising existing or developing new strategic documents at all levels.*

Since 2007, the institutional framework for environment and sustainable development has been constantly changing. A separate Ministry of Environment existed for slightly more than a year (May 2007 – July 2008). Thereafter, the key environmental authority changed its name, affiliation and scope of responsibilities several times. Constant transformations shaking the environmental sector in Serbia have impacted on the continuity of efforts to improve environmental policy and legislation and ensure effective implementation. While several strategic documents on the environment point out the problems with the institutional framework, it appears that, time and again, institutional changes are suggested without serious analysis of actual needs. No detailed analysis was performed of the consequences of the restructuring of environmental competences between ministries and institutional reforms of 2012 and 2014.

Recommendation 1.5:
The Government should ensure that an independent analysis of the institutional framework in the environmental sector is conducted, in order to identify problems, needs and ways to improve that framework.

Vertical coordination in Serbia functions mostly through personal contacts between governmental officials rather than through well-established mechanisms. National authorities exercise supervision over the work of local self-government units by requesting information and documents as needed.

Recommendation 1.6:
The Government, through the Ministry of Agriculture and Environmental Protection and the Ministry of Public Administration and Local Self-Government, should:

- *(a) Strengthen regular exchange of information with local self-government authorities on the*

implementation of delegated environmental protection responsibilities and assist them in the implementation of such responsibilities through the provision of necessary guidance and training;

(b) Continuously involve local self-government authorities in the development of environmental policies and legislation that affect them;

(c) Ensure that efficient mechanisms and adequate resources are provided to local self-government units for the implementation of delegated environmental protection responsibilities.

Serbia has a limited number of examples of good practice and experience with intergovernmental and multi-stakeholder bodies for coordination in matters related to the environment and sustainable development. The National Council for Sustainable Development, which could act as a key high-level authority for interministerial and multi-stakeholder dialogue on the environment and sustainable development, has not met since December 2011. Horizontal coordination takes place mostly through personal contacts between governmental officials.

Recommendation 1.7:
The Government should improve horizontal coordination on environmental and sustainable development matters, and in particular:

(a) Develop mechanisms for horizontal coordination;

(b) Ensure the effective operation of the National Council for Sustainable Development.

Chapter 2

COMPLIANCE AND ENFORCEMENT MECHANISMS

2.1 Institutional framework

Central level

Until April 2014, within the Ministry of Energy, Development and Environmental Protection,[1] three departments were engaged in compliance assurance. The Department for Planning and Management in the Environmental Sector was responsible for environmental impact assessments and integrated pollution prevention and control; the Department for Environmental Protection dealt with nature and biodiversity conservation, air and ozone layer protection, water and soil protection, and chemicals. The Department for Control and Surveillance (DCS) conducted environmental and ionizing radiation protection inspections and provided administrative response to non-compliance.

DCS had six structural units covering key areas of environmental supervision: industrial pollution (20 staff); soil, ground and surface waters (16); chemical accidents, chemicals and biocidal products (19); ionizing and non-ionizing radiation (5); waste management (13); and protection and use of natural resources (8).

Environmental inspectors at the central level have exclusive competences over the enforcement of legal requirements related to the prevention of and protection from chemical accidents (Seveso), chemical and biocidal products and the transboundary shipment of waste. The same goes for the supervision over operations of the Serbian Radiation Protection and Nuclear Safety Agency, which shall be enforced by the Ministry of Energy, Development and Environmental Protection and the Ministry of Science and Technological Development (competent for nuclear safety and radioactive waste management).

After a governmental reorganization in 2012, several DCS divisions were transferred to other ministries (in areas such as fisheries control, urban planning inspection, building inspection and mining inspection). Despite frequent reorganizations over recent years, DCS has enjoyed a certain stability of its core responsibilities.

Although cuts in the number of staff occurred, the central environmental enforcement authority managed to maintain and even develop its capacity. DCS employs 98 civil servants, of which 93 are inspectors, and five staff provide legal and administrative support. In the past few years, DCS equipment has been improved. For example, 24 vehicles for inspection, a ship, and equipment for field work and laboratory tests were procured.

Training needs have been systematically determined after the adoption of new legislation, and training provided, most often through EU-funded projects, e.g. the twinning project "Strengthening the Serbian Environmental Inspection and Relevant Stakeholders" (2011–2013). This project provided training for some 200 inspectors and helped develop inspection tools (e.g. checklists, guidelines, methodologies), as well as planning approaches. In 2014, DCS became the Department for Environmental Inspection (DEI). Sufficient funds have been allocated from the national budget for operational expenses. The budget is planned for the following year with a projection for the following two, providing certain stability.

The Republic Directorate for Water (Water Directorate) is the competent authority for issuing water permits. The Ministry responsible for environmental protection established emission limit values (ELVs) for wastewater as well as environmental quality standards for surface waters, groundwater and sediments. Water permits for groundwater abstraction are issued upon consent of the ministry responsible for mining.

Responsibilities for the enforcement of the Law on Waters are divided among three inspectorates: water, sanitary and environment. The water inspectorate (20 people), which is part of the Water Directorate, checks compliance and enforces requirements related to the water use regime and quality of surface waters

[1] In April 2014, the Ministry of Agriculture and Environmental Protection was set up on the basis of the former Ministry of Agriculture, Forestry and Water Management and former Ministry of Energy, Development and Environmental Protection. Hereafter, all information relating to the former two ministries relates to the period up to April 2014.

and groundwater, as well as to any activities that could affect water quality. The environmental inspectorate supervises the quality of effluents, the use of self-monitoring and application of measures to protect water quality. The sanitary inspectorate checks all aspects related to drinking water quality. Responsibilities between water and environmental inspectorates are not entirely delineated and there are overlaps in the area of water quality, but, in practice, they find ways to overcome them and cooperation on the ground is good.

Forty-six forestry and hunting inspectors of the Forest Administration, deployed throughout the territory, supervise the implementation of forest legislation. In countering illegal felling, they undertake joint actions with the police and the trade inspection. The forestry and hunting inspectors provide control in the forest areas and on forest roads, while trade inspectors and/or the police control areas outside the forests. In practice, these services quite often coordinate their activities, especially beyond the forest areas, given that only road police can stop cars, while forest inspectors have the mandate to establish the origin of transported goods. The number of forestry and hunting inspectors decreased between 2004 and 2014, from 66 to 46 persons.

The former Ministry of Natural Resources, Mining and Spatial Planning had a stake in coordinating the issuance of water permits for the use of groundwater. In the period 2012–2014, the Ministry has been given supervision tasks on fisheries according to the Law on Ministries (OG 72/12, 76/13) and the Law on the Protection and Sustainable Use of Fish Stocks.

The Ministry of Health has competences related to public drinking water supply, which includes enforcement of sanitary regulations relevant to the environment (e.g. the protection zones around drinking water sources). Supervision over the safety of drinking water and observance of sanitary requirements is conducted through sanitary inspectors. Other responsibilities relate to radioactive medical waste, chemicals and biocidal products and good laboratory practice.

The Ministry of Construction, Transport and Infrastructure has responsibilities related to the emission of air polluting substances and noise from vehicles, airplanes and inland water transport, such as the setting (with the consent of the Ministry of Energy, Development and Environmental Protection) of pollutants emission and noise limits, methods of emissions monitoring and measures for emissions reduction.

The General Police Directorate often acts in support of inspectorates, particularly in forestry and spatial planning.

Photo 2.1: Lake Vlasina

The Customs Administration is responsible for controlling the import, export and transit of hazardous chemicals, biocidal products, waste, ODSs, sources of ionizinig radiation, and endangered and protected species of wild flora and fauna. The Administration maintains close cooperation with the Ministry of Agriculture and Environmental Protection on implementing the Agreement on preliminary control of waste management, toxic substances and ODSs at border crossing points.

Specialized tasks of nature and natural resources protection are performed by the Institute for Nature Conservation of Serbia, including providing environmental protection requirements for activities and monitoring in protected areas. In Vojvodina, these tasks are assigned to the Provincial Institute for Nature Conservation.

Subnational level

In Vojvodina, relevant competencies are assigned to PSUPCEP. These include:

- Performing the EIA procedure and issuing integrated permits for projects/installations for which the building permit is granted by the competent provincial authority;
- Granting waste management permits;
- Inspection control in all aspects of environmental protection, with the notable exception of industrial accidents, ionizing radiation and transboundary movement of goods (hazardous waste, chemicals, biocidal products, ODSs and protected species).

New competences for the enforcement of the Law on the Protection and Sustainable Use of Fish Stocks and the Law on Nature Protection on its territory have been delegated to the Autonomous Province since 2009. The Sector for Environmental Inspections at PSUPCEP has a staff of 17 inspectors spread across seven regional offices. The Sector has four units: industrial pollution control (7 inspectors); protection and preservation of wild species (4); protected areas (2); and protection and sustainable use of fish stocks (4).

Tasks assigned to the third tier of governance include: establishing environmental requirements as part of urban development consents and building permits; reviewing and approving EIA studies; issuing IPPC permits and municipal waste management permits as well as permits for stationary air pollution sources; setting and keeping the register of environmental polluters; and inspecting compliance with and enforcing the implementation of laws and regulations on environmental protection, air protection, environmental noise, nature conservation, waste management and wastewater management. Those tasks are mostly implemented by the local secretariats for environmental protection. Data from the Standing Conference of Towns and Municipalities[2] mention 178 environmental inspectors working at the local self-government level, including 27 inspectors in Belgrade as of March 2014.

Capacity problems at the municipal level are significant, notably for EIA and IPPC. Short-time training delivered to representatives of local self-governments cannot compensate for the lack of staff and financing. In smaller municipalities there is a lack of qualified people to consider complex project/installation dossiers. Besides the issue of technical capacity, most of the 32 municipalities with competences on IPPC installations on their territory have serious problems with financing the permitting procedure, while the IPPC fee is entirely paid to the national budget.

The compliance assurance competences of the local self-government units are "entrusted", i.e. delegated, to the local self-governments, with the State retaining the ultimate responsibility for their implementation. The Ministry of Energy, Development and Environmental Protection should supervise performance as concerns the entrusted competences and in theory can recall them from subnational authorities in the event of failure. In practice, the Ministry does not have all the tools for such supervision. For example, there is no legal obligation for provincial authorities and local self-governments to regularly report on their activity (e.g. EIA, permitting and inspection). Lack of information is hampering the supervision activity and – more largely – the evaluation of institutional performance and effectiveness of policy instruments. The Law on Local Self-Government links funding of local self-governments to undertaking entrusted tasks. Given that transfers from the central budget are made for all sectors at once, withdrawing funding for a specific task is impossible. At the same time, prior to adopting the budget for environmental protection, local self-governments' secretariats for environmental protection are required to obtain approval by the Ministry. Cooperation and

[2] The Standing Conference of Towns and Municipalities of Serbia is an independent national association of local authorities created in 1953 to promote cooperation, exchange of experience and joint actions of common interest.

information exchange among the levels of environmental authorities is poor.

2.2 Legal framework

Since 2007, the legal framework has evolved in two main directions: (i) further extending the scope of environmental regulation; and (ii) improving instruments and procedures of compliance assurance. A milestone in this process was the approval of a "green package" of environmental laws in May 2009 aimed to transpose core principles of the EU environmental *acquis*. The 2010 Law on Waters replaced a similar two-decade-old legal act. These new laws have been complemented by secondary legislation. This considerably increased the workload of permitting and inspection authorities.

The legal basis for EIA has seen further development. The 2004 Law on Environmental Impact Assessment (OG 135/04) was updated in 2009 (OG 36/09). Implementing legislation was further developed in 2008. The Regulation establishing the list of projects for which an environmental impact assessment is mandatory and the list of projects for which EIA can be requested (OG 114/08) clarified the EIA scope and aligned it with EU requirements. In 2009, the Law on Nature Protection stated the need for an "assessment of acceptability" (appropriate assessment in terms of the Habitats Directive) that is required as part of EIA for projects that can have significant effects on the protected natural areas. All necessary secondary regulations are in place, and a manual was prepared detailing the EIA procedure and obligations of each actor. This manual is published and distributed to the Autonomous Province and local self-governments. The EIA procedure is tied up with building permits and can be conducted at all three levels of governance. An approved EIA study, together with conditions prescribed by the competent authority, is a prerequisite to obtaining a building and other subsequent permits. Annex 1 projects must undergo an EIA. Annex 2 projects may be subject to EIA following the decision by competent authorities. Adequate provisions exist for public participation and appeal.

The 2009 amendments made to the Law on EIA provided more flexibility and reduced the statutory duration of the EIA procedure from nine to four months. The competent authority may decide to merge the first and second phases of the procedure for Annex 2 projects, thus significantly shortening it. The assessment of Annex 1 projects can start directly from the scoping phase. The decision of the competent authority establishing that EIA is not required normally contains minimal environmental protection requirements.

According to the 2004 Law on Integrated Environmental Pollution Prevention and Control (IPPC Law), new installations must obtain their permits immediately, before commencing operations, while the existing installations must get their permits by 2015. A new implementing act related to the IPPC Law was approved in addition to the Regulation on type of activities and installations for which an integrated permit is issued (OG 84/05) and several acts providing for the content of the integrated permit and the IPPC application, the register of issued IPPC permits and other aspects. The Regulation on determination of integrated permit application submission dynamics programme regulates a national phasing-in plan, with different sectors to submit permit applications in different periods. The programme fixed the final deadline for applications at March 2014.

Inspection is also based on well-established legislation, both general and environmental: the Law on General Administrative Procedure (OG 33/97, 31/01, 30/10), the Law on State Administration, the Law on Environmental Protection and specific laws on environmental protection. The Law on General Administrative Procedure describes general inspection procedures and calls for cooperation between the enforcement agencies. The Law on Environmental Protection deals with a broad range of compliance assurance powers, providing inspectors with the right to order the correction of irregularities, prohibit activities that harm the environment or seize goods obtained through illegal action. At the same time, every law regulating a specific environmental area (e.g. air, waste, nature protection) describes in a more adapted way the duties and powers of inspectors as well as providing guidance on inspection criteria and procedures. Instructions on reporting requirements for provincial and local environmental inspections, which entered into force in January 2007, attempted to introduce unified planning, reporting and record-keeping requirements compliant with Recommendation 2001/331/EC providing for minimum criteria for environmental inspections in the Member States. Reportedly, these instructions are not followed in Vojvodina.

Serbian legislation establishes the right to administrative appeal against the decisions of the competent authorities, which can be used by individuals and legal entities. An appeal against the decision of a republic, provincial or municipal environmental inspector can be lodged to the Ministry within 15 days from the day of receipt of the

decision. Such appeal does not delay the execution of the decision. There are exceptions in which the decisions/orders of environmental inspectors are final in the administrative procedure; eventual disputes must be resolved in administrative courts. The decisions that cannot be appealed include: the prohibition of import, export and transit of waste; banning of import and export of endangered species of flora and fauna; and the prohibition of operation of a Seveso plant.

The EIA and IPPC laws provide no right to administrative appeal against the decision of the competent authority on approval of the EIA study and on issuing the IPPC permit, respectively, allowing instead initiation of an administrative dispute. No appeal can be made against the judgment brought into the administrative dispute (finality).

A particularity of the system of environmental regulation on industrial pollution control is its link with the planning and construction regulation. Many of the environmental laws distribute the responsibility for their implementation, including permitting and inspection, among different levels of governance. The distribution of those competences among authorities is related to their responsibilities on issuing the building permits set by the Law on Planning and Construction. If the competences for issuing a building permit are at the republic level, then the EIA and IPPC permitting procedures will also be carried out by competent bodies at the republic level, while republic environmental inspectors will be in charge of enforcement of environmental laws at those installations. If the respective permits and consents are issued by Vojvodina or the local self-governments, then the provincial or municipal environmental inspectors, respectively, will be in charge of enforcement.

Some exceptions to this distribution of tasks on inspection among the levels of governance exist. For example, the Law on Nature Protection follows a territorial approach when entrusting inspection tasks in protected areas to the provincial level while municipal inspectors check compliance in protected areas proclaimed by local self-governments.

Ambient quality standards

Ambient environmental quality standards for air, surface and groundwater, water sediments and soil, together with related monitoring provisions, have been established in a range of regulations. Many of these regulations have been revised in the period after 2007.

The Regulation on monitoring conditions and air quality requirements (OG 11/10, 75/10, 63/13), Rulebook on the content of air quality plans (OG 21/10), Regulation on determination of zones and agglomerations (OG 58/11, 98/12), Regulation on determination of the list of air quality categories in zones and agglomerations (OG 17/14), Rulebook on the content of short-term action plans (OG 65/10) and Regulation on the air quality control programme in the national network (OG 58/11) establish air quality standards, air quality zones and agglomerations, a national air quality monitoring network and a data quality control programme.

Measures are being taken locally to gradually ensure compliance. An air quality action plan was recently adopted for Bor, where sulphur dioxide levels drastically exceeded the limit values in the ambient air due to mining activity. An air quality plan is expected to be adopted in 2015 for Belgrade, which will enable the implementation of requirements of the Law on Air Protection.

The Regulation on limit values for pollutants in surface and groundwaters and sediments and deadlines for their achievement (OG 50/12) sets environment quality standards (EQS) for surface waters and gives the basis for their grouping into five classes. The Regulation establishes EQS for nitrates and pesticides in groundwater, and sets the ban on emission of pollutants according to List I and a timetable for establishing of the groundwater threshold values for pollutants according to List II of Directive 80/68/EEC pertaining to environmental quality standards for groundwater and ELV for pollutants in groundwater. In accordance with this Regulation, deadlines for the achievement of EQS have to be in accordance with the timelines set in the water management plans. For surface waters and sediments that are not impacted by transboundary pollution, the deadline for achieving the better class than the current is the end of 2032.

The 2011 Regulation on limit values for priority and priority hazardous surface water pollutants and deadlines for their achievement (OG 35/11) introduced EQS for 33 priority substances including 17 priority hazardous substances. Based on the results of the water status monitoring programme conducted by SEPA in 2012, the surface water EQS were revised. The 2014 Regulation on limit values for priority and priority hazardous surface water pollutants and deadlines for their achievement (OG 24/14) enlarged the list of EQS to 60 priority and priority hazardous substances, except the EQS for biota. It divides the substances into two groups: the first group of 35 substances is already being

monitored, while the second group (25 substances) would be gradually introduced for monitoring and the latest by the end of 2018.

The 2010 Regulation on the programme of systematic monitoring of soil quality, indicators for assessing the risk of soil degradation and the methodology for the development of remediation programmes (OG 88/10) contains limit values of several pollutants serving for the assessment of chemical contamination of soils.

Emission standards

The 2010 Regulation on limit values for emissions of air pollutants (OG 71/10, 6/11-corr.) defined specific environmental norms for different sectors. As a signatory to the Energy Community Treaty, Serbia committed itself to implement Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (LCP Directive) from 31 December 2017 for the energy sector network that includes thermo power plants. However, the 2011 National Environmental Approximation Strategy envisaged 2023 as the earliest possible year for compliance. Serbia is to set a national emission reduction plan, with timeframes for compliance for existing large combustion plants defined by the adoption on 24 October 2013 of Decision D/2013/05/MC-EnC of the Ministerial Council of the Energy Community (on the implementation of Directive 2001/80/EC, the LCP Directive).

The Regulation on the list of industrial installations and activities for controlling emission of volatile organic compounds, emission values of volatile organic compounds during the certain consumption of solvents and total allowed emissions, and emission reduction scheme (OG 100/11) and the Rulebook on technical measures and requirements relating to allowed emission factors for volatile organic compounds resulting from the storage and transportation of petrol (OG 1/12, 25/12, 48/12) further set emission standards for air pollutants in accordance with the Law on Air Protection

Pursuant to the Law on Waste Management, the Regulation on the types of waste for which thermal treatment is carried out, and the conditions and criteria for determining the location, technical and technological requirements for the design, construction, equipment and operation of the facility (OG 102/10, 50/12) prescribes limit values for emissions of pollutants into the air and discharges into water. Relevant technical regulations under the law governing road safety regulate the emission standards for air pollutants from mobile sources.

Serbia is reorienting its traditional approach to water quality regulation, predominantly based on EQS, to a more preventive one aimed at mitigating pollution closer to its source, by introducing ELVs and providing for stricter measures if EQS in the receiving water bodies are not met (the so-called “combined approach”).

The Regulation on emission limit values for pollutants in water and deadlines for their achievement (OG 67/11, 48/12) introduced quality requirements for effluent discharges, as maximum allowable concentrations of harmful substances in wastewater that may be discharged into the sewer and the receiving water bodies. It concerns municipal wastewater and industrial effluents, including from installations using several hazardous substances. The Regulation sets ELVs for effluent discharges from 49 industrial sectors, mostly based on Best Available Techniques (BAT). Under certain circumstances, the competent authorities can apply stricter ELVs.

The amendments brought to the Regulation in May 2012 postponed deadlines for reaching ELVs for communal and industrial wastewater. The Regulation is applied immediately to new facilities. For existing industrial and other polluters, the deadline for reaching ELVs is the end of 2030. For existing communal wastewater treatment plants from agglomerations with a load over 2,000 PE, the deadline for reaching ELVs is the end of 2045. For existing wastewater treatment plants from agglomerations with a load of less than 2,000 PE, deadlines are to be defined through the water management plans for each agglomeration.

Product standards

The quality of petrol and liquid fuels is regulated by the 2012 Rulebook on technical and other requirements for liquid fuels of petroleum origin (OG 123/12). Placing leaded gasoline on the market was banned, and the use of petrol containing maximum 13 mg/l of lead was allowed up to 31 July 2013. Amendments brought to the Rulebook in 2013 further toughened the requirement allowing the placing on the market of only petrol which corresponds to the European Standard EN 228 (maximum 5 mg/l of lead). The Rulebook also regulates the sulphur content of certain liquid fuels: the use of heavy fuel (4 per cent of sulphur) was banned as of 1 January 2014.

The Law on Waste Management bans the trade in

batteries and accumulators that contain more than 0.0005 per cent by weight of mercury and 0.002 per cent of cadmium, with some exceptions. The Rulebook on manner and procedures for the management of waste batteries and accumulators (OG 86/10) contains provisions regarding the collection or recycling system for mercury-containing batteries.

The Law on Chemicals envisages the bans and restrictions on the production, placing on the market (which comprises import) and use of certain chemicals, as well as articles containing such chemicals in such concentations that they represent unacceptable risk to human health and the environment. These bans and restrictions are prescribed by the Rulebook on bans and restrictions on the production, use and placing on the market of chemicals (OG 90/13).

2.3 Regulated community

In 2012, the Statistical Office reported a total of 84,921 enterprises registered. The distribution of business entities by size class revealed the presence of 505 large and 2,025 medium-sized enterprises.

Besides the economic/business activity databases, the enforcement authorities have more specialized sources of information for identifying and profiling the regulated community. DCS is regularly informed about activities for which a permit or other authorization has been issued by the Ministry of Energy, Development and Environmental Protection and which implicitly become subject of control by environmental inspectors. Information from the databases of other agencies is also used to identify the subjects of control.

A valuable source of information for inspection work planning is the National Pollution Sources Register, maintained by SEPA (chapter 4). The system has been fully operational since 2012, with more than 1,200 operators already providing data regularly. Regular reporting is established for the waste management permits issued at different levels: the Ministry, Vojvodina and local self-governments. In May 2014, this public register contained 1,659 permits. Thematic inspection campaigns are used to identify and profile the smallest installations. Citizens' complaints and information received through the Ministry's on-call service are another source.

The number of large installations seems to be relatively limited. Information on such installations has been updated recently and is available (despite not being officially published). As of March 2014, the list of IPPC installations included 185 units. This list is regularly revised by a working group established at the Ministry, based on information received from environmental inspectors and operators. Large poultry and pig farms constitute one fifth of all IPPC installations. Most of the IPPC facilities in the industrial sector are in the metal processing, organic chemistry and cement production sectors. There are 108 Seveso installations in total, including 42 upper tier and 66 lower tier. Twenty-seven large combustion plants are registered. Only four controlled landfills exist regulated under the IPPC Law. The distribution of responsibility for IPPC facilities across the competent authorities is broadly split along the lines of food/intensive agriculture activities that are currently assigned to the local self-governments, and the remaining industry sectors that are assigned to the Ministry and the Autonomous Province.

Apart from IPPC installations, there is little information available on the number of facilities for which the local self-governments are responsible. Potential sources of information for inspectors at the local level are the lists of operators to whom the work permit was issued by the competent local authority, as well as the local registers of pollution sources held by the local self-governments. There are significant information gaps and lack of clarity as related to the size of the regulated community, mainly due to the absence of a centralized data base of controlled installations and the lack of common approaches to defining the regulated community. Consequently, the scope of (and the very approach to) regulation may not be consistent across the country. For example, the environmental inspection in Vojvodina identified 356 industrial facilities that must be inspected across the entire Province. At the same time, in Kikinda (67,000 people) about 1,350 facilities subject to environmental control were profiled, and among them were only eight large units. This denotes two different approaches to defining, whom, actually, the inspection is controlling – all and everyone or only relatively large installations.

2.4 Environmental impact assessment

The number of EIA procedures completed at the republic and provincial levels is presented in table 2.1. Most of them are carried out at the municipal level. However, this information is difficult to verify: the Autonomous Province of Vojvodina and local self-governments do not have the legal obligation to regularly report to the central environmental authority. However, the Law on Local Self-Government stipulates: "In carrying out tasks from

their competence, the authorities of the Republic and the territorial autonomy shall: … (3) request reports, data and information about the performance of tasks … of units of local self-government". There is no integrated EIA database at national level. Lack of this information is an impediment for a sound assessment of EIA performance in Serbia.

The share of negative EIA decisions (consent refused) pronounced by the competent bodies is limited and is around 5 per cent at the republic level and 8 per cent in Vojvodina. This can partly be explained by the common use of the EIA scoping procedure and legal requirements concerning the minimum qualification and experience for EIA study developers that generally improves the quality of the assessment. The competent authorities keep a public register of the records on the EIA procedures and decisions.

In Belgrade, roughly only one out of 10 applications entering the EIA procedure reaches the review phase, which means that 90 per cent of the projects are screened out (this is not the case for central and provincial authorities). Competent authorities at the municipal level, which predominantly deal with smaller enterprises (EIA Annex 2), have the tendency to wrap up project assessment at the screening phase, by prescribing some general environmental protection requirements to be included in the technical documentation.

Another explanation is related to the vast legalization programme for enterprises that operate without proper permits, which is currently underway. In order to be regularized, enterprises are required to pass through the entire permitting procedure. For installations for which EIA may be required, the competent authority can decide during the screening phase not to require the EIA ("due diligence") study but, rather, to incorporate meaningful environmental protection measures into their screening decision, which will become part of the project technical documentation.

When a proposed activity is likely to cause transboundary impact, the assessment carried out pursuant to national legislation is supplemented by an assessment under the Espoo Convention. During recent years, Serbia has had a few EIA cases in a transboundary context, as both a party of origin and affected party (chapter 5).

Capacity development activities contributed to the improvement of EIA outcomes over recent years. General and sector-specific guidelines are available to support the developers. Instructions were prepared for competent authorities, particularly to assist with determining the level of decision-making on EIA and screening of Annex 2 projects. A manual on minimal requirements for environmental protection was issued in 2010, defining the environmental requirements for projects that were screened out from the EIA process. It was mainly intended to prevent overuse of the EIA study for small projects, especially at the local level.

2.5 Environmental permitting

Environmental permits are granted by different authorities, at three decision levels. Permits are issued on nature protection, ionizing radiation, waste management, air protection, IPPC and chemicals management. Other authorizations (consents/approvals) are granted on EIA, chemical accidents protection, environmental noise and air quality management.

Integrated permitting of large industrial installations

The final deadline for IPPC applications is fixed at March 2014. The first IPPC applications were received in early 2010. Of the current 185 IPPC units, 162 operators (87 per cent) submitted permit applications and only nine permits have been issued so far. Three permits were granted at national level, four at the provincial level and two at local self-government level. Information on issued IPPC permits is published on the websites of the Ministry responsible for environment and PSUPCEP. Taking into account the difficulties operators have in completing applications for integrated permits, the country will fail to meet the deadline of 2015 for existing installations to obtain IPPC permits.

Table 2.1: Number of EIA studies considered in the review phase by different competent authorities

	2006	2007	2008	2009	2010	2011	2012	2013
Republic level	45	41	27	38	28	44	58	55
Vojvodina	..	60	25	28	14	20	16	17
Belgrade	29	29	21	24	7	11	9	1

Source: Ministry of Energy, Development and Environmental Protection; Vojvodina Secretariat for Urban Planning, Construction and Environmental Protection; Secretariat for Environmental Protection of Belgrade.

Amendments might be introduced to the IPPC Law providing for the extension of the period for obtaining an integrated permit until 2020. A register of issued permits shall be kept by the competent authority.

The competences for integrated permitting are distributed among the three levels of governance in line with the competences for construction permitting, which are regulated by the Law on Planning and Construction. That is why IPPC permits for many installations must be regulated by municipalities (e.g. intensive poultry/livestock farms or food industries, irrespective of their size).

Three people are working on IPPC issues at the national level and two at the provincial level. It is not known how many people are engaged in this process at the municipal level (currently, 60 IPPC installations have been identified in 35 municipalities), though none of them is likely to be solely responsible for this task. The capacity of local authorities to assess technically complex IPPC applications raises doubts, notably in smaller municipalities.

Providing the resources for developing and maintaining the knowledge and skills required for issuing integrated permits across the local self-governments does not look like a cost-effective option. Given the number of facilities requiring an IPPC permit, it may be better to concentrate the resources available for IPPC at the national/provincial level.

Serbia has not achieved one of the key objectives of introducing integrated permitting: to ease the administrative burden on both regulators and enterprises. For example, the application for an integrated permit for new IPPC installations can only be considered when all other assessment and permitting procedures are completed, including the building and/or operation permits and a separate water permit. Competent authorities issue the permit within a maximum 240 days.

The Law on Planning and Construction does not recognize the issuing of the IPPC permit and does not clarify the relationship between a construction permit and an IPPC permit.

The official IPPC procedure starts after the operation permit, prescribed by the Law on Planning and Construction, is issued. This makes it possible to build installations non-compliant with BAT that may then need difficult and costly retrofitting in line with BAT requirements.

Application of BAT is one of the criteria for determining ELVs for a specific installation, alongside its technical characteristics, location and specific environmental conditions. ELVs set in the integrated permit may be more stringent than limit values determined in special regulations.

Currently, IPPC applications are developed by the operators themselves and/or by hired consulting companies. No system of accreditation exists for consulting companies that are hired to prepare IPPC applications. The submission of the IPPC application is often preceded by informal consultations between the operator and the competent authority.

The competent authority informs stakeholders and the public at various stages of integrated permitting, in writing through local media as well as via the Internet. The time frames for submitting opinions to the competent authorities on the application and the draft permit are 15 days in both cases. However, the general level of public interest in the area of IPPC appears low.

After the draft permit is made public, a technical committee is established by the competent authority in order to evaluate the IPPC application and the draft permit. Such committees involve representatives of the competent authority, other organizations and independent experts.

External members of technical committees are supposed to receive a fee from the budget of competent authorities. This can pose problems in the case when responsibility for IPPC procedure is with LSGs since municipalities do not have a specific budget for this activity. The administrative fee for IPPC permitting is paid by the operators to the central budget.

Seveso installations

Serbia has a number of installations subject to major accident hazards control in relation to dangerous chemicals. At the beginning of 2014, there were registered 46 upper tier and 57 lower tier Seveso establishments, most of them in the chemical industry, oil refinery, storage of oil products, storage of explosives and fertilizer production. Upper tier establishments are obliged to prepare safety reports and internal emergency plans (SRIEP) and deliver them to the central environmental authority for approval. Lower tier establishments are required to notify the environmental authority on their activities related to dangerous substances and to prepare an "accident prevention policy". The inspection of all Seveso establishments is within the competence of

DCS. In addition, local self-governments have to prepare external emergency plans pursuant to the Law on Emergency Situations (OG 111/09, 92/11, 93/12).

As of September 2014, a SRIEP had not been submitted for one upper tier establishment despite the process having to be completed by the end of 2011. Of 46 submitted SRIEPs, 32 have been evaluated and amendments have been requested because of various insufficiencies. So far, one SRIEP has been approved.

The remaining 14 SRIEPs are under different stages of the administrative procedure. This includes a public insight and public presentation and debate, the establishing of technical committees for review of submitted documents, evaluation of submitted documents, on-site inspection of Seveso establishments and drafting of the decision/consent. For all lower tier Seveso installations/establishments, the "accident prevention policy" documents have been developed.

Based on the received SRIEPs and the notifications, the Ministry of Agriculture and Environmental Protection keeps a register of Seveso installations. No external emergency plan has been drawn up so far by the local self-governments, according to data provided by the Ministry of the Interior.

Both the lack of administrative capacity and the lack of capacity of industrial operators in preparing documentation have caused the mentioned delays. In the Ministry, the Section for Protection from Large Chemical Accidents, which is the competent authority for the evaluation of the safety reports and internal emergency plans, has only three experts. Operators' capacity to develop specific issues of the SRIEP is insufficient. Consulting companies hired by operators to develop the SRIEP also lack experience to do the job. Competent national experts who are included in the process of examination of the SRIEPs (members of technical committees) have to be continuously trained. The Law imposes no requirements on the qualification and work experience of the developers of safety reports.

Single media permits

Permits for non-IPPC installations are media specific. Various media-specific environmental permits are issued, covering waste, water, air pollution, nature protection, environmental noise, chemicals and radiation safety.

Air protection

Several types of authorizations were issued by the Ministry's Section for Protection of Air and Ozone Layer, including: permits for the measurement of ambient air quality (55) and emissions from stationary pollution sources (55); authorizations for self-monitoring of emissions (3); and approvals of the air quality control programmes (33) and air quality plans (1) adopted by the Autonomous Province authorities and the local self-governments after the enactment of the Law on Air Protection. Between 2007 and 2013, the Ministry issued 276 import, export and transit licences for ODSs and 722 for fluorinated GHGs. One operation licence was granted in 2011 to a centre for recovery, recycling and reclamation of controlled substances and fluorinated GHGs. Only three authorizations for self-monitoring of emissions were issued in 2013, after detailed requirements were prescribed by the Rulebook on conditions for issuing consents to operators for air quality measurement and/or measurement of emissions from stationary sources of pollution (OG 16/12). The authorities responsible for environmental protection are entrusted to approve the emission reduction plans prepared by the operators of facilities located in areas of the third category of air quality.

The ambient air and emissions quality measurement permits are issued with no fixed term (no validity period indicated). The permit can be withdrawn, however, if irregularities are noted during environmental inspections. Four people are working in the Section for Protection of Air and Ozone Layer on issuing permits, and one person is working with local self-governments on air quality control programmes and air quality plans.

Waste management

According to the Law on Waste Management, permits have to be obtained for performance of one or more activities on waste management, as follows: (i) collection of waste; (ii) transport of waste; (iii) storing of waste; (iv) waste treatment; and (v) waste disposal. A combined permit can be issued to one operator performing several of these activities.

Permits for management of hazardous waste, non-hazardous waste incineration and treatment of waste in mobile facilities were issued by the Ministry's Division for Waste Management. The Ministry had exclusive prerogatives on the transboundary movement of waste. The Autonomous Province is entrusted with the issuing of permits for all waste management activities on its territory and for all the

facilities that apply to the provincial authorities for a building permit. Municipalities and Belgrade are entrusted with the issuing of permits for collection, transport, storage, treatment and disposal of inert and non-hazardous waste.

During the period 2007–2013, the main environmental authority issued 2,246 permits for transboundary movement of waste, including 206 permits for hazardous waste shipments. Since the enactment of the Law on Waste Management, the Ministry has issued 1,376 waste management permits, including 244 permits for collecting or/and transport of hazardous waste, 71 permits for storage and treatment of waste and 25 permits for storage of hazardous waste. In the same period, the competent body of the Autonomous Province granted 176 waste management permits, including 32 permits for different operations with hazardous waste. Belgrade provided about 100 permits, predominantly for storage and treatment as well as for collection and transport of non-hazardous waste. Permits for storage, treatment and disposal of waste are issued for a period of 10 years; an application for renewal and/or revision of conditions contained in the permit shall be submitted after the expiry of this term.

The register of waste management permits issued by all competent authorities is publicly available on SEPA's official website. As of April 2014, the list of waste management permit holders included 1,759 legal entities. Pursuant to the Law on Packaging and Packaging Waste, the Ministry issued six licences for packaging waste management. Fourteen people are working in the Division for Waste Management on issuing permits covering all waste categories; only one person is involved in waste permitting in Vojvodina. One person in SEPA maintains a register of issued waste management permits.

Chemicals

The Law on Chemicals provides, inter alia, for permits for the placing on the market and the use of particularly hazardous chemicals, systematic monitoring of chemicals, supervision and other issues related to chemicals management. Nine types of administrative acts (permits, consents and certificates) were issued by the Ministry's Division of Chemicals, which took over the responsibilities of the Chemicals Agency. Among others, 38 permits for the placing of particularly hazardous chemicals on the market were issued to manufacturers, importers and downstream users, and 28 acknowledgements on the notification procedure/PIC procedure were issued in 2011–2013.

The Chemicals Registry is established for the purpose of creating a comprehensive database of chemicals placed on the Serbian market. As of September 2014, 2,511 companies reported data on chemicals produced or imported, and data on 46,708 chemicals (substances and mixtures) are reported to the Registry. Its data are used for preparation of inspection campaigns.

Relevant procedures for placing biocidal products on the market (including authorization) are prescribed under the Law on Biocidal Products. The Ministry is currently carring out a national "transitional" procedure, i.e. it issues decisions on inclusion of a biocidal product on the Temporary List for technical dossier submission. Since the Law came into force, 1,468 applications for inclusion of biocidal products on the Temporary List have been submitted and 1,013 biocidal products were included on the Temporary List. The Division of Chemicals lacks capacity for carrying out risk assessment of biocidal products for the purpose of granting an authorization and will have to consider the possibility of relying on assessments by external experts. Since the abolition of the Chemicals Agency, the number of staff dealing with chemicals has decreased.

The local self-governments are entrusted the tasks of issuing permits for placing particularly hazardous chemicals on the market to distributors who are not importers, manufacturers or downstream users, as well as permits for the use of particularly hazardous chemicals by private persons. In 2013, the Secretariat for Environmental Protection of Belgrade issued six permits for distribution of particularly hazardous chemicals.

Noise

The Ministry will be issuing licences for environmental noise measurements. So far, 37 organizations have been authorized to measure environmental noise. The licence is valid for a period of four years and can be renewed.

Nature protection

The Ministry issues various types of permits covering the transboundary movement and trade of protected species, collection of wild species for internal and external trade purposes, and collection of protected wildlife species for research and educational purposes (table 2.2). Usually, this is done on the basis of the opinion provided by the Institute for Nature Conservation of Serbia or the Provincial Institute for Nature Conservation.

Table 2.2: Nature protection permits, 2007-2013

	2007	2008	2009	2010	2011	2012	2013
Collection of wild species	369	360	384	407	311	227	311
Export of wild animal and plant species	403	377	405	405	389	353	389
Import of wild animal and plant species	113	104	84	101	141	144	139
Research and education purposes	..	..	..	29	37	33	43
CITES permits	49	87	93	69	48	126	145
Import of non-native species	..	..	..	..	84	96	128

Source: Ministry of Energy, Development and Environmental Protection, 2014.

Over the most recent period, more than 1,000 permits have been issued by the Ministry's Department for Environmental Protection every year, by five officers (including two persons for CITES permits). The province and local self-governments do not have permitting tasks on nature protection.

Fisheries

Since 2012, the Ministry of Natural Resources, Mining and Spatial Planning has been in charge of the fisheries. Several types of authorizations are issued: consent for an act of promulgation of a fishing area; consent for the management programme of a fishing area; permit for fishing for scientific purposes; permit for rehabilitation fishing; and permit for fish translocation. In 2010, 131 permits were issued on the basis of the Law on the Protection and Sustainable Use of Fish Stocks. Allochthonous species can be introduced into an aquaculture facility upon the authorization of the Ministry of Energy, Development and Environmental Protection.

Water

The responsibilities for water permitting are divided between the Water Directorate and the competent bodies of the Autonomous Province, Belgrade and the local self-governments, depending on the type of structures/ facilities. This includes setting water terms as part of the project's technical documentation, giving water approval prior to the initiation of construction and issuing water permits. The Province and Belgrade have the same competences as the Republic, on their territories, while local self-governments have a more limited range of facilities/activities to regulate. Water permits for groundwater use cannot be issued without the consent of the ministry in charge of geological research (Ministry of Natural Resources, Mining and Spatial Planning).

The water permit integrates both the water use and water discharge conditions. A water permit for structures and works is issued by the body that has granted the water approval. The water permit is a precondition for obtaining an operation permit. Water permits are issued for a specific period of time, not longer than 15 years.

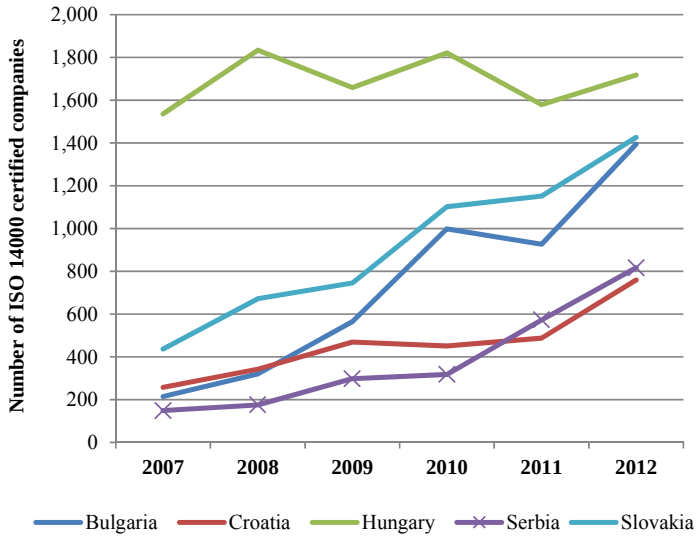
In 2013, the Water Directorate handled 874 applications, which resulted in 688 decisions to issue water acts (water terms, water approvals, water permits and water orders) and 186 decisions to reject an application. Five persons are dealing with these and other related activities. All the water acts issued by the Water Directorate are recorded in written form in the registers of water districts (water books), and in electronic format are posted on the Water Directorate website. According to the water books, 1,358 water permits were issued between 2006 and 2014, almost equally distributed among the catchments of the Danube, Morava and Sava Rivers.

All the decisions rendered on the issuance of water acts are submitted to the competent water inspector as well as to the local self-government unit and the competent public water management company.

2.6 Compliance promotion and voluntary schemes

Since 2007, progress in this area has been mixed. Government action on promoting compliance has apparently focused on providing financial support to the regulated community. This support alone has not resulted in spectacular change in business practices. For example, resource efficiency is much lower on the agenda of Serbian enterprises in comparison with those in the EU, and environmental management is largely seen as a constraint rather than an opportunity. At the same time, only 2 per cent of Serbian enterprises declare that they face difficulties in complying (in comparison with 3 per cent on average in the EU, 4 per cent in Hungary and 6 per cent in Latvia). When compared with non-compliance data resulting from inspection activity (see section 2.7), this figure very likely denotes a poor understanding of environmental requirements.

Figure 2.1: Adoption of environmental management systems by enterprises in selected countries, 2007-2012



Source: http://www.iso.org/iso/home/standards/certification/iso-survey.htm?certificate=ISO 14001

Voluntary initiatives, such as adoption of certified environmental management systems, continued to develop steadily but remained at a comparatively modest level (figure 2.1).

There are no enterprises certified according to the EU Environmental Management and Audit Scheme. Both national and international systems of product labelling are present in Serbia. By February 2014, the Ecolabel of Serbia had been assigned to eight products of three companies, while three more products of two companies were in the review process.

Competent authorities put limited efforts into providing relevant information to enterprises. Communication with business actors mostly takes the form of consultations during the development of legislation, or during relevant administrative procedures. Awareness-raising and the education element of inspections is hardly present in Serbia.

Enterprise Eurobarometer survey data still call for Serbian authorities to simplify procedural aspects of environmental regulation in order to promote compliance. While 40 per cent of Serbian small and medium-sized enterprises (SMEs) (the largest segment, similar to the EU average of 46 per cent) report that they did not encounter any difficulties when trying to act on the environment, one prominent factor affecting environmental action, as declared by almost one in four companies (23 per cent), is the complexity of administrative/legal procedures.

Financial support to companies that aim to improve their environmental results is higher in Serbia than the EU average. At the same time, the vast majority of enterprises (77 per cent) consider that the existing legislation is sufficiently stringent, and would not wish to go beyond compliance, especially in the absence of financial incentives. The relevance of other factors driving environmental action is still negligible. Overall, enterprise action in Serbia seems to be very much contingent upon one form or another of state subsidy or donor support.

With donor support, the National Cleaner Production Centre was established in 2007. It offers advice on resource efficiency measures, as well as support services related to administrative procedures. The 2009 National Strategy for Cleaner Production (OG 17/09) set the overall framework for improving incentives for resource-efficient and cleaner production. Chemical Leasing, launched globally by the United Nations Industrial Development Organization (UNIDO) in 2005, has been implemented at 50 enterprises in Serbia. The programme encourages better chemicals management by decoupling the payment from the consumption of chemicals.

Since 2007, the Chamber of Commerce has run the Corporate Social Responsibility (CSR) Award, for which 272 companies have applied. In 2012, with 42 candidates, the CSR Award was given to five large enterprises and five SMEs. There are plans to establish a call centre to assist enterprises on environmental matters.

2.7 Identification of non-compliance: self-monitoring and inspection

Self-monitoring

According to the Law on Environmental Protection, the regulated industrial installations are obliged to monitor their polluting emissions and submit reports to the authorities on the results. Self-monitoring is carried out by or on behalf of operators of controlled installations. Large installations make recourse to instrumental self-monitoring, which is implemented by accredited laboratories. Large combustion plants and cement plants are required to have continuous online measurements.

Compliance with self-monitoring and reporting is verified by the environmental inspectors during site visits or through documentation review. Instrumental checks of emissions quality for inspection purposes are rare. The quality of self-monitoring results is controlled by a system of laboratories and installations licensing. The Ministry of Energy, Development and Environmental Protection provides permits for the measurement of emissions from stationary pollution sources to laboratories, and authorizations for self-monitoring of emissions to the operators.

Although the environmental inspectors are empowered to take samples on site, they are not doing so because the sampling of waste, soil, water and air is carried out with equipment the inspectors do not possess and which requires accreditation they do not have.

With regard to chemicals, inspectors could be discouraged from ordering analytical checks by the fact that the costs of sampling and analysis cannot be recovered if laboratory tests do not show non-compliance.

Inspection

In its overall design, the system of inspection largely follows Recommendation 2001/331/EC providing for minimum criteria for environmental inspections in the Member States. In 2007, a unified planning method, reporting and record-keeping on inspections were introduced at all levels. Guidelines and instructions for inspections are available. There are regular (planned) inspections and ad hoc site visits, which are related to complaints, requests from other authorities or incidents/accidents. The inspector is not obliged to notify the regulated entity that an on-site visit will take place, unless such a notification is necessary for the purpose of performing the visit. The mechanisms to verify compliance include on-site inspection surveillance and review of documentation. Generally, inspectors spend 50 per cent of their time on site, the rest being dedicated to other forms of compliance checks. Inspectors should follow standardized operating procedures that help them to take consistent and transparent decisions.

Inspectors provide good territorial coverage of the country. However, the existence of many small offices carries the risk of making the organization inefficient. Under such organization, inspection controls may have the tendency to focus more on formal requirements than on substantial issues related to risk factors, and to try to inspect all businesses or to select inspection targets based on inspectors' subjective views or sheer convenience (e.g. proximity to the inspectorate's office).

Thanks to international projects, environmental inspectors have undergone active training over the last few years, notably at the central and provincial levels. The staff turnover is limited. The qualifications and the mix of specialists carrying out inspection are reported to be adequate. The organization of DCS allows for a certain specialization of inspectors and a broad range of skills, so that most aspects of environmental impact are appropriately covered. As all civil servants, inspectors have to pass the so-called "State examination" one year after employment.

There is an inspection planning system in place within DCS and within the Inspection Department of the Autonomous Province, which is based on annual work plans. The 2007 internal instruction on planning and reporting on environmental inspections provides guidance on the allocation of time to different tasks. However, it does not envisage time for preparing court actions. Annual inspection plans are not publicly disclosed by DCS, while a similar plan for IPPC installations in Vojvodina (2014–2015) was posted on the Internet.

Results of each site visit are properly recorded. Inspection reports contain the findings of the site visit and proposed improvement measures. Such reports are shared with the company, and the company should provide feedback to inspectors on the implementation of improvement measures. Inspectors also report on other activities. Such information is compiled in annual reports, with very little analysis. A national report on inspection activities and their impact is not available, given that local authorities are not obliged to report to central authorities. Nonetheless, half the local self-governments

submitted reports on their inspection work to the DCS in 2010.

Since 2009, the number of inspections carried out by DCS has been on a downward trend (table 2.3). This has to be put in the context of a decrease in personnel followed by the transfer of a number of competences and staff (protected areas, fisheries) to the Ministry of Natural Resources, Mining and Spatial Planning. At the same time, the complexity of tasks increased after the enactment of the "green package" of laws in 2009. Every republic-level inspector carries out 100–110 site visits per year, on average. The workload of inspectors in territorial units is higher since the inspectors based in Belgrade also have supervision and other kinds of tasks, but it is generally comparable with that of other inspectorates covering the environmental sector.

The breakdown by inspection areas (based on available data from 2012) shows a clear emphasis on industrial pollution control. The share of planned inspections in the total number of inspections is about 70 per cent; the rest are ad hoc inspections (however, there are inspection areas where this proportion can be inverted, e.g. waste). Between 10 and 30 per cent of regular inspections require follow-up. The number of complaint-driven inspections is relatively small. In 2013, 765 complaints were filed with the Ministry of Energy, Development and Environmental Protection, most of them, reportedly, on waste management problems. Of these, an inspection control was undertaken or administrative procedure conducted on 426 cases (less than 5 per cent of the total number of inspections by DCS), while 339 complaints were forwarded to other authorities.

Data from the Autonomous Province (table 2.4) and Belgrade (table 2.5) show, first and foremost, notable differences in the reporting format of the environmental inspections operating at different levels, despite efforts to unify the reporting procedures across the country, as mentioned above. The very important share of complaint-driven inspections in Belgrade probably demonstrates the higher awareness of environmental issues of the capital's inhabitants. The number of checks reported by 27 Belgrade inspectors is striking and indicates reporting problems rather than real intensity of work.

Unlike large municipalities, smaller ones face important capacity problems. In most of them, one person conducts inspection of a great number of sectors. Local-level inspectors lack training, technical and legal knowledge as well as the basic equipment required to carry out their duties.

The water inspectorate carried out 3,840 checks in 2013. This inspectorate has its own internal guidelines on inspection and emergency situations, e.g. accidental pollution. While joint inspections with the Ministry of Interior are carried out, no joint actions involve environmental inspectors. A lack of formal communication and coordination between inspections (such as cooperation protocols) is said to be compensated by good informal contacts.

The sanitary inspectorate has undertaken roughly between 2,000 and 3,000 checks of facilities for public water supply over recent years. It also enforces legislation on chemicals and biocidal products (i.e. control of chemicals marketing and the general conditions of production).

Since 2012, protected areas and fishery inspections have been moved to the Ministry of Natural Resources, Mining and Spatial Planning. Five protected areas inspectors have primarily administrative control functions and supervise the activity of protected areas management as well as the work of inspectors on local or province level for the entrusted tasks. Seven fishery inspectors supervise the management of fishing areas/districts. During recent years they carried out between 500 and 1,000 checks annually. They do joint ad hoc control campaigns with the police. A corpus of fishery guards, forest guards and gamekeepers support the inspectors, taking action on nature protection.

Coordination mechanisms on environmental inspection in Serbia are not effective enough. There is only ad hoc communication and coordination, and no/few formalised mechanisms of cooperation exist. Attempts were made to formally establish an environmental inspection and enforcement network; however, there was resistance to this initiative based on the view that the legislation (specifically, the Law on State Administration) already contained sufficient provisions to enable state organizations to work together.

Inspection campaigns are planned and implemented by different divisions of DCS, often involving other inspecting authorities. For Seveso installations, joint inspections based on ad hoc agreements with other inspections are done (fire inspection of the Ministry of Interior, labour inspection, and pressurized equipment inspection). At the same time, no joint inspections are reported for IPPC facilities.

Table 2.3: Administrative and judicial non-compliance measures taken by environmental inspections, 2007-2013

	2007	2008	2009	2010	2011	2012	2013
	Department for Control and Surveillance						
Inspections	11,302	13,423	13,794	12,860	11,590	9,566	8,800
Decisions	1,417	1,772	2,799	2,646	2,785	1,580	1,614
Imposed prohibitions	149	200	167	165	175	224	162
Closure of installations	8	5	1	1	2	..	3
Misdemeanor charges	742	827	885	402	374	271	157
Commercial charges	112	139	118	97	72	37	62
Criminal charges	42	31	35	15	8	5	11
	Environmental inspection (PSUPCEP)						
Inspections	..	..	..	1,682	2,084	2,015	n.a.
Decisions	..	..	..	348	409	561	..
Misdemeanor charges	..	..	..	42	50	34	..
Commercial charges	..	..	..	8	10	7	..
Criminal charges	..	..	..	0	4	2	..
	Water inspection						
Inspections	4,555	5,545	..	3,791	2,638	2,946	3,840
Decisions	1,191	1,427	..	982	834	874	975
Misdemeanor charges	302	367	..	241	167	170	123
Commercial charges	91	120	..	20	9	8	10
Criminal charges	3	10	..	2	..	4	2
	Sanitary inspection						
Inspections	..	..	..	3,165	2,345	1,853	1,630
Decisions	..	..	..	800	608	471	561
Imposed prohibitions	..	..	..	344	328	255	252
Misdemeanour charges	..	..	..	..	23	15	7
Commercial charges	..	..	..	..	4	0	8
Criminal charges	..	..	..	..	0	0	0

Source: Ministry of Agriculture and Environmental Protection; Provincial Secretariat for Urban Planning, Construction and Environmental Protection; Ministry of Health, 2014.

Table 2.4: Statistical data relevant to Vojvodina Autonomous Province environmental inspection activity, 2010–2012

	Industrial facilities			Protected areas			Fisheries			Protected species		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
Planned inspections	523	572	404	97	71	105	340	500	643	304	307	339
Complaint driven	131	197	196	60	54	34	9	35	32	23	92	51
Other unplanned	100	154	110	19	0	6	34	20	47	41	82	48
Total	**754**	**923**	**710**	**177**	**125**	**145**	**383**	**555**	**722**	**368**	**481**	**438**

Source: Provincial Secretariat for Urban Planning, Construction and Environmental Protection, 2014.

Table 2.5: Number of environmental inspections performed in Belgrade, 2007–2013

	2007	2008	2009	2010	2011	2012	2013
Planned inspections	1,029	1,702	1,174	2,500	3,342	3,587	3,021
Inspections upon complaints	2,401	2,776	2,180	2,567	1,799	1,623	2,942

Source: Secretariat for Environmental Protection of Belgrade, 2014.

Cooperation among the enforcement authorities responsible for the transboundary movement of dangerous substances, protected endangered species and hazardous waste (border police, customs and environmental inspectorate) has improved during the last few years.

Within the Ministry of Energy, Development and Environmental Protection, inspectors are mostly

informed, and much less consulted, on issues of permitting. DCS staff regularly receive information on EIA consents, IPPC permits, decisions on the approval of safety reports and waste management permits, etc. Commonly, such documents are sent to them within 14 days of issuance by the Integrated Permits Department. However, feedback from inspectors is not systematically considered a part of permitting.

There are several vehicles for communication with the general public: the inspection's emergency phone line and e-mail, and preparation of information for the media and the interested public (NGOs, individual citizens' requests).

At the international level, the environmental inspectorate has a good record of cooperation, particularly within the Environmental Compliance and Enforcement Network and the Regional Environmental Network for Accession. This cooperation has given the inspectorate considerable insights into best practice in the development of effective working relationships with other bodies.

2.8 Non-compliance responses

Administrative enforcement

On average, some 20 per cent of environmental inspections carried out at the central level result in some form of administrative response. Most often, enforcement orders (decisions) requiring corrective measures are issued (table 2.3). The same tool is actively used by the water inspectors and the sanitary inspectors. The number of inspectors' decisions is a good indication of compliance rates.

The majority of the enforcement orders are related to non-compliance by industry, falling under the Laws on Environmental Protection, Air Protection, IPPC and EIA. A noticeable number of decisions applied by DCS inspectors impose the temporary prohibition of activities until corrective measures are implemented. Temporary bans on the work of drinking water facilities are actively used by the sanitary inspectors. In cases of legal violations potentially threatening the population's health and the environment, the inspectors can order the suspension of activity or closure on an installation; these are usually accompanied by legal sanctions. A few such cases per year occur (table 2.3 for all indicators). Responses at the provincial level are limited to prescribing corrective measures. There is no information on administrative responses at the municipal level.

The Law on General Administrative Procedure foresees the possibility of suspending the action of an inspector's decision in a case of force majeure through the appeal procedure. Sometimes, this is used as a legal instrument for maintaining the activity of big installations.

Between 2007 and 2013, about 250 appeals against the decisions of municipal, provincial and republic environmental inspectors were resolved annually by the ministry competent for environmental protection. The appeal procedure could be very long, since the Ministry of Energy, Development and Environmental Protection's Administrative and Legal Affairs Oversight Group employed three people to address appeals filed against decisions taken at all levels of governance. The number of employees of this section in the Ministry of Agriculture and Environmental Protection recently increased from three to five people.

Misdemeanour and economic/commercial proceedings

Most cases of environmental offences are resolved through misdemeanor courts. Every year, the environmental inspection files several hundreds of indictments (table 2.3). This number has been decreasing over recent years, possibly indicating a growing preference for administrative enforcement instruments and certain reluctance to involve courts due to the mixed results of collaboration with the judicial authorities (e.g. long duration of the procedure and inefficiency of certain legal actions).

In 2013, the misdemeanour courts processed 105 charges (of 157 filed by the DCS); of these, they imposed fines in 32 cases, seized tools in 13 cases, rejected 2 cases, freed from charges in 4 cases and suspended the proceedings in 28 cases. These data are largely consistent with the findings of the survey of environmental offences conducted by the Association of Judges of Misdemeanor Courts in 2009–2011. Offenders are found guilty and convicted in about 50 per cent of cases. The defendants in environmental offence cases are most frequently handed down the minimum fines imposed by law, the penalties are often considerably mitigated or admonitions are imposed. There are a relatively large proportion of court decisions to suspend actions, which may point to the insufficient capacity of the courts to treat environmental cases and/or to courts overload. The amount of imposed and collected fines is not publicly available. Fines go to the state budget.

The most frequent misdemeanors are those defined in the forest and fishery legislation, as well as in the

Law on Waters and the Law on Environmental Protection. For the latter, most cases refer to failure to act in line with an inspector's ruling and failure to submit data for the polluters register. At the same time, the number of motions for initiating misdemeanor proceedings is small for chemicals, packaging waste and radiation issues.

The most frequent commercial offences are those laid down in the Law on Environmental Protection and the Law on Waste Management. In 2013, the commercial courts processed 41 charges for economic offences (of 62 pressed by the DCS) and imposed fines for 23 charges (mostly on legal entities); three charges were dismissed and the procedure was suspended in one case. In other processed charges, the court required additional information. An analysis of environmental crime cases carried out by the Association of Public Prosecutors and Deputy Public Prosecutors of Serbia showed that the courts imposed on legal entities fines in the smallest amount laid down in sectoral laws, in practically all cases. Extremely rare are cases when security measures were imposed on legal entities committing a commercial offence, in addition to fines.

In the misdemeanor procedure, the inspector can be a witness but is also given the authority to investigate, gather evidence and prosecute. The indictment can be prepared by either the inspector or an attorney. This poses the problem of inspectors' legal competence, which has an important role in ensuring that cases and evidence are prepared properly and presented in the appropriate format to the public prosecutor's office (thus ensuring a successful prosecution). Communication between the courts and environmental inspectors is strained at times. There is a perception that the judiciary is ineffective when it comes to imposing sanctions for environmental offences. It can take some time for a court proceeding to result in a court order and an eventual sanction; then, in many cases, sanctions are not imposed or are largely symbolic. The inspectorate is not kept informed on the progress of environmental court cases and reasons for cases being closed without fines or abandoned.

Criminal enforcement

Recourse to the courts is one of the most powerful instruments in the inspector's arsenal, but environmental inspectors do not use it much because collaboration with the courts is perceived as inadequate. The number of criminal environmental enforcement cases is relatively limited and yet decreasing (table 2.3). The number of criminal charges pressed by the environmental inspectorate has dropped since 2009, a fact that can also be related to the enactment of the legislative "green package", each law providing for penal sanctions for commercial offences and misdemeanors. Of 11 criminal charges submitted by the DCS to the public prosecutor´s office in 2013, only two have been considered and both rejected; in the process of other criminal cases, the court required additional data. Other enforcement agencies operating on environmental matters are even less active in pressing criminal charges: e.g. the sanitary inspection did not file any criminal charge in 2011–2013.

According to statistical data of the basic courts for the period 2011–2012, first-instance judgments for 311 persons were rendered for criminal offences related to environmental protection. Of these, 209 were judgments of conviction, including 13 prison sentences, 44 fines and 152 suspended sentences. For the rest, 57 persons were acquitted and 45 were denied the charges. These numbers speak to a lax sentencing policy on environmental cases, reflected in the handing down of many suspended sentences and judgments of acquittal.

The number of criminal charges filed for different offences is very disproportionate. The percentage of charges filed and indictments issued for environmental crimes is still negligible, compared with other crimes. The most frequently committed environmental crimes are devastation of forests, illegal logging, poaching game, illegal fishing, and killing and cruelty to animals, while the number of charges filed for the criminal offences related to environmental pollution, failure to undertake environmental protection measures or damaging the environment is much smaller. Public prosecutors tend to follow charges filed for the criminal offences that used to be defined as belonging to the group of commercial offences, such as illegal logging and poaching, while the prosecution of "true" environmental crimes is negligible.

In the implementation of efficient criminal environmental enforcement, Serbia shares problems faced by other countries in the region that relate to capacity within environmental inspectorates, the judicial authorities, and a lack of cooperation among authorities. The judges' lack of knowledge of environmental law and experience on environment cases leads to difficulties in defining and quantifying the health and social risks of certain activities and determining whether a particular offence falls under the circumstances of the criminal sanction. In specific cases, judges find challenging the identification of the link between the offence and its consequences.

At the same time, environmental inspectors face difficulties in gathering evidence and providing information to support prosecution. Measurements carried out by environmental inspectors are not accepted as legally valid proof in court cases. The requirement to use certified organizations for this purpose has its limits, since there are no accredited laboratories for certain analytic areas. Generally, the organization of joint training seminars and other forms of capacity-building for inspection authorities, prosecutors and judges seems to be much needed. The issue has been addressed during recent years but more training and joint workshops are required, and it may be worth considering establishing special units within each core competence to deal with environmental protection.

2.9 Conclusions and recommendations

Compliance assurance is exposed to several institutional problems. Division of responsibilities across the levels of governance does not take account of capacity constraints faced by local authorities, and horizontal cooperation is fairly limited. Thus, IPPC was delegated to lower levels while there is no technical capacity at those levels to regulate large industry and, in particular, apply BAT. Inconsistencies remain in the vertical division of mandates for inspection. Similarly, there are problems of horizontal organization. Institutionalized cooperation and coordination mechanisms are lacking.

Recommendation 2.1:
The Government should assess and redefine the division of compliance assurance mandates and reinforce the relevant coordination arrangements within and across all levels of governance, including by:

- *(a) Concentrating responsibilities for regulating large installations at the national level to overcome the problem of low capacity;*
- *(b) Improving cooperation between the competent regulatory authorities and the Serbian Environmental Protection Agency so that the information collected by the Agency is fully used for monitoring and ensuring compliance;*
- *(c) Strengthening horizontal coordination and cooperation between inspection and permitting authorities;*
- *(d) Establishing a system of regular reporting on compliance from the lower levels to the central authorities, and issuing a consolidated national environmental compliance report.*

Administrative procedures in the field of planning, construction and environment are not harmonized and coordinated. Within the overall system, environmental assessments and authorizations are procedurally complex as such, but also in terms of their interaction with other procedures, e.g. construction permits. No consideration of best available techniques is currently required at stages preceding the IPPC procedure.

Recommendation 2.2:
The Government should further improve and streamline environmental impact assessment (EIA) and permit issuing procedures by:

- *(a) Harmonizing planning and construction activities with the environmental conditions and requests under the EIA and IPPC procedures;*
- *(b) Ensuring an integrated approach and the coordination of the competent authorities in issuing IPPC permits;*
- *(c) Following up on the best available techniques requirements in procedures preceding the IPPC permitting;*
- *(d) Simplifying the regulatory regime for small and medium-sized enterprises.*

Although introduced in the legislation, public participation in environmental assessment and permitting remains limited. The legal system provides for adequate rights enabling citizens and citizen organizations to participate in EIA and integrated permitting. But the reality is such that the general public does not show interest in being heard.

Recommendation 2.3:
The Ministry of Agriculture and Environmental Protection should enable access to information and public participation in compliance mechanisms by:

- *(a) Developing and applying proactive strategies for involving the public;*
- *(b) Strengthening public involvement in the integrated permitting of IPPC installations;*
- *(c) Regularly disclosing compliance and enforcement information and tailoring it to the needs and understanding of the general public.*

Although efforts to professionalize inspection authorities resulted in organizational innovation, such as adoption of risk-based planning methodologies, management approaches within the environmental inspection still leave room for improvement. A modern information system in support of inspection planning is lacking. Staff training is very much an

occasional activity, conducted as part of donor projects, without a clear understanding of emerging needs. Criteria for performance measurement are not clear. Transparency and accountability remain weak.

Recommendation 2.4:
The Government should promote further improvements in the management of inspection authorities, in particular in the planning and performance measurement and disclosure phases.

There are a relatively large proportion of court decisions to suspend actions, which may point to the insufficient capacity of the courts to treat environmental cases and/or to courts overload. Some challenges remain: in gathering evidence and building cases for prosecution, unclear and lengthy procedures, a lack of effective communication, and limited individual capacity. To speed up behavioural and environmental changes are expected from new legislation,

Serbia needs to reconsider how response is provided in cases of environmental non-compliance. The existing approaches make it possible for the regulated community to remain in non-compliance for the long periods required for judicial enforcement, which strategy is predominantly used because of its procedural "safety" for inspectors.

The misbalance between administrative and judicial enforcement is often rooted in a limited comprehension of procedures by individuals involved in inspection and non-compliance response.

Recommendation 2.5:
The Government should enable an improvement in the procedures for and outcomes of judicial enforcement by:

(a) Continuously providing joint training and other forms of capacity-building for inspection and judicial authorities;
(b) Strengthening communication mechanisms between the executive and the judicial authorities, and improving feedback from the judiciary on all environmental cases brought before the courts, including those deemed inadmissible at a preliminary stage;
(c) Developing standard operating procedures and manuals on the enforcement of environmental laws with a focus on the application of administrative fines.

Chapter 3

ECONOMIC INSTRUMENTS, ENVIRONMENTAL EXPENDITURE AND INVESTMENTS FOR GREENING THE ECONOMY

3.1 Economic instruments for environmental protection

Serbia has been applying a wide range of economic instruments that can potentially help to support the achievement of goals related to environmental protection, including nature protection, as well as the rational use of natural resources. The corresponding revenues were also – until the end of September 2012 – an important source for financing of environmental and nature protection measures. Economic instruments applied in Serbia consist of charges (one of the main sources of funding), environmentally motivated tax incentives and subsidies.

Pollution charges

The Law on Environmental Protection regulates pollution charges pertaining to emissions of air pollutants and industrial waste; the Law on Waters has established water pollution charges. The Law on Waste Management regulates some product charges that are tantamount to payments in advance of future disposal costs of harmful goods. Revenues from charges are shared between the central state (60 per cent) and the local self-government (40 per cent) on whose territory the corresponding activities take place. Revenues from these charges, which were transferred to the Environmental Protection Fund (abolished in 2012), have now been allocated to the state budget. Local self-governments have their own environmental protection funds.

Charges for air pollution from stationary sources

Charges for air pollution from stationary sources have been collected for sulphur dioxides, nitrogen oxides and particulate matter (inorganic dust). As from 2011, there is a separate tax on emissions of fine particles from asphalt plants; the tax rate is nearly 10 times the rate for other particulate matter (PM) emissions (table 3.1).

A peculiar feature of the system of pollution charges has been that the base rates per ton of emissions, which were established in 2005, apply fully only as from the beginning of the year 2016. Until then, the effective rates correspond to a progressively increasing share of the nominal base rates. This percentage amounted to 20 per cent up to the end of 2008 and 40 per cent up to the end of 2011. As from 2012 and until the end of 2015, this share amounts to 70 per cent. The rationale has been to help polluters to achieve a gradual transition towards the full amounts to be paid as from 2016 and, related to that, to create progressively stronger incentives for adopting cleaner technologies. To prevent an erosion of rates by cumulative inflation, they have been adjusted by the annual percentage changes in the consumer price index. In the event, rates rose by some 57 per cent in 2013 compared with 2007 (table 3.1).

The effective base charge rates for emissions of SO_2, NO_2, and PM, moreover, apply only if the annual emissions (for each of these pollutants) exceed 500 tons. Lower annual emissions benefit from an "incentive coefficient". In the case of SO_2, for example, the effective base charge rate per ton is lowered by a further 17 per cent if the annual emissions are within the range of 100–500 t/year. For NO_2 and PM, the corresponding lower bound is 50 tons and 10 tons, respectively. Emissions below these lower bounds benefit from a larger "discount" of 33 per cent. There is also a legal provision for applying lower charges where prescribed emission limit values (ELVs) are not exceeded, but it has not been applied so far.

Up to 2011, the charges for emissions of air pollutants (SO_2, NO_2, PM) applied only to enterprises with integrated permits.

Charges on emissions of substances that deplete the ozone layer

Production of ozone-depleting chemicals such as chlorofluorocarbons is prohibited in Serbia. Their import has been subject to a licence from the ministry in charge of environmental protection and a tax per kg since December 2005.

Photo 3.1: Agriculture in Vojvodina

Table 3.1: Pollution charges, 2010, 2013

		Nominal base rates		Effective base rates		
		Dinar/ton		Dinar/ton		€/ton
Pollutants	**Tax base**	**2010**	**2013**	**2010**	**2013**	**2013**
SO_2, SO_3 (expressed as SO_2)	ton	6,950.0	8,353.0	2,780.0	5,847.1	51.7
NO_2, NO (expressed as NO_2)	ton	5,560.0	6,683.0	2,224.0	4,678.1	41.3
PM	ton	11,121.0	13,367.0	4,448.4	9,356.9	82.7
PM from asphalt plants	ton	120,000.0	129,360.0	48,000.0	90,552.0	800.4
Ozone depleting substances	kg	139,000.0	48,500.0	55,600.0	48,500.0	300.1
Industrial waste generation						
Non-hazardous waste	ton	236.0	284.0	94.4	198.8	1.8
Hazardous waste	ton	1,182.0	1,421.0	472.8	994.7	8.8
Plastic bags						
Biodegradable	ton	1,000.0	1,115.0	1,000.0	1,115.0	8.8
Other	ton	20,000.0	22,300.0	20,000.0	22,300.0	176.8

Source: Regulation on the types of pollutants, criteria for calculating compensation for environmental pollution, and amount and method of calculation and payment of fees (OG 113/05, 6/07, 8/10, 15/12, 91/12).
Note: Charges per ton in terms of € were calculated using the average annual exchange rate of 2013: €1=113.14 dinars.

The tax rate was reduced by nearly 70 per cent to 45 dinars (€0.39) in 2010 to maintain competitiveness. In 2013, the rate amounted to 48.5 dinars (€0.42).[3]

Charges on air pollution from mobile sources

Air pollution charges on mobile sources have taken the form of an annual tax on the use of motor vehicles, which had to be paid by the physical and legal persons that owned them. The tax base comprised the type and age of the vehicle, the engine size and the type of fuel used. For each vehicle category (motorcycles, passenger cars, vans, trucks, tractors), the tax rate increased with the engine size and the age of the vehicle. Vehicles using unleaded petrol and diesel corresponding to Euro IV standards (maximum 50 ppm of sulphur) benefited from a lower tax rate compared with vehicles using leaded petrol and diesel below Euro IV standards. The

[3] Based on average monthly exchange rate for April 2014: €1= 115.54 dinars

lowest tax rate in a given vehicle category was applied to liquefied petroleum gas. This tax was, however, abolished in autumn 2012, in the context of a package of measures designed by the Government to reduce the overall tax burden on the private sector, notably the business sector.

Industrial waste charges

Enterprises have to pay a tax for waste generated and disposed waste. In 2013, the rate was 284 dinars (€2.45) per ton for non-hazardous waste and 1,421 dinars (€12.30) per ton for hazardous waste. There is no differentiation of rates for hazardous waste depending on its characteristics, such as toxicity. There is no specialized landfill for hazardous waste in Serbia; hazardous waste is therefore mainly kept on enterprise premises (chapter 8).

Tax on plastic bags

A charge for the import or domestic production of plastic (polyethylene) bags was introduced in autumn 2010 and applied as from 2011. Those subject to the tax are the legal persons that import or produce these bags in the domestic economy. The tax base is the weight in tons of the bags placed on the domestic market (table 3.1). The tax rate in 2013 amounted to some €8.80 for biodegradable bags and some €177 for other plastic bags. Introduction of the tax was delayed due to the lack of adequate domestic technical capacities for determining the chemical characteristics of plastic bags, i.e. whether they are biodegradable or not. The introduction of the tax was controversial and accompanied by strong resistance of enterprises to paying. Total payments due in 2011 amounted to some 7.7 million dinars (€0.07 million) but only some 30 per cent was paid. In 2012, some 30 enterprises disputed the amount of this tax.

Charges on products that after use become special waste streams

The system of pollution charges was enlarged in 2010 by the introduction of charges on products that, after use, have become rapidly increasing special, and often also hazardous, waste streams. Those subject to the tax are the domestic producers or importers of these products, which comprise motor vehicle tyres, products containing asbestos, batteries and accumulators, mineral and synthetic oils and lubricants, electric and electronic products, and motor vehicles. The tax base is either the number of units of the corresponding product (such as tyres) or another measure (such as kg for batteries). Rates per unit are indexed to annual consumer price inflation (table 3.2). In principle, charges imposed are to cover the costs of management of the corresponding waste products. Taxes have to be paid when these products are imported or first placed on the domestic market.

The taxation system is part and parcel of a system designed to collect the corresponding waste products with the aim of treatment and/or recycling, with specific medium-term targets for collection and recycling rates. These functions have been entrusted to specialized waste operators that have obtained a corresponding licence from the ministry in charge of environmental protection. These charges on special waste streams were complemented by charges for packaging and packaging waste, which have to be paid by companies that place packaging or packaged products on the domestic market. The collection of packaging charges started in 2012.

Water pollution charges

Water pollution charges, also known previously in Serbia as water protection charges, are part of a system of charges for water use, which are determined by the central Government in annual regulations on charges for water use. All kinds of water use require a corresponding permit.

ELVs for discharge of wastewater were adopted only in 2011 in the Regulation on emission limit values for pollutants in water and deadlines for their achievement. The 2012 amendments establish that the Regulation is applied immediately to new facilities and that the deadline for existing industrial and other polluters is the end of 2030. For communal wastewater discharged in towns with a population of more than 2,000, the deadline for reaching the ELVs is the end of 2045.

The current system of water pollution charges does not explicitly take into account the effective discharge of water pollutants (such as BOD, COD, nitrogen, phosphorous). Rather, it distinguishes six categories of sources of wastewaters, including different branches of industry, power plants, and urban wastewater collected in sewers and septic tanks, for which different charge rates per m^3 of water discharged have been established (table 3.2). Charge rates are increased by 50 per cent for a water recipient that is in a protected area. A provision (still valid in 2008) that primary treatment of wastewater prior to effluent discharges leads to reduced rates of effluent charges (80 per cent of normal rate), if treatment covers at least 50 per cent of total water discharge, is no longer applied.

Rates per m^3 of effluents for each category have been raised by some 43 per cent in 2014 compared with

2007, which is somewhat less than cumulative inflation over this period.

The rates for wastewater discharge are very low, creating no incentives for investments in wastewater treatment. And these rates are also far below those that would be required to ensure the financial viability of modern wastewater treatment plants. Collection rates for water pollution charges have declined in the face of the economic crisis. Total revenues from wastewater discharges amounted to 1.17 billion dinars (€10.3 million) in 2013, down from 1.53 billion dinars (€13.5 million) in 2010. In 2012, collected revenues amounted to only 0.77 billion dinars (€6.8 million).[4]

There is also an indirect fee for water pollution for diffuse polluters of agricultural and forestry land. The tax base is the produced or imported volume (kg) of fertilizers, chemical substances for plant protection or weed eradication, and phosphate-based detergents, and the payers of this charge are the producers or importers of these substances.

Charges for use of natural resources

Charges for use of water resources

Besides taxes on discharge of wastewaters (into natural recipients), there is an array of charges for water abstraction for various purposes, such as supply of drinking water by municipal water companies to households and industry, irrigation water for agriculture, hydro- and thermopower generation, and bottling of mineral water. The corresponding levies are, in general, based on the volume of water abstracted. Water used by energy plants is charged as a percentage (2.3 per cent for hydropower, 1.25 per cent for thermopower) of the base price per kWh of electricity generated, which was set at 3.54 dinars (3.1 euro cents) in 2014 (table 3.3).

As regards irrigation, a modest volumetric charge has been introduced only in 2014, but its application depends on the use of measurement devices. In the absence of measurement devices, large farms and food companies involved in agricultural activity continue to pay a symbolic charge per ha per month, which amounts to only some €6 in 2014. And small farmers typically have their own water sources (wells) and can use water for free (and without measurement). In the event, there have been no incentives for water saving in the agricultural sector, which is also reflected in large inefficiencies in crop irrigation.

Charges for use and trade of wild flora and fauna

The collection and trade of protected wild flora and fauna species is subject to a permit which is only issued to legal entities (natural persons are excluded), and a number of rules that have been established in the Regulation on controlling the use and trade of wild flora and fauna species (OG 31/05, 45/05, 22/07, 38/08, 9/10, 69/11). For each protected species collected there is a fee, which corresponds to 10 per cent of the established price of the species. These prices are determined by the ministry in charge of environmental protection in consultation with the ministry in charge of foreign trade. Prices are announced before the annual round of bidding for the permits takes place. Revenues from these fees were earmarked for the Environmental Protection Fund until it was abolished in 2012. The revenues have since been allocated to the general state budget.

Fees for use of fishing areas (inland waters)

These fees are based on the Law on the Protection and Sustainable Use of Fish Stocks. The Law distinguishes two types of fishing activities: commercial and recreational. Both are subject to a permit. The fee for an annual recreational fishing permit amounts to some 6,000 dinars (€53) for 2013–2014, up from 4,600 dinars (€40) during 2010–2012. The fee for a commercial fishing permit depends on the fishing district and has ranged from 90,000 to 250,000 dinars (some €780 to €2,160) since 2010. A given fishing area can be open to a public tender process for commercial fishing and a corresponding permit can be awarded for a period of up to 10 years. Revenues from permits are allocated to the central Government budget.

The number of commercial permits dropped sharply (by some 45 per cent) in 2010 compared with 2008/2009, due to a new legal requirement that commercial fishers had to officially register as entrepreneurs and, in addition, pass a professional examination. In 2013, 319 commercial permits were issued, compared with an average of something more than 600 permits in 2008–2009. It has been surmised that the decreased presence of commercial fishers could potentially aggravate the problem of illegal fishing and poaching, but there is no supporting evidence for this. In fact, the resources for control and surveillance of fishing districts have been increased significantly in recent years.

[4] All figures in € were calculated using the average annual exchange rate for 2013.

Table 3.2: Water pollution charges, 2007, 2014

	Dinar/m^3		€/m^3
Source of wastewaters	**2007**	**2014**	**2014**
Ferrous and non-ferrous metals industry; oil and oil derivatives; leather and textiles; chemicals; paper and pulp; vehicles, machine tools; slaughter industry, pig farms.	3.55	5.08	0.04
Electrical power industry; rubber,shipbuilding, food; metal processing; civil engineering; power plants with recirculation	2.07	2.97	0.03
Wood and wood processing industry; tobacco processing; building materials production and processing	1.99	2.85	0.03
Urban wastewaters collected in sewers	0.15	0.21	0.00
Other wastewaters (septic tanks)	0.99	1.42	0.01
Thermopower plants with open flow cooling system	0.03	0.04	0.00

Source: Regulation on fees for water in 2014 (OG 15/14) and earlier issues.
Note: Figures in € were calculated using the average annual exchange rate for 2013: €1 = 113.14 dinars.

Table 3.3: Charges for water abstraction, 2007, 2014

		Dinars		€ cents
Purpose	**Unit**	**2007**	**2014**	**2014**
Raw water abstraction	Dinar/m^3	0.19	0.27	0.24
Water of drinking water quality for own use	Dinar/m^3	0.25	0.37	0.33
Irrigation water: Measuring devices	Dinar/m^3	..	0.11	0.10
Irrigation water: No measuring devices	Dinar/ha	..	667.82	590.27
Water of drinking water quality for sale to citizens	Dinar/m^3	0.16	0.23	0.20
Water of drinking water quality for sale to enterprises	Dinar/m^3	0.33	0.44	0.39
Mineral and natural water abstracting for bottling	Dinar/litre	1.00	1.35	1.20
Water for hydropower	Dinar/kWh	0.05	0.08	0.07
Water for thermopower	Dinar/kWh	0.03	0.04	0.04

Source: Regulation on fees for water in 2014 (OG 15/14); Regulation on amount of fees for water use, water protection and fees for extraction of materials from water courses in 2007 (OG 27/07).
Note: Charges for water abstraction for energy production are calculated as a percentage of the price of 1 KWh.

In addition to the permit fee, there is a fee for the use of a fishing area, which since 2010 amounts to 15 per cent of the costs of issuing permits for commercial fishing and 10 per cent of the corresponding costs for a recreational fishing licence. Recreational fishing licences can be annual, daily or for multiple days. Until October 2012, the revenues from these user fees were allocated to the Environmental Protection Fund for financing protection measures for fishery districts. Revenues were earmarked for the protection, improvement and sustainable use of fish resources. Upon entry into force of the Law on the Cessation of the Environmental Protection Fund (OG 93/12), these revenues became the budget revenues of Serbia. Annual revenues from the user charges amounted to some 28 million dinars (€0.24 million) in 2013, of which 88 per cent were related to recreational fishing. In general, the revenues generated from the user fee have enabled basic operating costs for the management of the fishing districts to be covered.

Fees for hunting

These fees are governed by the Law on Game and Hunting, which establishes that game is a natural resource and property of Serbia, which can be used under the conditions and in the manner prescribed by this Law. The amount of compensation for hunting is prescribed by the ministry in charge of hunting. The fee is determined as a percentage of the value of the harvested protected animals, and can range from 5 per cent to 30 per cent, depending on the type of game.

The funds generated from these fees for hunting of protected species of wildlife within a given hunting season belong to the state-run Development Fund, which has mainly been providing loans to support the SME sector and business start-ups. Hunting fees collected on the territory of the Autonomous Province belong 30 per cent to the state budget and 70 per cent to the budget of the Autonomous Province.

Fees for forest use

The Law on Forests prescribes a fee for the use of forests and forest lands. The new Law on Forests has introduced a different method of determining this fee. The tax base is the annual business revenue from forest resources management generated by the user. The tax rate applied is 3 per cent or 5 per cent, depending on the type of resource use. Under the old Law, the forest user had to pay a fee that corresponded to 3 per cent of the market value of harvested timber on the forest road. The corresponding revenues are allocated 70 per cent to the state budget and 30 per cent to the budget of the local self-government where the territory is located. These revenues are earmarked for forest management.

There was, moreover, a separate fee for the protection and utilization of forest functions. It was based on the 2010 Law on Forests. The fee had to be paid by all legal entities (i.e. businesses) with the exception of legal entities engaged in state-owned forest management. The tax base was the total business revenue of the legal entity, and the tax rate amounted to 0.025 per cent. The revenue was directly transferred into the budget allocation Forest Fund (or into the Autonomous Province's separate forest fund) in order to improve forest resources (65 per cent of all forests in Serbia are coppice – low quality forests, mainly used as fuelwood). This fee, which was really a tax, was abolished as from October 2012.

Fee for use of mineral resources

The Law on Mining and Geological Exploration (OG 88/11) regulates the conditions and manner of exploitation of mineral resources (i.e. mineral raw materials) which are state owned. Economic entities operating in mining have to pay a fee for the use of mineral resources, given that the fee has been specified in the provisions of the Law. Fees for use of mineral resources are determined as a percentage of total revenues from these business activities (e.g. 3 per cent in the case of hydrocarbons, natural gas and metallic minerals, and 2 per cent in the case of radioactive materials.) The fee for use of coal from underground exploitation is 0.5 per cent. This special reduction granted by the Government is designed to reflect the specific conditions and costs imposed by underground exploitation.

In the case of non-metallic raw materials for production of construction materials, the fee is determined per ton of the excavated materials. These are set annually in a Regulation on the level of fee for the use of non-metallic raw materials for production of construction materials. The revenues generated from these fees are divided evenly between the state budget and that of the local self-government (municipality) on whose territory these activities are taking place. There is, moreover, a levy on the extraction of non-fuel minerals (sand and gravel) from watercourses

Charges for use of protected areas

Fees for the use of protected areas are based on the Law on Nature Protection as well as the Regulation on detailed criteria, method of calculation and payment of fees for the use of protected areas (OG 43/10). The Protected Area Manager, i.e. the managing authority, can prescribe and collect user charges for a range of commercial and non-commercial activities undertaken within the territory, such as tourism, sport activities, catering, trade, use of wild flora and fauna, crafts, camping, use of motor vehicles, water management, etc. The decisions of the Protected Area Manager concerning the level and payment of user fees are subject to the approval of the ministry competent for national parks.

Revenues collected from these fees are fully earmarked for the financing of the protected areas system. Other sources of financing are state budget subsidies and foreign loans and grants. Revenues collected from fees at the 56 national-level protected areas amounted to some 200 million dinars (about €1.75 million) in 2012. They are barely sufficient to cover the current operating costs. To date, there has been no assessment of the inherent economic value of the various uses made of the protected areas and a coherent medium- and longer term financing strategy has not yet been developed. State budget subsidies for protected areas of national interest amounted to 160 million dinars (about €1.5 million) in 2013 and 2014.

Fee for environmental protection and improvement

This is a local charge, which is based on the Law on Environmental Protection. It was also prescribed in the Law on Local Self-Government Financing (OG 62/06, 47/11, 93/12) as a source of revenue for local self-governments related to activities on their territory. In the context of the abolition of a large number of local parafiscal levies and the corresponding amendments to the Law on Local Self-Government Financing (OG 62/06, 47/11, 93/12) decided in September 2012, it is no longer explicitly mentioned in the list of sources of local

self-government revenue. Instead, there is now mention of "other allowances in accordance with the law". But the fee still exists according to the Law on Environmental Protection, which means that it is also included in the wider formulation of levies used in the Law on Local Self-Government Financing.

This fee *may be* prescribed by a local self-government entity based on an annual decision of its Assembly. The fee has multiple tax bases, and the maximum rates per tax base that may be applied are determined by the central Government based on the Regulation on the criteria for determining the fee for the protection and improvement of the environment and the maximum amount of fees (OG 111/09). Tax bases for the fee are:

- Surface of residential buildings: up to 1 dinar (€0.0086) per m^2;
- Surface of commercial buildings and office space: up to 3 dinars (€0.0259) per m^2;
- Land used for business activities (except agricultural and forest lands): up to 0.5 dinar (€0.0043) per m^2;
- Sales revenues from activities that affect the environment (sales of raw materials; semi-finished products sold in the domestic market and abroad): up to 0.4 per cent of annual revenues;
- Heavy truck transport (load capacity of more than 5 tons) of goods (such as oil and oil products, raw materials, chemicals) in the territory of the municipality: up to 100 dinars (€0.863) per ton.

In the case that multiple tax bases apply to a single taxpayer, the total amount due cannot exceed 0.4 per cent of the annual revenues. Although officially designated a "fee", this is really a parafiscal tax on local residents and enterprises, which is due even when there is no polluting activity. In principle, the funds are to be used for financing environmental protection measures. The revenues are allocated to the municipality's environmental protection funds.

Environmentally motivated tax incentives and subsidies

The Law on Environmental Protection provides for the possibility to offer tax relief or other financial support for applying technologies and producing and marketing products that lead to a reduction in environmental pollution compared with other technologies or products. In a similar vein, consumers that support the reuse of products or their packaging can benefit from special incentive measures.

Thus, the Law on Corporate Profit Tax (OG 25/01, 80/02, 43/03, 84/04) provides for the accelerated depreciation of fixed assets that are used for environmental improvements (prevention of air, water and soil pollution; noise mitigation; energy saving; etc.) at rates which are up to 25 per cent higher than the regular ones. Moreover, the Law provides incentives for enterprises' investments based on tax credits. A number of industries, including agriculture, fishery and recycling, have benefited from generous preferential tax credits in the amount of 80 per cent of the investment. But this preferential rate has been abolished from 1 October 2012 and has been aligned with tax credits for other industries, which can range from 20 per cent to 40 per cent.

The Customs Law (OG 73/03, 61/05, 85/05, 62/06, 9/10) stipulates that import of equipment that directly supports environmental protection is exempt from import duties, provided that the equipment is not produced in the domestic market. This requires a corresponding certificate from the ministry in charge of environmental protection and the Serbian Chamber of Commerce.

A scheme, which was established in 2010, provides financial incentives designed to support the reuse, recycling and use of waste as secondary raw materials and for energy production, based on the Regulation on the amount and conditions for the allocation of subsidies (OG 88/09, 67/10, 101/10, 86/11, 35/12). The scheme covers waste tyres, waste electrical and electronic equipment (WEEE) and waste oil, as well as batteries and accumulators. The subsidies are awarded to the corresponding specialized waste operators per kg or ton of the collected waste products. The incentive system also comprises a subsidy for the domestic producers of reusable plastic bags (with handles), with a higher subsidy for plastic bags that contain biodegradable additives. The waste collection operators for waste electrical and electronic equipment (WEEE) can benefit, moreover, from special incentives for investments in equipment for the disposal of this kind of waste. The amount of the investment subsidy depends on the size (small, medium, large) of the enterprise.

The scheme was based on the Law on Environmental Protection Fund (OG 72/09, 101/11). It was also operated by the Environmental Protection Fund, which selected waste operators based on public tenders and also paid the corresponding subsidies. The scheme has been managed by the ministry in charge of environmental protection since the abolition of the Fund at the end of September

2012. The new legal base of the scheme will be provided by the (still draft) law on amendments to the Law on Environmental Protection.

Tariffs for communal utility services

The upgrading of service quality, including more stringent environmental standards, for traditional communal utility services such as water supply and sewerage, wastewater treatment and solid waste management, as well as the extension of the corresponding infrastructure across the country, requires considerable financial resources. The funding of these costs has to rely, to a large extent, on the recovery of the corresponding costs from final consumers based on the polluter-pays and user-pays principles but also, in some cases, from projects. This holds, *mutatis mutandis*, also for services provided by energy utilities, viz. electricity and gas supply, which are not part of communal services in Serbia. The extent of cost recovery is, however, limited by the ability (and willingness) of consumers to pay higher charges for improved services (affordability constraint).

In Serbia, local self-governments, which are responsible for communal services, have delegated the actual provision of these services to public utility companies (PUCs) that are owned and managed by the municipality. Most of these PUCs are specialized in one of the service areas. In the area of waste services, however, a frequent feature is that the waste companies are also engaged in other activities such as street cleaning, municipal vehicle repair and construction works. Given that there is no separate accounting for these different activities, the extent of cost recovery for waste services is difficult to gauge. The assets (land, buildings, machinery and equipment) that are used by the PUCs were property of the State until 2011, when ownership of these assets was transferred to local self-governments based on the new Law on Public Property (OG 72/11), replacing the Law on Assets Owned by Serbia (last amended in 2005). In principle, this allows local self-governments now to lease these assets to their PUCs.

Cooperation among municipalities that would result in the regionalization of communal service provision is still underdeveloped in Serbia (chapters 7 and 8), although there are important potential financial benefits from efficiency gains associated with economies of scale. This holds notably for smaller municipalities. Regionalization would also provide a more conducive environment for private sector involvement in the provision of these services, based on public–private partnerships (PPPs). In fact, PPPs currently play only a very limited role in communal service provision in Serbia. A comprehensive and effective regulatory framework for PPPs was established only in 2011, with the entering into force of the Law on Public–Private Partnerships and Concessions (OG 88/11); the Law on Communal Utility Activities (OG 88/11) and the Law on Public Property. But there are still remaining ambiguities, which have been posing a major obstacle for the development of PPPs, *inter alia* concerning the transfer of risk between public and private partners, lack of clear criteria for the approval of PPP projects, ownership rights and dispute resolution. On the other hand, PPPs could have an important role to play in Serbia, given the shortage of public funds and the inefficiency of many public utility companies.

Local self-governments (i.e. municipal councils) have extensive autonomy in setting tariffs for utility services for different customer groups, which has made them subject to local political influence. An important constraint imposed by the central government is that tariff increases shall not exceed the projected annual rate of inflation independent of the evolution of operating costs and investment needs. Household tariffs for the main communal services (water supply and sanitation, waste collection and disposal) benefit from sizeable cross-subsidies by the imposition of much higher charge rates on industrial and commercial customers, though there is no economic justification for this. This reflects, rather, a perception that utility services are an integral part of social policy against the backdrop of widespread poverty and high unemployment. But this indiscriminate policy ignores the fact that the business sector will pass on the higher costs of utility services to the final consumer and that the main beneficiaries of the artificially low prices for communal services notably include households with above-average incomes that could well afford cost-reflective tariffs.

There is no formal tariff methodology for communal services that aims at ensuring cost-reflective tariff-setting. In general, tariffs are set to recover operating costs, but revenue estimates have tended to assume an unrealistic bill collection rate of 100 per cent. The financial performance of municipal utilities varies significantly among sectors and individual municipalities. Many of them incur sizeable losses because tariff revenues are not sufficient to cover operating costs. The financial statements of many PUCs tend to understate the size of losses because municipal subsidies are often reported as ordinary revenues. Revenues of PUCs are often insufficient to ensure adequate maintenance and repair of the fixed

capital stock. Capital expenditures for the extension and modernization of the service network have been financed either (on a small scale) from the municipal budget or – mainly – by loans and grants from foreign sources. The scope for PUCs to borrow from domestic commercial banks has been narrowly circumscribed, given the instability of their cash flow.

Besides inadequate tariffs for the services provided, the financial problems of many PUCs have been compounded by the inefficiency of operations (overstaffing), poor management and low bill collection rates. There are no incentives for PUCs to improve their economic and financial performance. There are no service agreements between the municipalities and their PUCst that define what is expected from each company and the resources available for achieving these goals. The monitoring capacities of local self-governments as regards efficiency issues are, moreover, quite limited.

Current tariff levels for municipal services provided to private households are quite low. Data from household budget surveys suggest that affordability of communal services is not an issue for average-income earners (table 3.4). Expenditures on solid waste management services accounted for only 0.3 per cent, and water supply and sanitation for only 0.7 per cent, of average monthly household incomes in Serbia in 2012.

There is no generally agreed international criterion for affordability of water and waste services that would fit the specific local circumstances of individual countries, but it is noteworthy that international financial institutions (IFIs), such as the World Bank and the European Bank for Reconstruction and Development (EBRD), often take as a benchmark that waste and water charges combined should not exceed 4 per cent of average household incomes. All this suggests that there is ample scope for improving the financial performance of municipal services by (gradually) moving tariffs (notably for households) up to cost-reflective levels. There are other ways and means to improve financial performance, which include, notably, ensuring a high collection rate for bills and improving the overall efficiency of service provision. Nevertheless, affordability remains a problem for lower-income households, for which adequate instruments (such as targeted social assistance) have still to be designed. The current prevailing system is that municipal councils decide about tariff reductions for certain groups of vulnerable persons, often without compensating the PUCs for the resulting shortfall of revenues.

Tariffs for municipal waste collection and disposal

The characteristics of the tariff system for municipal waste services are quite similar among the various municipalities in Serbia. In general, the tariff system distinguishes two major categories of customers, viz. natural persons (households) and legal entities (such as business companies). The fee base is the size (m^2) of the residential or commercial premises, which does not create any incentives for waste minimization.

There are, moreover, monthly lump-sum charges for certain categories of small commercial and certain institutional customers. In the city of Belgrade, such lump-sum charges apply up to a certain size of the corresponding premises (30 m^2), beyond which additional charges per m^2 apply (table 3.5). Waste collection, transport and disposal at the landfill are managed by the city waste company (Gradska Cistoca). Revenues from tariffs for waste services during recent years were, in general, only sufficient to cover basic operating costs excluding costs for repairs and maintenance. Capital expenditures are normally funded directly from the municipal budget. The average collection rate of waste bills in recent years was around 85 per cent, but this masks a much lower collection rate for household bills.

Table 3.4: Household budget survey: Expenditures on communal services

	Waste disposal	Sewerage	Water supply	Electricity	Central heating	Total
Total	**0.3**	**0.0**	**0.7**	**6.2**	**0.1**	**7.3**
Belgrade region	0.4	0.1	0.9	6.2	0.4	8.0
Vojvodina Province	0.4	0.0	0.9	6.4	0.1	7.8
Northern region	0.2	0.1	0.7	5.6	0.1	6.7
Southern region	0.3	0.0	0.5	6.6	0.0	7.4

Source: Statistical Office, Household budget survey 2012.

Table 3.5: Monthly municipal waste fees in the City of Belgrade

Customer group	Unit	Dinar 2010	Dinar 2014	€ 2014
Private households	Per m^2	4.27	4.54	0.04
Industry, business premises	Per m^2	11.58	12.32	0.11
Small crafts, trade and services (up to 30 m^2)				
a) Law offices, galleries, dry-cleaners, etc.	Lumpsum	824.97	878.05	7.58
b) Pharmacies, coffee shops, liquor stores, etc.	Lumpsum	1,072.45	1,141.47	9.85
c) Fun games, sports betting, gyms etc.	Lumpsum	1,310.79	1,395.14	12.04
d) Grocery stores, restaurants, garages, etc.	Lumpsum	1,549.11	1,648.50	14.23
Small crafts, trade and services (more than 30m^2) paying lumpsums: additional fee	Per m^2	17.82	18.96	0.16
Open air retail and wholesale markets	Per m^2	17.82	18.96	0.16

Source: Belgrade Waste Company (PUC "Gradska Cistoca").
Note: Tariffs for 2014 applicable since April 2011. Figures in € were calculated using the average monthly exchange rate for March 2014: €1= 115.84 dinars.

Certain categories of persons, notably low-income households, benefit from discounts on base tariffs, which are decided by the municipal council. The corresponding shortfall in revenues is not compensated from the city budget. The tariffs applied in Belgrade in April 2014 by the city waste company Gradska Cistoca rose by 6.4 per cent for each of the customer categories, compared with the tariffs applied in 2010. This is much less than the cumulative increase in the consumer price index, which was some 29 per cent in 2013 compared with 2010.

Tariffs for water supply and sewerage

All water consumption is metered, but in multi-family buildings only aggregate consumption for the building as a whole is based on metered consumption. This total is then divided on a pro-rata basis using the size of living space of the individual apartments as the criterion. This system does not provide effective incentives for rational use of water resources. In Belgrade, the city government has pursued a policy of reducing the cross-subsidization of household tariffs in recent years.

Tariffs for legal entities have remained unchanged since 2011, while household tariffs, including for sanitation, rose by 37 per cent in 2014 compared with 2011, broadly in line with the inflation rate. But tariffs for water supply and sewerage combined for legal entities were still some 80 per cent higher than for households in spring 2014. In other major cities, this tariff gap was even larger (Novi Sad 135 per cent, Niš 150 per cent, Kragujevac 90 per cent). In contrast, in Subotica this difference amounted to "only" 30 per cent.

The smaller discrepancy between the two tariff groups in Subotica reflects changes in tariff policy that can be associated with access to international financial assistance (notably an EBRD loan) for the upgrading and extension of the wastewater treatment facilities in recent years and the associated commitment of the local self-government to ensure more cost-reflective tariffs. While household water tariffs are broadly similar among the major municipalities, there are significant differences in tariffs for industrial water users (table 3.6).

The financial performance of water utilities in the country has been mixed. In 2010, 60 of the 145 water companies recorded significant losses. In Belgrade, the water company (Vodovod Beograd) has been able to generate tariff revenues that were insufficient to ensure adequate repair and maintenance of the water network. The mirror image to this has been a shortening of the useful service lives of the capital stock. Half the pipes of the water network in the capital are more than 50 years old. Depreciation allowances have been too low for the building up of adequate reserves for the financing of replacement investments.

Besides tariffs that are not cost reflective, another problem that adversely affects the financial performance of water companies is the high proportion of non-revenue water, i.e. the gap between volume of water produced and water sold – due to technical losses (e.g. leakages in the pipes) or administrative losses such as illegal connections and faulty metering. In Belgrade, the combined losses amounted to some 33 per cent in 2012, of which the large bulk (27 percentage points) was accounted for by technical losses.

Table 3.6: Water supply and sewerage tariffs in major cities of Serbia

	Water supply	Sewerage	WWT	Total	Total
	Dinar/m^3				€/m^3
Belgrade					
Households	46.15	18.66	..	64.81	0.56
Enterprises	76.36	41.10	..	117.46	1.01
Novi Sad					
Households	54.57	34.39	..	88.96	0.77
Enterprises	128.68	80.88	..	209.56	1.81
Niš					
Households	44.58	8.46	..	53.04	0.46
Enterprises	111.54	21.21	..	132.75	1.15
Kragujevac					
Households	40.76	13.52	13.52	67.80	0.59
Enterprises	79.09	26.21	26.21	131.51	1.14
Subotica					
Households	46.53	23.68	25.74	95.95	0.83
Enterprises	51.70	33.00	40.70	125.40	1.08

Source: Direct communication and websites of municipal water companies.
Note: Figures in € were calculated using the average monthly exchange rate for March 2014: €1=115.84 dinars. Tariffs include 10 per cent VAT applicable in April 2014.
WWT = Wastewater treatment.

The rate of bill collection in the city of Belgrade was 90 per cent in 2013, down from 95 per cent in 2010. This reflects, notably, the impact of the economic crisis on the ability of enterprises to pay their water bills. Higher tariffs have also contributed to a decline in water consumption by the population and industry in combination with improved efficiency of water use.

Tariffs for district heating

There are 55 towns in Serbia which supply district heating, with gas being the major fuel used. Some 80 per cent of the heating capacity of the corresponding plants is for supply to households; the remainder serves business premises. Given the pervasive lack of metering devices for energy flows (calorimeters), nearly all consumers connected to the network are charged on the basis of the floor size (i.e. per m^2) of the buildings rather than the actual consumption of heat.

Accordingly, there have been no incentives for energy savings. Heating tariffs, moreover, are not cost reflective. For many years, district heating has been somewhat considered to be an integral part of local social welfare services rather than a commercial activity. A national tariff reform is underway, however, accompanied by the installation of metering devices that allow metering of heat consumption by each consumer. There are also projects underway to improve the energy efficiency of buildings (chapter 6).

Electricity tariffs

Electricity generation, distribution and supply are carried out by the state-owned Public Enterprise "Electroprivreda Srbije". Transmission has been legally unbundled to a separate company, Public Enterprise "Electromreza". The electricity market for large consumers, which are directly connected to the transmission network, was liberalized in January 2010. The tariffs for these so-called eligible consumers are determined by contracts agreed with the supplier. Smaller consumers, including SMEs and private households, continue to be supplied at tariffs that are regulated by the Energy Agency. The Agency does not have full tariff-setting power; tariffs are approved by the government on the basis of an "opinion" formed by the Agency.

In April 2014, average electricity tariffs in the country were some 43 per cent higher compared with 2008 (table 3.7). This is broadly in line with an increase in consumer price inflation by 48 per cent over this period. But the average rise in tariffs masks a below-average increase in household tariffs by 31 per cent. According to the Agency, the current system of electricity tariffs does not contain any cross-subsidies among the different customer categories. But electricity generation depends significantly on subsidized coal, which impedes true cost recovery. Tariffs only take into account to a minimal extent the environmental impact of lignite-fired power plants.

Table 3.7: Average electricity tariffs

Consumption category	Dinar/kWh as from				€/kWh
	01/08/2008	01/03/2010	01/04/2011	01/08/2013	01/08/2013
High and medium voltage	3.88	4.19	4.97	5.75	0.05
Low voltage consumption	4.82	5.34	6.09	6.73	0.06
of which					
Households	4.38	4.89	5.54	5.74	0.05
Total	**4.55**	**5.01**	**5.79**	**6.51**	**0.06**

Source: Energy Agency.
Note: Tariffs were calculated by applying the approved tariffs to planned electricity balances. Figures in € were calculated using the average monthly exchange rate for March 2014: €1= 115.84 dinars.

Electricity tariffs in Serbia are by far the lowest in Europe. The household tariff of €0.05 per kWh applied in 2013 is significantly lower than in neighbouring countries with similar levels of real income per capita, viz. Bulgaria (€0.077); Croatia (€0.109) and Romania (€0.089). This pattern is broadly the same for electricity prices for industrial consumers. All this suggests that approved tariffs in Serbia have remained below the full cost price level. In other words, there is no adequate return on capital that would ensure the long-term financial viability of the electricity system, including the financing of the investments necessary for guaranteeing the security of supply. In 2010, approved tariffs across all customer categories corresponded to some 85 per cent of the full cost price, and this pattern has not changed significantly since then.

Bill collection rates for private households are quite high, at around 95 per cent. Bill collection rates for industrial customers are much lower; they were only some 89 per cent in 2009.

It appears that some of the larger industrial customers have been failing to settle their bills in recent years in the face of the lingering economic crisis. But they have remained connected to the network. Substantial arrears have also been accumulated by the private household sector.

A recently introduced incentive is that households which pay their bills within the defined timeframe benefit from a 5 per cent discount on the total amount due. In 2013, accumulated electricity debts of companies and households amounted to almost €1 billion. The state-owned Public Enterprise "Electroprivreda Srbije" hopes to be able to collect €330 million by offering debtors the possibility to pay the outstanding amounts in instalments and without interest payments.

Against this backdrop, the financial situation of the electricity sector is relatively bleak. This reflects the combination of a number of factors, notably the strong state control of tariffs and the resulting unrealistically low prices for electricity, which are largely influenced by social rather than economic considerations. Other factors include the inefficient collection of receivables and a low profit margin and thus a low rate of return on fixed assets. In the event, investments in the modernization and extension of the energy sector infrastructure have been largely insufficient.

In 2012, electricity consumption accounted for some 7 per cent of the average monthly household budget, which does not appear to be excessive. To ensure affordability of energy consumption for vulnerable persons, the Government has adopted the Regulation on the protection of vulnerable energy consumers (OG 27/13), which establishes criteria and measures for consumer protection. This scheme entered into force at the beginning of 2013. Household customers can benefit from support measures subject to evidence concerning family size and income levels.

The Government has, moreover, adopted feed-in tariffs for promoting power generation from renewable energy sources (RES). These entered into force at the beginning of 2010 based on the Regulation on incentive measures for power generation using renewable energy sources and co-generation of heat and power (OG 99/09), which was amended in 2012 (OG 114/12).

This Regulation was repealed by the Regulation on incentive measures for privileged power producers (OG 8/13), which entered into force in March 2014. The existing system of feed-in tariffs provides substantial incentives to investors in renewable energy production, and they are adjusted on an annual basis in line with consumer price inflation in

the euro area. But the share of RES in the energy sector is still very small (chapter 6).

Excise duties on energy products

Excise duties are levied on all types of motor gasoline and diesel fuel, as well as on other oil derivatives that are obtained from oil fractions with a distillation range of up to 380ºC. A number of other energy products (electricity, natural gas, coke, coal and heavy fuel oil) are not subject to excises in Serbia. Excise rates in national currency units are adjusted at the beginning of each year, based on the change in the consumer price index during the preceding year. Excise duty rates have increased significantly during recent years to levels above the corresponding EU minimum rates in 2014 (table 3.8).

Given the slow phasing out of leaded petrol (chapter 2), the corresponding excise rates were raised above the rates of unleaded petrol only as from the beginning of October 2012. In 2010, the excise rate on leaded petrol was still lower than the rate for unleaded petrol. As from October 2012, all uses of liquefied petroleum gas are also subject to excise; before this date this was the case only for liquefied petroleum gas used for motor vehicles.

Excise duties on biofuels and bioliquids were introduced in Serbia effective from 30 May 2013. Biofuels are used for transportation, whereas bioliquids are used for production of electrical and heat energy and for cooling. Buyers of biofuels and bioliquids are entitled to a partial refund of paid excise duty until the application of a regulation that specifies the mandatory content of biofuels and bioliquids in gas oil. This legislation is currently being developed and is planned to enter into force in 2015.

The Government liberalized the domestic market for oil derivatives in 2011, which also involved abolishing the regulation of prices for oil and petroleum products. Since then, petrol and diesel prices largely reflect world market conditions, the exchange rate of the dinar against the US dollar and the level of indirect taxes, viz. VAT and excise duty. In 2014, motor vehicle fuels are subject to, besides excise duties, VAT of 20 per cent. On 22 April 2014, the share of excise duty and VAT in the pump price for unleaded petrol (95 RON) amounted to 49.5 per cent. The corresponding share for diesel fuel was somewhat lower, at 46.4 per cent. A provision that 10 per cent of the revenues from excise duties on fuels for road motor vehicles were to be earmarked for road maintenance was abolished in 2012.

Road user charges

There are three different types of road user charges in Serbia; the revenues collected are partly earmarked for the construction, maintenance and rehabilitation of public roads.

Fee for special transport vehicles

The fee is paid for domestically registered vehicles exceeding the legally permitted dimensions, total gross weight or axle load. These vehicles can cause considerable damage to the roads, and the idea of the fee is to induce transport operators to use other modes of transport (e.g. transport by rail).

Table 3.8: Excise duty rates on oil derivatives, 2010, 2013–2014

		Dinar			€	EU minimum rates €
	Unit\Year	**2010**	**2013**	**2014**	**2014**	**2014**
Leaded petrol	Litre	45.0	55.0	55.0	0.47	0.42
Unleaded petrol	Litre	49.5	49.6	50.0	0.43	0.36
Gas oils	Litre	35.0	42.0	46.0	0.40	0.33
Kerosene	kg	..	62.0	62.0	0.54	0.33
Liquid petroleum gas	kg	18.0	30.0	35.0	0.30	0.13
Other petroleum products	kg	53.4	62.0	62.0	0.54	..
Biofuels and bioliquids	kg	..	42.0	47.0	0.41	..

Source: Law on Excise Duties (OG 22/01, 73/01, 80/02, 43/03, 72/03, 43/04, 55/04, 135/04, 46/05, 101/05, 61/07, 5/09, 31/09).
Note: Figures in € were calculated using the average monthly exchange rate for March 2014: €1=115.84 dinars. Other petroleum products: comprises other oil derivatives which are obtained from oil fraction which have distillation range up to 380ºC. EU minimum rate for kerosene is expressed as € per litre.

Special fee for use of roads for foreign-registered commercial vehicles

The fee has to be paid for large foreign commercial vehicles, including buses, at the time of border crossing. The fee is collected by the Customs Administration based on the Law on International Road Transport (OG 60/98, 5/99, 44/99, 74/99, 4/00, 101/05, 18/10). The charge rate is €0.003 per gross registered ton per km**.** Revenues collected are allocated to the Public Enterprise "Roads of Serbia", which manages the construction and maintenance of public roads, except for a small service charge which is allocated to the Customs Administration.

Special charge for using motorways (road toll)

Toll collection in Serbia is conducted on motorways, which have a total length of over 550 km. The fee has to be paid by domestic and foreign cars; the level of the fee depends on the type of vehicle and the specific motorway section. Differences in charge rates between motor vehicles with Serbian and foreign number plates were eliminated as from February 2009. Given that charge rates for foreign vehicles were higher, this had resulted in a sizeable decline in annual toll revenues in 2009. The funds collected constitute the most important source of revenues of the Public Enterprise "Roads of Serbia".

3.2 Domestic environmental expenditures

The economic and financial context for environmental policy in Serbia has deteriorated significantly in the aftermath of the global financial crisis in 2007/2008. Economic growth has been sluggish; unemployment rose to very high levels; and government finances deteriorated significantly. In the event, the major preoccupation of the Government has been to strengthen international competitiveness in order to create the foundations for a sustained recovery and the restoration of macroeconomic stability.

Measures aiming at the reduction of the high Government budget deficits have been mostly focusing on fiscal adjustments on the expenditure side. The earmarking of revenues from pollution charges was abolished in 2012. In this context, the operation of the Environmental Protection Fund was also terminated (box 3.1).

Box 3.1: Environmental Protection Fund

The Government established the national Environmental Protection Fund with the status of an independent legal entity in 2004. The general mandate of the Fund was to finance projects designed to improve environmental protection in the country. There was no direct financing of institutions. For financing (or co-financing) these projects, the Fund relied on revenues from a number of earmarked environmentally related taxes and fees that were collected by the Treasury. Current expenditures of the Fund were directly financed from the state budget. The support provided by the Fund to domestic legal entities, such as local self-governments, municipal utility companies and industrial companies, could take the form of grants, loans and subsidies. The Fund became fully operational in 2006. The 2009 Law on Environmental Protection Fund (OG 72/09, 101/11) formally regulated the activities, organization and financing of the Fund. A management board that was headed by the minister in charge of environmental protection managed the Fund, based on the adopted annual and medium-term work programmes. At the same time, the minister was also in charge of the supervision of the Fund, which could lead to conflicts of interest.

The Fund financed a broad range of projects that were in line with the established national policy priorities, including air quality monitoring, water protection, and nature and biodiversity protection. Strong emphasis was put on the improvement of waste management, notably the remediation of dumpsites, support for the construction of regional landfills and incentives for recycling. Within the framework of the campaign "Let's clean up Serbia", which was launched in 2009 and extended until 2012, the Fund provided funds (some €20 million) for the procurement of equipment for municipal waste collection and treatment, removal of non-compliant dumpsites and raising of public awareness. The Fund was also one of the key stakeholders for protected area financing. Over time, the strong rise in earmarked revenues meant that the Fund accounted for about one quarter of total general government expenditures on environmental protection in Serbia in the period 2010–2012. While there was regular public reporting by the Fund on the development of its annual revenues, this was not the case for annual expenditures on the projects supported. An annual financial report was submitted to the relevant ministry, but it was not in the public domain. Capacities for project management, including monitoring, were limited. There was no review of the efficiency of operations of the Fund and the environmental effectiveness of resource allocation.

In the context of efforts to achieve progress in budget consolidation and increase the overall "fiscal space" by reducing expenditures, the Government deemed the earmarking of the revenue sources for the Fund to be no longer justified. In the event, earmarking of these and other revenue sources was abolished at the end of September 2012. At the same time, the Fund was found to be "unnecessary" and also abolished. The functions of the Fund have been transferred to the ministry in charge of environmental protection. Domestic financing of environmental protection (at the national level) is now fully reliant on the annual appropriations of funds from the central government budget.

The goal to improve environmental conditions has been part and parcel of major strategies developed by the Government (chapter 1), such as the 2008 National Sustainable Development Strategy; 2010 National Environmental Protection Programme; and the 2010 National Waste Management Strategy for the period 2010–2019. The development of a national strategy for the development of the water sector (elsewhere referred to as the draft water management strategy) is still not completed. The requirements of the planned EU accession for environmental policies, reforms and measures were covered in the 2008 National Programme for Integration with the EU for the period 2008–2012 and are currently reflected in the 2013 National Plan for the Adoption of the *Acquis* for the period 2013–2016.

The financial implications for the environmental sector were broached in the 2011 National Environmental Approximation Strategy. The costs of upgrading and extending the environmental capital infrastructure in Serbia are considerable. Rough estimates suggest that the corresponding costs could amount to approximately €10.5 billion. This is the net present value of projected annual expenditures, at constant prices of 2010, over the period 2011–2030, using a discount rate of 5 per cent. More than half of the projected expenditures will have to be devoted to the water sector and roughly another quarter to the waste sector (table 3.9). Total costs correspond to some €1,400 per capita, which is some 20 per cent higher than estimated for other countries in the region that have joined the EU in recent years. The reason for these higher expenditures is the low level of existing infrastructure and standards of services in Serbia.

In a more general way, the upgrading of the environmental infrastructure is part and parcel of a broad range of measures required to achieve a progressive "greening of the economy" in Serbia. To illustrate, massive investments are needed to improve energy efficiency, increase the role of renewable energy sources and reduce the role of subsidized coal in the energy sector (chapter 6). In industry, many companies are operating with obsolete pollution-intensive technologies, and there is, accordingly, great scope for the introduction of cleaner technologies. In agriculture, there is, notably, scope for increasing the role of organic and other environmentally friendly agricultural production methods. In the transport sector, the quality of transport services, as well as road and railway infrastructure, has to be improved, etc.

Reliance on state budget funds (from tax and other revenues) alone will not be sufficient by far to cover all the required investments in the public sector. And international financial assistance can cover only a limited scope of activities when it comes to the financing of environmental and other infrastructure. As regards the industrial sector, the necessary investments for improving environmental performance will have to be largely financed by the private sector, based on a mix of policy measures (regulations and economic instruments, including subsidies) that provide adequate incentives for pollution abatement control based on innovative green technologies.

The upgrading of communal utility services, in turn, will have to mobilize increases resources by gradually raising tariffs to full cost-reflective levels, very likely combined with the increasing use of public–private partnerships and concessions. In a similar vein, it is important to have an effective policy mix of regulations and user charges for ensuring the sustainable use of natural resources and the adequate management of protected area systems.

Financing sources for environmental protection for the period 2007–2013

The potential financing sources for environmental expenditures are the central government budget, the budgets of local self-governments, user charges for utility services provided by the PUCs, business sector expenditures, and foreign grants and loans.

Government sector

Environmental expenditures from the central and local self-government budgets up to September 2012 were, to a large extent, financed from earmarked revenues collected from a number of environmentally related charges. These comprised:

- Air emission charges;
- Tax on use of motor vehicles;
- Tax on industrial waste generation and storage;
- Fee for import of ozone-depleting substances;
- Fee for use and trade of wild flora and fauna;
- Fee for use of (inland) fishing areas;
- Fee for products that become special waste streams after their use;
- Fee for packaging and packaging waste.
- Tax on plastic bags.

Some of the revenues collected from each of these charges were shared between the central government and the local self-government on whose territory the corresponding activities take place. Thus, 60 per cent of the revenues from air pollution charges, industrial waste charges, tax on use of motor vehicles, which was abolished as from October 2012, and the fee for import of ODSs were are allocated to the central government budget and the remainder 40 per cent to the local self-government budgets.

Up to 2009, these proportions were the inverse, i.e., 40 per cent for central government and 60 per cent for the municipal budgets. The revenues from the other environmental charges were fully allocated to the central government budget. In 2010–2011, average annual financial resources from all these earmarked levies (before revenue sharing) amounted to some 7.6 billion dinars (€74 million), corresponding to 0.25 per cent of GDP (table 3.9).

There is no published information on the effective collection rates of these various charges. In any case, the payment of pollution charges has been adversely affected by the lingering difficulties faced by companies in the industrial sector. Thus, the collection rate for pollution charges (SO_2, NO_2, PM, industrial hazardous waste) fell to 46 per cent in 2013, down from an already low 70 per cent in 2011.

The earmarked resources retained at the central government level were transferred to the national Environmental Protection Fund, while the resources allocated to the local self-government budgets were transferred to local environmental protection funds. This system was radically changed with the abolition of the national Fund and the phasing out of earmarking of revenues collected for the central government budget at the end of September 2012 (box 3.2). All revenues from the fees on environmental protection are general revenues of the state budget in accordance of the Law on the Budget System (OG 54/09, 73/10, 101/10, 101/11, 93/12, 62/13, 63/13). The revenue-sharing arrangement for these charges, however, and the earmarking of the corresponding resources for financing environmental protection at the local self-government level, have not been affected.

The annual budget of the national Environmental Protection Fund peaked at 4.8 billion dinars (€47 million) in 2010, when new charges on products that become waste streams after their use were introduced (table 3.10). In fact, the corresponding revenues accounted for 46 per cent of the annual budget in 2010 and nearly 80 per cent in 2011. These product charges were earmarked for financing waste management projects only, which created the potential problem of "overfunding" of these activities (in the years ahead) compared with other priority sectors (notably the water sector), for which projected available funds, notably for capital expenditures, were not sufficient. It should be noted that the development of annual revenues of the Environmental Protection Fund in terms of euros is significantly influenced by the progressive depreciation of the dinar since 2007.

Table 3.9: Revenues from environmental charges earmarked for financing environmental protection, 2007-2013, million dinars

Area	2007	2008	2009	2010	2011	2012	2013
Pollution charges (SO2,NOx,PM, waste)	1,258.7	1,373.0	2,935.3	4,285.3	2,234.2	1,829.2	2,918.3
Tax on ozone depleting substances	16.8	9.2	15.4	7.6	17.7	10.1	4.7
Tax on use of motor vehicles	1,036.8	1,118.1	1,243.4	1,352.5	1,433.1	1,144.6	0.0
Fees for trade and use of wild flora and fauna	..	..	61.9	72.4	51.2	40.6	60.5
Fees for use of fisheries (inland waters)	..	25.4	26.8	27.4	26.4	26.2	27.8
Fees for special waste streams	..	..	..	2,224.1	3,443.0	1,866.3	2,242.1
Charges for packaging waste	..	..	..	..	..	17.0	15.5
Total above	**2,312.3**	**2,525.6**	**4,282.7**	**7,969.2**	**7,205.6**	**4,933.9**	**5,268.8**
Total above in € million	28.9	31.0	45.6	77.3	70.7	43.6	46.6
Total as per cent of GDP	0.1	0.1	0.2	0.3	0.2	0.1	0.1

Source: Ministry responsible for environmental protection.
Note: Earmarking was abolished as from October 2012. Tax on use of motor vehicles was abolished effective 1 October 2012. Revenues from tax on ozone-depleting substances include fees for plastic bags (from 2011). Excluding local tax on environmental protection and improvement. Figures in € were calculated using the average annual exchange rate for the corresponding year.

Box 3.2: Instrument for Pre-accession Assistance

IPA II sets a new framework for providing pre-accession assistance for the period 2014–2020.The most important novelty of IPA II is its strategic focus. Country strategy papers are the specific strategic planning documents made for each beneficiary for the seven-year period to provide for stronger ownership through integrating reform and development. IPA II targets reforms within the framework of pre-defined sectors. These sectors cover areas closely linked to the enlargement strategy, and allow a move towards more targeted assistance, ensuring efficiency, sustainability and focus on results. Environment is a sector defined in the Final Draft Country Strategy Paper (submitted to the European Commission), and indicative allocation for the environmental sector is 13 per cent of the total IPA II budget for the seven-year period. IPA II also allows for a more systematic use of sector budget support. Finally, it gives more weight to performance measurement: indicators agreed with the beneficiaries will help assess the extent to which the expected results have been achieved.

Table 3.10: Budget of Environmental Protection Fund, 2007-2012

Unit	2007	2008	2009	2010	2011	2012
Dinar million	924.9	1,025.5	2,605.1	4,821.5	4,354.4	3,740.3
€ million	11.6	12.6	27.7	46.8	42.7	33.1
Total as per cent of GDP	**0.04**	**0.04**	**0.10**	**0.17**	**0.14**	**0.11**

Source: Ministry responsible for environmental protection.
Note: Total revenues from earmarked fees. Figures in € were calculated using the average annual exchange rate for the corresponding year.

In contrast, at the level of local self-governments, the earmarking of the shared revenues from environmental charges has continued. In fact, local self-governments are obliged to have local budget funds for the financing of environmental expenditures. But these local budget funds are just subaccounts in the budget of the local self-government. Annual expenditure plans have to be reviewed and approved by the ministry responsible for environmental protection. A report on the use of the budget funds has to be submitted to the ministry in March of each year for the preceding year. A major additional source of budget resources for municipal environmental financing is a local tax on environmental protection and improvement. On average, municipal resources from earmarked environmental charges have attained broadly the same level as the budget of the national Environmental Protection Fund (table 3.11).

There was also earmarking of water use charges for the financing of projects on water use, water protection, construction, rehabilitation and maintenance of water sector infrastructures, including communal wastewater facilities, in line with the stipulations of the Law on Waters. Revenues from water pollution fees were specifically earmarked for financing water protection projects. But this earmarking was also abolished at the level of the central government budget at the end of September 2012. The earmarked revenues constituted the so-called "water budget fund", which was administered by the Water Directorate of the Ministry of Agriculture, Forestry and Water Management. A revenue-sharing arrangement (80 per cent for the central government budget, 20 per cent for municipal budgets) is still applied and the local funds from water pollution fees are still earmarked for water sector projects. The total budget of this "water budget fund" corresponded to some 0.1 per cent of GDP during the period 2010–2013 (table 3.12).

Table 3.11: Local self-government revenues from earmarked environmental charges, 2007, 2010, 2013, million dinars

Sources	2007	2010	2013
Revenue from pollution charges	1,387.4	2,258.1	1,169.2
Special fee for protection and improvement of the environment	1,173.9	1,612.4	2,676.1
Total	**2,561.3**	**3,870.6**	**3,845.2**
Total above in € million	32.03	37.56	33.99
Total as per cent of GDP	0.11	0.13	0.10

Source: Ministry responsible for environmental protection.
Note: Figures in € were calculated using the average annual exchange rate for the corresponding year.

Table 3.12: Earmarked revenues from charges for use of water resources, 2010–2013, million dinars

Source	2010	2011	2012	2013
Water use charges	1,920.0	2,020.0	1,270.0	2,040.0
Effluent charges	1,530.0	1,150.0	770.0	1,170.0
Total	**3,450.0**	**3,170.0**	**2,040.0**	**3,210.0**
Total above in € million	33.47	31.06	17.99	28.38
Total as per cent of GDP	0.12	0.10	0.06	0.09

Source: Water Directorate, Ministry of Agriculture, Forestry and Water Management.
Note: Earmarking was abolished as from October 2012. Figures in € were calculated using the average annual exchange rate for the corresponding year.

The previously earmarked resources for the financing of environmental protection were supplemented by other budget resources at both the central government and municipal levels. This pertains, notably, for the financing of current expenditures (such as costs of staff and equipment) but also for support for the financing of capital expenditures at the level of PUCs operating in the waste and water sector. But there is no systematic published information on these expenditures. The tariff revenues of PUCs have, in general, been insufficient for engaging in a meaningful way in capital expenditures.

Overall, general government expenditures on environmental protection in Serbia have been on a rising trend in recent years. They corresponded to some €135 million or 0.45 per cent of GDP in 2012, up from a recent low of 0.29 per cent in 2009 (table 3.13). The large bulk of expenditures (some 60 per cent in 2012) were at the level of local self-governments, which illustrates that the latter have been the major actor for the implementation of environmental projects. This feature should also prevail in the coming decade; it will, however, require the upgrading of local (and regional) administrative and technical capacities.

Major emphasis so far has been on the upgrading and extension of solid waste management services at the municipal and regional levels. The available evidence suggests that environmental investments by "specialized producers" i.e. the PUCs dealing with waste and wastewater management, have been largely financed from municipal budgets, the state budget and foreign financial assistance.

Information on environmental expenditures in industry is very limited, given that enterprises are not obliged to report on this kind of expenditure to the government and the Statistical Office. But, in general, industrial expenditures on pollution abatement and clean technologies have been insufficient to achieve a noteworthy reduction, if any at all, of environmental pressures. This reflects the combined effect of a lack of adequate incentives from pollution charges and fines (including the lack of effective enforcement) and the weak financial state of many industrial companies, which is reflected in limited funds for financing fixed investments in environmental protection. It should be noted in this context that the instrument of liability for environmental damage caused by industrial companies, and the obligation to have insurance covering risks to the environment and health of third parties, have so far not been applied in Serbia.

While it can be safely assumed that the general government environmental expenditures (0.45 per cent of GDP in 2012) constitute a lower bound to total economy environmental expenditures in Serbia, there is insufficient information for gauging the magnitudes of environmental expenditures in other sectors of the economy. According to SEPA, total economy environmental expenditures could correspond to up to 0.9 per cent of GDP in 2011 and 2012, but the quality of the underlying statistics is difficult to gauge. In other words, there is a lack of specific and sufficient evidence for supporting these higher figures.

In any case, the upshot is that environmental expenditures in Serbia have so far been significantly lower than what has been estimated to be necessary for progressively raising environmental standards, notably those embodied in the EU *acquis*. To illustrate, the National Environmental Protection Programme for the period 2010–2019 projected that environmental investments would correspond to 1.4 per cent of GDP in 2014 and increase to a level corresponding to 2.4 per cent of GDP by 2019. And the projected financial burden for approximation of the EU *acquis* corresponds to more than 2 per cent of GDP for the period 2015–2022 and will have to remain above a level corresponding to more than 1 per cent of GDP thereafter, up to 2030.

Foreign loans and grants

Serbia has benefited from development assistance provided by multilateral institutions (such as the EBRD, EU, UNDP, World Bank) and on a bilateral basis from a number of countries. Financial resources from the EU have been made available within the framework of the EU Instrument for Pre-accession Assistance (IPA). In the previous period, the environmental sector in Serbia was supported through EU assistance via the IPA (2007–2013), and its implementation is still underway.

Aid flows to Serbia have been monitored and planned based on the information system ISDACON (Inter-Sector Development and Aid Coordination Network), which was established by the Government in September 2003 and which is now administered by the Serbian EU Integration Office.

Total cumulative disbursements of development assistance for the sector "environment protection" amounted to €106 million during the period 2007–2013. Annual disbursements corresponded to some 0.05 per cent of GDP. Some 95 per cent of funds were provided in the form of grants; the remainder (some €6 million) was concessional loans. This suggests that the large bulk of funds was used for capacity-building, given that soft loans are typically limited to the financing of infrastructure projects. Other sectors that benefited from development assistance and often associated direct and indirect favourable environmental impacts include, notably, water and sanitation; energy; transport; and agriculture, forestry and fishery. Disbursements of grants and soft loans for environmental protection accounted for some 1.5 per cent of total development assistance to Serbia during the period 2010–2013. As regards the water and sanitation sector, cumulative disbursements amounted to some €129 million during the period 2007–2013, and some 55 per cent of these disbursements were based on concessional loans (table 3.14).

Table 3.13: Government expenditures on environmental protection, 2007–2012, million dinars

	2007	2008	2009	2010	2011	2012
Central government	1,660.5	1,848.2	1,792.4	4,147.5	4,920.8	6,546.4
Local government	6,731.8	8,058.6	6,208.1	8,091.6	8,547.9	9,451.7
Intragovernmental transfers	**0.0**	**0.0**	**0.0**	**885.5**	**1,102.5**	**668.1**
Total general government	8,392.3	9,906.8	8,000.5	11,353.6	12,366.2	15,330.0
Total in million euros	**105.0**	**121.6**	**85.2**	**110.2**	**121.3**	**135.5**
Total as per cent of GDP	0.37	0.37	0.29	0.39	0.39	0.45
Total as per cent of total government expenditures	0.79	0.80	0.62	0.80	0.81	0.91

Source: IMF Government Finance Statistics (electronic database), accessed May 2014.
Note: Expenditures by functions of government (COFOG), cash basis. General government expenditures excluding intra-governmental transfers. Figures in € were calculated using the average annual exchange rate for the corresponding year.

Table 3.14: Foreign financial assistance for environmental protection (disbursements), 2007–2013, € million

Sector	2007	2008	2009	2010	2011	2012	2013
Environmental protection	14.80	5.25	14.72	15.51	20.07	18.95	16.64
Water supply and sanitation	8.56	9.12	13.81	11.48	27.20	24.51	34.72
Total	**23.36**	**14.37**	**28.53**	**26.99**	**47.27**	**43.46**	**51.36**
Total as per cent of GDP	0.08	0.04	0.10	0.10	0.15	0.15	0.16
Environmental protection	0.05	0.02	0.05	0.06	0.06	0.06	0.05
Water supply and sanitation	0.03	0.03	0.05	0.04	0.09	0.08	0.10

Source: ISDACON database (www.evropa.gov.rs).
Note: Grants and concessional loans.

3.3 Conclusions and recommendations

There has been some progress, albeit limited, in the application of pollution charges in Serbia. New instruments in the area of waste management were introduced, which include, notably, charges for products that become waste streams after their use, charges for packaging and packaging waste, and a tax on plastic bags. Excises on motor fuels were raised to (or somewhat above) EU minimum levels. All these pollution charges, moreover, are indexed to annual inflation. Emission charges are, however, not

complemented by effective emission limit values. While the new instruments for waste management are relatively new and their effectiveness difficult to assess so far, the traditional pollution charges for air and water pollution, as well as for industrial waste generation and storage, have remained too low to create effective incentives for pollution abatement and control. Their main function has been to generate revenues for financing government expenditures on environmental protection (and more recently, for the Treasury). Potential revenues, moreover, were not fully realized, due to the partly weak enforcement of payment of pollution charges against the backdrop of a lingering structural crisis in industry.

Recommendation 3.1:
The Government, through the Ministry of Finance and the Ministry of Agriculture and Environmental Protection, should:

- *(a) Conduct a regular assessment of the various pollution and product charges and adapt these instruments accordingly, taking into account, to the extent possible, damage caused by polluting behaviour as well as producer/importer responsibility;*
- *(b) Examine the environmental benefits of combining pollution charges with effective specific emission limit values for individual pollution sources.*

Municipalities are setting tariffs for communal utility services, notably solid waste management and water supply and sewerage services. Tariffs are not cost reflective and revenues collected often barely cover operating costs of the PUCs, which are owned by the municipalities. There is, moreover, a pervasive and significant cross-subsidization of generally very low household tariffs from much higher tariffs applied to enterprises – which are themselves not justified economically. Waste and water companies lack funds for adequate maintenance and repair, and depend for capital expenditures on subsidies from central government and municipal budgets, as well as foreign assistance.

The investments required for upgrading and extending waste and water services infrastructure are high, and government financing plans show that a large proportion of the necessary funds will have to be mobilized through progressive improvement in cost recovery by the PUCs to make them financially viable, accompanied by measures that also make them more economically efficient (e.g. by reducing overstaffing).

Recommendation 3.2:
The Government, in cooperation with local self-governments and public utility companies, should introduce economic principles for the operation and management of public utility companies with the aim of increasing the cost-effectiveness of their operations, including through the promotion of the regionalization of communal services to benefit from economies of scale, and specialization and greater attractiveness for private sector involvement (public–private partnerships). This would also involve:

- *(a) Adopting a formal tariff methodology for the calculation of full cost recovery tariffs;*
- *(b) Gradually raising tariffs to cost-reflective levels, taking into account affordability issues;*
- *(c) Phasing out the strong cross-subsidization of household tariffs by enterprises;*
- *(d) Providing targeted social assistance for vulnerable groups that are using communal services;*
- *(e) Improving bill collection rates and reducing technical losses;*
- *(f) Creating greater incentives for the rational use of water services by introducing individual metering of water consumption by households in multi-family buildings;*
- *(g) Considering the introduction of household waste tariffs on a per capita basis (rather than per square metre of premises) and the feasibility of waste charges for enterprises per unit of volume or weight.*

The national Environmental Protection Fund was abolished by the Government in 2012, together with the earmarking of revenues from environmentally related charges for financing environmental projects by the Fund. Other earmarked charges were also abolished, notably the revenues from water use charges used by the Water Directorate for financing water sector projects, including water protection measures.

While these government measures have to be seen in the broader context of the need for stringent fiscal consolidation, the partly narrow earmarking of revenues for purposes related to the sources of the revenues had its own problems as regards the need to ensure an efficient allocation of scarce financial resources in line with government priorities. There were also other problems, such as the lack of monitoring of effective implementation of many projects. In the event, all central government environmental expenditures are now being financed from general tax revenues. This has led to a radical

change in the planning and programming of funds devoted to environmental protection.

Recommendation 3.3:
The Government should:

(a) *Establish an effective financial mechanism to support the implementation of environmental policy and legislation;*
(b) *Regularly review environmental expenditures (current and capital) and, inter alia, ensure that they are effectively aligned with priorities in environmental and other sectoral strategic documents;*
(c) *Assess the effectiveness of the implementation of the projects financed and ensure that outputs are produced at the lowest possible cost;*
(d) *Ensure that foreign financial assistance is aligned with national and local environmental priorities.*

Reliable, comprehensive and timely statistical data are part and parcel of evidence-based environmental policymaking. This pertains not only to indicators for gauging the state of the environment but also to expenditures on environmental protection by both the public sector and the private sector, including, notably, the expenditures of so-called public and private "specialized producers" whose principal activity is the production of environmental protection services (such as waste and wastewater services).

High-quality expenditure data are also essential for donors and international financing institutions to ensure the effective targeting of their assistance programmes. There are important gaps, however, in the collection and reporting of statistical data concerning environmental expenditures in Serbia, notably at the local self-government level, including those of PUCs, as well as regards industry and other parts of the business sector.

Recommendation 3.4:
The Statistical Office should establish a comprehensive information system on environmental expenditures covering the government sector and the private sector, using methodologies that conform to international standards such as the Eurostat/OECD methodology for pollution abatement and control (PAC) expenditure and the United Nations Classification of Environmental Protection Activities (CEPA).

Chapter 4

ENVIRONMENTAL MONITORING, INFORMATION AND EDUCATION

4.1 Environmental monitoring

Air

The territory of Serbia is divided into three zones for the monitoring of air quality. There are also eight agglomerations selected to be closely monitored on air quality: Belgrade, Bor, Kosjerić, Niš, Novi Sad, Pančevo, Smederevo and Užice.

To monitor the air quality in the established zones and agglomerations, state, national and local networks of stationary automatic monitoring stations for air quality were developed:

- The state network covering mainly the zone of Serbia with only a few stations in the zone of Vojvodina, consisting of 40 automatic stations altogether;
- The regional network in the zone of Vojvodina consisting of seven stations;
- Local networks: Belgrade with five stations, Pančevo with four and Bor with one.

The state and regional networks are complementary to each other. The local networks are set up as warning networks to alert against peak concentrations harmful to people's health.

The networks of the stationary automatic stations are relatively recent. The state network was established between 2006 and 2011, with 24 stations purchased with funding received from the European Commission, 13 acquired with funding from the Environmental Protection Fund and three donated by the cement industry.

All the 40 stations are equipped with analysers to measure SO_2, CO and $NO/NO_x/NO_2$ concentration. At 10 stations, PM_{10} concentration is measured as well as BTX[5] and VOCs. Altogether, some 155 analysers are available in the network, on average some four per station. Data from the stations on the measured substances are available in real time on the website of SEPA.

The state network consists of more stations than the number of stations initially prescribed for installation in zones and agglomerations in accordance with the air protection legislation. This, however, allows for some flexibility to move the analysers between the stations for certain substances. A mobile automatic station is available, which is used for monitoring activities in the event of accidental pollution.

The measurement of the pollutants within the automatic network is done according to reference methods. The network itself is in the process of accreditation. The urban local networks use non-reference measurement methods. However, equivalency testing for the non-reference methods is under preparation.

Also, manual measurements are continued. They are done in parallel to the automatic stations network to establish the correction factors. They are also conducted to measure the concentration of pollutants in areas where members of the public have lodged complaints or expressed concerns regarding the level of air pollution. At the same time, it is envisaged that manual monitoring will be reduced, if not discontinued.

In addition, there is also a network consisting of 13 stations to sample allergenic pollen. One station (Kamenicki Vis) is equipped to measure the transboundary air pollution in accordance with the requirements of the Convention on Long-range Transboundary Air Pollution and its European Monitoring and Evaluation Programme (EMEP).

The establishment of the automatic network of air quality monitoring stations in recent years can be considered as a step forward. The network was fully operational in 2012 and early 2013. With the abolition of the Environmental Protection Fund, however, assurance of the necessary funding poses a challenge. Thus, in 2013 and 2014, operational monitoring was carried out with noticeable difficulties due to the lack of funds for equipment servicing and maintenance of the network.

[5] Benzene, toluene and xylene

Photo 4.1: Belgrade, air quality monitoring station

From a health perspective, it is considered that a lot has been done for outdoor air quality and its monitoring while only very little has been done regarding indoor air quality.

Water

Water quality monitoring is conducted on surface waters and groundwaters (table 7.7). The monitoring of surface waters was designed on the basis of the requirements of national water legislation, partially covering the requirements of the water-related directives. Surveillance monitoring is performed at 51 measuring stations to ensure a comprehensive review of the water status; operational monitoring is the monitoring performed at 84 measuring stations to establish or confirm the status of those water bodies identified as risky.

In the selection process for surveillance monitoring, the principle of the "single station/location" in a water body was applied. These locations are the backbone of the network for the future investigation of the surface waters; they offer a comprehensive overview of the ecological and chemical status of the waters, as well as allowing the classification of the water bodies into five classes.

The parameters monitored at the surveillance stations relate to:

- Parameters indicative of all biological quality elements;
- Parameters indicative of all hydromorphological quality elements;
- Parameters indicative of all general physico-chemical quality elements;
- Priority groups of pollutants discharged into the river basin or sub-basin;
- Other pollutants discharged in significant quantities into the river basin or sub-basin.

Unfortunately, due to budgetary insufficiencies, not all the defined parameters are monitored at the required frequency of one year at all the surveillance monitoring locations. The monitoring is therefore divided into phases from year to year, while, at the same time, it is ensured that all the required parameters are tested at least once per year in each of the river basins and in accordance with the basins' management plans.

The operational monitoring is then conducted to assess the size of pressures; thus, the following parameters are monitored:

- Parameters indicative of the biological and hydromorphological quality elements most sensitive to the pressures to which the water bodies are exposed;
- All priority substances and other pollutants discharged in significant quantities.

In addition, investigative monitoring is conducted with the mobile laboratory in the event of accidents and is paid for from the general water quality monitoring budget. Therefore, the requirements for investigative monitoring, in the event of many accidents, can substantially decrease budgetary capability to carry out the operational and surveillance monitoring activities.

In respect of groundwater, quality monitoring is carried out at 64 points where piezometers are available. Nonetheless, since these piezometers belong to the network for water quantity measurements, the groundwater monitoring network requires a complete redesign, in order to meet the legislative requirements.

Water quantity monitoring is performed at 190 monitoring stations for surface water and 408 stations for groundwater. For surface water, all the basins are monitored. Of the 190 surface water stations, some 74 are reporting stations, providing data in real time that are available on the website of the Hydrometeorological Service (HMS). The maximal parameters that can be measured or observed at the stations are water level, flow, temperature, transport of suspended sediments and ice events.

The surface water stations network has been undergoing modernization since 2001, with digital technology being introduced. This modernization is, at the same time, a rehabilitation of the network that was not maintained properly during the 1990s.

Surface water quantity monitoring also relies on water observers – non-professionals hired to observe the surface water in their neighbourhoods. There is a bottleneck in using the observers, stemming from a change of regulations – a requirement for a special permit to rehire them.

As far as groundwater quantity monitoring is concerned, it is performed only in alluvial sediments of major rivers and quaternary deposits. The monitoring is done on the level and temperature of groundwater. The measurements are done either automatically – if the station is a digital automatic one – or manually by a measuring tape with a whistle or electric measuring tape with a sensor.

Drinking water is monitored in large (some 130–140), small-scale and individual (some 2,000) water supply systems at the expense of the system operator. The frequency of sampling depends on the system and can be from several to as many as 60 samples a day. However, while for the large-scale water supply systems monitoring functions well, with the operators also running internal controls according to HAZOP (hazard and operability study), the small scale systems pose a challenge. They have often been built with the means of the water users and have no formal operators, who would normally make arrangements for the monitoring activities. As a result, no regular monitoring of water quality is taking place.

Bathing water monitoring is conducted locally at lakes and rivers between 15 June and 15 September. The waters are investigated for microbiological and chemical substances, with samples taken once in 15 days. The monitoring practice will change, however, with new regulations being prepared. With the new practice, only microbiological substances will be measured.

Soil

There is no regular soil monitoring in Serbia. At the same time, certain collection of data takes place on an ad hoc basis at regional or local levels and through pilot projects with the involvement of donors.

Efforts are made to establish an inventory of contaminated sites which fall under the local soil contamination monitoring. In 2006, EPA started an inventory of contaminated sites, including remediation activities, on the territory of Serbia. It contains a breakdown of the main sources causing local soil contamination and provides an overview of the main contaminants. Data for the inventory are collected from local governments and industrial operators on the basis of a questionnaire for determination of contaminated sites.

Furthermore, for certain sites – zones around landfills – a detailed investigation is conducted through sample-taking.

In addition, a project entitled “Assessment methods for management of water pollution from diffuse sources in Serbia” was implemented, twinning with the Swedish Environmental Protection Agency, to determine the methodology for diffuse soil pollution assessment. Within the pilot project for establishing the Integrated Environmental Monitoring System in Serbia within SEPA, soil samples were taken from more than 200 sites throughout Serbia. The project provided a good basis for establishing regular soil monitoring; however, a legislative basis for it is lacking.

With regard to soil quality monitoring, a project was implemented to determine the soil organic carbon content in Serbia and to delineate risk areas for soil organic matter decline. A secondary result of the

project was the creation of a database on organic carbon in soils, which was reported to the European Soil Data Centre of the European Commission.

Noise and vibration

Noise measurement is based on attended periodical measurements, conducted according to local methodology. The monitoring is done at a community level and depends on the budget available. The monitoring is conducted by authorized institutions that possess the necessary equipment and whose employees have sufficient experience in noise measurements.

The measurements can be done either continuously for 24 hours or several times per 24 hours in 15-minute intervals, usually three times per day and two times per night. It is important, however, that the selected intervals represent the actual noise situation at the monitored locations. Measurement data have been collected for major agglomerations for the last 30 years.

In Belgrade, for example, the monitoring is done at 35 measurement points, once in spring and once in autumn with continuous 24-hour monitoring. In Novi Sad, there are 16 points for a once-a-month measurement: at 10 of these locations there is continuous monitoring, and at six locations monitoring is conducted three times a day at 15-minute intervals. For budgetary reasons, there was no measurement of noise in Novi Sad in 2013. In Niš, there are 44 measurement points with observations every quarter of a year at 11 different points.

Vibration is not monitored.

Radioactivity

A routine monitoring programme is in place in Serbia to measure ambient gamma dose rate equivalents in the air, radionuclides content in the air, solid and liquid precipitation, surface and drinking waters, and food, as well as examination of the level of exposure to naturally occurring ionizing radiation in residential and work environments. Also, radionuclides content is measured at locations affected by depleted uranium.

The gamma dose radiation in the air is measured continuously with gamma dose rate stations at nine locations. The system of stations is also used as early warning for emergencies. In addition, this gamma dose radiation is measured at 16 locations with thermoluminescent dosimeters, with a reading period of once every three months.

The measurement of radionuclides content in the air is done continuously with air sampling pumps at seven locations. The examination of radionuclides in solid and liquid precipitation is done at nine locations. For each of these measurements, the samples collected within the period of a month are combined at the end of each month into an aggregated monthly sample to analyse with gamma spectrometry.

The examination of radionuclides content in surface water is done on a daily basis for the Danube (four locations), Sava (two locations), Nisava, Tisza, Timok and Drina (one location for each) Rivers. For the Danube and Sava Rivers, samples of waters are aggregated into monthly samples, and for the other rivers as three-monthly samples, and analysed by gamma spectroscopy. Further, sediments – sampled from the river bed – are examined once every six months.

The drinking water for settlements of more than 100,000 inhabitants is examined on a daily basis by sampling the water from the water supply systems. Total alpha and beta activity and gamma spectrometric examination is done on the aggregated monthly samples. Examination of three-monthly samples is done for drinking water from upstream of the Danube and Sava Rivers, the location of nuclear facilities, on strontium-90 and tritium.

Soil is examined at locations affected by depleted uranium. This is done at four locations. The samples are analysed by gamma spectrometry for radionuclide content.

Biodiversity including forests

There has been no programme developed for biodiversity monitoring so far in Serbia. It is only in the stage of preparation. Monitoring is therefore mainly done on species and habitats prioritized for monitoring as per annual budget available. Usually, from the vast number of protected species, those species that are threatened by extinction, as included in the red lists, are monitored. In Serbia, red lists have been prepared for flora and butterflies but there is no red list for animals yet.

Forest monitoring in Serbia has been performed in accordance with the ICP Forests Programme since 2003, i.e. level I and level II monitoring is conducted. Level I refers to monitoring of forest conditions, which is mainly observation and assessment of defoliation and discoloration of the tree crowns in certain areas of the sample plot in Serbia. There are some 130 plots in Serbia for level I monitoring.

Level II refers to monitoring of forest vitality, which is an applied system of comparative analysis which combines studies from different fields of forestry. The level II assessments provide data on the harmful effects of insects and fungi, as well as adverse impacts of humans and climate change. Level II monitoring in Serbia is conducted at the national parks Kopaonik and Fruška Gora.

Analytical laboratories

Serbia established a national laboratory for air, water, sediments and soil sample analysis, with the latter to be started in the future. The laboratory is fully integrated into the structure of SEPA and has 20 dedicated employees. It is well equipped, with certain instruments and equipment donated or purchased through the support of donors, in particular, the EU. Additional equipment is still purchased to allow the conducting of analysis on new parameters, e.g. hazardous substances in waters, hence, to further increase analytical capacity.

Some 140 methods accredited by the Serbian Accreditation Agency for analysis of air, water and soil samples are used in the laboratory. It has also been accredited with ISO 17025 for determination of air quality and water quality parameters according to a number of international and national standards. Further accreditation is in the process of preparation, for example for new methods for soil analysis.

Serbia also established a laboratory for calibration of the analysers installed at the stationary stations for air quality. The laboratory can calibrate analysers for four parameters: SO_2, NO_x, CO and O_3. For other parameters, calibration is done with laboratories abroad.

Institutes of public health operate laboratories accredited on some 25 standards for analysing drinking water quality.

There are also several laboratories accredited for radioactivity analysis, among them the Institute of Occupational Health (recently examining the radionuclide content in food), the Institute of Nuclear Sciences "Vinca", Laboratory for Radiation and Environmental Protection (recently examining air and precipitation), and the Faculty of Science, Department of Physics, Department of Nuclear Physics, Laboratory for Radioactivity and Dose Ionizing and Non-ionizing Radiations of the University of Novi Sad (lately testing tritium and radon concentration).

4.2 Environmental information and data reporting

Data reporting by enterprises

Data reporting by enterprises, including their self-monitoring activities to collect data in the first place, is imposed on the enterprises and carried out in the framework of the National Register of Pollution Sources (National Pollutant Release and Transfer Register (PRTR)), which is managed by SEPA. The legal basis sets the obligation for enterprises on what kind of emission or waste data they need to report.

First of all, enterprises classified as PRTR enterprises are required to report on their emissions of pollutants into the air, water and soil, as well as waste generation and general data on the facility. They are required to use specific reporting forms when submitting their reports yearly to SEPA.

Enterprises that are not classified as PRTR enterprises but are emitting pollution above a prescribed limit value are obliged to provide data on emissions of pollutants into the air. The form for collecting the data from non-PRTR enterprises is the same as that for PRTR enterprises.

Furthermore, data on waste generation, using the same form for waste generation as that for PRTR enterprises, are required from all other registered enterprises permitted to generate types of waste not collected through a municipal waste service.

Enterprises that are licensed for waste landfilling, treatment, export or import are required to report using relevant landfilling, treatment, export or import forms.

There are also requirements in place for enterprises that place packaged products on the market, and for those managing packaging waste, to deliver data regarding packaging or packaging waste by using relevant packaging and packaging waste management forms.

Finally, enterprises producing or importing products that after use become special waste streams – batteries and accumulators, motor and similar oils, vehicles, tyres, products with asbestos content and plastic bags – are required to report on these products using the relevant form.
The enterprises are required to give assurance of having financial resources for monitoring activities as well as other emissions measurement activities, so that they can evaluate the impact of their business operation on the environment.

Taking into account all the reporting requirements, the National Register of Pollution Sources, as managed by SEPA, includes data as presented in Table 4.1.

Enterprises also receive surveys and questionnaires from the Statistical Office to report on water use and wastewater, emissions of pollutants into the air, fuel consumption for energy purposes, etc. Certain reporting by enterprises is of the same type of data to both SEPA and the Statistical Office, which was the reason why both institutions took steps to develop joint questionnaires.

Nonetheless, due to differences in approaches – publication of individual data versus confidentiality about the individual data and publication of aggregated data only – cooperation has not yet resulted in using joint questionnaires. At the same time, while data on pollution are not confidential, elaboration and use of a joint questionnaire on pollution could, in principle, be introduced, which could lead to decreasing the enterprises' double-reporting obligations.

Statistical data

Data pertaining to the environment are collected and processed for several statistical areas, such as air, water, waste and hazardous chemicals.

Data are also collected on irrigated areas, areas and facilities flooded by surface water and groundwaters, and areas and facilities protected by floods. Since 2013, data for public water supply as well as for public sewerage systems, are obtained by the following sectors: Water collection, treatment and supply; Agriculture, forestry and fishing; Mining and quarrying; Manufacturing; Electricity, gas, steam and air conditioning supply; Construction and Other services. Furthermore, within the national accounts, information about costs of environmental protection and indicators of material costs is available. Data on crimes against the environment are also collected.

Database management

A number of databases are maintained by SEPA to store the environmental data related to air quality, water quality, contaminated soil sites, pollen concentration, biodiversity economic activity, instruments for environmental protection and environmental expenditures. There are also databases containing the PRTR data as collected from the enterprises (air pollution, water pollution, waste generation).

The various databases available at SEPA are not interconnected in any way at the moment. Hence, integration work continues in order that the integrated environmental information system can be established, which will allow, when necessary, the overlapping of data or their combination for presentation in a geographic information system.

The statistical databases are maintained to store data on the quantity of waters used per water source, the purpose of water use by economic sector, consumption of fossil fuels, and other data necessary for calculation of emissions to the air. Other databases still need to be developed, for example for noise.

Table 4.1: Data collected from the enterprises constituting the National Register of Pollution Sources

Type of data	Reporting enterprises
General facility form Emissions of pollutants into the air water soil Waste management	PRTR enterprises
Emissions of pollutants into the air	Non-PRTR enterprises emitting above the set limit value
Waste generation	Non-PRTR enterprises licensed for the type of activities
Waste landfilling Waste treatment Waste export Waste import Products that after use become special waste flows Packaging and packaging waste	All enterprises licensed for the particular type of activities

Source: Serbian Environmental Protection Agency, 2014.

At the moment, the integration of information and data is conducted through the Internet for data available online, in particular, through such portals as Ecoregister (http://www.ekoregistar.sepa.gov.rs/) linking data and environmental information available with some 850 institutions in Serbia. Analysis of the integrated data and information is published in the state of the environment report.

The Statistical Office maintains a statistical database for hazardous chemicals, which provides data on the production, consumption, export and import of chemicals, as per the economic sectors: Mining and quarrying; Manufacturing; Electricity, gas, steam, and air conditioning supply; Water supply and sewerage; and by toxicity class. Through regular statistical surveys, it also provides a statistical database on water abstraction, water usage, water distribution, wastewater, treated wastewater by type of treatment both from industry and public water supply, and waste discharge, as well as data on water needed for irrigation.

Environmental indicators and their use

In 2010, Serbia adopted a list of 81 environmental indicators in 12 thematic areas, as follows: Air and Climate Change (11 indicators), Water (11), Nature and Biodiversity (4), Soil (5), Waste (9), Noise (2), Non-ionizing Radiation (1), Forestry, Hunting and Fisheries (8), Sustainable Use of Natural Resources (7), Economic and Social Resources and Activities (17), International and National Legislation (1) and Subject of Environmental Protection System (5).

Notwithstanding, the indicators were already in use earlier and they have been classified since 2008 in accordance with the driving forces–pressures–state–impact–response (DPSIR) framework. The necessary data for the calculation of the indicators are available in various institutions at national and local levels, and shared with SEPA, which is in charge of managing the indicators. The majority of indicators are used in the state of the environment report in the context of understanding and assessing the changes underway in the environment, including environmental pressures stemming from the main economic activities. The applied set of indicators is reasonable in terms of serving the purpose of assessment.

Environmental reporting, publication of environmental data and indicator-based assessment reports

Serbia produces its state of the environment report annually. It has been based on assessment of indicators since 2006 and there have been several annual thematic reports since 2010/2011, for instance on the state of air quality, management of packaging and packaging waste, results of testing the quality of surface water and groundwaters, the status of land, the status of lakes and reservoirs, and, since 2012, on specific waste streams. In addition, an annual report on the status of soil is produced as part of a special publication that gives a comprehensive overview of pressures on soil and land use changes in Serbia. Last but not least, a report entitled *Biodiversity of Serbia: State and perspectives* is produced. The reports for 2013 are expected to be published in September 2014, in line with usual practice.

As far as the indicator-based state of the environment report is concerned, the same structure has been used since 2010, providing assessment with regard to the thematic areas as specified for the environmental indicators.

Within the report's section on economic and social resources and activities, agriculture, energy, industry and tourism are assessed as the most crucial economic sectors for Serbia. The report also includes the structure of economic instruments for environmental protection and environmental investments, which are partially estimated, and an assessment of the success of the implementation of the environmental legislation.

A useful feature of the report is inclusion of key messages derived from the analysis made for each indicator, assessed under the thematic areas and their respective subareas. The report also contains recommendations for future actions, the implementation of which should further support improvement in the particular area discussed. The report does not contain an abridged SWOT analysis, but includes a country comparison whenever an indicator has an international significance. Some of the indicators are ECE compatible, while some are simply national indicators derived from one or more international ones.

The report is produced annually and this frequency can be questioned, in particular because in such a short period of time it is impossible to observe visible changes in trends and impacts for the majority of thematic areas assessed in the report.

Furthermore, this period of time may be insufficient to implement some of the actions recommended in the previous report. In addition to the various thematic reports and the annual state of the environment report, Serbia publishes some environmental data and information online:

- Environmental indicators with a short description;
- Air quality data in real time;
- Water quality data on a daily basis;
- Water quality index, monthly values for the period 1998–2012;
- Water quantity data;
- Concentration of pollen in the air as daily data and weekly reports;
- Information about exceedances of concentration of pollutants in the air and incidental water pollution as alarm information.

A clearinghouse mechanism for biodiversity was also established and is available online.

Use of environmental information as a decision-making tool

Environmental information, recommendations and conclusions, in particular those contained in the thematic reports or the reports on the state of the environment, are considered when developing new regulations, programmes, strategies and measures. Collected data are used to establish baseline information, e.g. for negotiation purposes. This further supports understanding of progress achieved with the implementation of programmes, strategies and measures.

4.3 Availability of and access to information

Environmental information of public importance in Serbia, except for information defined by law as restricted, is freely available at no cost to the public. Furthermore, access to information that concerns a threat to or protection of public health and the environment cannot be restricted by the authorities.

In the event that a public authority seeks to deny an applicant access to information, it has 15 days to inform in writing its decision to reject the request for information and give a reason for the rejection. Such a decision must contain the available relief against it. Otherwise, the authorities are obliged to respond to a request for access to information within 24 hours in respect of information concerning threats to the environment, or 30 days in respect of information concerning environmental protection, e.g. interpretation of the provision of environmental laws, or 15–40 days for a request of a more general nature.

The information being requested is usually provided by the authorities using the equipment available to them. If a copy is requested, it will be usually be issued in the form in which the information is stored, unless a particular form is requested and it is possible for the authorities to deliver it in this form using the available technical means.

The authorities are obliged to inform the public of their rights and obligations and ways of exercising those rights and obligations, on the scope of their work, on the supervising authority and ways of making contact with them, and of other information important for the transparent operation of their work and their relationship with the public and other stakeholders. Each authority therefore produces an up-to-date booklet describing its duties, structure, contact information, etc. Authorities also provide a sample request form for access to information of public importance and a sample complaint form to the Commissioner for Information of Public Importance.

In 2007, Serbia established the function of Commissioner whose role it is to be a civic defender and assist the public and protect its rights with regard to environmental matters, as well as to control the work of the authorities. The function was introduced as an independent public authority.

Regarding the availability of environmental information, the vast array of environmental information and data in Serbia is available to the public and other stakeholders through Ecoregister. It contains information kept by the competent ministries and other government agencies and organizations, municipal and city authorities dealing with environmental matters and the management of protected areas, as well as all the available data on flora and fauna, pollutants, the degree of air, water and soil pollution, etc. The main objective of Ecoregister is to provide the public with easy, quick and user-friendly access to information about the environment and improve the general accessibility of such information to the public.

In terms of information that is not available in electronic or some other form, Ecoregister could refer its users to the relevant institutions responsible for the collection and publication of such data, and provide the contact information of the competent person in the particular institution and a description of the procedures for submitting requests for access to the requested information or document.

Ecoregister is a sub-domain on the website of SEPA. It was developed with the support of the Organization for Security and Co-operation in Europe (OSCE) in 2012 and its system update in March 2014 was also supported by OSCE. The availability of and access to

environmental information is further facilitated in Serbia by four Aarhus centres in:

- Kragujevac, opened in April 2010;
- Subotica, opened in March 2011 for Vojvodina;
- Novi Sad, opened in late 2011, for South Backa District;
- Niš, opened in late 2012 for the south-east region of Serbia.

The centres provide information, promote the right of access to environmental information and education, raise awareness and knowledge on environmental protection, and facilitate and enable the participation of citizens in the decision-making process. They can also organize public events, round tables and conferences, as necessary and driven by demand.

With the support of OSCE and Germany, the Aarhus centres together organized an "Aarhus Caravan" – a campaign conducted in 20 towns and municipalities of Serbia with the aim to promote and inform citizens of their rights arising from the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters and relevant national laws, and explain how the Convention and laws can impact on improvement in the quality of life of citizens. As in other countries, despite the effort taken to provide the public with environmental information, the overall level of public awareness about the need for environmental protection and environmental culture in Serbia is considered unsatisfactory. Furthermore, media coverage of environmental and sustainable development issues is considered insufficient, which reflects the lack of interest by the general public and hence also the media. At the same time, local authorities often do not see the need to raise environmental awareness and address environmental problems through a participatory approach.

4.4 Education

Preschool

A mandatory preschool education – for children aged from 5.5 to 6.5 years – includes elements of ecological education in the subject, the world around us. These elements, adapted to the age of the children, concern environmental protection, ecology and sustainable development.

Primary schools

The applied approach to environmental education in primary schools (grades 1 to 8, for children aged from 7 to 15 years) teaches environmental protection, efficient use of natural resources, sustainable development, etc., through integration of these programmes into the curricula of several primary subjects:

- Grades 1–4 (classes with one teacher): subjects such as The world around us and Nature and society;
- Grades 5–8 (classes with subject teachers): subjects such as primary Biology but also Geography, as well as certain elements in Chemistry, Physics, and Technology and informatics.

In addition, elements of environmental education are included in Civic education (which can be chosen in place of Religion) and Guardians of nature, which is one of six optional subjects, of which one must be taken by pupils as part of their obligatory curriculum. The choice can often be limited to fewer than six subjects, depending on the school.

With the 2009 reform of the curriculum for primary schools, grades 7 and 8, environmental and ecological programmes were modified. The Biology class in grade 8 was entirely dedicated to ecology and environmental protection in the context of sustainable development, following international standards and guidelines.

At the same time, a new education reform is being finalized and will be tested in pilot schools during the school year 2014–2015. With this reform, environmental protection and ecology were placed among the key competences that pupils have to acquire during their primary and secondary education.

Being a key competence, environmental protection and ecology in the context of sustainable development will not only be learnt through selected primary or voluntary subjects, as is the existing practice, or as a dedicated subject, but through all the subjects taught at schools, including, for example, Art, Mathematics, Serbian.

This new multidisciplinary approach to teaching environmental protection and ecology will be tested at 115 schools: grades 5–7 in primary schools and grades 1–3 in the general secondary schools. The curricula are then expected to be further adjusted, based on the test result, and introduced to all primary and secondary schools in Serbia. The availability of necessary funds for teacher training will be key to the rapid and full implementation of the reform.

Secondary schools

The applied approach in secondary education, similarly to that in primary education, is to teach environmental protection and ecology through the primary subjects, in particular, Biology. The subject of Biology is entirely dedicated to environmental protection and ecology in grade 4 in general and natural sciences grammar schools, as well as in technical secondary schools. In the social sciences grammar schools, this subject is taught in grade 2.

Elements of environmental education are also included in the optional subjects.

When it comes to the secondary professional schools, the general teaching programme includes a mandatory subject, Ecology and nature protection.

As in primary schools, environmental protection and ecology were designated a key competence for pupils to acquire during secondary education, and hence it will be taught through all possible subjects.

Vocational training

The secondary vocational schools are introducing new subjects and educational profiles which particularly address environmental protection. The goal is that future professionals are aware of the need to protect the environment and contribute to sustainable development, and hence acquire the necessary competences to achieve this goal in their professions.

In this context, recently introduced profiles are: environmental technician in the area of chemistry or non-metals; graphic design; and recycling technician.

New subjects have been included in the curricula for various environment-related courses, for example: the curriculum for midwifery and nursing now includes a subject concerning medical waste and its disposal; for construction professionals, choice of materials; for tourism specialists, environmental protection and sustainable tourism; and for hydrology and meteorology professionals, management of waters, protection of coastal areas and climate change.

Higher education

Higher education on environmental issues is available at 24 faculties of four state universities in Serbia (Belgrade, Kragujevac, Niš and Novi Sad). These faculties have set up departments or study groups for teaching environmental issues in graduate, postgraduate and doctoral programmes.

In addition, private universities offer studies on environmental programmes and subjects, such as the Faculty of Applied Ecology of Singidunum University in Belgrade and the Faculty of Environmental Protection of Educons University in Sremska Kamenica.

The Faculty of Pedagogy and Teaching of Belgrade University has a one-year course called Nature and society, intended for the training of teachers, which is composed of combined sciences: biology, chemistry and physics.

Training of teachers

Teachers are obliged to attend specialized courses in various areas. The training is done through various programmes accredited by the Ministry of Education, Science and Technological Development, some of which cover environmental protection and sustainable development.

Training of teachers about new techniques, methods and content of different scientific disciplines is also conducted in the Research Centre Petnica (RCP) – an independent organization addressing the development of scientific culture, scientific literacy, education and culture. The RCP programmes include a wide range of areas and disciplines within natural, social and technical sciences, including ecology, environment and sustainable development.

In addition, teaching aid material on environmental protection and sustainable development is developed under various projects supported by international organizations and donors. A “green pack” – multimedia environmental education kit – is an additional teaching aid for teachers in elementary schools on environmental protection and sustainable development. As part of the green pack project, teachers were also able to participate in initial training on introducing the material into teaching practice.

A handbook, “Green Pack Serbia”, offers teachers lesson plans on 22 environmental topics with information specific for Serbia It is structured to provide teachers with information on each theme with lesson objectives and methodology.

Despite the efforts to provide teachers with training programmes and teaching aid material, it is considered that the availability of training and material pertaining to environmental protection and

sustainable development, to assist everyday teaching, is still insufficient.

Training and retraining of civil servants

A programme of education on sustainable development for civil servants was launched in 2012. It was developed by the Human Resource Management Service of what is now the Ministry of Agriculture and Environmental Protection. Some 20 civil servants have completed the programme annually.

Informal and non-formal education

Numerous campaigns have been organized to raise the public's awareness and knowledge of environmental protection and sustainable development. The Ministry of Agriculture and Environmental Protection provided support for the publication and distribution of a magazine, *Environment and Sustainable Development*: *NIP Decja kuca*, intended for schoolchildren and young people. This publication is of high quality – evident in its concept, contents, illustrations and text – which can be of great importance in both studying and promoting ecology and environmental protection. The scope of this publication promotes the concept of sustainable development, especially its focus on environmental protection and natural resources.

There are special magazines that deal with environmental issues, as well as children magazines with special emphasis on environmental issues, such as *Djacko doba*, *Ekolarac*, *Djak prvak*, *Zrnce* and *Zivotna sredina i odrzivi razvoj*. Information and education centres in protected areas also promote environmental protection.

At the same time, a strategic approach to pursuing informal and non-formal education is lacking. There is also limited interest from the media. The number and quality of articles in daily newspapers and periodicals, as well as television and radio programmes, is generally far from satisfactory. Instead, dissemination of information, an important component of informal education, is fragmented, not systematically planned and, in most cases, only event driven.

Education for sustainable development

Sustainable development – within the context of teaching environmental protection and ecology as part of the ongoing education reform – is among the key competences to be acquired by pupils during their primary and secondary education.

As the Ministry of Agriculture and Environmental Protection is the leading institution on environmental protection and sustainable development in Serbia, its involvement in creating the school curricula can be very useful. At the moment, however, the Ministry of Agriculture and Environmental Protection does not have a permanent member on the commission establishing the curricula.

4.5 Legal framework

Monitoring and assessment

The main law governing the continuous control, monitoring and assessment of the state of the environment in Serbia is the Law on Environmental Protection. It gives the responsibilities to the Government, Autonomous Province and local self-government units to adopt monitoring programmes on their territories in accordance with special laws. Further, it places the obligation on the national, autonomous province and local self-governments to provide financial resources for the conducting of monitoring.

The Law further specifies the content and manner of performing monitoring, the authorized organizations for monitoring, the requirements of self-monitoring by polluters, and the requirements of monitoring data submission. It also regulates the establishment and maintenance of an environmental information system, and registers of sources of environmental pollution. It introduces the requirement for preparation of an annual report on the state of the environment in Serbia and prescribes the content of the report. It also gives all relevant institutions the responsibility to share the environmental data and information they collect and process with the institution responsible for environmental reporting, i.e. SEPA.

Air monitoring is regulated through the Law on Air Protection supported by the Regulation on monitoring conditions and air quality standards, Regulation on determination of zones and agglomerations, and Regulation on determination of the list of air quality categories in zones and agglomerations. It further specifies the responsibilities for air quality monitoring and monitoring of emissions into air, giving them to the government authorities – represented through the relevant ministry – and the legal entities which are licensed for this activity. It further prescribes that the air quality monitoring in the state network should be carried out by SEPA and the competent agencies responsible for hydrometeorological activities. The

air legislation is a good basis for governing air pollution.

The 2010 Law on Waters, replacing its 1991 predecessor, supported by the Rulebook on determination of surface and groundwater bodies (OG 96/10), Rulebook establishing reference conditions for surface water body types (OG 67/11), Rulebook on the parameters of the ecological and chemical status of surface waters and the parameters of the chemical and quantitative status of groundwater (OG 74/11), Regulation on limit values for pollutants in surface and groundwaters and sediments and deadlines for their achievement, 2014 Regulation on limit values for priority and priority hazardous surface water pollutants and deadlines for their achievement, and Regulation on the approval of the annual programme of monitoring of water status for 2012/2013/2014, constitutes the legal basis to govern water monitoring.

The Law on Waters designates the national organization responsible for hydrometeorological affairs to monitor water status. Regarding water quality measurement, the Law on Waters stipulates that this might be conducted by an entity other than the organization responsible for hydrometeorological affairs. Furthermore, the Law requires that the data collected on the status of waters be shared with SEPA. The annual programme for monitoring is to be prepared by the relevant ministry responsible for water management in cooperation with the ministry responsible for environmental protection and adopted by the Government.

As far as drinking water quality monitoring is concerned, the regulations are expected to change, since the current ones are not yet harmonized with the relevant EU regulations, which is Serbia's goal. Furthermore, there is a legal gap concerning ownership, i.e. the legal status, of the small-scale water supply system, which results in the lack of the legal entity that would operate the supply system and ensure the necessary monitoring.

Regarding designation of the authority responsible for drinking water monitoring, the Law on Waters mandates the relevant ministry to determine which entity should have the authority; it could be either the organization responsible for hydrometeorological affairs or another entity authorized by the ministry. In addition, the Law prescribes the function of oversight to the ministry responsible for health affairs via the health inspectorate for drinking and bathing waters.

A rulebook for monitoring bathing water is under development. It will prescribe the necessary frequency of monitoring, which is currently only prescribed by the relevant competent authority. It will, further, exclude the monitoring of chemical substances and require the monitoring of microbiological substances.

A law on soil protection is only now under development. This is one reason why the monitoring of soil is also not regularly performed but, rather, conducted on a project basis. Pursuant to the Law on Environmental Protection, the Government adopted the Regulation on the programme of systematic monitoring of soil quality, indicators for assessing the risk of soil degradation and the methodology for the development of remediation programmes. The Regulation prescribes limit values, concentrations of hazardous and harmful substances that could indicate significant contamination, and remediation values in soil and groundwater. According to the Regulation, the Inventory of Contaminated Sites is an integral part of the environmental protection information system administered by SEPA. Additionally, the Regulation on the criteria for determining the status of the endangered environment and priorities for rehabilitation and remediation (OG 22/10) determines the status of the vulnerable environment.

Noise monitoring is regulated by the Law on Protection from Environmental Noise and a Rulebook on methods of measuring noise and the content and scope of the report on the measurement of noise (OG 72/10). The legislation offers a sufficient basis for effective noise monitoring. The Law designates the Government, Autonomous Province and local self-government units to organize the monitoring on their territories.

Radioactivity monitoring is regulated by the Law on Ionizing Radiation Protection and Nuclear Safety and Rulebook for establishing the programme of systematic examination of radioactivity in the environment (OG 100/10) and Rulebook on radioactivity monitoring (OG 97/11). The Law stipulates that the Serbian Radiation Protection and Nuclear Safety Agency is responsible for radioactivity monitoring. Furthermore, the Law enables the Agency to use accredited subcontractors for conducing the sampling and analyses. The radioactivity legislation is currently compared against EU requirements regarding radiation protection.

Monitoring of biodiversity is regulated by the Law on Nature Protection and Regulation on the ecological network. Even if it provides a good basis for effective monitoring, the legislation does not work, since it is not implemented. The necessary monitoring programmes as required by the laws were not yet developed. The Law designates the Institute for

Nature Conservation of Serbia and other professional and scientific organizations, as authorized by the relevant ministry, to conduct the monitoring of the status of the ecological network. Further, the Law on Forests regulates the monitoring of forests and designates the task of monitoring to organizations that are authorized to carry out scientific research on forests. The authorization is provided by the relevant ministry.

There are also regulations to govern information and data collection and assessment. Among them are the Regulation on the environmental information system, methodology, structure, common ground, categories and levels of data collection, the contents of the information in public access (OG 112/09), Rulebook on the national list of indicators of environmental protection (OG 37/11) and Rulebook on the methodology for the development of national and local registers of sources of pollution, and the methodology for the type, manner and deadlines for data collection (OG 91/10).

Access to information

The legislative basis to give the public the right to, and govern public access to, environmental information is provided by several acts, the main one of which is the Law on Free Access to Information of Public Importance (OG 120/04, 54/07, 104/09, 36/10).

The main Law, along with the clauses on access to information in other laws, provides a sufficient basis to ensure public access to environmental information and data, as well as to create environmental awareness. There are, however, some incompatibilities detected between the laws. The Law on Environmental Protection offers less favourable terms of access to environmental information than does the Law on Free Access to Information of Public Importance.

Education

The Law on the Fundamentals of the Education System (OG 72/09, 52/11, 55/13) and Law on Environmental Protection provide the framework for assuring environmental and sustainable development education.
The Law on the Fundamentals of the Education System states that raising awareness about the importance of sustainable development, protection and preservation of nature and the environment, environmental ethics and animal protection is among the aims of education. It prescribes the general outcomes of education, one of them being effective and critical use of scientific and technological knowledge by students to show responsibility towards their lives, the lives of others and the environment, and to act in accordance with the rules of environmental ethics.

The Law on Environmental Protection prescribes that raising awareness about the importance of sustainable development, protection and conservation of nature and the environment, environmental ethics and animal protection is one of the objectives of primary education and that the school programme must include subjects concerning environmental protection.

4.6 Policy framework

Monitoring

Monitoring activities are carried out based on the annual monitoring programmes which are prepared by relevant ministries responsible for the various environmental media or topics. Nevertheless, a biodiversity programme is lacking. There is no national programme on soil monitoring, but some local governments, depending on their budget, adopt annual soil monitoring programmes on the basis of the Regulation on the programme of systematic monitoring of soil quality, indicators for assessing the risk of soil degradation and the methodology for the development of remediation programmes.

Furthermore, the implementation of monitoring programmes is subject to the financial and human resources made available to conduct the monitoring activities. In a number of cases, these resources are insufficient to allow the optimal monitoring activities – e.g. water quality monitoring – to be conducted, or to keep the monitoring network fully operational – e.g. the air monitoring network.

Availability of and access to information

The Strategy for the Implementation of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters – the Aarhus Convention (OG 103/11) and related Action Plan were established in Serbia to verify its compliance with the provisions of the Convention. A SWOT analysis on the implementation of the strategy was prepared.

The Strategy for the Development of Electronic Government for the period 2009–2013 (OG 83/09, 5/10) defines the main priorities to advance the state of the information society. It also specifies the

activities that influence the creation of the infrastructural and other conditions that make it possible for information from all domains, including the environment, to become more accessible to the general public through databases accessible via public telecommunication networks.

Education

A number of measures are undertaken to promote environmental education and awareness about the need to protect the environment and to ensure sustainable development. They include the organization of festivals, seminars, fairs, other public events, etc. As already mentioned, there is a need for a more strategic approach in this regard.

4.7 Institutional framework

Monitoring and assessment

The Government, Autonomous Province and self-government units are responsible for organizing environmental monitoring in accordance with specialized laws. In practical terms, the following organizations are involved in monitoring:

- Air quality: SEPA manages the state network for air quality; Vojvodina Autonomous Province manages its regional air quality network; the municipalities of Belgrade, Pančevo and Bor manage their local air quality networks;
- Water: HMS monitors the quantity of waters; SEPA monitors the quality of waters; the Institutes of Public Health measure the quality of both drinking water and bathing waters;
- Noise: the municipalities contract noise measurement providers that are authorized for noise measurement;
- Radioactivity: the Serbian Radiation Protection and Nuclear Safety Agency oversees the monitoring of radioactivity and engages accredited subcontractors to conduct the sampling and analyses, for example: the Institute of Occupational Health; Institute of Nuclear Sciences "Vinca", Laboratory for Radiation and Environmental Protection; and the Faculty of Science, Department of Physics, Department of Nuclear Physics, Laboratory for Radioactivity and Dose Ionizing and Non-ionizing Radiations of the University of Novi Sad;
- Biodiversity: the Institute for Nature Conservation of Serbia conducts the monitoring;
- Forests: the Institute of Forestry in Belgrade and the Institute of Lowland Forestry and Environment in Novi Sad conduct the monitoring.

The Regulation on the programme of systematic monitoring of soil quality, indicators for assessing the risk of soil degradation and the methodology for the development of remediation programmes defines three levels of soil monitoring: national, regional and local, each containing sets of localities to be monitored. However, it does not define which entity is responsible for the monitoring of soil.

SEPA, in accordance with legislation, is also in charge of the environmental information system and maintains the National Register of Pollution Sources. SEPA also produces the report on the state of the environment as well as other thematic reports.

Access to information

Until 2009, the Ministry of Culture and the Media was responsible for monitoring the implementation of the Law on Free Access to Information of Public Importance. However, the Ministry did not have the infrastructure necessary for initiating offence proceedings against persons authorized to access information who did not act in accordance with the Law. As a result, punitive provisions had no legal effect. With the adoption of amendments to the Law in December 2009, the Ministry of Public Administration and Local Self-Government became responsible for monitoring the implementation of the Law on Free Access to Information of Public Importance.

Education

The Ministry of Education, Science and Technological Development is the authority in charge of the entire system of education at national level, as well as for the development of international cooperation on education. This also refers to education for sustainable development (ESD) to a great extent, although the competences for this are shared with the Ministry of Agriculture and Environmental Protection, including for international cooperation in ESD, such as following the implementation of the UNECE ESD Strategy and UNESCO activities in this regard.

Both Ministries also involve other relevant institutions or coordinate with them activities related to environmental education and awareness-raising and development of environmental culture, which are

crossing-cutting themes. The Institute for Education Advancement works on developing the curricula.

There is, however, a need for a more strategic approach by the various governmental institutions to the implementation of environmental education in accordance with the sustainable development principles. This would facilitate the development and reform processes which have been initiated in Serbia.

4.8 Conclusions and recommendations

Serbia established monitoring and the monitoring networks for most of the environmental media or themes. There is no monitoring of soil. Biodiversity monitoring, and data collection for economic instruments and environmental expenditure and investments are underdeveloped. Regarding soil, this is due to the lack of legislation on soil protection and, resulting from this, failure to designate the competent authorities for the monitoring function. On the positive side, however, knowledge of how to organize soil monitoring is already available in the country, thanks to pilot projects. As far as biodiversity monitoring is concerned, it is underdeveloped due to the lack of a monitoring programme, which is in the development stage. In relation to the evaluation of economic instruments for environmental protection, there is a lack of adequate data; therefore, in many cases, these data are estimated according to the baseline data collected from different institutions.

For other monitoring networks, the monitoring is not often conducted at an optimal level; this situation is imposed by the monitoring budgets available. Furthermore, groundwater monitoring requires the design of a new network, and the monitoring of drinking water in small-scale water supply systems requires legal developments to ensure the establishment of legal entities that will manage the networks and provide the monitoring. Indoor air quality has not been given enough consideration to date and policy development, including on its monitoring, is lacking. Finally, noise monitoring is not systematized.

Recommendation 4.1:
The Government, through the relevant ministries, should ensure that resources are provided and effective monitoring is performed for environmental media and themes, and in particular:

(a) Introduce regulation on the monitoring of soil and designate competent authorities for the monitoring functions;
(b) Establish a monitoring programme for biodiversity;
(c) Improve the groundwater monitoring network;
(d) Clarify the responsibility of small-scale water supply systems for drinking water monitoring;
(e) Ensure that noise monitoring is systematically carried out at the local level.

A vast array of data is collected and made available in Serbia, directly on the website of SEPA or through the various thematic reports or the indicator-based state of the environment report. Data collection and processing are well managed. Nevertheless, further efforts are required by SEPA and the Statistical Office to jointly collect environmental information from enterprises, where collection is currently done separately but addresses the same data. Databases that are developed for maintenance of the various thematic data are not yet integrated to comprise one system. In addition, a database for noise is not yet developed. The state of the environment report is produced annually, which can be considered too frequent, since in such a short period of time it is impossible to observe visible changes in trends, impacts, etc, for the majority of thematic areas assessed in the report. In addition, this period of time may be insufficient to implement some of the actions recommended by the report. The frequency could therefore be reconsidered and, if altered, the relevant requirement of the Law on Environmental Protection should be amended. A change in frequency, for example to every 4–5 years, could free up resources for other activities related to environmental assessment and reporting, and database development and management.

Recommendation 4.2:
The Government should:

(a) Introduce, where relevant, joint data collection activities to avoid double collection;
(b) Develop the environment-related databases that are lacking and accelerate the integration of all environment-related databases into one environmental system;
(c) Reconsider the frequency with which the state of the environment report is produced.

Access to environmental information and data is assured at a satisfactory level. Furthermore, a user-friendly register – Ecoregister – was established, which provides any user, including members of the public, with easy access to available environmental information and data. This register was established

with the assistance of OSCE in 2012, as was the first system update to ensure the functioning of all links within the register. In the future, however, the Government's own resources will be required to ensure the necessary system updates.

Recommendation 4.3:
The Ministry of Agriculture and Environmental Protection, together with the Serbian Environmental Protection Agency, should ensure that the Ecoregister is properly maintained, through the provision of adequate national funding and human resources, so that it serves its function of providing the public with access to an array of up-to-date environmental information and data.

Serbia is underway in implementing educational reform, in which environmental protection in the framework of sustainable development is designated a key competence to be acquired by pupils during their education.

However, the manner in which this competence can be efficiently acquired – i.e. teaching it through a multidisciplinary approach – depends on teachers' ability to integrate the concepts of environmental protection and sustainable development into the subjects they teach. This, in turn, depends on the availability of teaching aid material and teacher training, both of which are still considered insufficient.

There are a number of activities related to informal and non-formal education in Serbia; however, they are often event driven, while a systematic plan or strategic approach to general public awareness-raising is lacking. In addition, media involvement in non-formal education on environmental protection and sustainable development is rather weak.

Recommendation 4.4:
The Ministry of Education, Science and Technological Development and the Ministry of Agriculture and Environmental Protection should:

(a) Further improve access to and the availability of environmental protection and sustainable development training and teaching aid materials for teachers;
(b) Develop and implement a strategic approach to informal and non-formal education on environmental protection and sustainable development and strengthen the involvement of the media in this regard.

PART II: DOMESTIC–INTERNATIONAL INTERFACE

Chapter 5

IMPLEMENTATION OF INTERNATIONAL ENVIRONMENTAL AGREEMENTS

5.1 General priorities for international cooperation related to environment and sustainable development

The Constitution states that "generally accepted rules of international law and ratified international treaties shall be an integral part of the legal system in Serbia and applied directly. Ratified international treaties must be in accordance with the Constitution". The Law on Concluding and Implementing International Agreements (OG 32/13) regulates in detail the procedure on the matter.

Until April 2014, the Ministry of Energy, Development and Environmental Protection was in charge of coordination of the implementation of international environmental agreements. The majority of the multilateral environmental agreements (MEAs) were under the competency of this Ministry, while some were shared with the Ministry of Agriculture, Forestry and Water Management (Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Convention on Co-operation for the Protection and Sustainable Use of the River Danube, Framework Agreement on the Sava River Basin) , the Ministry of Health, and the Ministry of Agriculture, Forestry and Water Management (Protocol on Water and Health) and the Ministry of Natural Resources, Mining and Spatial Planning (European Landscape Convention, Framework Convention on the Protection and Sustainable Development of the Carpathians).

The Ministry was also in charge of the formulation of national positions with regard to MEAs, payment of annual contributions for MEAs under its competency, and participation in meetings under MEAs. In April 2014, the Ministry of Agriculture and Environmental Protection was set up on the basis of the former Ministry of Agriculture, Forestry and Water Management, former Ministry of Natural Resources, Mining and Spatial Planning and former Ministry of Energy, Development and Environmental Protection (chapter 1).

This means that, since April 2014, coordination of the implementation of most international environmental agreements has been under one roof.

Priorities of bilateral and multilateral cooperation are defined in a number of national documents developed since 2007, e.g., the 2010 National Environmental Protection Programme, the 2008 National Programme for Integration with the EU, the 2011 National Strategy for the Implementation of the Aarhus Convention with the Action Plan, the 2013 National Plan for the Adoption of the *Acquis* for the period 2013–2016, the 2011 National Environmental Approximation Strategy, the United Nations Country Partnership Strategy for the period 2011–2015 and the 2010 Country Programme Action Plan for the period 2011–2015, and the Biodiversity Strategy for the period 2011–2018.

During the period 2007–2013, Serbia received €106 million of development assistance for the sector "environment protection", provided by multilateral institutions (such as the EBRD, EU, UNDP, World Bank) and by a number of countries on a bilateral basis. Annual disbursements corresponded to some 0.05 per cent of GDP. Financial resources from the EU have been made available within the framework of the EU Instrument for Pre-accession Assistance (IPA) (chapter 3).

5.2 Global and regional multilateral environmental agreements

Protection of biodiversity and nature conservation

Convention of Wetlands of International Importance

Since 2007, Serbia has designated four more Ramsar sites (box 5.1, table 5.1). As of April 2014, Serbia has 10 sites designated as wetlands of international importance, with a total area of 63,919 ha. In 2012, Serbia submitted a national report to the eleventh meeting of the Conference of the Parties.

Photo 5.1: Danube River, Iron Gate

Box 5.1: Newly designated Ramsar sites

Gornje Podunavlje (the Upper Danube Basin) is located in Vojvodina along the Danube River and forms a natural unity with the Gemenc and Kopacki Rit Ramsar sites in Hungary and Croatia respectively. This special nature reserve is also an Important Plant Area (IPA) and an Important Bird Area (IBA). This area is the habitat of rare plant species such as winter aconite (*Eranthis hyemalis*), water violet (*Hottonia palustris*) and mare's tail (*Hippuris vulgaris*), an important spawning place and a migratory route of fishes, a nesting place of the white-tailed eagle (*Haliaeetus albicilla*) and the black stork (*Ciconia nigra*), as well as the habitat of the largest population of red deer (*Cervus elaphus*) in Serbia.

Vlasina is an IBA. It comprises the Vlasinsko reservoir (established in 1949) and the valley of the River Vlasina, along with two islands and several peninsulas. The peat islands and bogs represent one of the most important refuges of the boreal flora in southern Europe. The site harbours many rare and threatened vegetal and animal species. More than 125 bird species are recorded, among them the endangered corncrake (*Crex crex*), which nests every year within the site and on sloping meadows of the surrounding mountains, as well as a colony of sand martins (*Riparia riparia*) with around 300 active nests, unique in this biogeographical region. Prior to creation of the reservoir, the Vlasinsko Blato, or peat bog, was considered the largest peat bog in the Balkans and one of the largest in Europe.

Zasavica is a special nature reserve and an IBA. It represents one of the last preserved pristine swamp areas in Serbia. The natural conditions are favourable for many rare plant and animal species, such as greater spearwort (*Ranunculus lingua*), water violet (*Hottonia palustris*), marsh nettle (*Urtica kioviensis*), freshwater sponge (*Spongilla lacustris*), a rare species of oligochaete (*Rynchelmnis limnosela*), Danube crested newt (*Triturus dobrogicus*), and ferruginous duck (*Aythya nyroca*), as well as otter (*Lutra lutra*) and beaver (*Castor fiber*). It is also the only habitat of the mudminnow (*Umbra krameri*) in Serbia.

Koviljsko-Petrovaradinski Rit is a special nature reserve and an IBA. This alluvial area harbours large numbers of threatened plant species such as water violet (*Hottonia palustris)* and four-leaved clover (*Marsilea quadrifolia)*. It is crucial as a spawning ground for many fish species such as sterlet (*Acipenser ruthenus)* and important for many birds, including the black stork (*Ciconia nigra)*, amphibians such as the great crested newt (*Triturus cristatus)*, and diverse species of invertebrates, reptiles and mammals.

Table 5.1: Ramsar sites designated since 2007

Site name	Ramsar site number	Designation date	Total site area (ha)
Gornje Podunavlje	1737	20/11/2007	22,480
Vlasina	1738	20/11/2007	3,209
Zasavica	1783	13/03/2008	1,913
Koviljsko-Petrovaradinski Rit	2028	8/3/2012	8,292

Source: http://www.ramsar.org/cda/en/ramsar-pubs-notes-annotated-ramsar-16189/main/ramsar/1-30-168%5E16189_4000_0__, accessed on 16 July 2014

Convention concerning the Protection of the World Cultural and Natural Heritage

Since 2007, Serbia has inscribed one more property on the World Heritage List (Palace of Galerius in Gamzigrad-Romuliana) and submitted six properties on the Tentative List (Fortified Manasija Monastery, Negotinske Pivnice, Smederevo Fortress, archaeological site of Caričin Grad – Iustiniana Prima, Historical place of Bač and its Surroundings, and Stećak's – Medieval Tombstones). As of April 2014, Serbia has four properties inscribed on the World Heritage List and 11 properties submitted on the Tentative List.

In 2006, the World Heritage Committee inscribed the Medieval Monuments in Kosovo[6] on the List of World Heritage in Danger. Since that time, every year the World Heritage Committee has decided to retain the Medieval Monuments on the List of World Heritage in Danger.

Convention on International Trade in Endangered Species of Wild Flora and Fauna

Serbia has been a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 2002, initially as the Federal Republic of Yugoslavia (Serbia and Montenegro). Since 2006, Serbia has resumed obligations in continuation after the dissolution of the Union of Serbia and Montenegro. The country regularly submits reports to the Secretariat.

To implement the provisions of the Convention, the Rulebook on the transboundary movement and trade in protected species details the conditions of import, export, trade, farming and other activities related to cross-border movement and trade in species, the procedure for issuance of permits and other documents, and other activities governing this field. The Rulebook also contains the list of wild plant and animal species which are the subject of traffic control measures.

The authority responsible for the implementation of the Convention, and for issuing the permits on trade in endangered species of wild fauna and flora, is the Ministry of Agriculture and Environmental Protection, precisely, its Group for the implementation of CITES, whereas the Institute for Nature Conservation of Serbia and the Provincial Institute for Nature Conservation are the main scientific, professional institutions responsible for providing advice and opinions. The Natural History Museum in Belgrade, the Faculty of Biology of the University of Belgrade and the Institute for Biological Research "Siniša Stanković" are also periodically consulted for scientific expertise. The direct enforcement bodies for CITES and relevant national legislation are the Environmental Inspection, Customs Administration and Border Police, while the Criminal Police, Border Veterinary Inspection and Border Phytosanitary Inspection are also involved in enforcing CITES.

The implementation of CITES and the relevant national wildlife-trade-related legislation has improved in recent years, with a steady increase in the number of seizures, confiscations and convictions made regarding illegal transboundary and internal trade in protected species. The most frequent seizures were of live reptiles and birds, but seizures of other taxonomic groups were also recorded, as well as seizures of parts, derivatives and products of protected species. The enforcement authorities have received instructions and training through workshops and materials such as the *Guidebook for control of transboundary movement and trade of protected species*. The *Guidebook* contains comprehensive information on the species that are most frequently subject to cross-border trade and control procedures.

From April to October 2014, the IPA Twinning Light Project "Strengthening the capacities of authorities responsible for CITES and wildlife trade regulations enforcement in Serbia" has successfully been

[6] All references to Kosovo in the present report should be understood to be in full compliance with Security Council Resolution 1244 (1999), without prejudice to the status of Kosovo.

completed. The overall objective of the project was to enable the enforcement authorities for CITES to conduct efficient controls of transboundary and internal trade in protected species of wild fauna and flora, and thus ensure that Serbia meets its international obligations and complies with the EU Wildlife Trade Regulations control measures. Over the six-month period of the project, more than 12 specialized workshops have been held and more than 500 participants have been trained in the relevant CITES enforcement issues. The participants in the specialized training included environmental inspectors, border police and customs officers, judges and prosecutors, and scientific authority staff, as well as staff from rescue centres and zoological parks dealing with seized and confiscated specimens.

A number of problems remain for ensuring long-term efficiency in CITES and wildlife trade regulation enforcement. There is a general lack of human resources for the administrative burden of regulating all relevant issues for CITES, and the organizational structure of enforcement bodies and their responsibilities requires strategic revision, given the tasks of controlling transboundary and internal trade. Furthermore, the lack of adequate facilities for housing and caring for confiscated wildlife is posing a serious problem for enforcement and needs to be addressed immediately. Certain legislative changes are also required on the level of the national laws to ensure adequate sanctioning and certain regulatory issues for CITES and wildlife trade issues.

Convention on Biological Diversity

Progress was noted since 2007 in implementation of the Convention on Biological Diversity (CBD). In 2010, Serbia submitted four national reports to the Convention. In 2011, the Biodiversity Strategy and Action Plan for the period 2011–2018 were adopted. The Strategy contains in-depth analysis of the current state of biological diversity in the country, and the institutional, legal and financial framework for biodiversity protection. It also outlines all major threats to biodiversity and their underlying causes. Also in 2011, the Serbian biodiversity portal was established as part of the global information exchange network set up by the CBD. The portal serves as the national clearing-house mechanism (CHM).

The related Action Plan contains activities, responsible institutions and timeframes, as well as potential sources of financial resources for implementation of the Strategy. Unfortunately, the Action Plan lacks financial estimates of the implementation of the proposed actions and their sources of funding.

The other drawback of the current version of the Biodiversity Strategy and Action Plan is that it does not include a number of elements of the new CBD Strategic Plan for the period 2011–2020 and its global biodiversity targets (so-called Aichi targets). To fill the gap, the Global Environment Facility (GEF)-funded project "National Biodiversity Planning to Support the Implementation of the CBD 2011–2020 Strategic Plan" is being implemented. The implementing agency for the project is UNDP and its timeframe is January 2013–January 2016. The project addresses the country's need to continue to fulfil its obligations under the CBD, with particular focus on the Convention's Article 6 and the CBD Conference of the Parties (COP) Decision X/2. The project also contributes to Serbia's efforts towards implementing the CBD Strategic Plan 2011–2020 at the national level. The Fifth National Report to the Convention was also elaborated under the project and submitted to the Secretariat in 2014, prior to the 12th CBD COP held in October 2014.

The objective of the project is to fully integrate new aspects of the CBD strategic plan into the Biodiversity Strategy and Action Plan, such as mainstreaming and anchoring the implementation of the Plan into national development frameworks, valuing ecosystem services and promoting ecosystem-based adaptation and resilience.

Another GEF project, "Ensuring Financial Sustainability of the Protected Areas System of Serbia", with an overall budget of US$950,000, is being implemented by UNDP Serbia. The timeframe of the project is 2010–2014. The purpose of the project is to improve the financial sustainability and cost-effectiveness of Serbia's protected areas system, foster more efficient management and contribute to more effective biodiversity conservation in the country.

In 2012, Serbia submitted the Second Regular National Report on the Implementation of the Cartagena Protocol on Biosafety. The 2009 Law on Genetically Modified Organisms regulates only experimental work with GMOs (use of GMOs in closed systems and deliberate release of GMOs into the environment for establishing experimental field plots with GMOs). The Law prohibits the placing on the market of GMOs and products of GMOs, as well as commercial growing of GMOs. Given that the ban on the placing on the market of GMOs and products of GMOs, and the ban on the commercial growing of GMOs is not in compliance with EU legislation in

this area, Serbia has to amend the Law by weakening its national legislation.

The Plant Protection Administration and Veterinary Administration are involved in the activities on GMOs. Testing of GMOs and GMO products for the purpose of identification and quantification of genetic modification is carried out by an accredited laboratory. The Expert Council for Biological Safety has been established, consisting of 18 members chosen from among scientists and experts on biosafety (biologists, geneticists, entomologists, ecologists, veterinarians, agronomists, nutritionists, toxicologists, allergists and other professions). The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity has been signed and is expected to be ratified in 2015.

Convention on the Conservation of European Wildlife and Natural Habitats

Serbia ratified the Bern Convention on the Conservation of European Wildlife and Natural Habitats in 2007. Since the ratification Serbia developed and submitted to the Convention Secretariat its Introductory National Report, Report on Climate Change and Biodiversity and several reports of the implementation of Recommendations, as follows: No. 110 (2004) on minimizing adverse effects of above-ground electricity transmission facilities (power lines) on birds, No. 120 (2006) on the European Strategy for the Conservation of Invertebrates, No. 132 (2007) on the conservation of fungi in Europe, No. 137 (2008) on population level management of large carnivore populations, No. 136 (2008) on improving the conservation of the common hamster (*Cricetus cricetus*) in Europe, No. 154 (2011) on the European Code of Conduct on Pets and Invasive Alien Species, and the Questionnaire on illegal killing, trapping and trade of birds, including updates of these reports.

Three Biennial Reports on Exceptions were submitted to the Secretariat for the periods 2007–2008, 2009–2010 and 2011–2012. The Competent Authorities to Grant Exceptions are the ministry responsible for environmental protection, the Institute for Nature Conservation of Serbia and the Provincial Institute for Nature Conservation.

The following research institutions were licensed for scientific research purposes:

- Institute for Nature Conservation of Serbia;
- Natural History Museum in Belgrade;
- Institute for Biological Research "Siniša Stanković" of the University of Belgrade;
- Faculty of Natural Sciences and Mathematics of the University of Kragujevac;
- Faculty of Sciences of the University of Novi Sad;
- Faculty of Science and Mathematics of the University of Niš;
- Faculty of Pharmacy of the University of Belgrade;
- Institute for Multidisciplinary Research of the University of Belgrade;
- Public Enterprise "National Park Djerdap";
- Public Enterprise "National Park Fruška Gora".

Based on the criteria in the Bern Convention Recommendation No. 16 (1989) on areas of special conservation interest, a list of 61 candidate Emerald sites in Serbia has been considered at the two Biogeographical Seminars and accepted by the Standing Committee of the Bern Convention. The total land area of these sites covers 1,019,269 ha, which is equivalent to 11.54 per cent of the territory of Serbia.

These areas are part of the National Ecological Network and considered as particularly important for the protection and conservation of wild plant and animal species and their habitats. Eleven areas are located on the route of the European Green Belt. Forty-two areas of international importance for the conservation of bird diversity in Serbia have been selected by applying the IBA criteria. Using internationally standardized criteria – the presence of endangered species and endangered habitats and species diversity – 62 Important Plant Areas (IPAs) have been identified in Serbia, on 8 per cent of the territory. Forty Prime Butterfly Areas have been selected, which occupy 903,643 ha, or 10.23 per cent of Serbian territory.

Convention on the Conservation of Migratory Species of Wild Animals

Serbia ratified the Bonn Convention on the Conservation of Migratory Species of Wild Animals in 2007. The Convention came into force in Serbia in May 2008. Until April 2014, the Ministry of Energy, Development and Environmental Protection was in charge of the conservation of migratory species in the country. The Forest Administration of the Ministry of Agriculture, Forestry and Water Management was also involved in the process of protection and regulation of hunting of wild animals, mammals and birds.

The Law on Nature Protection and the Rulebook on special technical and technological solutions that enable undisturbed and safe communication of wild animals (OG 72/10) provide protection measures for migratory species, including birds and bats, in the context of the building of wind generators, electric posts, towers and bridges.

The Rulebook on the proclamation and protection of strictly protected and protected wild species of plants, animals and fungi contains lists of national strictly protected and protected species of plants, animals and fungi, which also include the species listed in the appendices to the Convention.

Since its ratification of the Bern Convention, Serbia has submitted to the Convention Secretariat two national implementation reports. The third report is being prepared for submission to the Secretariat in April 2014.

The Ministry of Energy, Development and Environmental Protection and the Natural History Museum contributed to the preparation of the Guidelines on how to avoid or mitigate impact of electricity power grids on migratory birds in the African–Eurasian region, which was prepared by the Secretariat of the Agreement on the Conservation of African–Eurasian Migratory Waterbirds (AEWA). The Ministry provides support to interested stakeholders for their participation in competition for small grants to support implementation of the Convention.

In the period 2009–2011, the project "Monitoring of birds and bats migrations by lasting marking with aluminium and colour rings" was financed by the Ministry. The project was implemented by the Natural History Museum. Its outcomes include data on migratory species numbers and frequency and the physiological conditions of bird and bat populations in the country and their population structure during migration, and scientific knowledge of migratory individuals migrating over Serbian territory. In 2013, the Ministry launched the second phase of the project, which will last until 2015.

European Landscape Convention

Serbia ratified the European Landscape Convention in 2011. The ministry responsible for the environment, as the National Focal Point for the Convention, in cooperation with the Ministry of Culture and Information, is responsible for the implementation of the Convention. As of March 2014, the drafting of the Action Plan for the Implementation of the European Landscape Convention and the Rulebook on landscape categorization of Serbia is being finalized, funded by the Swedish International Development Cooperation Agency (SIDA) and Serbia's Project Fund for Institutional Development (PROFID). This documents will be the basic tool for the implementation of the Convention, contributing to environmental protection and cultural development.

The legislation related to the enforcement and implementation of this Convention includes the Law on Environmental Protection, the Law on Nature Protection, the Spatial Plan for the period 2010–2020, and the National Strategy for Sustainable Use of Natural Resources and Goods.

United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa

In 2007, Serbia ratified the Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa. The National Environmental Protection Programme contains few objectives with regard to combating desertification and land degradation, namely:

- To develop a long-term strategy and related action plans and programmes for drought, degradation and desertification management (short-term objective for 2010–2014);
- To reduce poverty through a contribution to combating desertification and the consequences of drought and to educate and inform the public through activities at national and international levels about fighting land degradation and desertification (ongoing objectives 2010–2019).

The National Action Plan on mitigating the effects of drought and land degradation was drafted in 2013 and is awaiting approval. Serbia has regularly reported to the Convention on Performance, Review and Assessment of the Implementation System, through reporting cycles 2010–2011 and 2012–2013, and will do so for 2014–2015.

Water protection

Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention)

Serbia ratified the Convention on the Protection and Use of Transboundary Watercourses and

International Lakes in 2010. The responsibilities for implementation of the Convention have been shared between the Ministry of Energy, Development and Environmental Protection and the Ministry of Agriculture, Forestry and Water Management. The Water Directorate, now within the Ministry of Agriculture and Environmental Protection, coordinates activities. Serbia participated in the activities of Convention bodies and in the process of preparation of various documents, e.g. the 2011 Second Assessment of Transboundary Rivers, Lakes and Groundwaters. At its sixth session (Rome, 28–30 November 2012), the Meeting of the Parties to the Water Convention elected its Bureau. Serbia represents the South-Eastern European region in the Bureau.

Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes

Serbia became a Party to the 2003 Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes in 2013.

On the initiative of the Ministry of Health, the Agreement on the Establishment of the National Working Group in Order to Undertake Joint Measures and Activities Important for the Implementation of the Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes was signed by the three key ministries of the Serbian Government: the Ministry of Health, the Ministry of Energy, Development and Environmental Protection and the Ministry of Agriculture, Forestry and Water Management. The ministerial agreement resulted in the establishment of the National Working Group (NWG), charged with the main tasks of:

- Monitoring and analysing implementation of the Protocol both in Serbia and across its borders in order to prevent, control and reduce water-related diseases;
- Coordinating and undertaking related activities under the Protocol (including without limitation exchange of data and information and provision of direct assistance);
- Reporting on progress to relevant national and international institutions.

The NWG, chaired by a representative of the Department of Public Health of the Ministry of Health, has already performed baseline analysis, in order to respond to the obligation to establish and publish targets and target dates within two years of ratification, as referred to in article 6 of the Protocol.

The baseline analysis represent the first technical step that the NWG has made in order to review the legal framework (national and international) and the environmental and health situation in Serbia. This analysis is essential for the setting of priority issues and actions under the Protocol.

At the Third Ministerial Conference, held in Oslo in November 2013, Serbia became the co-lead party, together with Germany and the NGO Women in Europe for a Common Future (WECF), on the Protocol's programme area 3 – Small Scale Water Supplies and Sanitation of the Programme of Work for 2014–2016. Together with its co-lead partners, Serbia supports the parties and other states to improve the situation of small-scale water supply and sanitation (SSWSS) systems, to consider SSWSS in the target-setting process, to improve in-country evidence based on the SSWSS situation, and to scale up the water and sanitation safety planning approach.

Implementation of the Protocol in Serbia is facilitated by the three National Focal Points representing the health, natural resources and environmental sectors. In 2013, Serbia launched a case study of its national activities on raising awareness on the importance of the Protocol. In December 2014, a national workshop on target-setting for the Protocol was held, supported by UNECE and WHO, who aimed to assist Serbia in that process.

Convention on Co-operation for the Protection and Sustainable Use of the River Danube

Serbia continues to participate in regional cooperation on water protection. The country has been a member of the International Commission for the Protection of the Danube River (ICPDR) since August 2003. In the period 2010–2012, Serbia participated in the study by ICPDR to provide a common and basin-wide understanding towards the development of its Climate Change Adaptation Strategy for the Danube River Basin. The Strategy was adopted in 2012.

Together with other member countries of ICPDR, Serbia participates in the preparation of the Second Danube River Basin Management Plan. Serbia also participated in the preparation of the Sava River Basin Management Plan, which should be adopted at the Fifth Meeting of the Parties (December 2014). Serbia is also a member of the International Sava River Basin Commission (ISRBC) and the Tisza

River Basin Forum on Flood Control/Tisza Water Forum.

Framework Agreement on the Sava River Basin

Since 2004, Serbia has been a party to the Framework Agreement on the Sava River Basin and to the Navigation Protocol. Serbia signed the Protocol on Prevention of Water Pollution Caused by Navigation to the Framework Agreement on the Sava River Basin in 2009 and the Protocol on Flood Protection in 2010. Both protocols are in the process of ratification. Serbia participated in the review process for two other protocols that were adopted by the ISRBC: the Protocol on Emergency Situations and the Protocol on Sediment Management.

Other

Serbia concluded bilateral agreements on inland waterways and navigation with the neighbouring countries Croatia and Bosnia and Herzegovina. For two years there have been discussions with Romania on developing a new transboundary water agreement (the current one dates from 1955). Serbia is also considering the extension of bilateral agreements on surface waters to address groundwaters too, possibly based on UNECE Model Provisions on Transboundary Groundwaters.

Serbia joined the Organisation of the Black Sea Economic Cooperation in 2003 and participates in its Commission for Environmental Protection Cooperation.

Air protection, ozone-layer protection and climate change

Convention for the Protection of the Ozone Layer

In accordance with Article 7 of the Montreal Protocol, Serbia reports to the Ozone Secretariat on consumption of controlled substances. Reporting is done in a timely manner. Information on consumption of ODSs for Serbia is available on the website of the Ozone Secretariat (table 5.2). The report for 2013 is in preparation. The most important implementation measures that have been undertaken are:

- Introducing and maintaining a fully operational licensing and quota system for hydrochlorofluorocarbons (HCFCs);
- Enforcement of control measures to sustain chlorofluorocarbon (CFC) and HCFC phase-out, which is related to cooperation with the Customs Administration for the border control of ODSs imports, as well as environmental inspection controlling importers and exporters of the substances, as well as installations containing controlled substances;
- Prevention of illegal ODS trade (all ODSs) by using the informal Prior Informed Consent mechanism of communication and consultations between importing and exporting countries – the checking of each shipment with the exporting/importing country. The Ministry of Agriculture and Environmental Protection's database on imports and exports is cross-checked with the Customs Administration's database quarterly;
- Cooperation with the National Refrigeration Association;
- Organization and follow-up of widespread and various public awareness activities (press articles, information on the website, posters and other promotional material, cooperation with the NGO sector, celebrating International Ozone Day).

United Nations Framework Convention on Climate Change

Serbia has been a party to the United Nations Framework Convention on Climate Change since 2001 and the Kyoto Protocol since 2008. In 2009, Serbia ratified the Amendment to Annex B of the Kyoto Protocol. As a non-Annex I country, Serbia has only general obligations, such as reporting. In 2010, Serbia submitted its Initial National Communication to the Framework Convention. It is currently preparing its Second National Communication and First Biannual Update Report. UNDP is the Implementing Agency for both projects. An ongoing GEF/UNDP project supports the preparation process (chapter 6).

Convention on Long-range Transboundary Air Pollution

Since 2007, Serbia has moved ahead on air protection by adopting the Law on Air Protection in 2009. The Law was followed by 11 by-laws dealing with air emission and air quality issues (annex IV). Areas that are subject to the Convention's Protocols are also regulated by other legal acts: the Law on Integrated Environmental Pollution Prevention and Control, Law on Waste Management, Law on Chemicals and relevant by-laws.

Table 5.2: Ozone-depleting substances consumption, ODP tons

Annex	Grp	AGN	2007	2008	2009	2010	2011	2012	Baseline
Annex A, Groups I and II substances baseline is the average of 1995–1997	I	CFCs	53.5	76.7	19.2	0.0	0.0	0.0	849.2
	II	Halons	0.0	1.8	0.0	0.0	0.0	0.0	3.8
Annex B, Groups I, II and III substances' baseline is the average of 1998–2000	II	Carbon Tetrachloride	1.1	2.1	1.5	0.0	0.0	0.0	18.8
Annex C, Group I substances baseline is 2015 for consumption. For production, the baseline is the average of production and consumption in 2015	I	HCFCs	9.2	7.4	9.0	7.8	12.5	11.0	8.4

Source: http://montreal-protocol.org/new_site/en/ozone_data_tools_access.php, accessed on 16 July 2014
Note: AGN: Annex Group Name

Progress has been made in meeting the requirements of the Protocol on heavy metals in terms of fulfilling the requirements on fuel quality and lead content of marketed petrol. It was only in 2011 that the country banned placing leaded petrol on the market to comply with the requirements concerning the lead content of marketed petrol.

In 2007, Serbia started to collect data for the National Register of Pollution Sources. In 2012, Serbia reported on the Convention on Long-range Transboundary Air Pollution Inventory for the period 2000–2010. The Inventory was compiled mainly according to the recommendations for inventories set out by the Convention's Executive Body and in the EMEP/EEA Emission Inventory Guidebook 2009. This was the first year that Serbia reported emission data for all relevant pollutants covered by the three most recent Protocols as well as an Informative Inventory Report.

In 2013, Serbia reported on the Convention Inventory for the period 1990–2011. The EMEP/EEA methodology was used for developing this emission inventory.

The main official sources of activity data for the inventory of pollutant emissions included:

- The Statistical Office, which collects data on the amounts of raw materials and products relating to activities defined by the National Classification of Business Activities;
- The Ministry of Interior, which keeps databases of vehicles;
- The Serbian Environmental Protection Agency (SEPA), which collects data from emission point sources.

In 2010, Serbia adopted the National Action Plan for implementation and ratification of the Protocol on Heavy Metals; the Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone; and the Protocol on Persistent Organic Pollutants (POPs) to the Convention. The Action Plan was developed under the UNECE-supported project "Implementation and Ratification of the Protocol on Heavy Metals, Protocol on Persistent Organic Pollutants and Gothenburg Protocol" aimed at assisting the countries from the Western Balkans region in the ratification and implementation of the three Protocols.

As a result of the project, in 2012, Serbia ratified the Protocol on Persistent Organic Pollutants (POPs) and the Protocol on Heavy Metals (OG 1/12). Ratification of the Gothenburg Protocol is postponed as the country is not able to comply with the requirements of the sulphur content in certain liquid fules. In addition, reliable estimations of national emission ceilings could not be performed due to uncertainties within the process of complying with the ELVs for the large combustion plants (LCP) sector and lack of reliable industry information and plans on the reduction of emissions, primarily of the energy sector.

Waste and chemicals management

Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

Since 2007, Serbia filled the gaps in the legislation with regard to the provisions of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal by adopting the Law on Waste Management and a number of by-laws regulating transboundary waste shipments, namely:

- Rulebook on the content of documentation submitted in support of the application for the permit for import, export and transit of waste (OG 60/09, 101/10);
- Regulation on the lists for the transboundary movement of waste, the content and layout of documents accompanying the transboundary movement of waste with instructions for their completion (OG 60/09);
- Regulation on determining certain types of hazardous waste that may be imported as secondary raw materials (OG 60/09);
- Regulation on the list of non-hazardous waste for which a licence is not required, and the documentation accompanying transboundary movement (OG 102/10).

The import of hazardous waste for the purpose of its disposal or recovery for energy purposes is forbidden. The import of hazardous waste may be permitted only if there is a facility for the treatment of such waste, for the operation of which a permit has been issued.

According to Serbian legislation, waste, for the treatment or disposal of which in an ecologically acceptable and efficient way there are no technical possibilities and facilities in Serbia, shall be exported. However, the country restricts the export of hazardous wastes and other wastes for final disposal in accordance with the provisions of the Basel Convention and its Ban amendment.

In 2013, Serbia submitted the revised questionnaire on Transmission of Information (in accordance with articles 13 & 16 of the Basel Convention) for the period 2010–2011. The report for 2012 was submitted.

Serbia has made no progress with regard to ratification of the Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal. In 2007, the country was in the initial stages of ratification. Serbia is currently still in that position.

Convention on Persistent Organic Pollutants

Serbia ratified the Stockholm Convention on Persistent Organic Pollutants (POPs) in 2009. In the same year, the Government adopted the National Implementation Plan (NIP). The NIP was developed within the project "Enable Activities for the Development of the NIP for the Convention on Persistent Organic Pollutants", with financial aid provided by GEF in cooperation with UNEP. National implementation measures are defined in the NIP and those measures are mostly realized through establishing a national legal framework related to the POPs. National implementation measures regarding new POPs will be developed in the updated NIP. Updating the NIP is ongoing.

In the period 2009–2014, Serbia adopted a series of laws in line with the NIP: the Law on Chemicals, Law on Waste Management and Law on Integrated Environmental Pollution Prevention and Control, and promulgated relevant sublegal acts.

Within the Ministry of Agriculture and Environmental Protection, the Division of Chemicals is responsible for the implementation of the Stockholm Convention (prohibitions of or restrictions on produce, placing on the market and use of POPs), and the Division of Waste Management for implementation of provisions of the Stockholm Convention related to POPs in waste. SEPA is responsible for the monitoring and reporting of POPs in the environment.

Governmental authorities in charge of enforcement of the legal acts related to the Stockholm Convention include the Environmental Inspectorate (Ministry of Agriculture and Environmental Protection), Sanitary Inspectorate (Ministry of Health) and Market Inspectorate (Ministry of Trade, Tourism and Telecommunications).

In 2010, Serbia submitted the National Report on POPs to the Secretariat of the Stockholm Convention. In 2014, the Ministry of Energy, Development and Environmental Protection, in cooperation with UNIDO, began realization of the project "Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs)", funded by GEF. One of the activities is to prepare inventories of new POPs and update inventories of old POPs. The updated NIP will include implementation measures and related actions, including those required for updating the legal framework for POPs management (especially new POPs) and raising awareness of relevant target groups on new POPs in Serbia.

Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

Serbia ratified the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade in 2009 (OG 38/09). The provisions of the Convention have been transposed into the Serbian legislation

through the Law on Chemicals, and the Rulebook on the import and export of certain hazardous chemicals (OG 89/10 and 15/13).

Pursuant to the Law on Chemicals, the Serbian Chemicals Agency was the competent authority for implementation of the Rotterdam Convention (i.e. the Designated National Authority (DNA)), from March 2010 until October 2012. According to the latest amendments to the Law on Chemicals, competences have been transferred to the ministry in charge of environmental protection, which was the Ministry of Energy, Development and Environmental Protection from October 2012 until April 2014, when the Ministry of Agriculture and Environmental Protection took over competences. Table 5.3 shows the number of procedures conducted for the export and import of certain hazardous chemicals.

Table 5.3: Number of procedures conducted for export and import of certain hazardous chemicals

	Notification procedure/ Prior Informed Consent procedure conducted for	
	Import of certain hazardous chemicals	Export of certain hazardous chemicals
2009	16	
2010	38	2
2011	39	13
2012	32	7
2013	58	17

Source: Ministry of Energy, Development and Environmental Protection, 2014.

Strategic Approach to International Chemicals Management

Since 2006, Serbia has supported the Strategic Approach to International Chemicals Management (SAICM) by active participation through regulatory bodies, in order to achieve sound chemicals management as a basis for sustainable development and to ensure that, by 2020, chemicals are used and produced safely. Achievement of SAICM goals at national level is mostly done through transposition of all relevant EU legislation and implementation of various projects such as the Quick Start Programme. Also, many strategic documents related to environmental protection have been developed taking into account SAICM recommendations: the 2008 National Sustainable Development Strategy, the 2009 National Strategy for Cleaner Production, the 2010 National Environmental Protection Programme and the 2011 National Environmental Approximation Strategy. Serbia won the bronze award from SAICM for its valuable contribution for the period 2009–2012.

Minamata Convention on Mercury

In the period of 2007–2013, Serbia actively participated in the negotiation process regarding the global legally binding instrument on mercury – Minamata Convention on Mercury – through the work of the ad-hoc working groups and participating in the work of the Intergovernmental Negotiating Committee (INC). Serbia signed the Convention in 2014.

Risk management

Convention on the Transboundary Effects of Industrial Accidents

Serbia ratified the Convention on the Transboundary Effects of Industrial Accidents in 2009. In the same year, the Law on Amending the Law on Environmental Protection was adopted and the current type of permitting system for the operators of Seveso establishments prescribed. By entering this latter Law into force, conditions were created for the adoption of relevant by-laws for implementation of the provisions on protection from accidents. These by-laws were adopted in 2010.

The fact-finding mission on the Convention took place in June 2007. The mission concluded that the basic tasks under the Convention – as described in the Assistance Programme – have been implemented and recommended the country participate in the next phase of the Assistance Programme (implementation phase).

Within the Assistance Programme, numerous activities and training sessions were organized related to improving capacities for the implementation of the Convention, on both the national and international levels, with financial and technical support provided. Serbia decided to improve its emergency preparedness and requested assistance from the Convention Secretariat.

The pilot project under the Assistance Programme, for Bulgaria, Romania and Serbia, on joint management of transboundary emergencies from spills of hazardous substances into the Danube River, was launched. The field exercise was held in September 2009. The exercise started in Prahovo, Serbia, and was performed along the Danube River as far asl Vidin, Bulgaria. The evaluation workshop was held after the exercise, in Negotin, Serbia.

In 2010, the training session on evaluation of safety reports was held in Belgrade within the framework of the implementation phase of the Assistance

Programme and the Project on Evaluation of Safety Reports. Serbian representatives participated in the training sessions on on-site inspection of hazardous industrial sites that were held in Zagreb, Croatia, in 2011 and Split, Croatia, in 2012. Within the project, the checklists for evaluation and inspection of safety reports were developed. As a follow-up to the international training sessions, the national training session on the safety management system as part of safety reports was held in 2013 in Belgrade.

Serbia submitted implementation reports for the fourth, fifth, sixth and seventh rounds (for 2006/2007, 2008/2009, 2010/2011 and 2012/2013 respectively).

Since ratification of the Convention, Serbia has moved its legal framework towards full implementation of its obligations under the Convention. The draft amendments to the Law on Environmental Protection envisage the creation of a legal basis for the adoption of a separate law that would enable complete transposition of the Seveso III Directive (Directive 2012/18/EU). In accordance with the National Plan for the Adoption of the *Acquis* for the period 2013–2016, it is planned to finalize the draft legislation in 2015.

Harmonization of Serbian legislation with Directive 2012/18/EU would serve as the basis for the preparation of amendments to the Law on Ratification of the Convention, pursuant to the ongoing process of amending the Convention, respectively its Annex I and harmonization with Annex I of the Seveso III Directive.

The Rulebook on the procedure of notification and exchange of information on a Seveso installation or complex whose activities may lead to chemical accidents with transboundary effects (OG 26/13) enables the implementation of relevant obligations under the Convention.

The Rulebook on the methodology for elaboration of risk assessment and protection and rescue plans in emergency situations (OG 96/12) prescribes the methodology for elaboration of risk assessment regarding natural and other disasters, as a basic document for elaboration of an external protection and rescue plan in emergency situations, at all levels. Since 2013, the Rulebook on the preventive measures for safe and healthy operation during exposure to chemicals (OG 106/09) has been in force. Other important legal acts include:

- Regulation on the preventive measures for safe and healthy operation because of risk from explosive atmospheres (OG 101/12, 12/13);
- List of substances of very high concern (OG 94/13);
- Rulebook on the classification, packaging, labelling and advertising of chemicals and certain articles according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (OG 64/10, 26/11, 105/13);
- Rulebook on the methodology for elaboration and content of accident protection plan (OG 82/12);
- Rulebook on types and quantities of hazardous substances, facilities and other criteria on the basis of which the accident protection plan shall be drafted and measures taken to prevent accidents and limit the impact of the accident on human life and health, material goods and the environment (OG 8/13);
- Rulebook on the content and manner of the keeping the Register of the companies and other legal persons handling dangerous substances (OG 53/13);
- Rulebook on the content of the information about hazards, measures and actions in the event of accident (OG 18/12).

Transboundary environmental impact assessment

Convention on Environmental Impact Assessment in a Transboundary Context

Serbia has been a party to the Espoo Convention on Environmental Impact Assessment in a Transboundary Context since 2007, and to the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context since 2010. However, the country has started the process of ratification of the amendment to the Convention, which is currently under interministerial consultation. Serbia is planning to ratify the Multilateral agreement among the countries of South-Eastern Europe for the implementation of the Convention.

Serbia submitted reports on implementation of the Convention for the periods 2006–2009 and 2010–2012. To a large extent, the Laws on Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) have been developed in accordance with the provisions of the Convention and the Protocol (chapters 1 and 2). For all the steps within the transboundary EIA procedure, the Ministry of Energy, Development and

Environmental Protection was the responsible authority until late April 2014, when these competences were transferred to the Ministry of Agriculture and Environmental Protection. Depending on the type of project, other ministries and government agencies and the general public might be involved.

Serbia applies the Convention's provisions in practice. In the period 2010–2012, there were six cases under the scope of the Convention, in which Serbia was the party of origin or an affected party:

- The Sava River waterway project and determination of the control lines from Racinovci to Sisak – process completed. Croatia was the party of origin and Serbia was the affected party;
- Regulation of the Karas River on Serbian territory – in process. Serbia is the party of origin and Romania is the affected party;
- The SEZGED CCGT Power Plant – process completed. Hungary was the party of origin and Serbia was the affected party;
- The South Stream gas transmission pipeline project – in process. Serbia is the party of origin and the affected parties include Bosnia and Herzegovina, Bulgaria, Croatia and Hungary;
- Procedure for EIA across national borders in the Study of the environmental impact assessment of the waterway and regional works on the Danube River from 1,380 km to 1,433 km – in process. Croatia is the party of origin and Serbia is the affected party;
- Notification to an affected party of a proposed activity under Article 3 of the Espoo Convention – the National Energy Programme (e.g. hydropower plants, nuclear power station) – in process. Before adoption of the Programme, Slovenia, as the party of origin, sent Serbia the notification for consultations.

Public participation

Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters

Serbia ratified the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters in 2009, and the Protocol on Pollutant Release and Transfer Registers in 2011. Serbia has not ratified the GMO amendment to the Convention. The Convention is transposed in the national legislation (Laws on Environmental Protection, on Environmental Impact Assessment and on Strategic Environmental Assessment). Since 2007, many projects have been or are being implemented to implement all three pillars of the Aarhus Convention. The Organization for Security and Co-operation in Europe (OSCE) Mission in Serbia supported:

- The preparation of the Strategy for the implementation of the Aarhus Convention in Serbia and its Action Plan (2011);
- The preparation of the "Survey of Environmental Offences", conducted by the Association of Judges of Misdemeanour Courts in Serbia (2009–2011), in order to evaluate the implementation of environmental penalty procedures;
- The preparation of the "Analysis of Statistical Data on the Protection of the Environment through Criminal Law in Serbia", developed by the Serbian Association of Public Prosecutors and Deputy Public Prosecutors;
- The development of the model legislation for enhanced public participation in environmental decision-making at local level. The models were produced by the Aarhus Centre Kragujevac legal team in the form of predrafted municipal assembly decisions for towns of different sizes, in line with national legislation. Model legislation for establishing environmental councils introduced the "Green seat" in the local Assembly and the "Green Ombudsperson";
- Creation of the first National Metaregister for Environmental Information, i.e. Ecoregister that includes a database and a web portal with links to existing databases and documents with information referring to the environment which are available online.

In March 2012, the Ministry of Energy, Development and Environmental Protection, in cooperation with the Regional Environmental Centre for Central and Eastern Europe (REC), organized a two-day training session on "How to organize a successful public participation process and benefit from it", which was held within the framework of the Environment and Security (ENVSEC) Initiative-funded project "How to organize public hearings and use other mechanisms to facilitate public participation in environmental decision-making as well as the EIA/SEA processes".

In 2013, the Ministry, with the support of OSCE, launched a project to create a guide on the right of access to justice in matters related to environmental

protection in administrative procedures and administrative disputes. The guide is intended for civil servants, judges dealing with administrative judicial matters, students of environmental law, representatives of civil society and the general public.

In cooperation with REC, the Ministry organized:

- The training course on "Implementing the third pillar of the Aarhus Convention: Access to justice: rights, opportunities and barriers to using them in practice in Serbia" for representatives of the civil sector;
- A round table meeting and a two-day training seminar for judges and prosecutors on "The implementation of the third pillar of the Aarhus Convention: Access to justice in environmental matters in Serbia".

All three activities were held in the framework of the project "Capacity Building to Put the Aarhus Convention into Action and Support Development of PRTR Systems in South and Eastern European Countries", funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and by the German Federal Environment Agency.

The campaigning project "Aarhus Caravan 2013" was implemented in cooperation with the OSCE Mission in Serbia, with the support of Germany. This project was launched by the establishment of the Network of Aarhus Centres in Serbia that serves as a platform for coordination between four Aarhus Centres (Kragujevac, Subotica, Novi Sad and Niš).

The "Aarhus Caravan" travelled through 20 towns and municipalities throughout Serbia and public campaigns were organized in the town centres. The project also included publication of a brochure containing basic data on the Aarhus centres, and the organization of four round tables.

5.3 Bilateral and multilateral cooperation on environment and sustainable development

Transport, Health and Environment Pan-European Programme

Serbia has expressed its consent on the text of the Amsterdam Declaration, "Transport Choices for our Health, Environment and Prosperity", and agreed on four priority goals to be reached and concrete mechanisms to achieve them.

Since 2009, Serbia has taken a number of steps in order to implement the Amsterdam Declaration. The country agreed to reduce GHG emissions by improving access to sustainable modes of transport in larger cities, integrating land use and transport planning in promoting the use of sustainable transport solutions in nature protected areas, initiating various programmes for integrated public transport, and prioritizing integration of environmental and health aspects into transport policies and in decision-making processes.

Aarhus centres raised awareness in the municipalities, local communities and protected areas and among the wider public of safe and healthy transportation systems. Promotional activities on the local level contributed to understanding of policymaking processes that integrate transport, environment and health issues more effectively, with a focus on institutional arrangements.

Bilateral cooperation

Serbia cooperates bilaterally with a number of countries on environmental protection. An emphasis is put on cooperation with neighbouring countries and receiving technical and other assistance from donor countries. In many cases, the effectiveness of cooperation depends more on the availability of funds for joint programmes and projects than on the existence of formal agreements. Nevertheless, Serbia gives importance to the signing of such agreements and/or memoranda of understanding (MoUs).

Intergovernmental environmental agreements exist with Azerbaijan and Turkey. MoUs on cooperation in environmental protection were signed at the ministerial level with Austria in 2010, Belarus in 2007, Bosnia and Herzegovina (Republic Srpska) in 2011 and 2013, Bulgaria in 2007, Cuba in 2007, France in 2013, Hungary in 2007, Montenegro in 2007 and 2013, Portugal in 2011, Romania in 2007 and Slovenia in 2007. Although each agreement envisages reporting on implementation to the bilateral working group established under each agreement, no information on the practical implementation of the MoUs is available.

Serbia plans to sign intergovernmental environmental agreements with Bosnia and Herzegovina, and MoUs on cooperation in environmental protection with the former Yugoslav Republic of Macedonia. The Agreement between Serbia and Hungary for the Early Exchange of Information in the Event of Radiological Emergency was signed in 2014. Implementation of the bilateral agreements is conducted in direct communication between the competent institutions (ministries in charge of environmental protection). Working groups are

established for operationalization of the agreements, and programmes on implementation are created with the mutual agreement of both sides. The programmes of implementation are prepared for a one- or two-year term.

5.4 World Summits on sustainable development commitments

In 2000, Serbia adopted the Millennium Development Goals (MDGs) and incorporated them into the 2003 National Strategy for Poverty Reduction. In 2006, the National Progress Report on the MDGs was prepared, and in 2009 a mid-term report was produced. Table 5.4 presents information on current progress in the implementation of MDG7 "Ensure environmental sustainability".

Serbia undertook some preparatory activities before the Rio+20 Conference, in particular:

- The sub-regional Green Economy and Sustainable Consumption and Production Workshop was held in Belgrade in April 2011;
- The Serbia–EU Forum (September 2011) included a panel discussion on sustainable development and green economy;
- In November 2011 and May 2012, national seminars were organized to prepare documents for Rio+20;
- In March 2012, a sub-regional conference of the Adriatic-Ionian region (Adriatic Ionian Initiative) and the Black Sea region (Organisation of the Black Sea Economic Cooperation) took place;
- The regional conference "The Environment Toward Europe – meeting Rio+20 – EnE12" was held in May 2012;
- A UNCSD side event, "Green Economy: Achievements and Perspectives in the Adriatic-Ionian Region" was held in Rio de Janeiro in June 2012.

Serbia has contributed to "The Study on Achievements and Perspectives towards a Green Economy and Sustainable Growth in Serbia". The Study recognizes the benefits, opportunities and challenges of transition to a green economy. It recognizes that a green economy should support – not replace – the social, economic and environmental pillars of sustainable development.

It provides an overview and starting point for how green economic transition can occur in Serbia, offering a macroeconomic profile of the country, sector-specific overviews, economic modelling and potential policy-enabling conditions. Three sectors have been identified for their importance to the national economy:

- Energy demand: with emphasis on energy efficiency in buildings (including residential, commercial and services energy use), industry and transport;
- Energy supply: with emphasis on power generation, including the use of renewable energy;
- Agriculture: with focus on the potential to transition to organic agriculture practices, increasing value added and employment.

Serbia has supported transition towards a resource-efficient and low-carbon Europe. The country also supported the strengthening of UNEP as the universal governing body for environmental policy at the global level.

Table 5.4: Current progress on MDG7 implementation

Target	Specific Target	Preliminary information on implementation
1. Integrate sustainable development principles in national documents, halt the loss of natural resources and encourage their revitalization	1. Adopt and implement national programmes, strategies and laws governing the area of sustainable development and environmental protection in the Republic of Serbia by 2015	
	2. Increase land area covered by forest to 32% of the total territory of the Republic of Serbia by 2015	Percentage of forested areas in relation to the total area of Serbia grew from 25.6% in 2000 to 32% in 2012
	3. Increase the land area protected to maintain biodiversity to 10% of the total territory of the Republic of Serbia by 2015	
	4. Reduce the number of households that use solid fuels to 25% of the total number of households in the Republic of Serbia by 2015	Percentage of households using solid fuel in relation to total number of households decreased from 60% in 2000 to 31.6% in 2012
	5. Increase energy efficiency and usage of renewable energy sources	Carbon dioxide emissions per capita (tons of CO_2 per capita) increased from 4.43 in 2000 to 7.18 in 2006 and then decreased to 6.3 in 2012
	6. Reduce air pollution	
2. Reduce the proportion of the population without adequate supply of drinking water, access to the sewage infrastructure and organized community waste collection	1. Increase the proportion of households with access to the public water supply network to 98% in urban areas and 65% in rural areas by 2015	Percentage of households with access to public waterworks increased from 69% in 2002 to 79% in 2010
	2. Increase the proportion of households covered by the public sewage systems to 65% by 2014 and increase the proportion of households covered by the public sewage systems in big towns (population over 100,000) to 100% by 2015	Percentage of households with access to public sewage system increased from 33% in 2002 to 54% in 2010
	3. Increase the proportion of population covered by the community waste collection system to 80% by 2015	
3. Improve housing conditions for poor inhabitants of unsanitary settlements	1. Increase the number of constructed social flats for poor and vulnerable social groups.	

Source: Government of Serbia. Millennium Development Goals in the Republic of Serbia: Monitoring Framework, 2006; Millennium Development Goals Barometer – Serbia 2013 (http://www.scribd.com/doc/173359867/Millenium-Development-Goals-Barometer-Serbia-2013, accessed 2 May 2014).

5.5 Conclusions and recommendations

The Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal to the Basel Convention is one of the multilateral environmental agreements which Serbia has not yet ratified. The country took initial steps towards its ratification in the period 2004–2006. The steps were concentrated on developing the legal civil liability regime, including environmental protection liability, insurance and transport services. At the time of the second review, Serbia was in the initial stages of ratification; at the time of the third review, the country is still in that position. Serbia has made no progress with regard to ratification of the Protocol during the last seven years.

Recommendation 5.1:
The Government should speed up the ratification procedure for the multilateral environmental agreements that have not yet been ratified.

The implementation of multilateral environmental agreements in Serbia is strongly dependent on international financial support. As an EU candidate country, Serbia enjoys funding through the Instrument for Pre-accession Assistance (IPA). Other

international donors are very active in the country, such as GEF, GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) and SIDA. During the period 2007–2013, Serbia has received €106 million of development assistance for the sector "environment protection", provided on both a multilateral and bilateral basis. The amount corresponded to some 0.05 per cent of GDP. This situation of high dependence on international aid cannot be sustainable in the future.

Recommendation 5.2:
The Government should systematically and gradually reduce the country's dependence on international aid in order to fulfil its obligations under multilateral environmental agreements and aim to raise its capacity to act within a scenario in which most of the funds are provided from domestic sources.

Serbia has made progress on all the indicators with regard to the country's commitments on the Millennium Development Goals. The country managed to reduce pollution and started to reorient itself towards energy efficiency and the use of cleaner energy. More households in Serbia now enjoy access to clean water and improved sanitation.

However, some of the values on the selected indicators are to be improved in order to achieve the MDGs' specific targets (usage of solid fuel, public sewerage systems coverage). The trends on many indicators of environmental sustainability have high variation and progress in some areas varies significantly between urban and rural areas.

Recommendation 5.3:
The Government should analyse trends related to each specific target of MDG7 and ensure that adequate funding is made available for implementation of the country's commitments on MDG7.

Chapter 6

CLIMATE CHANGE MITIGATION AND ADAPTION

Serbia ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 2001 and the Kyoto Protocol in 2008. As a non-Annex I country, Serbia has only general obligations, such as reporting. However, those general obligations have to be fulfilled in order for the country to be eligible for technical and economic assistance.

The most important comprehensive document on climate change is the Initial National Communication (INC) to UNFCCC from 2010. It gives a description of climate change impacts and GHG inventory, and measures and recommendations for both, adaptation and mitigation. The Second National Communication is under preparation and is expected in 2015.

6.1 Current and foreseeable economic and environmental impacts from climate change

Environmental impacts from climate change

Analyses of the period 1950–2004 show an increase in mean annual temperatures in most parts of Serbia. Temperature rise was higher in northern Serbia than in the south. Comparison of the period 1961–1990 with 1971–2000 shows an increase of 0.7°C in most of Serbia, whereas in the far southeast temperature dropped by 0.4°C. Mean annual precipitation did not follow a clear trend: it increased in the west and north of Serbia, but decreased in other parts of Serbia. However, the number of days with intensive precipitation did increase.

The main impacts from these changing temperature and precipitation patterns are increasing risks of droughts, reduced water resources (mainly during vegetation seasons), extreme temperatures (both heat and cold waves) and floods. The risk of fire is also increasing as a consequence of hot and dry summers (table 6.1), which are likely to increase due to climate change.

Serbia in general has a very high risk of flooding. The risk of flooding is likely to increase due to climate change. Among the 10 worst natural disasters (with respect to the number of affected people) in Serbia from 2006 to 2013 there have been six floods (in 2007, 2009, and twice in 2010 and in 2013) with 23,150 people affected.

Table 6.1: Forest fires

Year	ha
2003	88
2004	65
2005	20
2006	61
2007	811
2008	418
2009	1,205
2010	992
2011	3,297
2012	12,580

Source: Forest Resource Assessment, 2015.

Economic impacts from climate change

There is no comprehensive model on economic impacts from climate change for Serbia. Data on economic impacts from climate change on specific sectors are lacking. An assessment is in preparation for the Second National Communication. Agriculture, energy, water management and air traffic are the most vulnerable to natural disaster and extreme weather conditions. According to the World Bank, in 2005 the sectors dependent on weather conditions accounted for 47 per cent of GDP.

A single natural disaster cannot be related to climate change, but floods, as well as droughts or periods with extreme temperatures, are predicted to increase. Economic impacts from extreme weather events are immense: in 2005, the World Bank estimated that Serbia's annual average economic loss from natural disasters varies between 16 and 49 billion dinars, and its data show that economic losses by fires in public forests in the period 2000–2009 exceeded 36 billion dinars.

Comprehensive costs of both adaptation and not acting are not known for Serbia either. The Initial National Communication (INC) does state the necessity of elaborating a national action plan on adaptation, the costs of which are estimated to be US$3 million.

Photo 6.1: Obrenovac, floods

Emission and mitigation scenarios

According to the INC, estimated emissions from the electricity and district heating subsector are 46.1 million t CO_2 in 2015. According to newer data, they would hardly reach 38.7 million t CO_2 in 2015 and 41.7 million t CO_2 in 2020. Emission scenarios until 2020 are in preparation under the Second National Communication. Also, emissions shown in the INC for 2012 will be recalculated under the Second National Communication.

Mitigation scenarios from the INC show a reduction potential of 7 million t CO_2 from the predicted increase until 2015, while the recalculated increase is already 7.4 million t CO_2 lower (Table 6.2). The highest reduction potential is given in the energy sector by increasing efficiency and using more renewable energy sources. Newer data on emission scenarios give a mitigation potential of 5 million t CO_2 for the electricity and district heating subsector in 2020.

Industry

Industry is also likely to suffer from natural disasters and could itself become a threat for the environment. An example is the impact from the 2014 flood, which flooded the Kolubara coal mining basin. But there is no evidence of investigations on impacts from climate change.

Agriculture

The sector is highly vulnerable to extreme weather conditions as well as to decreasing annual precipitation during the growing season. Some research is done on crop production and climate-change-related issues. The development of water economy technologies such as bio-agriculture can be used to reduce the pressure on water resources and production costs in terms of ecology and economy.

6.2 Climate change and economic sectors

Since the Second National Communication is still being drafted, all estimates are based on World Bank data.

Energy

The energy sector (including transport) is responsible for around 75–78 per cent of GHG emissions and therefore is a key sector for mitigation. In 2010, the emissions from fuel combustion arose mostly from electricity and heat production (66 per cent), followed by the transport (14 per cent), manufacturing industries and construction (12 per cent) and residential (7 per cent) sectors.

Table 6.2: GHG emission scenarios by sector, million t CO_2 eq.

	Baseline Scenario				Mitigation Scenario	
	1990	**1998**	**2012**	**2015**	**2012**	**2015**
Energy	59.8	47.8	65.5	69.4	64.3	63.7
Fugitive emissions	3.0	2.8	3.9	4.3	3.9	3.9
Industry	4.3	3.6	5.5	6.5	5.5	6.5
Agriculture	11.8	9.5	11.8	12.9	11.7	12.7
Waste	1.9	2.7	3.9	4.2	3.9	3.4
Total	**80.8**	**66.3**	**90.7**	**97.3**	**89.3**	**90.2**
Forestry (sink)	-6.7	-8.7	-11.2	-11.2	-11.2	-11.6
Total with sink	**74.1**	**57.7**	**79.5**	**86.1**	**78.1**	**78.6**

Source: Initial National Communication to the United Nations Framework Convention on Climate Change, 2010.

Responsible for the largest proportion of the emissions is the high share of lignite of a rather poor quality in electricity and heat generation – with high emissions of GHG and air pollutants – mainly in large thermal power plants (TPPs). In 2012, around 70 per cent of the final energy supply was derived from lignite.

The Serbian economy is very energy intensive, with an energy intensity of 0.22 toe per unit of GDP in 2010, while that of OECD-Europe was 0.13 and the world average was 0.19 toe (table 6.3). These figures indicate that there is potential for reducing energy consumption by improving efficiency and thus reducing CO_2 emissions.

The energy sector in Serbia has some characteristic weaknesses, which contribute to high energy consumption and therefore high CO_2 emissions per unit of GDP:

- High electricity consumption due to outdated technologies and the predominance of ineffective electric heating and warm water preparation in households and services (53 per cent of electricity consumption is in the residential sector). Direct heating with electricity is generally considered to be an inefficient technology and if electricity is delivered by TPPs it is also linked with high emissions;
- The housing sector is a key subsector for reducing energy consumption. The existing building stock is in a bad state, with very high energy demand for heating and warm water preparation of 220 kWh/m²y. A large number of residential buildings are older than 30 years, have very poor energy standards and their thermal properties are increasingly deteriorating due to low construction quality and ageing. In addition, district heating bills are often based on m² rather than consumption, so there is no incentive to save energy;
- Low efficiency due to outdated technologies in electricity generation and consumption;
- High losses in electricity distribution;
- Price subsidies for coal, electricity and heat do not trigger efficiency measures, and make maintenance of infrastructure more difficult. With subsidized prices for energy, investments in improving efficiency have a longer payback time and therefore incentives to invest in efficiency measures are low.

Table 6.3: Primary energy consumption in 2010 per unit of GDP

	toe/1,000$$_{2005}$
OECD-Europe	0.13
World	0.19
Serbia	0.22
Croatia	0.12
the former Yugoslav Republic of Macedonia	0.23

Source: Draft Energy Sector Development Strategy until 2025 with projections to 2030.
Note: Primary energy consumption/GDP (reduced to purchasing power parity).

The share of renewable energy in primary energy consumption increased from 1990 to 2010 from 4.7 to 8.3 per cent, mainly since 2007, but the number of new installations is relatively small and restricted to small hydropower plants (HPPs) (<10 MW). As the amount of electricity produced by hydropower is influenced by the yearly precipitation regime, there are some fluctuations in renewable electricity production.

Transport

Of the 46 million t CO_2 emissions from fuel combustion in 2010, the share of the transport sector

was 6.5 million t CO_2 (14 per cent), of which road transport accounted for the most at 5.5 million t CO_2 (85 per cent). This value is rather low, but scenarios predict a further increase in CO_2 emissions. The car fleet – private and public transport – has a high average age.

Forestry

With global warming, Serbian forest ecosystems face an increase in forest fires (table 6.1), a shift of forest types into different latitudes and altitudes, changes in composition of certain forest communities and reduced ability to maintain biological diversity. There is no evidence of adapting management practices to improve resilience against climate change in the forest sector, but some efforts have been made in the protection of forests against fires.

There is still potential to raise production of wood products and use of wood residue and agricultural biomass products. Biomass capacity could be doubled from the approximately 3,400,000 million tons at present. But increasing demand from both inside and outside the country can easily outstrip supply in the long term. Sustainable management of forests and measures to improve forests from being overused are lacking and protection of natural forests to prevent their transformation into plantations is not enforced. This does not contribute to maintaining the sink capacity of forests.

Biodiversity

Data and analyses on climate change impacts on biodiversity are scarce, but predicted effects are loss of existing habitats, changes in the number and distribution of species, an increase in the number of vermin and diseases, and genetic changes, followed by extinction of species unable to adjust to changing climate and changes in the natural fish population. Changes in precipitation patterns in Serbia might lead to changes to ecosystems. Furthermore, species limited to mountain peaks might have no natural migration corridors and are most vulnerable to climate change as they live in isolated habitats with low population sizes. Most of these mountain-top species are endemic or stenoendemic.

Public health

A comprehensive analysis of climate change impacts on health in Serbia does not exist. Research is done only on the effects of meteorological phenomena on specific human health problems such as interdependencies between strokes or vascular diseases and weather conditions. Even though there is no reliable evidence that diseases such as malaria, dengue fever, West Nile fever or Lyme disease are expanding due to climate change, it is a fact that an unusually high number of causalities due to the above-mentioned diseases has been detected in Serbia.

6.3 Legal framework on mitigation and adaptation

The Law on Air Protection stipulates that air protection shall be implemented by "avoiding, preventing and abating the pollutions affecting … climate change". The Law provides for a strategy and an action plan including measures to slow climate change. The Law defines measures for emissions reduction, such as developing and using cleaner production technologies, inciting the use of renewable energy sources and increased efficiency, and increasing the removal of GHGs from the atmosphere. The Law proposes that the measures can be implemented by the Clean Development Mechanism (CDM). However, since 2012, CDM measures are no longer applicable to Serbia as far as the EU is concerned.

The Regulation on the methodology of data collection for the National Inventory of Greenhouse Gas Emissions (OG 81/10) was adopted in 2010.

Further relevant laws are the Law on Energy, Law on Efficient Use of Energy, and Law on Planning and Construction, and several by-laws with provisions for promoting renewable energy sources and improving efficiency and thus contributing to climate change mitigation. The adoption of the Law on Efficient Use of Energy, with provisions on eco-design requirements, labelling for electric appliances, regulations for the work of energy service companies, recommendations for the public sector to apply energy efficiency criteria in public procurement and other matters was a milestone, but full application of the Law is hampered by the lack of several by-laws.

For example, labelling was introduced for seven electric appliances in spring 2014, accompanied by some awareness promotion. Labelling for further appliances is still under way. The Law also introduces mandatory energy management systems for big consumers in the public, commercial and industrial sectors and obliges them to adopt and regularly revise energy efficiency action plans. It is planned that this measure will cover around 70 per cent of final energy consumption, but the consumption threshold above which the management systems is mandatory has yet to be defined. For communities above 20,000 inhabitants, an energy

manager is mandatory. It is also planned to introduce a yearly energy saving target of around 1 per cent of final energy consumption for those communities. Serbia put some effort into education for energy managers, prepared guidelines for preparing local energy plans and introduced a licensing system for energy managers qualified for energy audit. But by-laws or regulations to concretize these are still lacking and are deferring implementation.

For new buildings, Serbia has taken a major step to improve efficiency performance with the adoption of the Law on Planning and Construction and the corresponding by-laws, especially the Rulebook on energy efficiency in buildings (OG 61/11). The legal framework sets minimum energy performance standards for new buildings (annual final energy consumption between 55 and 100 kWh/m²y depending on the purpose of the building). Existing buildings have to improve by one energy efficiency class at major renovations. An energy certification system was introduced, accompanied by extensive training and licensing for engineers responsible for issuing those certificates. The energy performance of buildings is part of the construction permit and issuance of an energy certificate is mandatory for obtaining the occupancy permit. All new buildings should therefore reach the minimum efficiency standards, but a problem is a high proportion of illegally built houses.

An important step for increasing the share of renewable energies in electricity production was the introduction of a feed-in tariff in 2009 for renewables plants. The feed-in tariff is limited to a total installed capacity of 500 MW for wind-powered plants and 10 MW for photovoltaic plants until 2020. These quotas were introduced mainly in order to prevent high costs by exploding development and to allow an adaptation of feed-in tariffs for following quota.

But the main obstacle is the very tedious and complex administrative procedures to get all necessary permits and licences, during which several different authorities are involved and some inconsistencies between different documents pertaining to the environmental and energy laws can even lead to the halting of project development. It is reported that the procedure to get a building permit can take up to two years. For small hydropower, outdated cadastres also pose problems in the energy licensing process and a revision of cadastres is needed and envisaged.

For small installations below 1 MW of installed capacity, an energy permit and licence are not mandatory and solar energy panels on roofs do not need a construction permit. Given the relatively recent introduction of incentive mechanisms and framework, authorities have had limited opportunities to assess the effects of different legal provisions. Major adjustments to renewable regulations are still under way. It is one of the priorities of the Government to facilitate administrative procedures.

Serbia has neither capacity for the production of second generation biofuels, nor the necessary legal framework for introduction and use of biofuels, e.g. definition of methods and conditions for implementing sustainability requirements in the production and use of biofuels. The preparation of the following regulations is planned: decree on sustainability criteria for biofuels, amendments to the Rulebook on technical and other requirements for liquid fuels of bio-origin (OG 26/06), legislation on the system of fuel quality monitoring, decree on mandatory placing of a certain percentage of biofuel on the market, and rulebooks on licences and on incentives for growing raw materials and production of biofuel. The introduction of biofuels is planned for 2015.

The Law on Mining and Geological Exploration regulates geological storage of carbon dioxide. The Law is currently under revision to establish a legal basis for issues relating to the performance of geological research and its approval in order to determine geological formations eligible for carbon dioxide storage.

The Law on Meteorological and Hydrological Activities empowers HMS to act as the responsible institution for analysis, forecasting, warning and projections of existing or expected climate change. The Law on Waters stipulates that water activities shall be performed in a sustainable way, by which, among other criteria, “harmful consequences of global climate change” are lessened. The Law on Forests mentions the GHG mitigation potential of forests as one of the assets of sustainable forest management.

Adaptation to climate change is not mentioned or addressed in any sectoral law. However, sectoral laws may provide for measures that increase the resilience of the sector against climate change. For example, the Law on Forests stipulates mandatory plans to prevent forest fires for all forests.

6.4 Strategic framework on mitigation and adaptation

Serbia has no national strategy on climate change. The country is currently working on a strategic

document on long-term GHG mitigation targets and potential that is expected to be developed in 2016–2017.

Climate change is listed as one environmental risk factor in the 2008 National Sustainable Development Strategy. It mentions the need to adopt a national programme for climate change and an action plan for air protection, adapt the health-care system to impacts from climate change and adjust economic sectors to climate change.

The National Environmental Protection Programme refers to expected impacts from climate change (mainly droughts, heat waves, intensive rainfalls and others) and outlines the necessity for Serbia to get involved in international research activities of a multidisciplinary character in order to understand and mitigate the impacts on agriculture, forests and water. Progress was made on international research activities by various projects (mainly in the region). Furthermore, the multidisciplinary research project "Studying Climate Change and its Influence on the Environment: Impacts, Adaptation and Mitigation" began in 2011, financed by the Ministry of Education, Science and Technological Development (as of March 2014). First results are expected for 2014.

The National Environmental Protection Programme also identifies the planning of adaptation measures in the agricultural sector as a priority activity, emphasizing that the agricultural sector may be one of the sectors most affected. Preparing a GHG emission inventory, editing the INC (implemented) and preparing harmonization to the EU Emission Trade Directive are short-term objectives (2010–2014) as well as capacity-building. For the period 2010–2019, the following objectives are mentioned:

- To integrate climate change issues into other sectoral policies;
- To strengthen the institutional framework and administrative capacities to address climate change;
- To establish a monitoring system of climate change impact on biodiversity and in protected areas.

The 2010 National Strategy for Scientific and Technological Development for the period 2010–2015 (OG 13/10) specifies environmental protection and climate change as one of the seven priority areas to receive funding in the period 2011–2015. Research projects relating forestry and biodiversity to climate change impacts have been financed.

The 2011 National Strategy for Protection and Rescue in Emergency Situations lists climate change as one important factor with influence on emergency situations.

The 2012 National Strategy for Sustainable Use of Natural Resources and Goods mentions climate change issues in general. It outlines the importance of a national vulnerability analysis on climate change and the development of suitable management strategies for improving the adaptation potential of protected areas. It also outlines the necessity of climate change adaptation measures to improve the sustainable use and protection of water resources, but without specifying them any further.

The Strategy also refers to the negative impact of the energy sector on environment and climate change in particular and mentions the use of renewable energy sources, improvement of energy efficiency and environmental measures in power plants as important measures. It also stresses the importance of better aligning the development of renewable energy sources with the protection of biodiversity.

The 2011 National Environmental Approximation Strategy contains a chapter on air quality and climate change. It names the completion of the inventory of emissions and GHGs as one of the tasks and calls for emission reduction programmes to be installed once the inventories have been completed. The main focus related to climate change is on the preparation for participation in the EU Emissions Trading System (ETS). Among tasks ahead, it mentions adequate institutional arrangements and preparation of a national allocation plan. According to the Strategy, transposition and implementation of the relevant directive will not start before 2016.

Regional cooperation on climate change started with the so-called Belgrade South-Eastern Europe (SEE) Climate Change Initiative adopted as a result of the SEE ministerial consultation process by the UNECE Sixth Ministerial Conference "Environment for Europe" in 2007 in Belgrade. The Initiative aims for better cooperation regarding climate change issues. It initiated the establishment of the South-East European Virtual Climate Change Centre and recommended the elaboration of an action plan.

The 2008 South-Eastern European (SEE) Climate Change Framework Action Plan addresses the key areas of climate change monitoring and forecasting, climate modelling and reduction of risks, and socioeconomic information on climate change impacts, as well as adaptation and mitigation strategies and research in key sectors.

Implementation was mainly done on research and through numerous projects with HMS: examples are modelling of climate scenarios, research on climate change impacts on two river basins, and a project on joint disaster management risk assessment and preparedness in the Danube macro-region. Other activities include the introduction by HMS of early warning bulletins within the Climate Watch System covering the SEE region.

Adaptation

Forestry

The forestry sector was aware early on of the significance of forests for mitigating climate change, for example in the 2006 Forestry Development Strategy, although adaptation issues are not mentioned. The Strategy prescribes a forestry development programme as the next step towards its implementation. A draft forestry development programme has existed for several years but has not yet been adopted (chapter 1). One reason is that the financial conditions for implementing the action plan have changed with the abolition of the fee for the protection and utilization of forest functions in 2012 (chapter 3). The fee was earmarked for financing forest management. The implementation of measures suffered from limited financial capacities.

Public health

Adaptation to climate change is not mentioned as an issue in the 2009 Public Health Strategy, even though some of the goals would improve the sector's adaptation ability. A strategy on adaptation to climate change for the health sector is under preparation. Most ongoing activities concerning adaptation to climate change are related to heat waves. The Institute of Public Health of Serbia is finalizing a heat wave action plan and is working in close cooperation with HMS. The Institute also sees the necessity for a survey of how local hospitals are prepared for heat waves and other extreme weather events and tries to raise funds for this activity. It was not officially appointed and therefore not directly involved in the preparation of the Second National Communication.

Agriculture

The 2005 Agriculture Development Strategy did not mention climate change. The 2010 National Environmental Protection Programme states that the agricultural sector may suffer huge damage and be one of the sectors most affected by climate change. But no policy document on adaptation issues and agriculture was developed. The Strategy for Agriculture and Rural Development for the period 2014–2024 (OG 85/14) recognizes the importance of climate change impacts on agricultural production or the sector's vulnerability to changed climate conditions. It also defines the agricultural impacts on climate change. According to the Strategy, operational objectives that should help lead to more efficient food production addressing these challenges are: improvement and adaptation of production technology; the technical improvements of land, buildings and equipment; and raising awareness of climate change, its consequences and possible solutions.

The INC provided for a vulnerability analysis and recommended the reduction of the negative effects and use, if possible, of the positive effects of climate change. It also emphasized the need to include climate change issues in the agricultural policy agenda, sector strategies and action plans in order to mainstream socioeconomic development programmes and actions.

Measures such as improving and modernizing the irrigation and drainage systems require high investments. But several measures to improve resilient farming do not depend on investments but are hampered by farmers' low environmental awareness and knowledge. Such measures include adjusting harvest dates and the field work calendar to new climate conditions, reducing the share of summer crops in favour of winter crops, changing mulching practices or improving soil structure with adequate treatment in order to increase its water storage capacity. As stated above, development of water economy technologies can be used to reduce the pressure on water resources and production costs in terms of ecology and economy.

Though its importance is underlined in several strategies and programmes, the inclusion of climate change issues in sector strategies and an action plan on adaptation are lacking so far, as is improving intersector planning and the integral management of water resources in catchment areas of importance to agriculture. The INC calls for further capacity-building and awareness-raising, for example to improve the advisory service related to crop selection and to improve information about climate change impacts and possible methods of adaptation.

Biodiversity

The 2011 Biodiversity Strategy for the period 2011–2018 covers climate change issues and affirms the importance of developing mechanisms in order to

understand, plan and minimize possible effects of climate change on biodiversity. Its action plan includes measures comprising improving research on vulnerability towards climate change, especially for protected areas and rare ecosystems, identifying indicators for long-term climate change monitoring and raising awareness related to the impacts of climate chance. The Strategy calls for the development of a national biodiversity and climate change action plan and for adaptation strategies for protected areas based on the results of the above.

None of the measures has been implemented yet.

Infrastructure (transport, waterways and reservoirs)

An analysis of impacts from climate change on infrastructure is lacking, although infrastructure is likely to be affected by climate change (e.g. floods or droughts). Most plans for construction of dams or other water accumulation facilities have been postponed for economic reasons. A water management strategy is in preparation – to describe water needs up to 2030 and evaluate the necessity of additional reservoirs to improve total retention capacity. There is no evidence of a strategic approach for infrastructure resilience against climate change impacts, with the exception of energy infrastructure. The 2009 Green Book of the Electric Power Industry only focuses on energy infrastructure and adaptation issues in respect of one company.

Mitigation

Energy sector

In the 2005 Energy Sector Development Strategy until 2015, CO_2 is mentioned among the pollutants from fuel combustion which have to be reduced, but the Strategy focuses more on other air pollutants. However, the approaches to mitigation in the energy sector comprise a higher share of renewable energy and improved efficiency – two of the Strategy's five main priorities. They both have additional benefits such as improving energy independence, the reduction of air pollution and regional added value.

Further strategic documents in the energy sector relevant to mitigation are the 2007 Programme of Implementation of the Energy Sector Development Strategy for the period 2007–2012, Biomass Action Plan for the period 2010–2012, and 2013 National Renewable Energy Action Plan (NREAP) and First Action Plan for Energy Efficiency Action Plan (APEE) for the period 2010–2012 (and the second Energy Efficiency Action Plan for the period 2013–2015). The Energy Sector Development Strategy until 2025 with projections to 2030 is in preparation and exists as a draft, presented for public hearings.

The draft Energy Sector Development Strategy recognizes the reduction of impact from the energy sector on climate change as a key element in development towards a sustainable energy sector. The energy road map by 2050, with its target to reduce emissions by 2050 to 80–95 per cent below the level of 1990, is discussed, as are the possible consequences for Serbia. The draft considers that these targets can only be reached by introducing nuclear power – but without giving any estimation of possible costs or alternatives. Furthermore, carbon capture and storage is mentioned as a clean coal technology. However, an analysis of costs, and alternatives such as renewable energy and efficiency, including cost assessments, is lacking.

Targets set for renewable energy for 2012 (e.g. 45 MW installed wind energy plants as envisaged in the 2007 Energy Sector Development Implementation Programme 2007–2012 or biomass targets from the Biomass Action Plan for the period 2010–2012) were not met for various reasons, including development of the legal framework in the previous period.

NREAP sets new targets of increasing the share of renewable energy sources in gross final energy consumption by 2020 to 27 per cent compared with 21.2 per cent in 2009, and of 10 per cent of renewable sources in transport by 2020. NREAP further specifies the targets up until 2020 as:

- 1,092 MW installed capacity in electricity generation, mainly wind (500 MW), hydropower (250 MW with HPPs >10 MW, 188 MW with HPPS <10 MW) and biomass-CHP plants (100 MW). Solar and geothermal energy, waste, biogas and landfill gas account for the rest;
- Use of renewable energy sources in the heating and cooling sector is to increase by 10.2 per cent, and will be achieved mainly by biomass and, to a small extent, geothermal and solar energy.

Most of the increase has to be achieved in the period 2015–2020. A precondition for reaching the renewables target is that the targets on efficiency for 2020 will be met: if energy consumption in 2020 will outstrip the efficiency target, more renewable energy capacities will have to be constructed to reach the target for renewables. NREAP implementation will be monitored and reported to the Government on a yearly basis.

Until 2012, mostly hydropower plants have been built. Energy permits for 200 MW of wind power plants were issued and several wind farms are under construction (>100 MW). With regard to photovoltaic plants, the quota of 10 MW applications for those with the previous status of privileged producer is full, but most installations are still under construction. Since 2012, a couple of biogas plants using manure have become operational or are close to operation.

However, there are some obstacles to the successful construction of renewable energy plants. Investments in Serbian renewable energy installations are hindered by high interest rates, low energy prices, unsolved issues relating to land title and inheritance rights, a general insecurity for investors and, above all, tedious administrative procedures for obtaining the construction permit.

Energy efficiency

Serbia adopted the target of saving 9 per cent in final energy consumption by 2018 in comparison with that of 2008, which corresponds to a saving of 0.752 Mtoe. The first APEE included measures such as the introduction of energy management systems in the public, commercial and industrial sectors, promotion of energy service companies, improvement of the thermal properties of building stock, minimum energy standards for new buildings and incentives for highly efficient cogeneration plants.

The measures planned in the first APEE were either not implemented at all or only partly implemented because of delays in the adoption of the Law on Efficient Use of Energy and the accompanying by-laws, as well as lack of funding. Investment and funds have been reduced significantly and the population's purchasing power sank during the recession. Though anticipated much earlier, the legal base for the planned energy efficiency fund was only established in 2013 and in early 2014 the fund was not yet fully operable. The fund will finance technical efficiency projects in various sectors and support public lighting projects, construction of cogeneration plants and other efficiency projects.

The targets for energy savings up to 2012 of the first APEE were 80 per cent met (savings of 0.102 Mtoe out of 0.125 Mtoe), as energy consumption in industry and transport did decrease following the economic crisis. The second APEE is adapting previous measures and targets as well as introducing new measures, activities and targets for the period 2013–2015. However, most savings are expected to be realized in 2016–2018 as the legal framework would only come fully into force in 2015.

A further important step concerns district heating – the switch from billing based on m² to billing for heat consumption, which will become mandatory in winter 2014/2015 where technically feasible. A considerable decrease in consumption is expected if the measure is implemented successfully, but it does require investment in the installation of metering devices.

The reduction of electricity consumption for hot water purposes by the installation of solar-thermal collectors is also a measure in the second APEE, but the financial support system (by loans, grants or other incentives) is not yet clear.

The success of implementation of efficiency targets depends on whether possible obstacles are identified and cleared by appropriate measures, completion of the legal framework, and the full operation and continuity of the efficiency fund. Furthermore, electricity and heat generation is still subsidized, so the cost effectiveness of efficiency measures is not at an optimum and subsidies compete with the necessary allowances for the necessary maintenance and modernization measures (e.g. in the power network or district heating system). In general, energy efficiency is not yet recognized as a mechanism for economic development in other fields of business or the public sphere.

Transport

The INC addresses as main measures the re-establishment of an efficient international rail transport system; refurbishment of the road infrastructure; increasing the level and efficiency of river transport, primarily along the Danube River; a more efficient and modern vehicle fleet; and increasing use of compressed natural gas. A CO_2 reduction strategy in transport is lacking, as is information on emission trends after 2011.

The 2007 Strategy of Railway, Road, Inland Waterway, Air and Intermodal Transport Development for the period 2008–2015 includes the goal that transport sector development aligns with environmental protection, including global warming. But there is no strategic approach and neither are any measures identified regarding how emissions from the transport sector could be limited. Nevertheless, the Strategy addresses some goals which contribute to more environmentally friendly modes of transport, thus contributing to the reduction of GHG emissions.

The Strategy underlines the significance of improving urban and suburban public transport in Serbia, which accounts for a considerable share of total passenger transport (41 per cent in 2005), and identifies modernization and adaptation of the railway/tram infrastructure as a key factor in public transport improvement. In recent years, Belgrade succeeded in modernizing a large proportion of its bus fleet.

The improvement of the Serbian railway system (which accounted for 6 per cent of total passenger transport in 2005), with a modernized system and fast and frequent connections between major cities and the neighbouring countries, is another goal of the Strategy.

Since 2010, some investments have taken place. Relevant for Serbia is the modernization of the Serbian part of the Pan-European Corridor X, which is an important international railway connection, especially for freight transport, and connects the largest Serbian cities (Belgrade, Niš and Novi Sad) with each other and other cities in the region (Budapest, Sofia and Zagreb). In 2011, the Parliament decided to modernize and restore Corridor X. Partial modernization started in 2012. Connections between most important cities still lack frequency.

In general, there is great need to improve the transport infrastructure in Serbia but financing capacities are limited. For public transport it seems easier to refinance investments by fees. Examples from other countries show also that cooperation with private investors can be successful. Improving sustainable transport options, especially public transport, requires considerable investments but leads to significant long-term cost savings and, with rising energy prices in the future, avoided costs of a more efficient public transport sector will also be higher (UNDP/UNEP 2012). Serbia is working on emission performance standards for cars in line with modern standards.

Industry

Emissions from industrial processes result mainly from processing/refining and energy intensive industries. The INC considers the reduction potential of GHG emissions from industry as being very low. There are no strategies or action plans for emission reduction in the industrial sector.

Agriculture

GHGs from agriculture are methane from stockbreeding and nitrous oxide due to the use of fertilizers. The INC names the use of biogas from manure as having potential for emissions reduction as triggered by measures described above. Further measures, such as the increase of organic farming or efficient fertilizer management, are not considered; however, preparation of the Code of Good Agricultural Practice is ongoing.

6.5 Institutional framework

The Ministry of Agriculture and Environmental Protection is the national coordinator for the implementation of the UNFCCC and the Kyoto Protocol. The National Focal Point for the Convention and Protocol is also located in the Ministry of Agriculture and Environmental Protection, in the Division of Climate Change. A smaller unit responsible for climate change issues in the energy sector is located in the Ministry of Mining and Energy. The Division of Climate Change did not succeed in installing a high-level steering committee on climate change issues. Cooperation at technical level is described as good, but if political decisions are involved, cooperation is difficult.

SEPA is responsible for data collection, processing and reporting on GHGs. Responsibilities for projections on GHG emissions are not yet defined. The UNFCCC Secretariat requires biennial update reports on inventories. Reporting capacities will have to be fortified.

HMS is responsible for the adoption and carrying out of multiannual programmes of monitoring, researching and forecasting climate change, creating scenarios of regional and local climate change, and participation in the programmes of multidisciplinary research on the impacts, vulnerability and adaptation options of certain economic sectors to climate change. The South-East European Virtual Climate Change Centre (www.seevccc.rs), established in 2008, is hosted at HMS. Its tasks are climate monitoring, monthly and long-range forecasts, and dust forecasts. HMS also strengthens cooperation among hydrometeorological services in the region, builds capacity by forecasting training and workshops and conferences on climate change issues, and is developing regional climate models.

Other ministries are responsible for sectors related to climate change: the Ministry of Construction, Transport and Infrastructure, Ministry of Agriculture and Environmental Protection (for agriculture and forestry), Ministry of Finance, Ministry of Mining and Energy (also responsible for carbon capture issues) and Ministry of Public Administration and Local Self-Government.

Research is done by several universities and the Institute of Field and Vegetable Crops in Novi Sad. However, discussion of the findings between policymakers and researchers, and their transposition into policies and their implementation into farming procedures, are lacking.

In 2013, the foundation of a UNESCO Centre for Water, Sustainable Development and Climate Change as a part of the Serbian "Jaroslav Černi Institute for Development of Water Resources" was agreed between the Government and UNESCO. The task of the Centre will be to promote expert cooperation and information exchange among relevant organizations in South-East Europe. Among its first activities was the organization of an international conference on "Climate Change Impacts on Water Resources" in Belgrade in 2013.

Serbia participates in climate activities of the Environmental and Climate Regional Network for Accession, a European Community-managed network designed to prepare official candidate countries for accession by capacity-building in the environmental sector, with a strong focus on climate change. Serbian institutions participate in the four working groups on policies, GHG inventories, the EU Emissions Trading System (EU ETS) and adaptation.

Serbia is part of the Energy Community of the SEE Region, a community established between the EU and third countries to extend the EU internal energy market to South-East Europe and beyond, with the objective to support energy efficiency and renewable energy.

The South East European Forum on Climate Change Adaptation originated from a project by the EU Instrument for Pre-accession Assistance (IPA) in the period 2011–2012. Four national civil society networks have been established in Croatia, Serbia, Montenegro and the former Yugoslav Republic of Macedonia with the aims of strengthening capacities in the civil sector, raising public awareness and enhancing dialogue with decision makers.

6.6 Raising public awareness on climate-change-related issues

The 2010 National Environmental Protection Programme states that environmental awareness in Serbia is generally low. This applies a fortiori for awareness on climate change. Awareness on climate change issues is also low in the administration of relevant sectors, with the exception of forestry and energy.

The Programme includes awareness-raising about climate change, emission reduction measures, adaptation and further education as goals for the whole Programme period, 2009–2018.

HMS presents relevant information on climate change on its website and is providing education and capacity-building for the whole region.

Awareness-raising activities are often included in projects, e.g. in workshops and presentations in different regions of Serbia. Some NGOs have also been implementing projects with awareness campaigns on climate change.

There are examples of improving the curricula at universities, such as the inclusion of mandatory modules on global environmental changes in studies for a PhD in Agronomy at the University of Novi Sad.

Awareness-raising on energy efficiency and renewable energies had been one of the tasks of the Energy Efficiency Agency. Since the Agency's closure in 2012, this task has been neglected due to a lack of capacity at national level. There have been educational projects in some municipalities. For example, in its Strategy of City Development, Belgrade recognized the need to develop awareness of energy efficiency during childhood, and developed and implemented educational and promotional energy efficiency projects in kindergartens and schools in 2013.

6.7 Projects

Numerous projects related to climate change took place in recent years at national or regional level. They included the elaboration of adaptation and mitigation strategies for subsectors, as well as increasing efficiency or awareness and preparing adaptation measures. A few selected projects are presented below.

IPA 2012 Twinning project: Creation of a monitoring, reporting and verification system for the successful implementation of the EU Emissions Trading System

The objective of this project is to accelerate harmonization with and implementation of the EU climate *acquis* in Serbia through the establishment of the monitoring, reporting and verification system of GHG emissions for setting up the EU Emissions Trading System (EU ETS). The project started in September 2013 and will last for two years.

Support to Sustainable Transport in Belgrade

The objective of this project is to reduce the emission of GHGs originating from urban traffic in Belgrade by improving the public transport system, promoting the use of bicycles, improving safety for cyclists and providing a policy framework for the sustainable development of transport in Belgrade. This project is a pioneer attempt in Serbia to address these challenges and issues on a wider scale, and lasted from 2010 to 2014 with a budget of US$950,000. A case study for a possible replication of the project in Novi Sad is included. The project consisted of several parts.

Support was delivered to the development of a sustainable urban transport plan (SUTP), which will then be prepared by the Land Development Agency of Belgrade. A part of the project was devoted to promoting cycling as a green mode of transport, with the objective to increase the share of cyclists in traffic to 1.5 per cent by 2014. Cycling as a mode of transport is not taken into account by the strategic urban development documents nor adequately addressed in practice.

The project included awareness-raising campaigns, public open events and competitions, the introduction of GPS-based digital cycling maps, and pilot projects such as rentable bikes for employees. Accompanying measures of the Secretariat for Transport included the improvement of infrastructure (construction of cycle lanes, storage facilities). A budget for the extension of bicycle infrastructure was anchored in the city's budget.

The project included improving the education and awareness of schoolchildren by changing the behaviour and habits of parents, teachers and schoolchildren at selected schools. It included demonstration projects such as marking safe school routes and organizing walking groups at primary schools. Further activities included eco-driving training of bus drivers of GSP Beograd (the public transport company of Belgrade) and driving teachers of the Belgrade High School for Transport, in order to improve road safety as well as fuel savings.

During the project, GSP Beograd invested considerable sums to improve public transport by renewing the bus fleet. Since 2009, buses operating on Norm Euro 1 have been taken out of service and at the end of 2013, 30 per cent of the buses fulfilled or surpassed Euro 5 standards, with considerable improvements concerning noise, fuel consumption, air pollution and CO_2 emissions, as well as service quality.

Refurbishment of district heating systems

In a large development programme, Germany's Kreditanstalt für Wiederaufbau (KfW) has provided funding to rehabilitate district heating systems in Serbia since 2001. The funds have enabled the heating companies to repair their pipe networks, purchase more efficient boilers or replace those running on coal or heavy oil, which often generate heat very inefficiently, and install calorimeters. District heating systems in eight cities and towns were rehabilitated and in 2012 the programme was extended to 18 additional participants. Once completed, 22 of 57 district heating systems in Serbia will have been rehabilitated.

Heating will become more stable and energy efficient, but further benefits are better environmental protection, climate change mitigation and improving living conditions for approximately one million citizens. Energy efficiency in those district heating systems increased by 12 per cent, which corresponds to energy savings of 38 GWh and cost savings of €2 million annually. The annual reduction in CO_2 emissions is 10,000 t.

Agricultural Adaptation to Climate Change (Networking, Education, Research and Extension in the West Balkans)

The Universities of Belgrade and Novi Sad are participating in a project on agricultural adaptation to climate change in the West Balkans, funded by the Norwegian Programme in Higher Education from 2010–2014. The aim of the project is to increase knowledge and understanding within agriculture of adaptation to climate change education and research, by improving collaboration and information transfer between West Balkans universities, with the University of Sarajevo as lead partner. Several workshops were held about agriculture and climate change, such as suitable tillage options or the use of genetic resources and varieties for improving the adaptation potential of crops. Scientific articles from all partners and workshop presentations are published on the project website. An example is research on maize production in different growing seasons with respect to climate change. Alleviation of stress from drought and extremely high air temperature is possible by irrigation, using more tolerant genotypes, and by adequate soil management.

Investor guides on renewable energy plants

The objectives of the Guides for Investors prepared in a UNDP project in 2010 and updated in 2013 are to help investors with procedural steps for the

construction of renewable energy plants. The Guides for Investors contain clear information on procedures, competences and deadlines for the construction of plants for electricity and heat generation from biomass, geothermal energy and electricity generation from renewable energy sources. The Guides also describe the complex procedures and discrepancies in the process, so that they can be helpful in the process of streamlining and improving the procedural framework in the process of licensing new renewable energy plants.

6.8 Participation in the Clean Development Mechanism and other mechanisms

Serbia was successful in using the CDM by swiftly installing the Designated National Authority (DNA) and necessary procedures after ratification of the Kyoto Protocol. In 2010, the National Strategy for Incorporation into the Clean Development Mechanism of the Kyoto Protocol for the waste management, agriculture and forestry sectors (OG 8/10) was adopted. Serbia successfully registered seven CDM projects before 2012 related to renewable energy (several wind farms), energy efficiency and the waste sector. The wind energy farm in Plandiste with 102 MW is under construction and operation is expected at the end of 2014. There is no information available about the status of implementation of other CDM projects. As only least-developed countries are eligible for CDM projects registered in the ETS after 2012, development of further CDM projects lost its significance for Serbia.

The Nationally Appropriate Mitigation Actions (NAMAs) were introduced by UNFCCC as voluntary measures for emissions reduction by non-Annex I countries some years ago. In 2013, the UNFCCC registry to publish NAMAs seeking international support become fully operational and will help to facilitate the matching of NAMAs with available finance, technology and capacity-building. Serbia elaborated the "NAMA Development Guideline". Serbia is among the few countries that have submitted NAMAs to the registry (it has submitted 12).

6.9 Conclusions and recommendations

With climate change, Serbia has to face declining water resources, rising temperatures and more frequent extreme weather conditions. The country is vulnerable to the impacts of climate change, especially in agriculture, water management and the forestry sector. No strategy or action plan on adaptation to climate change exists at national level. Adaptation issues are lacking in most sectoral policies, especially agriculture, forestry and health, or are only addressed in a very general way without any systematic approach or measures for their implementation. Not all relevant sectors have been participating so far in the preparation of the Second National Communication.

Recommendation 6.1:
The Government should:

(a) Develop and adopt a national climate change adaptation strategy and related action plan, ensure that all relevant sectors are included and secure funding for the strategy's implementation;
(b) Ensure that adaptation issues are included in all sectoral strategic documents.

National GHG emissions are rather low measured per capita, but projections indicate an increase and emissions per GDP are high and above the EU average. There is considerable potential to reduce emissions. Serbia does not have long-term mitigation targets or a strategy.

Recommendation 6.2:
The Government should develop and adopt a low-emission development strategy with an action plan and secure funding for the strategy's implementation.

Serbia has considerable potential for renewable energy (hydro, wind, solar, biomass and geothermal), of which, at the moment, only hydropower is used for electricity production in considerable quantities and fuelwood for heating purposes, although this is mostly in an ineffective way. Serbia should tap this potential by taking environmental concerns into account. The legal framework for renewable electricity production is in place, but tedious licensing and permitting procedures slow down successful development.

There is evidence that indications in policy documents of the technical potential of renewable energy seem to be rather low and only refer to 2020. Investigations show that the Serbian energy system can integrate considerably higher amounts of wind energy up to 2020 without problems and still higher amounts with only minor refurbishments of infrastructure. Given the fact that wind energy is the cheapest renewable energy source, there would only be few additional costs if the limitation on the feed-in tariff for wind were raised. For photovoltaic energy, the limitation is very low; given the fact that the limitation of the feed-in tariff has already been

reached, no further photovoltaic plants would be constructed.

Recommendation 6.3:
The Government should:

(a) Introduce a one-stop-shop for investors to obtain all the necessary permits for the construction of renewable energy plants, and streamline and harmonize the licensing procedures;
(b) Conduct a comprehensive study on the potential of renewable energy sources and the necessary investments for their development, and adopt targets accordingly.

Energy consumption per unit of GDP is well above the European average and there is high potential for improving energy efficiency. Electricity and heat consumption in buildings (public, private and commercial) is still very high. The Law on Efficient Use of Energy set the basic principles for improving energy efficiency, yet the lack of by-laws still prevents the successful implementation of the Law. A consumption threshold for the introduction of mandatory energy management systems for big consumers in the public, commercial and industrial sectors is still lacking (as of March 2014) as are by-laws or regulations concretizing energy audits. Yearly energy saving targets for communities above 20,000 inhabitants are also awaiting introduction.

The Law on Planning and Construction and its by-laws provides for the better energy performance of buildings. New buildings should meet the energy consumption targets defined by the Law, but a high number of illegal buildings may present an obstacle to successful implementation of the Law.

Subsidized pricing on coal, electricity and heat are further obstacles to a more efficient energy sector.

Recommendation 6.4:
The Government should:

(a) Speed up the development of the missing secondary legislation for implementation of the Law on Efficient Use of Energy;
(b) Control and enforce the application of energy performance standards for new residential and public buildings and major renovations of existing ones.

PART III: ENVIRONMENTAL MAINSTREAMING IN PRIORITY SECTORS AND PROMOTION OF SUSTAINABLE DEVELOPMENT

Chapter 7

WATER MANAGEMENT

7.1 Management of water use and prevention of pollution

Industry

Total water used in industry, not including hydropower plants, amounted to 3,344,592 thousand m^3 in 2013. Water resources abstracted are mainly from surface water, consisting in their own water abstraction systems.

Only a small number of industrial facilities pretreat industrial wastewater prior to discharge into public sewers or other recipients and reused water is negligible (0.76 per cent). In accordance with data collected by SEPA, there are 167 discharging points of wastewaters from industry (table 7.1). In 2012, about 54.76 per cent of wastewaters from industry were discharged to rivers, 19.4 per cent to the public sewers system, 18.45 per cent to canals and 3.57 per cent to streams, lakes, collectors and lagoons.

Agriculture

Of the 5.05 million ha of land used in agriculture in 2013, 1.75 million are protected against floods, representing 34.6 per cent of total agricultural land. The total length of embankments is 2,828 km. To address the drainage problems, some 2.13 million ha have been provided with drainage facilities, incorporating 223 pumping stations and 5,601 km of drainage canals, but although irrigation systems cover roughly 105,000 ha, only 40,000 ha is available, causing unstable agriculture yield. Abstracted water from various sources in the period 2009–2013 is shown in Table 7.2.

Regarding the prevention and control of pollution of water resources by agricultural activities, a sampling campaign is carried out once a year in piezometers on the area of large rivers. The network of piezometers is located within the agricultural area and the zone impacted upon by watercourses, so that groundwater of the first aquifer is not only susceptible to pollution from the surfaces washed off and the side inflows from watercourses, but also, within the area of impact, from septic tanks and effluents from rural courtyards. For the Morava and Kolubara (Sava River tributaries) riversides and basins and the Macva region, the average depth of the pipes installed is 6–15 m and for Vojvodina it is 7–44 m.

For the analysis of the groundwater quality in the riversides and basins of large rivers in the period 2005–2012, three parameters were used – nitrates, chlorides and ammonium ion – as chemical indicators of organic pollution.

Table 7.1: Wastewater discharged from industry, 2007-2012, thousand m^3

	2007	2008	2009	2010	2011	2012
Discharged water from industry	3,047,030	3,448,477	3,134,243	3,375,161	3,257,010	3,158,231
Discharged processing wastewater	96,027	80,286	102,023	104,582	116,585	115,954
Discharged cooling water	2,951,003	3,368,191	3,032,220	3,270,579	3,140,430	3,042,277
Treated wastewater in industry	120,234	136,506	166,105	175,338	182,004	207,533

Source: Serbian Environmental Protection Agency, 2014.

Table 7.2: Abstracted water for irrigation, 2009-2013, thousand m^3

Year	Total	Groundwater and springs	Watercourses	Reservoirs and lakes and others
2009	43,477	1,280	38,602	3,595
2010	65,452	1,422	62,762	1,268
2011	66,092	1,400	61,168	3,524
2012	110,445	5,768	100,160	4,517
2013	88,130	4,536	80,026	3,568

Source: Statistical Office, 2014.

Photo 7.1: Floods nearby City of Sabac

Groundwater quality analysis in the basins of large rivers, where anthropogenic effects of urban and rural agglomerations are most prominent, leads to the conclusion that nitrate contents are not exceeded in relation to maximum admissible concentrations of inorganic substances in drinking water.

Generally, drinking water quality has been improved compared with the reference year 2005, since the percentage ratio of the concentration of nitrates with the value of ≤5 and 5–10 mg/l has increased compared with the previous years. In comparison with 2011, the quality has improved because the percentage ratio of concentration of nitrates with the value of >50 mg/l has been reduced.

The concentrations of chlorides do not exceed the value of 200 mg/l, which is admissible in drinking water (Rulebook on the hygiene of drinking water (OG 42/98, 44/99)). As direct indicators of faecal pollution and manure pollution, the presented concentration of chlorides in groundwater of the basin area of Serbian rivers suggests that there are no effects of potential organic pollution on deeper water-bearing layers.

Ammonium content evaluation was done in relation to the three limit concentration values, i.e. the Rulebook, EU Water Directive and World Health Organization recommendations. According to the distribution of ammonium concentration frequency below 0.1 mg/l NH_4 and >1.5 mg/l NH_4, the quality status in 2012 had deteriorated compared with 2011.

Energy

Flowing water used for hydropower plants amounted to 167.3 million m^3 in 2013.

Households

The amount of water abstraction for drinking water supply from the main sources remains without significant change since 2007 (table 7.3), because the Serbian population, 7.2 million, has had a negative growth rate in this period, in line with the slight progress in water supply and sewage coverage of the population (up 3.54 per cent and 10 per cent). Water demand in the reviewed period represents around 94.5 per cent of total water abstraction, including public water supply (12 per cent), industry and irrigation.

The volume of water consumption for domestic purposes is similar in Serbia to that in other European countries; the average daily consumption in 2012 was 143 l/capita. In 2012, in Belgrade, the Public Utility Company (PUC) Belgrade Waterworks and Sewerage supplied 648,000 m^3 of water daily to approximately 1,860,000 inhabitants and all commercial and industrial facilities.

Table 7.3: Abstracted drinking water supply, 2007-2013, thousand m^3

Year	Total	Groundwater and springs	Watercourses	Reservoirs and lakes
2007	691,839	499,048	135,743	57,048
2008	690,784	485,032	151,448	54,304
2009	684,725	486,862	146,119	51,744
2010	666,904	480,728	134,875	51,301
2011	672,904	472,671	143,158	57,075
2012	681,245	471,043	146,520	63,682
2013	657,720	441,869	156,786	59,065

Source: Statistical Office, 2014.

In Subotica, Vojvodina, the PUC Subotica Waterworks and Sewerage supplied 21,900 m^3 of water daily to approximately 146,000 inhabitants, and all commercial and industrial installations.

Drinking water supply

About 154 water supply systems in urban areas and 2,198 in rural areas are functioning under regular drinking water quality surveillance. In rural areas, there are many more so-called small-scale water supply networks whose waters are not controlled due to the unresolved issue of competence (chapter 4), so their real number is much higher.

In 2013, the raw water for drinking purposes comes from ground (67 per cent) and surface (33 per cent) waters. Differences exist all over the country, for example in Vojvodina where all drinking water comes from underground sources. According to the Census 2011 of Population, Households and Dwellings, around 70 per cent of the population is connected to public water supply systems, around 12 per cent is connected to rural water supply systems and around 10 per cent is connected to individual systems, while the remaining population is supplied from wells and pumps (table 7.4). In 2012, around 82 per cent of Serbia's population was supplied with urban or rural public water systems and around 92 per cent was supplied with drinking water by piped distribution systems.

Urban areas have much more complete coverage than rural areas. According to a recent Serbia benchmarking report, average water losses in Serbia are approximately 35 per cent of total water injected into the supply networks, being 38 per cent non-revenue water (NRW).[7]

Water losses in Belgrade reach 25 per cent of total distributed water, but there is a further 10 per cent of unbilled water; together these represent 35 per cent NRW. Water losses in Subotica are in the range of 26–30 per cent of total distributed water.

Usually this indicator (water losses) has been approached in regard to evaluation of network performance, more specifically with regard to pipe breaks, leaks and bursts, being also linked with efficiency of use of water, through the measurement of sustainable economic level of leakage. No related data were found (just 2.3 breaks/km/year). Measures to reduce losses, such as pipe rehabilitation or adoption of innovative maintenance solutions, are still weak in Serbia. Nevertheless, average data for several European countries can be compared with those of Serbia (35 per cent): Cyprus 20 per cent, France 24 per cent, Spain 25 per cent, Greece 30 per cent, Italy 30 per cent, Portugal 30 per cent, Croatia 40 per cent and Albania 64 per cent.

Wastewater infrastructure system

Of the 2.5 million households in Serbia, 1.44 million are connected to public sewerage systems (table 7.5). Of the 300 million m^3 of wastewater discharged in 2013, 71.4 per cent was from households, 14.6 per cent from industry and 14 per cent from other sectors. Only 16.8 per cent (50.4 million m^3) was treated, including 2.4 per cent with primary treatment, 11.8 per cent with secondary treatment and 2.5 per cent with tertiary treatment.

In terms of national coverage, in 2013, 58 per cent of the population was connected to public sewerage systems, but only 10.54 per cent of the population was connected to public sewerage systems served by an urban wastewater treatment plant (WWTP). The total length of the sewerage network is 15,779 km, including main collectors of 2,447 km and collecting networks of 13,332 km.

[7] NRW components: real losses (leaks and bursts), apparent losses (water theft and metering inaccuracies), billed unmetered consumption (water meters do not exist), and unbilled authorized consumption (unmetered watering, firefighting).

Table 7.4: Public water supply systems, 2007–2013

Year	Population connected %	Number of households connected to public water supply systems	Increase of connected households, per cent over 2007
2007 [1)]	78.25	1,957,993	..
2008 [1)]	82.57	1,996,367	1.96
2009 [1)]	84.71	2,067,260	5.58
2010	77.80	1,929,439	-1.46
2011	78.34	1,954,881	-0.16
2012	80.17	2,004,019	2.35
2013	82.01	2,039,942	4.19

Source: Statistical Office, 2014.
Note: 1. under revision.

Table 7.5: Public sewerage systems, 2007–2013

Year	Population connected to public sewerage systems, %	Population connected to public sewerage systems, with UWWTP, %	Number of households connected to public sewerage systems	% of increase based on 2007
2007 [1)]	48.64	8.54	1,217,070	..
2008 [1)]	51.76	8.67	1,251,473	2.83
2009 [1)]	54.07	10.00	1,319,097	8.38
2010	51.61	9.46	1,279,983	5.17
2011	53.07	9.79	1,324,376	8.82
2012	55.51	10.03	1,387,542	14.01
2013	57.79	10.54	1,437,515	18.11

Source: Statistical Office, 2014.
Note: [1)] Under revision. UWWTP = urban wastewater treatment plant.

Currently, 23 WWTPs are functioning, 9 not functioning and 18 under construction or reconstruction.

Despite the fact that only 10.54 per cent of population is connected to public sewerage systems with WWTP, there are 2,252,016 inhabitants in rural areas and 593,813 inhabitants in urban areas who are using septic tanks to treat wastewater. In some areas, mainly rural areas, septic tanks can be considered as properly treating wastewater. The capacity and efficiency of most of them is not sufficient, so that only 5 per cent of the population is considered to have an adequate and satisfactory level of wastewater treatment. The biggest cities (Belgrade, Niš and Novi Sad) still do not have appropriate WWTPs.

Wastewater is not reused. Treated urban wastewaters are usually discharged without reuse. In some industrial sectors, treated wastewaters are reused. According to available data, in 2013, treated wastewaters were reused in the following sectors: Electricity, gas, steam and air conditioning supply (875,000 m^3), manufacturing industry (54,000 m^3) and mining (2,000 m^3). Despite low wastewater treatment coverage, river water quality is acceptable, primarily as a result of a low level of loading by industrial pollutants and due to the self-purification capacity of the main national rivers.

7.2 Water resources quality

Surface waters and minimum flows in the channels

River water quality is relatively good in Serbia, particularly that of the Danube, Sava and Tisza Rivers and a number of small rivers. This is a result of measures undertaken in upstream countries, and strong reduced industrial activity in both Serbia and the Balkans region. Additionally, the self-purification capacity of rivers is significant, testified by the evolution of BOD_5 (g/m^3) in the Danube River in the period 1971–2013, at the entry point into the country (Bezdan) and the exit point (Radujevac):

- Bezdan: 5.5 (1971); 2.3 (2013);
- Radujevac: 2.5 (1971); 2.3 (2013).

Table 7.6: Most vulnerable sections of rivers and canals in Vojvodina in terms of water quality

River/canal	Sections
Canal Vrbas-Bezdan Canal	From 0 to 6 river kms
Plovni Begej	From the Romanian border to Klek lock
Aleksandrovac Canal	Whole canal
Begej	Through Zrenjanin to Stajićevo lock, and partly to the mouth of the Tisza
Kudoš	Downstream of Ruma
Krivaja	Downstream of Bačka Topola
Bogojevo - Bečej Canal	From the Vrbas-Bezdan Canal to the mouth of the Tisza
Tisza	From Senta to the dam on the Tisza

Source: Department of Chemistry, Biochemistry and Environmental Protection, University of Novi Sad.

This means that Serbia is not a contributor to the deterioration of the Danube River's water quality.

However, the situation with regard to national rivers is often worse, above all that of the Velika Morava River, and especially of small rivers whose riverbanks are occupied by large urban centres. The Danube–Tisza–Danube Canal and secondary irrigation and transport canal are also very much polluted in Vojvodina, due to discharges of untreated industrial and municipal wastewaters and run-off waters from agriculture. Table 7.6 shows the most vulnerable sections of rivers and canals in Vojvodina.

There are insufficient WWTP facilities and often they are not equipped with appropriate unit operations to guarantee water quality at disposal and also to ensure minimum flow in those rivers and canals. This implies that advanced technical solutions and significant expenditures need to be mobilized in the future.

Quality control and monitoring

Systematic water quality testing of surface water and groundwater in the period 2007–2011 was carried out under the 1991 Law on Waters. Monitoring programmes were performed to determine the quality of water in watercourses, "category 1" waters, reservoirs, groundwater aquifers and sediments (table 7.7).

In 2014, surveillance monitoring is performed at 51 measuring stations to ensure a comprehensive review of water status, and operational monitoring is performed at 84 measuring stations to establish or confirm the status of those water bodies identified as risky. Groundwater quality monitoring is conducted by means of 64 piezometers.

On the basis of previous experience in the preparation of national reports and data exchange with the European Environment Agency, it was concluded that the current monitoring system (systematic testing of water quality) does not match the needs of integrated monitoring in this area. The programme of monitoring the status of surface water and groundwaters, implemented in 2012 and 2013 by SEPA and HMS, has already been prepared in accordance with the new legislation.

The aim of the reconstruction of the monitoring system in Serbia is to define a more efficient system. It includes the surveillance monitoring conducted at 51 monitoring stations in order to provide a complete overview of water status and provide information on long-term trends, and operational monitoring conducted at 84 stations to establish or confirm the status of those water bodies identified as being at risk in terms of the impossibility of fulfilling the stated goals of environmental protection, and the assessment of each change in the status of these water bodies as a result of the programme of measures. Despite this progress, an appropriate water quality integrated management strategy, such as water safety plans, including risk analysis – which is already used in various EU countries as a tool to achieve safe water – is lacking.

Drinking water quality and health

At national level, monitoring of drinking water quality is conducted by the network of 24 Institutes of Public Health under the Ministry of Health. They also monitor the quality of bathing water and water in swimming pools. Monitoring of drinking water quality is conducted on a regular basis by both the Institutes of Public Health and the operators of about 154 water supply systems in urban areas.

In the period 2007–2012, in urban areas, approximately 60,000 drinking water samples each year were analysed for physical, chemical and microbiological quality parameters (figure 7.1).

Table 7.7: Monitoring of surface water and groundwater, 2007–2014

	2007	2008	2009	2010	2011	2012	2013	2014
Surface water quality monitoring points								
Streams	71	66	66	65	65	58	57	49
Springs	33	31	31	32	33	3	0	0
Reservoirs	25	26	26	28	26	3	5	5
Lakes	5	5	5	5	5	2	0	0
Groundwater quality monitoring wells	68	66	65	65	63	60	63	66
Sediment quality								
River sediment profiles	0	60	76	93	95	85	33	20
Mud in reservoirs	0	13	12	12	14	7	7	4

Source: Serbian Environmental Protection Agency, 2014.

Average microbiological and chemical non-compliance of drinking water were 4.9 per cent (ranging from 4 per cent to 5.9 per cent) and 15.4 per cent (ranging from 13.9 per cent to 19.9 per cent), respectively.

The most common parameters of physical and chemical non-compliance are increased turbidity and colour, increased concentrations of iron, manganese, ammonia, nitrates, nitrites and arsenic (in Vojvodina – see below), as well as increased organic matter. The most common causes of microbiological non-compliance were increases in total colony count and total coliform bacteria, and the presence of faecal coliform bacteria.

In the period 2007–2012, monitoring of drinking water quality was conducted on about 2,198 water supply systems in rural areas. Approximately 18,800 drinking water samples were analysed each year for physical, chemical and microbiological quality parameters according to the national regulation. Average microbiological and chemical non-compliance of drinking water from water supply systems in rural areas were 22.9 per cent (ranging from 21.4 per cent to 25.1 per cent) and 50.5 per cent (ranging from 44.8 per cent to 53.7 per cent), respectively.

The most common parameters of physical, chemical and microbiological non-compliance in rural areas are similar to those of the urban systems.

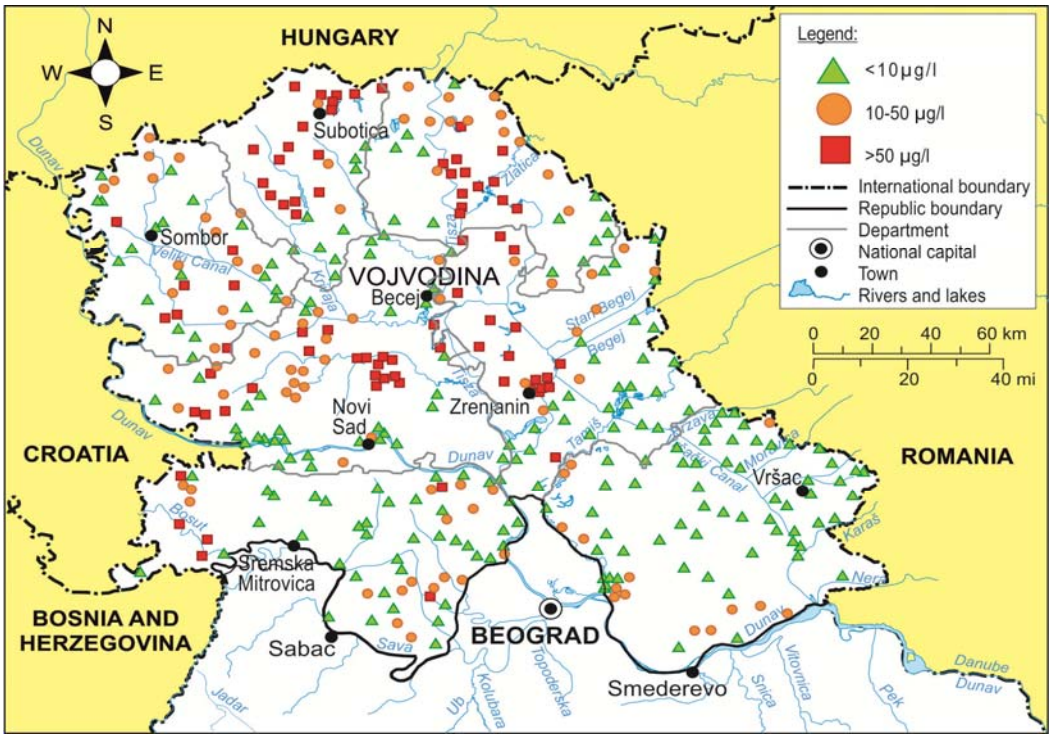
In the period 2007–2012, drinking water from an average 4,600 individual water supply facilities (public standpipes, schools, health centres, facilities for food production and restaurants with their own water sources) were analysed. Approximately 7,900 drinking water samples were analysed each year for physical, chemical and microbiological quality parameters according to the national regulation. Average microbiological and chemical non-compliance of drinking water from individual water supply facilities were 24.1 per cent (ranging from 18.1 per cent to 27.9 per cent) and 35.5 per cent (ranging from 30 per cent to 42.5 per cent), respectively.

The high natural arsenic content found in much of the groundwater resources in Vojvodina forms a serious threat to guaranteeing appropriate quality of drinking water, as shown in map 7.1.

Most of the water supply systems in Vojvodina do not have appropriate technology to remove arsenic from groundwater; thus, the arsenic content in drinking water in most of the territory is over the allowed value of 10 µg/l. This situation pertains to about 70 per cent of the municipalities of Vojvodina, which are using wells for public water supply, and about 50 per cent of the total population of the Autonomous Province. Arsenic removal from drinking water requires significant financial resources and specific units of water treatment, which are necessary to develop an appropriate plan to address this problem.

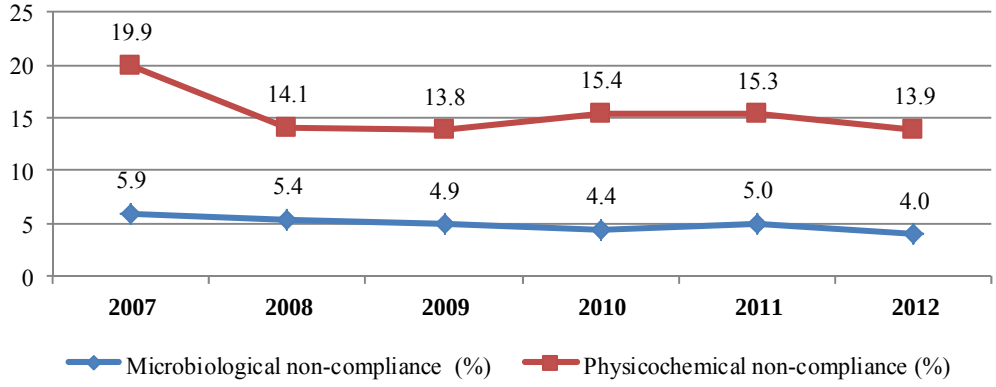
The quality of drinking water in Belgrade's public water systems is evaluated at 300 points of the network by the Public Enterprise "Beogradvode" and the Institute of Public Health of Belgrade City, by 10,000 analyses per year. According to data from the Institute of Public Health of Belgrade City in 2013, the physico-chemical and microbiological parameters were controlled in 6,891 samples, of which 0.63 per cent did not meet physico-chemical parameters and 2.74 per cent did not meet microbiological parameters. The results are better than in 2005 when 1.5 per cent of the samples did not meet the requirements with respect to physico-chemical parameters, and 6.4 per cent of the samples did not meet microbiological parameters. "Beogradvode" also controls water quality through analysis of an additional 8,000 or so samples per year, but results are not known since it has no obligation to submit them.

Map 7.1: Arsenic in groundwater used for water supply in Vojvodina



Source: Arsenic Platform: Possible solutions for water supply in Backa and Northern and Central Banat based on micro- and macroregional systems, Faculty of Sciences of the University of Novi Sad, 2013.
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Figure 7.1: Quality non-compliance of drinking water from public water supply systems in urban areas, 2007-2012, percentage



Source: Ministry of Energy, Development and Environmental Protection and Ministry of Health, 2014.

7.3 Flood protection management

Serbia has a General Plan for Flood Protection for the period 2012–2018 and adopts annual operational plans for flood protection.

The present state of flood protection infrastructures can be assessed as satisfactory. Flood protection embankments and other types of "line" protection extending over 3,500 km have been constructed (about 3,050 km on the category 1 waters), and the beds of numerous watercourses have been regulated and the conditions of water, deposits and ice flow have been improved (around 270 km on the waters of the first order, around 400 km on all watercourses). A certain number of river reservoir and retention ponds contribute to flood protection, but still a large part of the territory remains potentially threatened by floods.

Setting aside the impact of the extreme flood event of May 2014 (box 7.1), the dykes along the Sava River have been successfully strengthened at many

locations and the majority of them do not show signs of severe erosion on the land side, major instabilities and/or damage to the grass cover. This does not preclude, however, the need for a detailed damage assessment to be carried out of all flood protection measures along the Sava River and its tributaries.

The worst situation is in the basins of smaller watercourses where the existing protection measures are mainly of a local nature and limited to larger settlements, significant industrial facilities or agricultural complexes. Frequent and significant damage, as has occurred recently, is usually the result of unplanned urbanization and unfinished flood control systems and/or an obsolete protection level.

Operational flood protection measures cannot be implemented on all watercourses due to the sudden and short duration of major water-related events; therefore, the activities of the responsible authorities are mainly reduced to warnings, assistance to the inhabitants, damage recording and the rehabilitation of buildings after a flood wave has passed.

7.4 Legal, policy and institutional framework

Serbia lacks an appropriate framework on the water sector to achieve a sustainable approach to water and wastewater management policies. No programme for "efficient use of water" has been implemented and neither is there an innovative solution on a national scale. However, long-term directions will be established in the draft water management strategy until 2030, which is expected to be adopted in 2014.

According to the transposition and approximation strategy, estimates suggest that €9 billion to €10 billion will be needed to meet the requirements of the EU water-related directives.

Legal framework

The Law on Waters regulates the legal status of waters, integrated water management, the management of water infrastructure and status of water land, and financing of water sector activities. It covers surface water and groundwaters, including water supply, thermal and mineral waters, and transboundary waters. There are seven water districts defined in accordance with both hydrological and administrative boundaries. The Law defines planning documents to be adopted in the water sector: the water management strategy; water management plans for the Danube River Basin and for each water district; the annual water management programme; and plans which address protection against the adverse effects of water, including a flood risk management plan, a general flood defence plan, an operational flood defence action plan, as well as a plan of protection from water pollution and the monitoring programme. Most of these are in the process of elaboration (chapter 1).

More than 30 by-laws have been adopted accordingly.

Box 7.1: Floods, May 2014

A severe storm event hit the Balkans region strongly in May 2014, affecting Serbia mainly in the catchments of the Sava River and its tributaries. In about a four-day time span, a record high rainfall occurred. More than 200 mm of rain was recorded in a week, equivalent to the average rainfall over a period of three months in the region.

A severe "flash flood" occurred in the Serbian part of the Sava River basin, specifically on its tributary the Kolubara River, with water levels rising by 7 m in two days, resulting in the destruction of houses, bridges and sections of roads, and widespread flooding of urban and rural areas. The increased flow of groundwater resulted in widespread landslides, leading as well to the destruction of houses, roads and agricultural land. The Sava River itself rose more gradually (about 3.5 m in five days) which is why the water level in the Serbian part of the basin peaked after the rainfall event had ceased. As a result of the flooding, 34 persons died – 13 by drowning – and over 30,000 were evacuated from their homes.

Serious damage was also caused to coal mines, chemical plants, power plants and road infrastructure, which were entirely flooded, shut down or subject to landslides. It was recommended that special care be taken to avoid serious environmental damage caused by hazardous wastes.

Surface water quality in the Sava River, the main source of water supply for Belgrade, has been one of the main concerns, because any degradation poses a severe risk to the drinking water supply for the entire population of Belgrade. To avoid this, from the outset of the flooding, the Institute of Public Health of Belgrade City increased the drinking water monitoring sequence and installed additional treatment by activated carbon, in order to monitor any flood-related impact. At the same time, what is now the Ministry of Agriculture and Environmental Protection, carried out monitoring of the surface water of the Drina and Sava Rivers at selected sites upstream of the water source area of Belgrade, to control the main potential threats, leakage and "washing-out" of contaminants in the flooded area draining to the rivers, with special focus on industrial sites, the high concentration of pesticides from agricultural land, and sanitary and septic wastes also entering the water system from downstream.

The Law on Navigation and Ports on Inland Waterways (OG 73/10) regulates inland navigation; safety of navigation (administrative inspection, technical and other professional activities); the conditions and manner of use, maintenance and protection of inland waterways, ports, winter storage and moorings, boats and floating facilities; and treatment in the case of navigational accidents and inspections. In addition, this Law stresses the importance of the development of water transport, as well as the ports and harbours of Serbia.

The Law is under revision to be harmonized with new national and international legal frameworks, as well as the Waterborne Transport Development Strategy for the period 2015–2025 (OG 3/15).

The Law also specifically regulates the prevention of pollution from vessels. Vessels are prohibited from the discharge and leakage into inland waters of harmful objects or substances, including oil and oil derivatives, which may cause pollution of inland waters or create obstacles and dangers to navigation. In addition to this, strictly prohibited is the burning of garbage, sludge, deposits and special waste on board. In the event of pollution from a vessel, the Minister of Transport, with the consent of the ministers responsible for the environment and for water management, prescribes certain measures. Moreover, the law stipulates the following:

- Action in the case of discharges, spills or noxious substances or objects, or threat of release, spill or elimination of harmful objects or substances;
- Action in the case of discharge of water from the separation plant for bilge water, approved by the minister responsible for water management;
- A port open for international traffic must be equipped in such a way that oil, refined oil and other hazardous materials in operational facilities on the coast are not poured into the water;
- The commander of a vessel is required to submit harmful objects and substances before reaching the receiving station.

Policy framework

The major strategic document in the water sector, the 10-year Water Masterplan, which is still used, is expected to be replaced by a national water management strategy for the development of the water sector until 2030, covering water resources management, water supply and wastewater services.

The 2011 National Environmental Approximation Strategy proposes a set of measures, to be taken in the transition period of EU accession, to respond to the concerns of the water sector on integrated planning, infrastructure and financial support, and what must be done to transpose and implement the requirements for change into the legal, institutional, financial and economic frameworks.

The lack of definition, and consequently implementation until now, of a national water management strategy and clear guidance on reaching an appropriate level of sustainability and governance on water management has been a constraint on achieving both substantial capital investment and an improvement in the financial, environmental and operating performance of the water services.

The Water Management Programme for 2014 (OG 24/14) prescribes how funds are to be used for the improvement of regional water supply systems, pollution prevention, protection from harmful effects of water, the preparation of planning documents, implementation of projects and participation of Serbia in international cooperation on water.

Other strategic documents envisaged by the Law on Waters, in particular the water management plan for the Danube River Basin, water management plans for seven water districts, a flood risk management plan and plan of water protection from pollution, are to be adopted after the national water management strategy, even taking into account that some deadlines set for those documents have already passed.

Institutional framework

The Ministry of Agriculture and Environmental Protection, through the Water Directorate, performs state administration duties and expert tasks related to water management policy (water management, water resources, pollution prevention and flood protection), including input from public water management companies to establish and maintain a water information system. The capacity of the Water Directorate, as well as that of most institutions that support the water sector, is insufficient to carry out all the duties required by the Law on Waters. A particular problem is a lack of adequate human resources in local administration (local self-government units) able to properly prepare and implement capital projects.

SEPA carries out surface water and groundwater monitoring. According to results of surface water quality monitoring, SEPA publishes a report on the

quality of waters. Apart from regular monitoring, SEPA also performs emergency monitoring of water quality in cases of accidental pollution, based on the competences established in the Law on Waters. Pursuant to the Law on Waters, SEPA is obliged to carry out an emergency monitoring, immediately after being informed about accidental pollution, i.e. to take an increased number of measurements and continually follow movements of waves of accidental pollution along the watercourse(s) and provide information to competent authorities until the accidental pollution terminates. SEPA also performs monitoring on boundary profiles with Romania and Hungary, through signed and ratified agreements based on a common testing methodology of water quality on boundary profiles of watercourses.

At regional level, water management activities are performed by the public water management enterprises "Srbijavode", "Vode Vojvodine" – which executes its activities together with 21 water management companies – and "Beogradvode", pursuant to territorial jurisdiction. Most of them currently operate a range of services on water resources management, flood protection and pollution control, but not water and wastewater services.

Municipalities/local self-government units are responsible on their own territory for organizing and providing communal services, including water provision, sanitation and wastewater treatment.

At municipal level, public utility companies (PUCs) currently operate and, in many cases, this results in an operation that is smaller than the generally accepted level at which reasonable economies are achieved. Taking into account available international experiences and benchmarking, larger PUCs will be more sustainable and efficient, delivering better performance and lower prices for consumers.

A preliminary estimate of the engineering staff needed for the implementation of development projects foreseen in the draft water management strategy until 2030 amounts to 7,300, involving planning and design and construction. Total funding needed for this strengthening of human resources implies the need to mobilize more than €25 million and institute reforms of the Serbian educational system.

The Law on Waters provides for the establishment by the minister responsible for agriculture of a water council, as a technical professional advisory body to provide opinions on draft legislation and planning documents. It also provides for the establishment by the Government of a National Conference on Water, with the participation of local self-government units, water users, NGOs and other stakeholders, to take part in water management planning. As of April 2014, no water council had been created. A Decision on the establishment of a national conference on water was adopted in 2011; however, its members were not appointed (chapter 1).

Economic sustainability

Regarding investment, the basic problem is the wide gap between financial demand and current investments in the water sector (3–4 times less than needed). In addition, operational, maintenance and asset replacement costs must be considered.

Investment and operation costs, and the efficiency of operators, will play a crucial role on this subject. The draft water management strategy until 2030 includes preliminary estimates of funding needed by the water sector. In summary, the capital investment challenge in the water sector is estimated to be €9.08 billion (2010 current prices):

- €2.88 billion for water use, including €1.3 billion for drinking water;
- €5.4 billion for water protection, including €3.3 billion for urban wastewater collection and treatment;
- €0.8 billion for protection against adverse effects of water, namely agricultural pollution (nitrates).

Capital investment on this scale takes about 20 years to complete, according to current estimations. Concerning pricing, costs are not covered by the tariffs paid by consumers. At national level, average prices of water and wastewater services range from €1.0/cm to €1.5/cm.

In the case of the PUC Subotica Waterworks and Sewerage in Vojvodina (a technically very well managed municipal company with 50,000 water connections and 32,000 sewerage connections), 2013 prices are:

- Water supply: €0.4/m^3;
- Sewage: €0.25/cm^3;
- Wastewater treatment: €0.25/m^3;
- Total (plus 10 per cent rates): €0.99/m^3.

The prices of water are not economic prices but social prices. From 2006 until 2012, the Government controlled them and approved any changes, limiting their increase to the projected inflation rate for a given year, but this control was abolished with the

adoption of the Law on Communal Utility Activities and the Law on Public Enterprises (OG 119/12, 116/12, 116/13, 44/14). The Law on Communal Utility Activities gives principles for service prices: customer pays, polluter pays, cost coverage, same price for one service and affordability. The Law on Waters establishes a tariff reform, practical implementation of which requires the raising of the tariffs by local self-governments.

Tariff levels differ from one local self-government unit to another. Direct transfers from local self-government budgets to water management PUCs are rare, but local self-government units subsidize them through contracts for different non-core works or activities. Leakage and losses also contribute to the low efficiency of operation of Serbian water companies. Subotica PUC estimates losses are about 25–30 per cent, less than authorities estimate at a national level (30–50 per cent on average).

No private funds are currently allocated to water and water resources management and the Water Fund has not yet been created. Potential sources of funding envisaged to support the economic sustainability of the water sector mainly comprise the national water funds proceeding from water fees and pollution taxes, water tariffs, revenues of local administrations, EU IPA funds, grants and the financial resources of the owners of water management PUCs.

An independent supervision and regulatory body related to performance and the economic sustainability approach in the water and wastewater sector does not exist.

7.5 Conclusions and recommendations

No significant progress in coverage of water supply, sewerage, wastewater treatment and water resources has been made. According to official data, the situation can be considered acceptable only in drinking water supply.

Serbia lacks an efficient framework on the water sector to achieve an improvement in the long-term on water and wastewater management and water resources management systems. Some of the most relevant measures to materialize, taking into account that water is the largest environmental subsector in terms of approximation costs, are the following: providing investment in new infrastructure and equipment and replacement of portions of existing assets, extending coverage and care to the entire Serbian population, promoting integrated planning and implementation for water resources, improving and preserving water quality, and ensuring the economic and financial sustainability of water services companies.

Recommendation 7.1:
The Government should:

(a) Finalize, adopt, ensure funding for and implement the water management strategy until 2030;
(b) Adopt the necessary subsidiary legislation to the Law on Waters;
(c) Establish a national water council;
(d) Launch a programme of investments for the construction of new and the maintenance or renovation of existing water infrastructure.

A high level of losses in water distribution networks severely affects the level of efficiency of water services in Serbia. Establishment of a minimum indicator of losses for the economic purposes of the utility managers, and the improvement of internal and international "benchmarking", already initiated, are very useful.

As well, international cooperation with some European water partnerships and, at EU level, the European Innovation Partnership on Water would bring expertise and shared experience in the water sector. Community empowerment, through the significant participation of water stakeholders and the creation of institutional ways and bodies to frame it, has been strongly claimed by civil society organizations.

Recommendation 7.2:
The Government, through the Ministry of Construction, Transport and Infrastructure, the Ministry of Public Administration and Local Self-Government and the Ministry of Agriculture and Environmental Protection, should:

(a) Ensure the efficient use of water resources, and control the sustainability and vulnerability of water resources;
(b) Adopt innovative solutions for the extensive reuse of treated wastewaters;
(c) Promote the implementation of water safety plans by operators.

Most of Serbian territory lies in the Danube River Basin and a significant amount of the population lives in transboundary basins where countries have established multilateral water management coordination and cooperation.

Taking into account the climate change impacts on water-related issues in the Danube River Basin, key

issues to be carefully followed are: water availability, water security, water demand and scarcity, floods and impacts of low flows, surface and groundwater conservation and quality, droughts, shortages and health protection. Appropriate secondary legislation to govern these issues is lacking.

Although the present state of flood protection infrastructure can be assessed as satisfactory, a large portion of the territory of the country still remains potentially threatened by floods.

Recommendation 7.3:
The Government should:

(a) Implement adequate measures in the existing flood risk management system, and establish flood hazard maps and flood risk assessment;
(b) Ensure adequate protection from floods and water erosion and develop appropriate policies and financial instruments to ensure the management of water risks at the least cost to society;
(c) Review water scarcity and drought policies on climate change adaptation.

Chapter 8

WASTE MANAGEMENT

8.1 Introduction

Waste management in Serbia started a new era when the country developed a legislative framework based on EU waste management policy. There is a trend towards regionalization of waste management services, which is providing opportunities for private sector involvement. However, development of the necessary infrastructure lags behind expectations, mainly due to insufficient sources of local financing and dependence on funding by foreign donors.

Recycling of waste is meeting national targets but separate collection is introduced only as a local activity of individual municipalities. Large amounts of industrial waste are generated by the mining industry and utilization of industrial waste as a source of material or energy is increasing. Recently completed radioactive waste storage was licensed for full-scale operation, which is a precondition for the safe management of radioactive waste currently stored in old storage facilities and at the place of generation. Serbia has developed and implemented a system of permitting of waste management activities and is improving its control over the transboundary movement of waste.

8.2 Waste management

Municipal solid waste

Generation

Municipal solid waste (MSW) by definition in Serbia is household waste and similar waste generated by services, commerce and industry. Data on MSW have been systematically collected since 2006 and a new methodology was introduced in 2010, which requires public utility companies (PUCs) to report collected amounts and the morphological composition of MSW. In 2013, data were delivered by 106 of 168 companies. Data reported from some companies are still based on estimates, although the Regulation on the methodology for collecting data on the composition and quantities of municipal waste on the territory of the local government unit (OG 61/10) prescribes the methodology for analysing the amount and composition of solid waste in local government areas.

However, obtained data allows the characterization of MSW generation in Serbia. Based on results from these municipalities, it is estimated that the urban population generates, on average, 1 kg of MSW per person per day, the rural population, on average, 0.7 kg of MSW per person per day, and the Belgrade population, 1.2 kg of MSW per person per day. The generation and collection of MSW is summarized in table 8.1. The Faculty of Technical Sciences in Novi Sad has determined the composition of MSW in 2009 (table 8.2).

Collection

Organized collection of MSW was estimated to cover about 80 per cent of generated waste in 2013. Collection is organized mainly in urban areas, while rural areas are less well covered. The majority of local governments have equipment and vehicles for waste collection, but various vehicles are used, ranging from specialized waste collection vehicles with a press to ordinary trucks and tractors with a trailer.

Table 8.1: Municipal solid waste, 2006-2013

	2006	2007	2008	2009	2010	2011	2012	2013
Generated waste, million tons	1.73	2.07	2.55	2.63	2.65	2.71	2.62	2.41
Waste collected and disposed by municipal companies, million tons	1.04	1.24	1.52	1.58	1.89	2,09	1.83	1.92
Average coverage by waste collection (est.), (%)	0.60	0.60	0.60	0.60	0.72	0.77	0.70	0.80
Average daily quantity of MSW per kapita (kg)	0.62	0.77	0.95	0.98	0.99	1.01	0.99	0.92
MSW/person/year (kg)	230	280	350	360	360	370	360	340

Source: Serbian Environmental Protection Agency, 2014.

Photo 8.1: Separate waste collection in Belgrade downtown

In most municipalities, waste management is the responsibility of a multipurpose PUC which also delivers water and sewerage and a number of other services. Only the bigger cities have specialized waste management companies. Even these often carry out activities which are not strictly related to waste management, for example they are responsible for park maintenance, urban sanitation and the management of cemeteries. In 2008, there were only 11 PUCs that were specialized in waste management. In recent years, the process of privatization of these companies has begun and private or public–private companies are being formed. Since the transformation of public companies the effectiveness of service has improved and waste collection has started to expand to rural areas.

The private sector is establishing its presence in Serbia by creating public–private partnerships with municipalities. For example, A.S.A. EKO d.o.o. is providing services in Kikinda and Lapovo to 50,000 people and 676 enterprises. Brantner otpadna privreda d.o.o. has been operating in Serbia since 2007 in the municipalities of Novi Becej, Kovacica, Kanjiza and Opovo. Porr Umwelttechnik GmbH's Serbian subsidiary PWW is currently the largest private waste management provider in Serbia and collects the MSW of around 600,000 residents at present. It started its activities in Serbia in 2007 and is serving Leskovac and Jagodina. The presence of the private sector is an important driver for the introduction of new operational practice standards and development of modern waste recycling and disposal facilities.

Table 8.2: MSW composition

	%
Food waste and biodegradables	42.9
Plastics	15.1
Paper and cardboard	14.8
Glass	5.3
Textiles	5.0
Diapers	4.0
Metal	1.9
Fines	8.7
Other	2.3

Source: Project: Determining the composition of the waste, Faculty of Technical Sciences, Novi Sad, 2009.

Recycling

Serbia currently recycles about 14 per cent of collected MSW: glass, wood, paper, plastic and metal. Recycling activities are organized in larger towns. The most "recycling friendly" municipality in Serbia is Čačak, where primary separation in wet and dry fractions was introduced. The dry fraction is then sorted on a sorting line. Čačak is also operating a pilot composting facility with capacity of 500 t/year. But recycling activities are also going on in other

municipalities. Novi Sad has had a sorting line operational since 2002, which was modernized in 2010. Kragujevac is running a PET and paper separation programme. Indjija has a sorting line for plastics and paper separation and also collects electronic waste separately. Kruševac is separating plastics, paper and glass.

The private sector is involved in municipal separation schemes, but its main role is the purchase and processing of materials gained from separation. While in 2009 only 200 companies were registered for collection and recycling of waste, currently their number exceeds 2,200. Recycling of paper, plastics and glass from MSW is partially covered by operators of packaging waste management. It is expected that, with enforcement of the regional approach to waste management and support to development of waste management centres, recycling capacity will grow and will have positive impact on the reduction of MSW disposed on landfills.

Disposal

MSW is disposed to landfills and dumps. Considering the development of modern landfills, it is estimated that 25 per cent of MSW is disposed to sanitary landfills, 45 per cent is delivered to registered municipal dumpsites and 30 per cent ends up in uncontrolled dumpsites. There are 164 registered landfills and dumpsites and 4,481 illegal dumpsites according to the National Waste Management Strategy for the period 2010–2019 (although SEPA states 3,300 illegal dumpsites). About 70 per cent of all active dumpsites do not meet basic operational standards and are not stipulated through spatial planning documents, and no EIA of them has been developed; nor do they have the necessary permits.

Modern sanitary landfills are emerging as a result of international projects and private investments. The number of sanitary landfill sites is increasing. For example, A.S.A. has operated a landfill at Kikinda since 2008 and Lapovo since 2009. PWW developed a landfill at Leskovac in 2011.

Several regional sanitary landfills were developed: the landfill in Sremska Mitrovica opened in 2014, and since 2013 there has been an operational regional landfill in Pirot. Several other regional landfills are under preparation, but completion of a national network of sanitary landfills is not expected in the near future.

SEPA is developing a national database of disposal sites. Each municipality is requested to submit a report on disposal sites in its territory. This report includes information not only on site identification, size, volume and type of waste, but also on potential impact on human health and the environment. The database is an important source of information and is publicly available on the website of the Agency, and was used for preparing the division of disposal sites by volume of disposed waste shown in Table 8.3.

Table 8.3: Division of disposal sites by volume of deposited waste

Disposed volume (m^3)	Number
to 1,000	2,702
1,001 - 10,000	698
10,001 - 100,000	131
100,001 - 500,000	27
500,001 - 1,000,000	7
over 1,000,000	7
Total	**3,582**

Source: D. Ubavin, Faculty of Technical Sciences, University of Novi Sad, 2011.

Regionalization of MSW management

The implementation of the National Waste Management Strategy for the period 2010-2019 requires the formation of regional centres of waste management. The process of establishing a regional waste management centre is complex and starts with preparation and signing of the intermunicipal agreement of those municipalities which will be served by the future regional waste management centre. Then follows the selection of a future landfill site and preparation of the feasibility study for the adoption of the regional plan, which presents options for future arrangement of waste management services. Based on results of the feasibility study, a regional waste management plan is prepared and its impact is evaluated in the process of strategic assessment. Then, based on the regional plan, the regional strategy and action plans are prepared and local waste management plans are aligned with the regional plan. The process is finalized by establishment of a joint regional waste management company, which takes responsibility for development of the new waste infrastructure and provision of waste management services.

In 2012, the Ministry of Environment, Mining and Spatial Planning evaluated progress in this area with the following results:

- Eight regional landfills were already developed on the territory of the municipalities Jagodina, Kikinda, Lapovo, Leskovac, Pančevo, Pirot, Sremska

Mitrovica and Užice, and five of them were in operation;
- Three regional centres were under construction: Inđija, Nova Varoš, Sremska Mitrovica and Vršac;
- Planning and technical documentation was under preparation for the regional waste management centres in the regions of Novi Sad, Smederevo, Subotica, Ub, Vranje and Zajecar;
- Development of project documentation for Subotica and Ub/Kalenić is in the final stage; part of the funding for construction is planned to come from EU funds;
- The project documentation for Subotica is finalized; part of the funding for construction is planned to come from EU funds.

The actual progress of regionalization of MSW management is hard to assess, because the available information on disposal does not differentiate between waste disposed to old uncontrolled sites and waste disposed to new landfills.

Packaging waste

Recycling of packaging waste in line with the principle of producer's responsibility is supported by six operators. These operators of packaging waste management organize collection and recycling of packaging waste generated by the public and by industry. The number of companies participating in the packaging collection system increased from 492 in 2010 to 1,306 in 2012. The amount of collected packaging increased from 294,000 tons in 2010 to 340,000 tons in 2012. According to the 2012 Report on Management of Packaging Waste prepared by SEPA, the targets for packaging recovery set in the Plan on the Minimization of Waste Packaging in 2010–2014 (OG 88/09) were achieved.

Special waste streams

Waste streams which are of special attention under Serbian waste legislation include tyres, asbestos, batteries and accumulators, oils, electrical and electronic equipment, and vehicles. These are already monitored as products which will become special waste streams after use. Producers and importers of them are required by law to pay a fee, which is used for financing the recycling of special waste streams. The system was introduced by legislation in 2010 and early 2012. SEPA has put into operation the National Register of Pollution Sources. Since 2014, the system allows online data reporting. The introduction of this new system may mean that the data available for the period 2011–2013 do not cover all waste streams to the full extent, and more reliable data are expected in the future.

Tyres

Data on tyres were received from 326 companies in 2014. On average, about 25–30 thousand tons of tyres are put on the market in Serbia annually. Data on generation of used tyres vary significantly. Companies treating used tyres report 30–34 thousand tons of treated tyres. This greater amount of treated than sold tyres can be explained by the treatment of tyres stockpiled in the past. Import of used tyres does not influence this balance, according to official figuress, which state import of 500 t/year.

Asbestos

There is a strong decrease in construction materials containing asbestos being introduced to the Serbian market. While, in 2010, seven companies reported the sale of 426 tons of these materials, in 2013, three companies reported the sale of 3.5 tons. The generation of asbestos waste varies from 140–240 t/year but about 300 tons of asbestos waste treated or stored are reported annually. An additional 315 tons were exported for disposal in 2011.

Batteries and accumulators

More than 400 companies reported import or production of batteries and accumulators. Reported data indicate that 11–14 thousand tons of batteries and accumulators are introduced to the market annually. The reported amount of generated waste batteries and accumulators is growing continuously and reached 2,842 tons in 2013. However, companies performing treatment or export of batteries and accumulators reported in total about 20 thousand t/year.

Oils

The number of companies reporting on oils introduced to the Serbian market reached 350 in 2012; the figure for 2013 is not finalized yet. On average, about 13–16 thousand tons of oils are sold annually. The reported amount of waste oils is also growing. It reached 18,667 tons in 2013. But only 8,245 tons is reported as treated; the rest was used as secondary fuel.

Electrical and electronic equipment

More than 1,000 companies are reporting on electrical and electronic equipment placed on the Serbian market. On average, about 6–8 thousand tons

of this equipment is sold annually. Reports on generated electrical and electronic waste indicate about 5 thousand t/year. However, reported treated electrical and electronic waste is growing continuously, and reached 19 thousand tons in 2013.

Vehicles

Reporting on end-of-life vehicles was postponed by law, to start by January 2013. The first data indicate that about 2.8 tons of end-of-life vehicles were reported and 2.5 tons were treated.

Industrial waste

Data on industrial waste is collected by the Statistical Office and data on its generation have been published annually since 2008 (table 8.4). The total amount of industrial waste is strongly affected by the mining sector, which represents 88 per cent of reported waste, and by energy generation, which adds 10.5 per cent. The share of manufacturing waste is only 1.5 per cent, as reported in 2012. However, published data probably do not cover all waste generators in the country, because response rates vary: in the group of units with more than 250 employees the rate is nearly 90 per cent, in the group with 50–249 employees, 72 per cent, and in the groups with 10–19 and 20–49 employees, nearly 60 per cent.

The summary information on treatment of industrial waste (table 8.5) is less transparent, because the amount of waste disposed on land also includes soil from mining operations; thus, it is difficult to assess the situation in industrial waste disposal. Generally, trends in industrial waste treatment show encouraging development. The amount of waste used as secondary fuel is increasing and the amount of recycled waste is stable. Waste disposed by other means has strongly increased; this indicates that the number of companies reporting waste to SEPA is increasing.

Mining waste

Lignite from the coal mines of the Kolubara and Kostolac basins produces 65 per cent of electric energy in Serbia. RB Kolubara in Lazarevac produces 22.6 million tons of coal per year and Kostolac Coal Mine produces 5.7 million tons of coal per year. RB Kolubara publishes an annual report on the state of the environment, which includes details on waste management. The company has prepared waste management plans for individual plants. Management of waste generated from mine operation is subcontracted to private companies. The construction material industry is an important industrial sector facing continuous expansion, dependent upon mineral raw materials. There are cement plants in Beocin, Kosjerić and Novi Popovac, and brick industry in Kanjiza, Kikinda, Novi Becej, Novi Pazar and Ruma. Technical and architectural stone is exploited in open-pit mines near Ub, in Topola, Jelen Dol and Arandjelovac.

Private initiative (within the mining sector) is, for the most part, best seen in the exploitation of non-metals and construction materials. The mining–smelting basin in Bor is the largest producer of copper ore in Serbia; tailings in Bor require closer investigation due to pollution of surface waters. Data on mining waste indicate that the sector is increasing its activities (table 8.6).

Table 8.4: Generation of industrial waste, 2008-2012, ton/year

	2008	2009	2010	2011	2012
Mining and quarrying	15,009,969	21,109,318	26,458,201	41,517,933	47,896,172
Manufacturing	1,682,868	1,332,464	1,135,352	1,126,610	790,681
Energy generation	5,699,841	6,208,892	6,018,787	6,355,668	5,743,832
Total	**22,392,677**	**28,650,675**	**33,612,340**	**49,000,210**	**54,430,686**

Source: Statistical Office, 2014.

Table 8.5: Treatment of industrial waste, 2008-2012, ton/year

	2008	2009	2010	2011	2012
Used as fuel	34,300	18,054	26,701	28,877	49,026
Incinerated	42	107	128	154	29
Recycled	722,593	614,564	568,221	764,753	793,259
Disposed on land or to landfill	20,905,930	27,294,878	32,447,094	47,773,648	54,150,048
Other disposal	109,929	134,281	108,974	111,859	140,383

Source: Statistical Office, 2014.

The increase in recyclable waste may be caused by increased involvement of the mining sector in national waste recovery programmes. All mining activities and operations represent a potentially high environmental pollution risk. Active mining sites and those that are not operational at the moment (but not considered to be abandoned mines) are polluting the environment with untreated mining wastewaters and improperly deposited mining waste, which is changing the landscape.

There are numerous abandoned mining sites generating pollution caused by drainage of mining waste, thus contaminating the environment. There is no official cadastre of abandoned mining sites and therefore no clear picture of the potential environmental risk.

Energy generation waste

The state-owned electric utility power company Elektroprivreda Srbije operates power plants and coal mines. About 70 per cent of primary energy in Serbia is produced from coal-burning power plants (table 8.7). Waste from production of electricity, gas, steam and air conditioning supply is mainly ash and other residues from the incineration of coal. Elektroprivreda Srbije is currently implementing the project "Support to Environmental Protection in the Energy Sector", aimed at disposal of polychlorinatedbiphenyls (PCBs), oils and equipment containing PCBs. The first phase of this project – Inventory Preparation and PCBs Destruction Possibilities by Applying Current Domestic Technologies – was completed. Other activities of the company in waste management are aimed at exploring possibilities for reuse of ash in the construction industry, using waste as alternative fuels, identifying options for the utilization of used oils and reducing hazardous waste by better management of Ni-Cd batteries. Data on waste from energy generation are stable in the period 2008–2012. There is an increase in the category of recyclable waste, which indicates improvements in waste management.

Manufacturing waste

Manufacturing in Serbia generates a wide range of wastes, which are shown by category in table 8.8. Reported amounts of manufacturing waste vary annually. This is caused by two key factors: i) companies are becoming more familiar with reporting requirements and, thus, the quality of data is improving; ii) the structure of the manufacturing industry is undergoing transformation, and companies are increasing their effectiveness in the use of materials and reducing waste generation. In addition, an increasing share of recyclable waste shows that Government pressure to improve waste management practice is beginning to have an impact.

Table 8.6: Mining and quarrying waste, 2008-2012, ton/year

	2008	2009	2010	2011	2012
Chemical and medical waste	142	148	71	135	169
Recyclable waste	1,942	1,943	2,890	4,175	14,986
Used equipment	305	204	1,172	92	522
Animal and vegetable waste	29	6	150	..	..
Mixed waste	2,228	2,806	517	474	1,619
Sludges	..	..	..	1	..
Mineral and solidified waste	15,005,323	21,104,211	26,453,402	41,513,056	47,878,876
Total	**15,009,969**	**21,109,318**	**26,458,201**	**41,517,933**	**47,896,172**

Source: Statistical Office, 2014.

Table 8.7: Energy generation waste, 2008-2012, ton/year

	2008	2009	2010	2011	2012
Chemical and medical waste	1,017	454	1,050	2,069	1,550
Recyclable waste	10,167	11,030	14,965	17,744	14,346
Used equipment	1,494	159	776	762	999
Animal and vegetable waste	..	0	1	208	192
Mixed waste	443	590	505	649	139
Sludges	..	..	..	..	..
Mineral and solidified waste	5,686,719	6,196,659	6,001,490	6,334,236	5,726,606
Total	**5,699,841**	**6,208,892**	**6,018,787**	**6,355,668**	**5,743,832**

Source: Statistical Office, 2014.

Table 8.8: Manufacturing waste, 2008-2012, ton/year

	2008	2009	2010	2011	2012
Chemical and medical waste	117,348	74,661	79,604	59,222	55,542
Recyclable waste	158,811	144,681	129,826	133,329	159,523
Used equipment	5,915	3,592	1,144	3,277	1,921
Animal and vegetable waste	182,708	227,227	213,331	201,557	153,692
Mixed waste	63,627	58,435	42,857	49,299	45,716
Sludges	863	301	981	680	553
Mineral and solidified waste	1,153,597	823,567	667,609	679,245	373,735
Total	**1,682,868**	**1,332,464**	**1,135,352**	**1,126,610**	**790,681**

Source: Statistical Office, 2014.

Construction waste

According to the national legislation, construction waste includes waste generated from construction, reconstruction and maintenance or demolition of buildings, and also excavated material which cannot be used without previous processing.

The estimate share of waste types is as follows: soil from excavation, 75 per cent; waste from construction and demolition (ceramics, concrete, iron, steel, plastic waste), 15–25 per cent; and waste asphalt and concrete, 5–10 per cent.

Construction waste is disposed at disposal sites for municipal waste and is often used as inert material to cover waste at the landfill. Recycling of construction waste does not exist (asphalt is recycled in small quantities), although about 80 per cent of construction waste can be reused. According to the latest survey from the Statistical Office, the construction sector generated 363,706 tons of waste in 2012 and 328,235 tons in 2013 (table 8.9).

Agricultural waste

Agricultural waste in Serbia is defined as waste composed of remains from the agricultural, forestry, food and wood industries. Remains from agriculture can be classified into three main groups: waste generated in crop farming, fruit farming and animal farming. Waste generated in animal farming is actually manure generated by cows, pigs and poultry.

The total amount of agricultural waste produced in Serbia in 2013 was 130,152.26 tons of non-hazardous and 0.03 tons of hazardous waste. Quantities of agricultural waste amount to some 13 million tons annually. However, a large part of this waste is directly reused in the agricultural sector; therefore, it is not included in reported waste. Some subcategories of agricultural waste are not collected, such as animal carcasses and manure waste. Waste management on farms is inadequate (there are no facilities for liquid waste treatment or facilities to store manure), which leads to pollution of watercourses with nutrients.

Table 8.9: Construction and service sectors waste, 2012-2013, ton/year

	2012	2013
Construction	363,706	328,235
Service sectors	238,336	199,132
Wholesale and retail trade; repair of motor vehicles and	64,077	83,846
Transportation and storage	21,225	8,305
Accommodation and food service activities	8,326	6,664
Information and communication	4,378	10,482
Financial and insurance activities	2,495	2,087
Real estate activities	18,059	5,154
Professional, scientific and technical activities	4,650	1,409
Administrative and support service activities	34,367	8,057
Public administration and defense; compulsory social security	10,313	19,142
Education	13,851	14,835
Human health and social work activities	39,729	28,868
Arts, entertainment and recreation	6,551	1,945
Other service activities	10,314	8,338
Total	**602,042**	**527,367**

Source: Statistical Office, 2014.

The World Bank financed a project focused on reduction of pollution of the Danube River with nutrients. Of the 13 countries of the Danube River region, Serbia is ranked second in quantities of phosphates and third in quantities of nitrates released into the Danube River. The main reason is seen in the run-off of untreated liquid waste from large pig farms. The project covered procurement of containers for the storage of manure for a certain number of farms.

Animal waste is generated in slaughterhouses, facilities for meat and fish processing, facilities for animal breeding and farming, and similar facilities. In Serbia, 900 facilities are registered as slaughterhouses and plants for meat processing. According to available data, generation of animal waste in Serbia (slaughterhouse confiscates and carcasses of perished animals) includes 28,000 t/year of perished animals and 245,000 t/year of slaughterhouse waste, of which only approximately 20 per cent is processed in rendering facilities in an organized manner. The rest is disposed of without previous treatment to landfills or is buried. Facilities for animal waste treatment are operating in Baĉka Topola, Ćuprija, Plandište, Sombor, Sremska Mitrovica, Ţitiste, Vrbas and Zrenjanin.

Health-care waste

The existing health-care waste management system in Serbia is focused on the treatment of infectious waste and consists of a network of 31 central treatment points (CTPs) and 24 local treatment points (LTPs) where infectious health-care waste is treated by steam sterilization in autoclaves. The treated infectious waste may then be shredded, depending on whether the CTP or LTP is equipped with a shredder. The treated waste is deposited on dumpsites or in landfills.

CTPs have been established in general hospitals, which are typically in the main town or city within a district. LTPs have been established in the more remote health-care institutions. As they generate large amounts of infectious waste, these need a self-sufficient system in place.

CTPs have been provided with vehicles in order to collect and treat infectious waste from a number of other health-care institutions which do not have their own treatment equipment. In addition to treating their own waste, LTPs typically treat waste from only a few other health-care institutions (if any), which deliver their waste for treatment.

In the period 2007–2009, the EU donated 78 autoclaves (and shredders) to the health-care sector. In the period 2010–2011, an additional 46 autoclaves were donated and installed, in particular in the Institutes of Public Health and the specialized veterinary institutes.

Although a sound and countrywide basis for infectious waste treatment is in place, the system is not yet fully developed and functioning. In theory, the current installed capacity is sufficient to treat all the generated infectious waste. However, various operational and financial problems prevent the system being fully utilized. In 2011, about 65 per cent of all infectious waste was treated, which is one third more than in 2009.

Radioactive waste

Serbia has accumulated radioactive waste and disused sealed radioactive sources from the former Yugoslavia for more than 50 years. It has two research reactors, one operational which has nuclear fuel and one permanently shut down, without nuclear fuel. Mining of uranium was conducted in the Stara Planina Mountains. Exploitation and processing of uranium ore started in the late 1950s and continued until 1969, when the only mine was closed. Additionally, there are multiple waste generators in research facilities, hospitals and universities; some of these were temporarily keeping radioactive waste on their premises, for no longer than one year and only if permitted by licence.

The storage of radioactive waste is operated by the Public Company Nuclear Facilities of Serbia, which is the licence holder for storage of radioactive waste. Accumulated radioactive waste is stored in two light construction hangars (H1 and H-2) and one concrete hangar (H-3). Hangar H-1 was put into operation in 1968 and closed in 1982, and hangar H-2 was put into operation in 1982 and closed in 2012. Both storage facilities are full and do not comply with international standards. Hangar H-3 was put into operation in 2012 and is currently the only storage facility for radioactive waste in Serbia that accepts waste. Secure storage for radioactive sources was built next to Hangar H-3 and was put into operation in 2012. The H-1 building contains almost 800 m^3 of packaged and non-packaged waste:

- 1,500 pieces of 200 l metal (carbon steel) drums;
- 300 pieces of 30 l plastic containers;
- 300 pieces of disused sealed sources (Co-60 and Cs-137) in lead containers;

- An unknown inventory of different kinds of radioactive waste in the drums, as well as some contaminated free-loaded wastes and materials.

Building H-2 contains more than 1,000 m^3 of fully containerized waste and shielded sealed sources:

- 1,000 standard 200 l drums with repacked (compacted) waste from former open pitch repository (the average activity is about 185 MBq/drum);
- 300 standard 200 l drums with very low activity air filters, gathered after the Chernobyl accident;
- 450 standard 200 l drums with waste from various users;
- 31 pieces of 200 l drums with cemented sludge (of 1996) from the reactor spent fuel storage pool (with an average activity about 150 MBq/drum);
- 1,000 spent sealed sources (the total activity inside the containers is 22.2 TBq).

Because Serbia does not yet have a detailed inventory of radioactive waste, these figures should be understood as approximate. A project on a radioactive waste inventory is under preparation.

A new waste storage facility (Hangar H-3) was developed as a response to the need to improve nuclear waste storage standards. Construction of the new storage facility H-3 cost €2.4 million and was completed in November 2010. H-3 includes a storage facility with capacity of 1,700 m^3 of radioactive waste.

The operational licence was issued by the Serbian Radiation Protection and Nuclear Safety Agency in September 2012. A waste processing facility was constructed at this site in the 1980s, but was never commissioned. It was partially upgraded in November 2010 in order to be able to treat waste with low and intermediate levels of radioactivity, but further upgrades are needed. Improving the waste processing facility required an investment of €1 million, including equipment costs.

All radioactive waste can be kept for one year at the premises of the legal entity that generated it, if such a possibility is given in its licence. Otherwise, radioactive waste has to be sent to a radioactive waste storage facility. The Public Company Nuclear Facilities of Serbia is required to report by 31 March all generated radioactive waste for the previous year. These reports are available for 2011, 2012 and 2013. According to these reports, in 2011, a total of 60.3 m^3 of radioactive waste was stored.

This volume is mainly a result of activities regarding repackaging and shipment of spent nuclear fuel. In 2012, 6.2 m^3 of radioactive waste was stored in old radioactive waste storage facilities and 7.9 m^3 in a new radioactive waste storage facility – a total volume of 14.1 m^3. In 2013, a total of 5.8 m^3 of radioactive waste was stored, of which 4.6 m^3 is solid waste and 1.2 m^3 is liquid waste. In addition, 3,158 disused radioactive sources were stored in secure storage for radioactive sources. Records are also available for 2010 but total volume is not listed; only data on acceptance of waste is listed.

The Institute of Nuclear Sciences "Vinča", together with the Public Company Nuclear Facilities of Serbia, has begun to implement the VIND (Vinča Institute Nuclear Decommissioning) Programme, consisting of three projects:

- Spent Fuel Transport;
- Radioactive Waste Management at the Vinča site;
- Decommissioning of RA Reactor.

The Spent Fuel Transport Project was successfully completed in November–December 2010. In an operation coordinated by the International Atomic Energy Agency, 2.5 tons of spent nuclear fuel (around 8,000 fuel elements), left the Vinča Institute on 18 November 2010 and was transported to the Mayak reprocessing facility in Ozersk, Russia, where the fuel will be reprocessed and stored. No further spent fuel or weapons-grade materials remain on the territory of Serbia.

Serbia did not sign the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, or the Convention on Nuclear Safety. These two Conventions set a framework for secure storage of radioactive waste, including transport and the location, design and operation of storage facilities. They are also a platform for exchange of information on radioactive waste management and reporting on achievements.

Export and import of waste

There are high levels of transboundary movement of waste in Serbia. This is due to the central location of Serbia in the Balkans region and its continuing economic relations with countries of the former Yugoslavia. The majority of external trade in waste involves ferrous and non-ferrous scrap metals.

Another strong incentive for moving waste across borders is the lack of suitable waste management facilities, especially for hazardous waste. These factors are reflected in the structure of exported and imported waste.

The export and import of waste, both hazardous and non-hazardous, impacts on waste management in Serbia, increasing the share of recovered materials which would otherwise be disposed of. Serbia's export of hazardous waste has the additional effect of pollution reduction, as this waste would otherwise impact on the environment because uncontrolled disposal sites are still in use in Serbia.

In 2012, about 85 per cent of exported non-hazardous waste is ferrous and non-ferrous scrap metal. The rest is mainly recyclables. About 52 per cent of exports went to the Czech Republic. Significant amounts of waste are exported to Bosnia and Herzegovina, Bulgaria, Croatia, Italy, Romania, Slovenia, the former Yugoslav Republic of Macedonia and Turkey. The majority of exported hazardous waste is accumulators containing lead (35 per cent), used oils (20 per cent) and solid waste from the treatment of natural gas (11 per cent).

The largest share of imported waste in 2012 was iron scrap and other metals (42 per cent), followed by residues from alcohol distillation, and paper and cardboard. Imported waste was generated in Bosnia and Herzegovina, Croatia, Hungary and the former Yugoslav Republic of Macedonia.

In previous years, the main type of waste exported was scrap metal and the country of destination was Albania. Imported waste was mainly scrap metal and aluminium from Hungary, Slovenia and the former Yugoslav Republic of Macedonia. Amounts of imported waste are summarised in table 8.10.

Data on transboundary movement of waste document the import and export of waste, but there is no information on transit. The decrease in exports and imports after 2008 was caused by implementation of the Law on Waste Management, which changed permitting procedures. It is not clear whether the increase in exports in 2012 is the start of a new trend or only a deviation from exported volumes in previous years.

Serbia expressed its acceptance of the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal in 2002 (chapter 5).

8.3 Pressures from waste

Soil

SEPA started to develop the National Inventory of Contaminated Sites in 2006. This inventory includes municipal waste disposal sites along with other potentially polluted sites. As of 2012, 384 potentially and actually contaminated sites have been identified. Preliminary studies have been carried out on all contaminated sites identified up to 2012, while major site investigations have been completed on a lesser number of sites.

The greatest number of registered sources of localized soil pollution is related to municipal waste disposal (43.5 per cent), oil extraction and production (22.5 per cent) and industrial and commercial activities (10.2 per cent). The database of potentially contaminated industrial localities was updated in 2012 (218 localities). The greatest proportion of the soil localities identified as polluted belong to the oil industry (43.1 per cent), followed by the chemical industry (14.7 per cent) and the metal-working industry (9.6 per cent).

Air

Only limited information is available to assess the impact of waste generation, treatment and disposal of waste on the environment. Analyses were focused on areas which were cleaned up from pollution in industrial plants and rehabilitation of the areas covered by solid waste.

In the vicinity of existing industrial (hazardous and non-hazardous) waste disposal sites, no significant effects on air were identified. In the vicinity of unregulated dumps and landfills, increased concentration of particulates in the air and littering by waste from landfills were identified. The risk of fires in unregulated disposal sites is high and emissions from these fires represent a significant threat to air quality.

Table 8.10: Transboundary movements of non-hazardous waste, 2008-2013, tons

	2008	2009	2010	2011	2012	2013
Export	347,493	117,948	161,583	161,073	1,000,073	416,839
Import	55,323	4,360	5,840	205,585	222,520	221,797

Source: Serbian Environmental Protection Agency, 2014.

Water

If a disposal site is located close to a river, it may have a negative impact on the quality of surface water. For example, high concentrations of heavy metals, mineral oils and PCBs were found in samples from the old landfill on Ada Huja and at Vinča in Belgrade. Sediments of the Danube River in the vicinity of the river are also contaminated by these pollutants. Because the majority of disposal sites do not have a geological or artificial barrier, there is a risk of groundwater pollution by leachate and run-offs on the entire territory of Serbia.

This was recognized in the National Environmental Protection Programme, which states that run-offs and leachate from disposal sites for municipal and industrial wastes which do not have water control systems are considered to be one of the largest sources of pollution of surface waters and groundwater in Serbia. There is also a significant threat of water pollution from mine tailings.

8.4 Legal, policy and institutional framework

Legal framework

As an EU candidate country, Serbia is in the process of approximating its waste legislation to the EU waste law. The Law on Waste Management presents a modern view on waste management. It requires the preparation of a national waste management strategy, national plans for specific waste streams, and regional and local waste management plans. Additionally, specific plans have to be prepared for facilities governed by the IPPC Law, as well as operational plans for waste management facilities.

The Law on Waste Management defines requirements on proper waste management, specifically for waste management facilities, selection of a site for a facility, collection and transport of waste, temporary storage of waste, waste treatment and disposal of waste. Detailed requirements are set for the transport of hazardous waste, introducing the cradle-to-grave system.

Special waste streams are regulated according to the producer's responsibility principle, setting specific requirements on import, collection and recovery of accumulators and batteries, oils, tyres, electronics and end-of-life vehicles. The group of special waste streams was extended to include those waste types on which the authorities are focused: fluorescent tubes, PCB-containing equipment, POPs, asbestos, titanium dioxide and packaging waste.

The transboundary movement of waste is regulated in line with the Basel Convention. Import of hazardous waste is prohibited. The Ministry of Agriculture and Environmental Protection issues permits for the export, import and transit of waste.

The Law on Waste Management defines that prices for waste management services should be cost based. For development of waste management infrastructure, earmarked funds are considered as the main source of financing. These earmarked funds are revenues of the Environmental Protection Fund, funds in the Autonomous Province budget, funds of local self-government units, loans, donations and funds of legal and private entities which manage waste, charges and other sources of financing.

The rights and duties of environmental inspectors, defined in the Law on Waste Management, are broad and give a strong mandate to the inspector to enforce the Law. The inspector has, for example, the right to order waste generators to hand waste over to a person authorized for waste disposal/treatment, order closure or remediation of a disposal site, prohibit disposal or treatment of waste or order a generator to start separate collection of waste.

The Law on Waste Management is supported by a number of by-laws, which provide details on waste categorization and record-keeping, incineration of waste, transboundary movement of waste and waste disposal. Several by-laws regulate special waste streams (annex IV).

The Law on Packaging and Packaging Waste regulates management of and reporting on packaging and packaging waste, economic instruments in the form of product charges, and recovery targets for paper, plastics, glass, metal and wood.

Radioactive waste is regulated by the Law on Ionizing Radiation Protection and Nuclear Safety. The Rulebook on radioactive waste management (OG 60/11) prescribes the methods of temporary storage of radioactive waste at the place of its generation; conditions under which the radioactive waste is kept, collected, recorded, stored, processed and disposed; and keeping of records about radioactive waste and deadlines for delivering the records to the Serbian Radiation Protection and Nuclear Safety Agency.

Strategies and policies

The 2003 National Waste Management Strategy for the period 2003–2008 was evaluated in the process of preparation of the 2010 National Waste Management Strategy for the period 2010–2019. This evaluation

shows that achieved results are behind targets set in the 2003 Strategy. Most of the planned measures were not implemented, implemented only locally as a result of municipal initiative, or delayed for several years.

The National Waste Management Strategy for the period 2010–2019 aims to achieve compliance with EU waste management targets. The Strategy's objectives are both short term (2010–2013) and long term (2015– 2019).

Short-term objectives were not fully achieved. Legislation was mostly harmonized with EU legislation, but it is not sufficiently enforced, due to the difficult economic situation in Serbia. Waste management plans for specific waste streams were developed but not adopted, due to changes in the structure of ministries. The envisaged increase of coverage by collection services to 75 per cent was not achieved. A hazardous waste facility was prepared through several international projects, but its construction has not yet commenced. Partial progress was achieved in primary separation of municipal waste. Development of regional waste management plans and the management of animal waste and health-care waste have improved.

Long-term objectives envisage completion of the waste management network by developing an additional 12 regional centres for waste management, increasing the recycling of packaging waste to 25 per cent, and providing capacities for incineration of industrial and health-care waste.

The National Waste Management Strategy for the period 2010–2019 defines individual targets and objectives but lacks information on how to achieve them. Economic instruments aimed at stimulating waste generators to change their practices towards planned objectives are also lacking in the Strategy.

The main environmental goals of the Waterborne Transport Development Strategy for the period 2015–2025 (OG 3/15) include:

- Protecting the Danube River Basin from pollution by inland navigation in order to preserve valuable ecosystems and water resources;
- Establishing the national ship waste management concept and establishing a national coordination body;
- Establishing a cross-border coordinated ship waste management system along the Danube and its tributaries;
- Developing the ship waste collection infrastructure and Danube River fleet modernization;
- Promoting waste prevention and pre-treatment activities on board;
- Developing the network of ship waste reception facilities;
- Integrating river information services (RIS) and ship waste management;
- Developing and testing a (pilot) financing system for collection and disposal of oily and greasy ship waste;
- Promoting activities and cooperation on the international level: legal and administrative preparation of the international treaty/convention regarding ship waste management along the Danube and Sava Rivers.

Licensing of waste management

The Ministry of Agriculture and Environmental Protection, regional and local authorities issue permits for collection, transport, temporary storage, treatment and disposal of waste (table 8.11). Permits for hazardous waste management are issued by the Ministry only, as are permits for activities which extend beyond the territory of a single municipality.

Table 8.11: Number of permits in waste management, 2011-2013

Number of permits	2011	2012	2013
Collection	463	295	209
Transport	549	331	248
Storage	230	161	55
Treatment	199	141	51
Disposal	19	4	0
Total	**1,460**	**932**	**563**

Source: Reports on the state of the environment.

The Law on Waste Management defines the permitting procedure and content of a permit. A permit is valid for a period of 10 years by default. All permits are maintained in a register of permits and are publicly available on SEPA's website.
The number of permits for collection and transport seems to be high, considering that there are 150 municipalities and 24 cities. This high number of licences is caused by the specialization of individual waste streams, and also by industries having their own transportation for waste generated by them. A bigger problem is the low number of licences for waste disposal compared with the reported 164 registered landfills and dumpsites.

Economic instruments

The only economic instrument in waste management used in Serbia is charging users for provided waste collection and disposal services. Waste fees are calculated per square metre of residential or business area. Typically, collection of waste fees is carried out by PUCs that deal with collection, transport and disposal of waste. Fees from households are collected on a monthly basis, whether through a system of joint fees for both waste and utility services (mostly for water consumption), or separately. In larger towns, the joint system of fee collection is used, while separate collection prevails in smaller towns.

The Law on Waste Management introduced the principle of producer's responsibility for products which become special waste after use. This is connected with payment of a fee for placing a product on the market and the fee is used to cover the cost of recycling. Currently, this fee is levied on tyres from motor vehicles, products containing asbestos, batteries or accumulators, mineral and synthetic oils and lubricants, electrical and electronic equipment and passenger cars.

Considering the level of development of the waste management system, it is not yet ready for implementing more sophisticated economic instruments. At the moment, it is important to achieve cost-based pricing for all types of waste and ensure an increased fee collection rate. Additionally, economic instruments supporting the planned changes towards regional waste management and organized landfilling could be considered.

Institutional framework

In April 2014, the Ministry of Agriculture and Environmental Protection was set up on the basis of the former Ministry of Agriculture, Forestry and Water Management and former Ministry of Energy, Development and Environmental Protection (chapter 1).

The Division for Waste Management is part of the Department for Planning and Management on Environment in the organizational structure of the Ministry of Agriculture and Environmental Protection. The Division for Waste Management is responsible for preparation of the national strategy and national waste management plan and plans for special waste streams. It also prepares executive regulations and technical standards for implementation of waste management law. The Ministry approves regional waste management plans except for plans on the territory of the Autonomous Province, issues permits, approvals and confirmations of national importance, and maintains records of them as well as other permits issued by regional and local bodies.

Before April 2014, the former Ministry of Agriculture, Forestry and Water Management was responsible for management of agricultural waste and animal waste. These responsibilities are delegated to the Veterinary Administration, which is responsible for veterinary and sanitary control of waste of animal origin, control of operation of the facilities for production of foods of animal origin (slaughterhouses, dairies), and environmentally sound disposal of carcasses and waste of animal origin as well as the facilities for their treatment.

The Ministry of Health is responsible for management of waste from health-care facilities, management of pharmaceutical waste and sanitary monitoring.

The Ministry of Mining and Energy is responsible for management of waste from exploitation of minerals and waste from energy generation. This includes disposal of coal waste, ashes and slag.

The Environmental Protection Fund, until it was abolished in 2012, financed programmes, projects and other investment and operational activities in the field of waste management, particularly the following: construction of waste management plants, rehabilitation of dumpsites, rehabilitation of hazardous waste disposal sites, modernization of waste management companies, management of special waste flows, introduction of separate waste collection, reduction of waste generation, supporting development of treatment capacities and the recycled materials market. The Fund also financed preparation and implementation of regional waste management plans, development of an IT system for waste management, assisted in development and implementation of new waste treatment technologies and supported other activities enhancing the waste management system.

SEPA maintains and updates the database on waste management in the environmental protection IT system. Regarding special waste streams, SEPA collects data from the entities that perform collection, storage and treatment of all waste categories in this group. It also collects data on the implementation of regional or local waste management plans. Moreover, it collects data from the registers of issued permits, which are set up and maintained by the authorities in charge of permit issuing, and which submit the data from the register to SEPA. It collects the reports on

packaging and packaging waste management from manufacturers, importers, companies which deal with packaging and filling, and others, on the quantities and types of packaging and packaging waste. Based on these data, SEPA issues an annual report on the quantity of manufactured, imported and exported packaging and on packaging waste management. SEPA also prepares reports on the state of soil with key information on contaminated sites management.

The Autonomous Province of Vojvodina participates in preparation of the National Waste Management Strategy and national waste management plans for special wastes, and approves regional waste management plans on its territory. It coordinates and implements waste management activities within the Province and monitors progress on the implementation of waste management plans. It also issues permits, approvals and other documents as defined by the Law on Waste Management, maintains records and submits data to the Ministry.

Each local self-government unit (municipality) is responsible for preparation of a local waste management plan, and creating conditions and support for its implementation. The municipality is responsible for provision of municipal and non-hazardous waste services and for setting fees for these services.

It also issues permits, approvals and other documents as defined by the Law on Waste Management for waste activities on its territory, maintains permit records, and submits data on waste to the Ministry. The municipality has the right to express its opinion on planned investments in waste management infrastructure upon request of the Ministry or Autonomous Province.

Regarding radioactive waste, the Serbian Radiation Protection and Nuclear Safety Agency is responsible for preparation of the Radiation Safety and Security Programme, the Nuclear Safety and Security Programme and Radioactive Waste Management Programme. The Agency issues licences for operation of radioactive waste storage, including conditions of operation, reporting requirements and terms of inspection. It also issues licences for radiation practices, which can include authorization of temporary keeping of radioactive waste at the premises of the legal entity that produced the waste. Licences include conditions for keeping waste, depending on the type of radiation practice or nuclear activity. The duration of keeping must not exceed one year, by which date the waste must be transferred to the central radioactive waste storage.

8.5 Conclusions and recommendations

Information on municipal waste is based on estimations from several municipalities. Although these may provide sufficiently accurate estimations on management of MSW, it is necessary to improve the quality of these data. For example, data on MSW from modern landfills equipped with a weighbridge are not separated from data from other landfills and dumpsites. Moreover, municipal company representatives lack training in collection, verification, validation and submission of data on MSW. Better quality of data would allow the Ministry of Agriculture and Environmental Protection to assess progress on the modernization of MSW services.

The information on disposal of industrial waste is not fully clear, because mining waste disposal, which includes large amounts of tailings and spoils, is reported together with industrial waste deposited to disposal sites and landfills.

Recommendation 8.1:
The Ministry of Agriculture and Environmental Protection together with the Serbian Environmental Protection Agency should improve:

(a) Cooperation with municipalities in the collection and verification of data on municipal waste;
(b) Reporting procedures on all types of waste.

Serbia has improved infrastructure for radioactive waste storage and could benefit from joining international agreements on radioactive waste management. Furthermore, reliable information on radioactive waste generated and stored in Serbia is outdated.

Recommendation 8.2:
The Ministry of Education, Science and Technological Development and the Ministry of Agriculture and Environmental Protection, in cooperation with the Serbian Radiation Protection and Nuclear Safety Agency, should speed up the process of accession to the Convention on Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

One of the limitations in development of the waste sector is insufficient finances for operating waste management services, mostly since the abolition of the Environmental Protection Fund.

It is understood that this is a socially sensitive issue, but the legal requirement to introduce cost-based pricing is not implemented.

Recommendation 8.3:
The Serbian Radiation Protection and Nuclear Safety Agency should carry out a nationwide inventory of radioactive waste.

ANNEXES

Annex I: Implementation of the recommendations in the second Environmental Performance Review

Annex II: Participation of Serbia in multilateral environmental agreements

Annex III: Key data and indicators available for the review

Annex IV: List of major environment-related legislation

Annex V: Ministry of Agriculture and Environmental Protection and subordinated institutions

Annex I

IMPLEMENTATION OF THE RECOMMENDATIONS IN THE SECOND ENVIRONMENTAL PERFORMANCE REVIEW[8]

PART I: POLICYMAKING, PLANNING AND IMPLEMENTATION

Chapter 1: Legal and decision-making framework

Recommendation 1.1:
The Government should:
(a) Strengthen the newly established Ministry of Environmental Protection and ensure that it includes in its competences the protection of natural resources, including water and forests;
(b) Introduce structural changes in all ministries and authorities responsible for integrating environmental requirements into their respective policies;
(c) Strengthen the position of the National Council for Sustainable Development and make it operational, and create a permanent secretariat for its administrative and technical support; and
(d) Strengthen the Environment Protection Agency, to enable it to ensure information systems management as a basis for the strategic, legislative, enforcement and decision-making activities of environmental protection authorities.

(a) The recommendation has been partially implemented. From May 2007 until April 2014 the number of staff has been increased from 209 in 2007 to 290 in 2014. Staff numbers at the Serbian Environmental Protection Agency (SEPA) have increased from 40 to 88 during the same period. In July 2008, the Ministry of Environmental Protection became the Ministry of Environment, Mining and Spatial Planning. In July 2012, the competences on environmental policy were brought under the same roof as the competences on energy policy when a Ministry of Energy, Development and Environmental Protection was established. At that time, certain competences on nature protection were entrusted to the Ministry of Natural Resources, Mining and Spatial Planning. At the end of April 2014, the Ministry of Agriculture and Environmental Protection was formed. Therefore, during these years there was no fully fledged ministry of environmental protection. Until March 2014, competences on water were shared between the Ministry of Agriculture, Forestry and Water Management and the Ministry of Energy, Development and Environmental Protection, whereas competences on forests belonged to the Ministry of Agriculture, Forestry and Water Management. While the restructuring of April 2014 brings environment, water and forests under one ministry – the Ministry of Agriculture and Environmental Protection – it is too early to assess whether this will strengthen the integration of environmental considerations into the forestry and water management sectors.

(b) The recommendation has been partially implemented. As of March 2014, the Group for Environment, Agriculture and Rural Development was a part of the EU Integration Office, dealing with coordination of EU-accession-related issues on environment and climate change in cooperation with the line ministry. The Ministry of Foreign Affairs also included the Section for Human Rights and Environment, facilitating implementation of international environmental commitments in cooperation with the line ministry. The Sector for Emergency Situations of the Ministry of Internal Affairs deals with prevention and management of effects of natural disasters. A Department for Energy Efficiency and Construction Products was established within the then Ministry of Construction and Urban Planning.

(c) The recommendation has not been implemented. In 2007–2008, there was a reform of the National Council for Sustainable Development. In 2008–2011 the Council met four times. Since 2012, it has not met. No permanent secretariat to provide administrative and technical support to the Council was established.

[8] The second review of Serbia was carried out in 2007. During the third review, progress in the implementation of the recommendations in the second review was assessed by the EPR Team based on information provided by the country.

(d) The recommendation has been implemented. As of April 2014, the Serbian Environmental Protection Agency had filled 75 of 88 full-time positions, and had about 20 additional contracted staff. However, the increase in staff was connected with the transfer of responsibilities for air and water quality monitoring from the Hydrometeorological Service to the Agency in 2011 and respective transfer of 48 staff. The budget of the Agency remained largely the same. Since 2008, SEPA has kept the National Register of Pollution Sources. From 2012 the system was fully operational, managing data of the National Pollutant Release and Transfer Register (PRTR) and on waste management, air, water and land emissions, with more than 1,200 operators providing such data regularly (including about 250 on PRTR). SEPA's reporting obligations were also increased to include reporting on GHGs and to the Convention on Long-range Transboundary Air Pollution. However, SEPA's information systems management still does not serve as a basis for the strategic, legislative, enforcement and decision-making activities of environmental protection authorities.

Recommendation 1.2:
The Ministry of Environmental Protection should strengthen its capacity to carry out Strategic Environmental Assessment as envisaged by the Law on Environmental Protection and the Law on Strategic Environmental Assessment.

The recommendation has been implemented. By March 2014, Strategic Environmental Assessment (SEA) procedures had become usual practice for the ministry responsible for environmental protection. At the same time, capacity to carry out SEA at local self-government level is limited.

Recommendation 1.3:
In order to ensure the implementation of the legislation, the Ministry for Environmental Protection should:
(a) Continue to harmonize the legal framework with the European Union (EU) Directives and strive to remove existing inconsistencies and further improve its effective implementation; and
(b) Strengthen the existing unit responsible for environmental legislation, economic instruments and administrative supervision affairs with an adequate number of professional staff.

(a) Implementation of the recommendation is still ongoing. Serbia continues to harmonize its legal framework on environmental protection with EU directives, although the intensity of these efforts varied across thematic areas.

(b) The recommendation has not been implemented. In the period under review, there have been structural changes related to the unit competent for environmental legislation. As of March 2014, the Division for Legislative Harmonization on Energy and Environmental Protection in the Ministry of Energy, Development and Environmental Protection had seven employees.

Recommendation 1.4:
The Government, together with concerned ministries, should:
(a) Reconcile the content of the strategic documents on environment and sustainable development or coordinate their implementation; and
(b) Further develop and adopt the National Strategy for Sustainable Development, the National Strategy for Sustainable Use of Natural Resources and Goods, and the National Programme for Environmental Protection, and consider harmonizing sectoral strategies and action plans with their priorities and goals.

(a) The recommendation has been implemented. The draft National Environmental Protection Programme (NEPP), adopted in 2010, is one of the key documents used in the process of drafting the 2008 National Strategy for Sustainable Development (NSSD). Further strategic documents on the environment, including the 2012 Strategy for Sustainable Use of Natural Resources and Goods, largely rely on the NSSD and NEPP.

(b) The recommendation has been implemented, although room for improvement remains. The NSSD, NEPP and National Strategy for Sustainable Use of Natural Resources and Goods were adopted. Many sectoral strategies make reference to the NSSD. At the same time, actual integration of environmental considerations in sectoral policies is still to be achieved.

Recommendation 1.5:

In order to improve the enforcement of environmental legislation and rules, the Ministry of Environmental Protection should:

(a) Continue strengthening enforcement tools and the capacity of environmental inspection bodies at all levels (republic, province and local);

(b) Promote training programmes for environmental law enforcement, particularly on new legislation and permitting procedures;

(c) Develop, together with the Ministry of Justice, training programmes for judges, state prosecutors and police, to strengthen their capacities in the field of environmental enforcement; and

(d) Collect and make publicly available data on concluded administrative, civil and criminal lawsuits concerning the environment.

(a) The recommendation has been partially implemented. The institutional framework for environmental enforcement has been adjusted both horizontally and vertically in response to increasing complexities arising from new legal requirements (e.g. the package of environmental laws adopted in 2009). Despite frequent reorganizations of the main environmental authority over recent years, the Department for Control and Surveillance (DCS) has enjoyed a certain stability of its core responsibilities. The current structure allows for specialization of inspectors, which has positive repercussions on their capacity to respond to the expanded scope of regulation. Although the number of inspectors at the republic level did not increase, DCS preserved and strengthened its core activities.

A number of training programmes for inspectors have been conducted, mostly in the context of international initiatives as well as through twinning and IPA capacity-building projects. Particularly significant in this sense was the twinning programme with the Austrian Agency for Environmental Protection (2011–2013). Also, training of inspectors on chemicals was provided through projects implemented via the former Serbian Chemicals Agency, in particular the 2008 IPA Serbian–Austrian twinning project "Strengthening Administrative Capacities for the Implementation of a Chemicals Management System" (2010–2012), and Serbian–Swedish cooperation project "Chemicals Risk Management in Serbia" (2008–2014) financed by the Swedish International Development Agency (SIDA) and performed in cooperation with the Swedish Chemicals Agency (KemI). In certain areas, training activities and pilot inspections were realized in synergy between these two projects.

Enforcement capacity problems remain at the local level and many are related to the organization of multi-level environmental governance. Local inspectors are sometimes entrusted with competences on dealing with large and complex (e.g. IPPC) installations, but they are not prepared/trained for this; moreover, no budget is allocated for capacity-building at local level. No regular reporting on permitting and inspection activity at provincial and local level takes place. Lack of information is hampering the evaluation of institutional performance and effectiveness of enforcement instruments nationally. Administrative fines are not currently used by environmental inspectors, despite the law providing for their use. Overall, efforts have been made to maintain and develop the environmental enforcement capacity.

(b) This recommendation was implemented. Serbia was quite active in providing training programmes for different parties within the environmental regulatory (compliance assurance) cycle, including policymakers, permitting authorities, inspectors and industrial operators. Those were mostly conducted through internationally funded capacity-building projects, but national institutions (line ministry, former Chemicals Agency, Chamber of Commerce, municipalities) have been increasingly active in funding and organizing such activities. Areas of particularly intensive effort were implementation of a chemicals and biocidal products management system, hazardous waste management, promotion of new approaches to water protection, new energy-saving requirements for buildings, and chemical accident prevention and control.

(c) The recommendation has been implemented in fact. However, the outcomes of these activities are not so visible yet, since the mutual lack of understanding between environmental inspectors and the judiciary reportedly persists. Since 2007, the judiciary has benefited from more training in environmental laws. Several training activities on environmental crimes were held, drawing representatives from the police and judicial authorities and environmental inspectors, aimed at increasing the awareness of judges and public prosecutors about environmental issues and better enforcement of environmental laws.

For example, the Ministry of Energy, Development and Environmental Protection, in collaboration with the Ministry of Justice, Magistrates' Association, Judicial Centre and OSCE, organized annual training for judicial authorities over the course of three years (2009–2011). Training sessions have been attended by some 500 participants, including 190 judges and 20 prosecutors. Several publications were produced to follow up the training: "Guide to Environmental Legislation for Operators and Other Practitioners", "Guidelines on the Methods of Setting Fines for Environmental Violations – Manual for Misdemeanor Judges", "Procedures on Environmental Violations before Misdemeanor Courts for Misdemeanor Judges and Public Prosecutors", and "Instructions for Recording Environmental Violations intended for Environmental Inspectors".

Recently, the Ministry of Energy, Development and Environmental Protection in collaboration with REC and the Judicial Academy, organized two-day training for judges and prosecutors on the implementation of the right to legal protection in environmental matters. A guide on legal protection on environmental matters intended for civil servants, judges dealing with administrative matters, and representatives of civil society was developed in 2013.

(d) The recommendation has not been implemented yet. Data on concluded administrative, civil and criminal lawsuits concerning the environment are not published and are not available to the environmental inspectors and the general public. Inspectors often fail to be informed about the results of proceedings. According to the Ministry of Justice, access to case records remains restricted to litigants and a small number of interested persons. As part of the national judicial reform strategy, an automated case management programme for courts was developed, connecting all 60 basic and high courts, providing for free access of citizens to case data. This system is not yet operational.

Chapter 2: Information, public participation and education

Recommendation 2.1:
Based on the requirements of the European Environmental Agency (EEA) and European Environment Information and Observation Network (EIONET), the Ministry of Environmental Protection, through its Environment Protection Agency (EPA), should establish an effective and solid network of topic-related reference institutions which would regularly transmit environment-related information to the EPA, which would serve as a national focal point.

The recommendation is implemented. The legislation clearly designates the monitoring functions for the various environmental media and topics to dedicated institutions. It further imposes the requirement on the environmental data and information holders to transmit them to the Serbian Environmental Protection Agency. The legislation is enforced with competent institutions carrying out their functions. As a result, SEPA was able to improve meeting its international reporting obligations from 17 per cent to 78 per cent between 2004 and 2012.

Recommendation 2.2:
(a) The Government should:
- *Consolidate the regulatory framework by adopting by-laws on environmental information systems, including on content and procedures of monitoring, reporting systems, and polluter registers; and*
- *Review environmental monitoring programmes, harmonize them with international requirements, and ensure their full implementation;*

(b) The Ministry of Environmental Protection should enforce self-monitoring of polluters and reporting procedures, and ensure that this information and data are reported to the EPA, and further, to the public.
(c) The Environmental Protection Agency, in cooperation with the Statistical Office, should develop, through cooperation with international institutions, accurate and internationally harmonized national environmental statistics linked with environmental monitoring.

(a) The recommendation is close to being implemented. The regulatory framework was reinforced to clarify the content and procedures for monitoring, reporting and polluter registers, and to orientate the activities on the availability of necessary environmental data and information which is maintained in the environmental information system. Monitoring programmes were established in accordance with the reinforced regulatory framework. At the same time, regulations for soil monitoring are still lacking, as are monitoring programmes for soil and for biodiversity.

(b) The recommendation is implemented. Environmental inspectors verify self-monitoring activities by enterprises and their meeting the reporting obligations to SEPA established under the National Register of Pollution Sources.

(c) This recommendation is implemented. SEPA and the Statistical Office produce environmental statistics in accordance with the internationally harmonized standards, applying, in particular, the standards as promoted and required by EEA and Eurostat respectively.

Recommendation 2.3:
The Ministry of Environmental Protection through its Environment Protection Agency should, with the support of the Government, improve the quality of the state of the environment reporting and disclosure to the public by:

(a) Clearly specifying the coverage of the State of the Environment Reports, in particular by including a section on driving forces and pressures for environmental change, and reconsidering the periodicity of the State of the Environment reports;
(b) Improving ways of reporting on the state of the environment that will more timely follow the political agenda, for instance publishing topic-oriented reports and short briefings on emerging issues; and
(c) Making the information broadly available in a timely manner.

(a) The recommendation is partially implemented. The coverage of the state of the environment report is clear. It addresses the changes undergoing in all key environmental media and, further, speaks about waste, noise and radiation, as well as environmental and economic sectors such as forestry, hunting and fisheries, agriculture, energy, industry and tourism. It discusses the use of natural resources, application of economic instruments and assessment of the implementation of environmental legislation. The analysis is made based on environmental indicators applying the DPSIR (driving forces–pressure–state–impact–response) framework, hence, the driving forces and pressures for environmental change are well addressed in the report. The frequency of the report was not reconsidered and it continues to be published each year.

(b) The recommendation is implemented. Thematic or topic-oriented reports are produced to provide information about the status of a particular environmental medium or to address an emerging issue.

(c) The recommendation is implemented. Environmental data and information are widely available on the Internet. SEPA makes available all the environmental reports it produces. It also publishes data online, such as on real-time air quality, daily water quality, daily and weekly concentration of pollen in the air, and alarm information. Furthermore, the Hydrometeorological Service provides information on water quantity, floods alarms, etc. The Ecoregister was created, which links data and environmental information from some 850 institutions and makes them available through a single user-friendly portal.

Chapter 3: Implementation of international agreements and commitments

Recommendation 3.1:

(a) The Ministry of Environmental Protection should clearly define the country's priorities and objectives in the area of international environmental cooperation, and identify resources for achieving them from both domestic and external sources.

Priorities of bilateral and multilateral cooperation are defined in a number of national documents developed since 2007, e.g. the 2010 National Environmental Protection Programme, the 2008 National Programme for Integration with the EU, the 2011 National Strategy for Implementation of the Aarhus Convention with the Action Plan, the 2013 National Plan for the Adoption of the *Acquis* for the period 2013–2016, the 2011 National Environmental Approximation Strategy, the United Nations Country Partnership Strategy for 2011–2015 and the 2010 Country Programme Action Plan for the period 2011–2015, and the National Biodiversity Strategy for the period 2011–2018.

(b) The Ministry of Environmental Protection, in cooperation with the Development and Aid Coordination Unit of the Ministry of Finance, should develop a system that would allow full accounting of international assistance in the area of environmental protection and promote better coordination of the donor activities in this area, both with the donors and among the governmental agencies and local authorities.

The Ministry of Energy, Development and Environmental Protection participated in the process of drafting the document "Needs of the Republic of Serbia for International Assistance", which defines priorities and activities that should be achieved by international aid and national financing. Also, the Office for European Integration has, in cooperation with relevant ministries, developed the Methodology for Prioritization of Infrastructure Projects which resulted in the national list of infrastructure priority projects. This single list will ensure better coordination of donor activities.

Recommendation 3.2:

(a) The National Assembly should speed up the ratification procedure of the agreements, which the Government has adopted as precedence (See list a).

(b) The Government should proceed with the ratification of agreements for which all the necessary preparatory work is under way (See list b).

(c) In order to ensure the implementation of multilateral environmental agreements (MEAs) for which they have been designated as focal points and competent authorities, the Ministry of Environmental Protection, in cooperation with other relevant ministries and governmental bodies, should elaborate action plans for the implementation of MEAs, build sufficient national capacity, and continue striving to attract international assistance. Participation in the AIMS Network should continue.

List a of recommendation 3.2:

- *UNECE Convention on Environmental Impact Assessment in a Transboundary Context (i.e. Espoo Convention)*
- *Framework Convention on the Protection and Sustainable Development of the Carpathians*
- *Convention on the Conservation of Migratory Species of Wild Animals (Bern Convention)*
- *Convention of Conservation of European Wildlife and natural Habitats (Bonn Convention)*
- *United Nations Convention on Combat Desertification in Countries Experiencing Serious Drought and/or Desertification Particularly in Africa*
- *Kyoto Protocol*
- *UNECE Convention on the Protection and Use of Transboundary Waters and International Lakes (Helsinki Convention)*

List b of recommendation 3.2:

- *UNECE Convention on Access to Information, Public Participation in Decision /making and Access to Justice in Environmental Matters (Aarhus Convention)*
- *Stockholm Convention on Persistent Organic Pollutants (POPs Convention)*
- *Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC Convention)*
- *UNECE Convention on the Transboundary Effects of Industrial Accidents*
- *UNECE Strategic Environmental Assessment (SEA) Protocol*

(a) Serbia has ratified or acceded all agreements in list a.
(b) Serbia has ratified or acceded all agreements in list b.
(c) The following action plans have been elaborated since 2007:
    - National Action Plan for the Implementation and Ratification of the Protocol on Heavy Metals, the Protocol on Persistent Organic Pollutants and the Gothenburg Protocol to CLRTAP Convention;
    - Action Plan for the Implementation of the Aarhus Convention;
    - Action Plan to the Biodiversity Strategy for the period 2011–2018;
    - National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants.

Actions to implement some other MEAs were incorporated the National Environmental Protection Programme and its Action Plan for 2010–2014.

Serbia made progress in building national capacity to implement the ratified MEAs. The country continued attracting international assistance.

Recommendation 3.3:

a) The National Council for Sustainable Development, when approving the National Strategy for Sustainable Development, should ensure that its provisions support implementation of other strategic documents, in particular the National Environmental Strategy.

b) The Government should approve the National Strategy for Sustainable Development and submit it to the National Assembly for adoption (see also Recommendation 1.4).

c) The municipal authorities, when developing and implementing Local Agenda 21, should take advantage of the experience of existing local environmental action plans and take into account lessons learned from implementation of local environmental action plans (LEAPs).

(a) The National Strategy for Sustainable Development as well as a number of sectoral strategic documents were based on the provisions of the National Environmental Protection Programme.

(b) The National Strategy for Sustainable Development for the period 2009–2017 (OG 57/08) was adopted by Government in May 2008, together with an Action Plan for the Implementation of the National Strategy for Sustainable Development.

(c) Since 2007, almost 150 strategies for sustainable development and environmental protection, as well as environmental action plans of cities and municipalities, have been adopted. They have been developed in accordance with the methodology applied in the preparation of local environmental action plans. The experience of existing local environmental action plans and lessons learned from their implementation were taken into account.

PART II: MOBILIZING FINANCIAL RESOURCES FOR ENVIRONMENTAL PROTECTION

Chapter 4: Economic instruments for environmental protection

Recommendation 4.1:

The Ministry of Environmental Protection, in cooperation with major stakeholders, should:

(a) Conduct a thorough review of existing major traditional regulatory and economic instruments for environmental protection, with a view to establishing their current environmental and economic impact;

(b) Explore the scope for complementary use of economic instruments and traditional regulations for reducing pollution; and

(c) Raise pollution charges and regulatory standards in a gradual and predictable fashion, with enterprises receiving sufficient advance notice to be able to reduce adjustment costs and develop efficient approaches for complying with more stringent standards and policies.

(a) The recommendation was not implemented. However, the Government has been aware of the limited impact of economic instruments on environmental pollution.

(b) The recommendation was partially implemented. Pollution charges applied were not complemented by regulations concerning emission limits on air and water pollution. New regulations concerning emission limits adopted in 2012 apply to new facilities only.

(c) The recommendation was partially implemented. Pollution charges have been indexed to inflation. The Government has been reluctant to tighten environmental standards and policies in the face of the difficult economic situation in the industrial sector.

Recommendation 4.2

The Government should:

(a) Develop an action plan for the complete elimination of leaded petrol as well as the progressive reduction of sulphur content in petrol and diesel fuel to current EU requirements of 50 ppm, and announce a target date for achieving these goals as soon as possible;

(b) Introduce effective fiscal incentives which promote unleaded petrol and low-sulphur petrol and diesel;

(c) Design other measures to reduce pollution related to urban transport, such as strict mandatory technical inspections of vehicles (with a focus on exhaust emissions and noise pollution) and temporary fiscal incentives encouraging buyers to purchase new cars and scrap old ones.

4.2 (a) and (b) These two recommendations were implemented. Leaded motor fuel was phased out in 2011. Fuel quality standards have been aligned with EU standards.

4.2 (c) This recommendation has not been implemented. The Rulebook on technical inspection of vehicles, prescribing measures for the use of modern devices to control exhaust gas emissions, has not been adopted yet, hampering the application of standards prescribed for vehicles registered after 1 March 2014. At the same time, the average age of the vehicle fleet in Serbia is over 15 years, and the quality of fuel available on the market has been recently stabilized at a level required in EU countries. Bearing in mind these two facts, it is reasonable to expect that during vehicle technical inspection a large number of vehicles would fail to meet the roadworthiness requirements. The application of stricter standards would deprive a large number of vehicle owners of the right to use them and, with the objective impossibility of owning newer vehicles, the application of stricter standards could negatively affect the socioeconomic aspect.

Recommendation 4.3:
The Ministry of Environmental Protection, in cooperation with the Ministry of Local Self-Government, should support municipalities in the implementation of an effective household waste management policy. This should include guidance and training in basic techniques for calculating cost-reflective waste charges. In order to create incentives for waste minimization, waste charges should, to the extent possible, be proportional to the amount of waste collected. Municipal collection of enterprise waste should be based on the use of standardized bins and the nature of the waste to be collected. All charge rates should be calculated so as to ensure full cost recovery.

The recommendation was not implemented. Tariff-setting for municipal waste services has not changed since 2007. There is no formal tariff-setting methodology; the main aim is to cover the operating costs of public waste companies.

Recommendation 4.4:
The Government should:
(a) Initiate a reform of the tariff system in the water sector by gradually raising tariffs to a level that corresponds to full cost recovery for utility services while using targeted subsidies to address affordability problems;
(b) Strengthen enforcement measures to improve bill collection rates on water services;
(c) Apply water pollution charges on the overall quantity of wastewater discharged and the pollution, not just on pollution above specified limits.

The recommendation is largely not implemented. Income from tariffs in general only covers the operating costs of municipal water companies. Considerable cross-subsidies from enterprises to households have kept water tariffs for households at low levels, providing little incentive for rational use of water resources. Water pollution charges are now based on volumes of wastewater discharged, but charge rates are industry specific and do not yet take into account the specific pollutant contents of wastewater discharges.

Chapter 5: Environmental expenditures and their financing

Recommendation 5.1:
The Government should establish a coherent and comprehensive information and reporting system for environmental protection expenditures and revenues covering the public sector, the business sector and private households, using as a general framework the European System for the Collection of Economic Information on the Environment (SERIEE) developed by the Organisation for Economic Co-operation and Development/Eurostat and the associated Classification of Environmental Protection Activities and Expenditures (CEPA).

The recommendation is partially implemented. There remain large gaps in statistical data on environmental expenditures in both the government and non-government sectors. SEPA reports on expenditures from the central government budget, revenues from environmental fees, environmentally motivated tax incentives and subsidies, and foreign financial assistance, based on available data. However, the Agency does not have systematized data on expenditures from specialized institutions (e.g. public and private companies for waste management, wastewater), as well as some sectors of the economy (e.g. manufacturing).

Recommendation 5.2:
The Government should:

(a) Review its short- and medium-term budget plans with a view to allocating funds for environmental protection that are commensurate with ambitious but realistic policy targets;
(b) Ensure that an adequate share of public revenues is channelled to the Ministry of Environmental Protection, as well as the Environmental Protection Fund;
(c) Ensure that environmental protection is effectively integrated into all major investment projects financed from the National Investment Plan, especially for the energy, transport and agriculture sectors; and
(d) Provide the Environmental Protection Fund with human and financial resources.

The recommendation is not implemented. Government expenditures, including those of the Environmental Protection Fund (which was abolished in September 2012) have remained largely insufficient in view of the investments required for upgrading the environmental infrastructure.

Recommendation 5.3:
The Government should promote legal and institutional arrangements which strengthen the capacity of municipalities to prepare investment projects and which enable greater access to domestic capital markets for financing these projects. This involves, among other things:
(a) Supporting the preparation of multi-annual investment plans for municipal infrastructure development programmes;
(b) Encouraging local self-government units to invest in environmental infrastructure through greater use of loans based on existing legislation on public debt;
(c) Considering the need to relax existing borrowing constraints; and
(d) Developing guidelines and procedures for private-sector involvement in the provision of environmental utility services at the municipal level.

The recommendation is partially implemented. The methodology for selection and prioritization of infrastructure projects for the waste and water sector has been adopted by the Government, and a single project pipeline of priority projects developed, to be funded from the IPA, donors, IFIs and national funds. Further, more detailed planning for the waste sector is developed, including investments, timetable and financing in the period until 2030. Support for the preparation of a multi-annual investment plan for environmental municipal infrastructure for heavy investment related to EU directives in the waste and water sector is planned within the IPA 2013 project (starting at the beginning of 2015). The final planning documents are foreseen to be developed and adopted in 2015–2016. Public debt reached the national limit, which puts constraints on the use of new loans. Municipalities still lack administrative, financial and technical capacities.

Recommendation 5.4:
The Ministry of Agriculture, Forestry and Water Management, in cooperation with the Ministry of Environmental Protection, should reconsider the current system of earmarking water revenues, and optimize their allocation according to national priorities in the water sector.

The recommendation is not implemented. Earmarking of revenues from water charges was abolished as from October 2012, but until that time the compartmentalization of earmarking of revenues was not reformed.

PART III: INTEGRATION OF ENVIRONMENTAL CONCERNS INTO ECONOMIC SECTORS AND PROMOTION OF SUSTAINABLE DEVELOPMENT

Chapter 6: Water management for sustainable development

Recommendation 6.1:
The Ministry of Agriculture, Forestry and Water Management, in cooperation with the Ministry of Environmental Protection, should speed up the drafting of a new Law on Water, taking into account the country's commitments to introducing EU-relevant regulations, including the Water Framework Directive, and provisions of other international multilateral environmental agreements (MEAs), such as the Helsinki Water Convention and the Danube River Protection Convention.

See Recommendation 1.1(a) in Chapter 1.

The recommendation was partially implemented. The Law on Waters has been adopted in 2010, based in most of its provisions on the EU Water Framework Directive and other provisions from MEAs. Further transposition has been done through at least 30 by-laws. However, further EU legislation has to be transposed, such as the Nitrates Directive, Urban Wastewater Treatment Directive and Flood Risk Directive.

Recommendation 6.2:
The Government should provide more scope for municipalities and public water companies for financing enhancements in water infrastructure.

The recommendation was not implemented. Municipalities and their public water companies do not have enough capacities. A political, administrative and financing reform, specifically regarding water resources management, would improve the competencies of local self-governments, which cannot implement the EU subsidiary principle related to water management.

Recommendation 6.3:
The Ministry of Agriculture, Forestry and Water Management, in cooperation with the Ministry of Environmental Protection, should, after the completion of the Joint Danube Survey, carry out with the International Commission for the Protection of the Danube River an assessment of the transboundary impact of upstream countries on the quality of the Danube River entering Serbia.

The recommendation has been implemented. Serbia is a member of the International Commission for the Protection of the Danube River and has already undertaken much of the necessary preparatory and analytical work of the Danube Basin Management Plan according to the Danube River Protection Convention.

Recommendation 6.4:
To ensure good ecological quality of Serbian watercourses, the Ministry of Agriculture, Forestry and Water Management, in cooperation with the Ministry of Environmental Protection, should:
(a) Develop an action plan for the construction of wastewater treatment plants compatible with the EU relevant directives and allocate corresponding funds in the budget;
(b) Request the World Bank to reintroduce nutrient reduction from industrial facilities in the Nutrient Reduction Programme for the Danube River.

The recommendation has not been implemented. Water protection remains one of the main concerns. Coverage of water treatment plants in the country since 2007 is progressing, by more 10 per cent according to official data. Transposition of the Urban Wastewater Treatment Directive has not yet been completed, nor has the Industrial Emissions Directive, continuing the Integrated Pollution Prevention and Control regime.

Recommendation 6.5:
In order to ensure full responsibility for water pollution and to establish polluter databases, the Ministry of Agriculture, Forestry and Water Management, in cooperation with the Ministry of Environmental Protection, should initiate a new set of water pollution charges which stipulates the full application of the "polluter pays" principle.

The recommendation has been partially implemented. Related by-laws have been developed, but in the process of interministerial consultation, there is no positive feedback, because it could have an impact on the standard of living. Besides the Law on Environmental Protection, harmonization with the Law on Communal Utility Activities on the adoption of service pricing related to the polluter-pays principle was not done.

Recommendation 6.6:
To ensure a safe drinking-water supply, the Ministry of Agriculture, Forestry and Water Management, in cooperation with the Ministry of Environmental Protection and the Ministry of Health, within their competencies should:
(a) Complete the drafting of the regulation on the protection of drinking water abstraction, and speed up its adoption and further implementation;
(b) Enforce measures for the protection of sanitary protection zones at water intakes;
(c) Enable municipalities and water-utility companies with the means to improve drinking water treatment facilities;

(d) Call on water utilities to reduce losses in the drinking-water supply network and to provide for metering of the water quantities used in their networks; and
(e) Provide access to safe water for the population in areas without public water supply systems, with a target of reducing to 15 per cent, by 2015, the proportion of the population with no access to safe water, as stipulated in the Millennium Development Goals for Serbia.

a) The recommendation was partially implemented. The Drinking Water Directive has been almost fully transposed, covering all the related issues in urban areas and in a moderate percentage in rural areas. Some non-compliance is still found.
b) The recommendation was partially implemented. A set of regulations, additional to the Law on Waters, has already been adopted: Regulation on limit values for pollutants in surface and groundwaters and sediments and deadlines for their achievement; Regulation on emission limit values for pollutants in water and deadlines for their achievement; Regulation on the approval of the annual programme of monitoring of water status for 2013 (OG 43/13). A draft rulebook on method and conditions for wastewater quantity measurement and quality testing, and the content of the measurement report, is in preparation.
c) The recommendation has not been implemented: 3.54 per cent is the coverage increase since 2007.
d) The recommendation has not been implemented: water losses and non-revenue water is still too high in Serbia, estimated to reach more than 35 per cent.
e) The recommendation has not been implemented: since 2007, coverage has increased 3.54 per cent according to official data.

Chapter 7: Energy and environment

Recommendation 7.1:
To reduce the impact of energy production and consumption on the environment, the Government should:
(a) Ensure fuel switching from the utilization of electricity for space heating to the use of natural gas or connection to district heating systems;
(b) Increase energy efficiency to reduce electricity and heat demand; and
(c) Significantly increase the share of renewable energy sources in primary energy production by 2015.

a) The recommendation was partly implemented. Around 57,000 new consumers have been connected to district heating systems between 2006 and 2010. The implementation is ongoing. No significant fuel switch towards natural gas occurred.
b) The recommendation was partly implemented. The energy consumption targets of the First Energy Efficiency Action Plan of 1.5 per cent energy savings in final energy consumption in the period 2010–2012 have been 80 per cent met. Electricity and heating demand are still very high.
c) The implementation of this recommendation is ongoing. The national target is to increase the share of renewables in final energy consumption from 21.2 per cent in 2009 to 22.9 per cent in 2015 and 27 per cent in 2020. As the adoption of the legal framework was taking a long time, this increase was slowed down, but a series of plants for renewable electricity generation are under construction.

Recommendation 7.2:
The Government, in cooperation with the Energy Agency, should:
(a) Stop subsidizing the energy sector; in particular, it should make electricity prices fully reflective of costs, including the costs of production, grid operation and measures to reduce environmental impacts;
(b) Introduce cost-reflective prices for district heating in cooperation with responsible local authorities. The installation of a metering system should be proposed to allow a switch from area-based to consumption-based pricing as soon as possible. Measures to enlarge or overhaul the network should always include the installation of a metering system; and
(c) Develop special social measures to support vulnerable users.

a) On the energy sector, no funds are allocated from the Budget for subsidizing public enterprises which perform activities related to electric power. As of 1 January 2013, high voltage consumers purchase electricity on the open market; from 1 January 2014, medium voltage consumers will do so, and from 1 January 2015, all remaining users will do so. The draft law on energy provides for changes to the criteria for the category "small customers", so that instead of the number of employees, total annual income and voltage level of the buildings

connected to the electric power distribution system, the criterion will be the amount of electricity consumed annually.

From 1 January 2015, only customers belonging to the category "households" will be entitled to public electricity supply but, in accordance with the given law, at the same date, customers in this category have the right to freely choose a supplier on the market.

The price movements in the open electricity market are regulated by the market itself, according to the laws of supply and demand and market competitiveness. The prices of electricity for public supply are determined based on the Methodology for determining the cost of electricity for public supply (OG 52/13), which is adopted by the Energy Agency on the basis of a mechanism to control prices of electricity for public supply through cost-plus pricing, the mechanism used to determine the maximum allowed revenue of a public supplier for the regulatory period, i.e. the price of electricity for public supply. This ensures that: eligible expenses are covered in the public electricity supply process; the short-term and long-term supply is secured; economic and energy efficiency is encouraged; and there is no discrimination, i.e. there is equal treatment of all system users and prevention of mutual subsidizing of the different activities which are performed by energy entities and between customers and groups of customers.

b) The 2013 Law on Efficient Use of Energy stipulates, among other matters, that the local self-government unit is obliged to include the measured, i.e. actual, amount of provided thermal energy in the tariff system for district heating, as one of the elements for calculating the price of heating services. Under the same Law, the distributors of thermal energy are obliged to apply the mentioned tariff system within 18 months of the date of entry into force of the Law. In order to enable the application of this provision, the Law stipulates that every new building or building unit, e.g. apartment, should be equipped with a device for measuring the actual heat consumption. The same measure is prescribed for the connection of existing buildings to the distribution system.

In relation to the above, under the programme "Rehabilitation of the District Heating System in Serbia" Phase IV, realized in cooperation with the German development bank KfW, all programme participants, i.e. local government units and distributors, are under contractual obligation to implement the tariff system, which will include the actual amount of distributed thermal energy.

The Government adopted the Regulation on the method for determining the highest and the lowest average price of thermal energy (OG 37/13) which prescribed the method for calculation of the price of thermal energy depending on the actual costs incurred by the production and distribution of thermal energy. Through this Regulation, one of the key problems in the operation of heating plants referring to the disparity in prices of thermal energy compared with the price of other energy sources has been solved, which will allow a more regular supply and payment of energy, a better quality and a more regular supply of heat to customers, all with the aim of making the operation of heating plants sustainable.

c) In 2013, the Government adopted the Regulation on protection of vulnerable energy consumers. The process of liberalization of the electricity and natural gas markets in Serbia began with the adoption of the Law on Energy in 2004 and was realized through the adoption of amendments to that Law in 2011, which brought significant changes to the electricity and natural gas markets.

In accordance with the Law, the gradual opening up of the electricity and natural gas markets involves increased competition and introduction of the right of customers to choose their supplier of electricity or natural gas, as well as identifying market conditions for doing transactions, i.e. for achieving price levels that cover justified costs and the necessary development. Due to the need to bring prices of electricity and natural gas to an economic level, the need for internal rationalization of energy undertakings and for improvement of their financial performance while enhancing their competitiveness, it was necessary to relocate the social policy from energy undertakings and take measures to protect customers who, due to the increase in prices of electricity and natural gas, could be brought into a state of vulnerability.

However, despite certain positive and very significant results, these tendencies have led to negative tendencies resulting from several factors. All analyses show that, due to the economic crisis, the technical-technological lagging behind of the Serbian economy and its reduced competitiveness in the international market, the decline

in production in all industries, political instability and the extremely high unemployment rate, a large number of citizens live on the edge of existence, which directly leads to the inability of those citizens to meet their obligations and regularly pay electricity or gas bills. Resolving the issue of protection of vulnerable energy consumers is important, not just for certain vulnerable groups but also for the reform of the energy sector.

Recommendation 7.3:

The Government, in cooperation with the relevant ministries and agencies, should:

(a) Establish an energy efficiency fund as soon as possible for financing measures to improve energy efficiency in industry and households. The fund should be fed with a tax on electricity consumption by industrial customers, and be supplemented by international funding and other funding sources. Companies implementing an energy audit and energy-saving measures could be exempted from this tax;

(b) Introduce energy consumption standards for the construction of new buildings and the renovation of existing buildings; and

(c) Introduce a funding programme to promote insulation measures for residential and public buildings (e.g. soft loans and tax rebates) and to connect flats and buildings to district heating or to the gas grid.

(a) The implementation of the recommendation is ongoing. An energy efficiency fund in the state budget is introduced for 2014 but not yet fully operational. It is fed by the state budget, but by none of the other proposed funding possibilities.

(b) The recommendation is implemented. Standards for building were recently introduced.

(c) The recommendation is partly implemented. The above-mentioned energy efficiency fund will concentrate on residential and public buildings; further funding mechanisms such as fiscal incentives have not been implemented.

Recommendation 7.4:

The Energy Efficiency Agency and the Regional Energy Efficiency Centres should continue and intensify awareness- and capacity-building regarding energy efficiency measures. Public awareness campaigns should show the economic and ecological benefits of reduced fuel consumption.

The recommendation is partly implemented. The Energy Efficiency Agency was working on awareness-raising, but since its closure in 2012 capacities for awareness-raising are reduced significantly. There have been large efforts in training on capacity-building, e.g. on energy efficiency in buildings for engineers.

Recommendation 7.5:

To stimulate both the production and consumption of renewable energy, the Ministry of Mining and Energy should:

(a) Introduce as soon as possible implementing regulations for the Law on Energy to promote electricity and heat production from renewable energies;

(b) Introduce economic incentives, e.g. a feed-in tariff, for electricity produced from renewable energy sources;

(c) Simplify the complex licence procedures for facilities based on renewable energy and establish a one-stop shop to prepare renewable energy projects and offer support to possible investors during the licensing procedure;

(d) Engage itself, in cooperation with other competent ministries and industry representatives, in developing a range of investment projects in the energy, waste, forestry and agricultural sectors which reduce greenhouse gas emissions or enhance sequestration and which are therefore eligible for financial funding from the Clean Development Mechanisms after the Kyoto Protocol has been ratified; and

(e) Designate a body for implementing Clean Development Mechanism projects and entrust it with preparing ready-to-offer projects to investors.

a) The recommendation was implemented to a large extent. The legal framework for production of electricity from renewable sources is adopted, and recommendations for municipalities on incentives to use renewables for heat production is in preparation.

b) The recommendation was implemented. A feed-in tariff was introduced in 2009 and improved in 2013.

c) The recommendation was not implemented. The licensing procedure is still complex and responsibilities are split among many different institutions.

d) The recommendation was implemented. For efficiency, renewable energy and the waste sector, CDM projects were developed and seven projects have been deregistered. Furthermore, Serbia deregistered six NAMAs.
e) The recommendation was implemented. The Designated National Authority is located with the ministry responsible for the environment.

Recommendation 7.6:
The Government should develop measures to further reduce environmental impacts from thermal power plants and refineries on air, soil, ground and surface waters, as well as health impacts on human beings, by introducing best available techniques and abatement technologies, and should find ways to safely dispose of ash deposits.

The recommendation was implemented. The Government developed measures related to the reduction of environmental impacts of energy facilities (BAT implementation and ash deposition) through the adoption of relevant legislative acts: the IPPC Law, Law on Air Protection, Law on Waters, Law on Waste Management (including ash) and relevant secondary legislation. National environmental standards that are applicable for the operation of energy facilities are defined by the various laws (and relevant secondary legislation). The Law on Environmental Protection sets down general principles on environmental protection.

Moreover, Serbia ratified the Energy Community Treaty in 2006. Contracting parties have a binding obligation to implement certain EU directives related to the environment. Besides the Treaty, the legislation consists of various legislative acts that refer to the environmental impact of TPPs and refineries.

Annex II

PARTICIPATION OF SERBIA IN MULTILATERAL ENVIRONMENTAL AGREEMENTS

Worldwide agreements		Serbia	
Year		**Year**	**Status**
1958	(GENEVA) Convention on the Continental Shelf	2001	Su
1958	(GENEVA) Convention on Fishing and Conservation of the Living Resources of the High Seas	2001	Su
1958	(GENEVA) Convention on the Territorial Sea and the Contiguous Zone	2001	Su
1958	(GENEVA) Convention on the High Seas	2001	Su
1961	(PARIS) International Convention for the Protection of New Varieties of Plants	2013	Ac
1963	(VIENNA) Convention on Civil Liability for Nuclear Damage 1997 (VIENNA) Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage	2002	Su
1968	(LONDON, MOSCOW, WASHINGTON) Treaty on the Non-Proliferation of Nuclear Weapons (NPT)	2006	Su
1969	(BRUSSELS) Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties	2006	Su
1971	(RAMSAR) Convention on Wetlands of International Importance Especially as Waterfowl Habitat 1982 (PARIS) Amendment 1987 (REGINA) Amendments	2001	Su
1971	(GENEVA) Convention on Protection against Hazards from Benzene (ILO 136)	2000	Ra
1971	(LONDON, MOSCOW, WASHINGTON) Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-bed and the Ocean Floor and in the Subsoil thereof	2006	Su
1972	(PARIS) Convention concerning the Protection of the World Cultural and Natural Heritage	2001	Su
1972	(LONDON) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1996 (LONDON) Protocol	2006	Su
1972	(LONDON, MOSCOW, WASHINGTON) Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and on their Destruction	2001	Su
1972	(LONDON) International Convention on the International Regulations for Preventing Collisions at Sea	2006	Su
1972	(GENEVA) International Convention for Safe Containers	2006	Su
1973	(WASHINGTON) Convention on International Trade in Endangered Species of Wild Fauna and Flora 1979 (BONN) Amendment 1983 (GABORONE) Amendment	2006 2002 2002	Su At At
1973	(LONDON) Convention for the Prevention of Pollution from Ships (MARPOL) 1978 (LONDON) Protocol relating to the International Convention for the Prevention of Pollution from Ships 1997 (LONDON) Protocol to Amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto	2006 2010	Su Ac
1977	(GENEVA) Convention on Protection of Workers against Occupational Hazards from Air Pollution, Noise and Vibration (ILO 148)	2000	Ra
1979	(BONN) Convention on the Conservation of Migratory Species of Wild Animals 1991 (LONDON) Agreement Conservation of Bats in Europe 1992 (NEW YORK) Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS) 1995 (THE HAGUE) African/Eurasian Migratory Waterbird Agreement (AEWA) 1996 (MONACO) Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS)	2008	Ac

Worldwide agreements		Serbia	
Year		Year	Status
1980	(NEW YORK, VIENNA) Convention on the Physical Protection of Nuclear Material	2002	Su
1981	(GENEVA) Convention Concerning Occupational Safety and Health and the Working Environment (ILO 155)	2000	Ra
1982	(MONTEGO BAY) Convention on the Law of the Sea	2001	Su
	1994 (NEW YORK) Agreement related to the Implementation of Part XI of the Convention	1995	Ra
	1995 (NEW YORK) Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks		
1985	(GENEVA) Convention Concerning Occupational Health Services (ILO 161)	2000	Ra
1985	(VIENNA) Convention for the Protection of the Ozone Layer	2001	Su
	1987 (MONTREAL) Protocol on Substances that Deplete the Ozone Layer	2001	Su
	1990 (LONDON) Amendment to Protocol	2005	Ac
	1992 (COPENHAGEN) Amendment to Protocol	2005	Ac
	1997 (MONTREAL) Amendment to Protocol	2005	Ac
	1999 (BEIJING) Amendment to Protocol	2005	Ac
1986	(GENEVA) Convention Concerning Safety in the Use of Asbestos (ILO 162)	2000	Ra
1986	(VIENNA) Convention on Early Notification of a Nuclear Accident	2002	Su
1986	(VIENNA) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	2002	Su
1989	(BASEL) Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	2000	Ac
	1995 Ban Amendment	2002	At
	1999 (BASEL) Protocol on Liability and Compensation		
1990	(LONDON) Convention on Oil Pollution Preparedness, Response and Cooperation		
1992	(RIO DE JANEIRO) Convention on Biological Diversity	2002	Ra
	2000 (MONTREAL) Cartagena Protocol on Biosafety	2006	Ac
	2010 (NAGOYA) Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization	2011	Si
	2010 (NAGOYA - KUALA LUMPUR) Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety		
1992	(NEW YORK) Unnited Nations Framework Convention on Climate Change	2001	Ac
	1997 (KYOTO) Protocol	2007	Ac
1993	(ROME) Agreement to Promote Compliance with International Conservation and Managament Measures by Fishing Vessels on the High Seas		
1993	(PARIS) Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction	2000	Ac
1994	(VIENNA) Convention on Nuclear Safety		
1994	(PARIS) United Nations Convention to Combat Desertification	2007	Ac
1997	(VIENNA) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management		
1997	(NEW YORK) Convention on the Law of Non-navigational Uses of International Watercourses		
1997	(VIENNA) Convention on Supplementary Compensation for Nuclear Damage		
1998	(ROTTERDAM) Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	2009	Ac
2001	(STOCKHOLM) Convention on Persistent Organic Pollutants	2009	Ra
2001	(LONDON) Convention on Civil Liability for Bunker Oil Pollution Damage	2010	Ac
2004	(LONDON) Convention for the Control and Management of Ships' Ballast Water and Sediments		
2013	(KUMAMOTO) Minamata Convention on Mercury	2014	Si

Ac = Accession; Ad = Adherence; Ap = Approval; At = Acceptance; De = Denounced; Si = Signature; Su = Succession; Ra = Ratification.

Regional and subregional agreements		Serbia	
Year		**Year**	**Status**
1957	(GENEVA) European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)	2001	Su
1958	(GENEVA) Agreement - Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts	2001	Su
1968	(PARIS) European Convention - Protection of Animals during International Transport (revised in 2003)		
	1979 (STRASBOURG) Additional Protocol		
1969	(LONDON) European Convention on the Protection of the Archaeological Heritage (revised in 1992)	2009	Ra
1976	(STRASBOURG) European Convention for the Protection of Animals Kept for Farming Purposes	2001	Ac
1979	(BERN) Convention on the Conservation of European Wildlife and Natural Habitats	2008	Ra
1979	(GENEVA) Convention on Long-range Trans-boundary Air Pollution	2001	Su
	1984 (GENEVA) Protocol - Financing of Co-operative Programme (EMEP)	2001	Su
	1985 (HELSINKI) Protocol - Reduction of Sulphur Emissions by 30%		
	1988 (SOFIA) Protocol - Control of Emissions of Nitrogen Oxides		
	1991 (GENEVA) Protocol - Volatile Organic Compounds		
	1994 (OSLO) Protocol - Further Reduction of Sulphur Emissions		
	1998 (AARHUS) Protocol on Heavy Metals	2012	Ac
	1998 (AARHUS) Protocol on Persistent Organic Pollutants	2012	Ac
	1999 (GOTHENBURG) Protocol to Abate Acidification, Eutrophication and Ground-level Ozone		
1991	(ESPOO) Convention on Environmental Impact Assessment in a Transboundary Context	2007	Ac
	2001 (SOFIA) First Amendment		
	2003 (KIEV) Protocol on Strategic Environmental Assessment	2010	Ra
	2004 (CAVTAT) Second Amendment		
1992	(HELSINKI) Convention on the Protection and Use of Transboundary Watercourses and International Lakes	2010	Ac
	1999 (LONDON) Protocol on Water and Health	2013	Ac
	2003 (MADRID) Amendments to Articles 25 and 26	2010	Ac
1992	(HELSINKI) Convention on the Transboundary Effects of Industrial Accidents	2009	Ac
	2003 (KIEV) Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters		
1993	(OSLO and LUGANO) Convention - Civil Liability for Damage from Activities Dangerous for the Environment		
1994	(SOFIA) The Convention on Co-operation for the Protection and Sustainable Use of the River Danube	2003	Ra
1994	(LISBON) Energy Charter Treaty		
	1994 (LISBON) Protocol on Energy Efficiency and Related Environmental Aspects		
	1998 Amendment to the Trade-Related Provisions of the Energy Charter Treaty		
1998	(AARHUS) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	2009	Ac
	2003 (KIEV) Protocol on Pollutant Release and Transfer Register	2011	Ra
	2005 (ALMATY) Amendment on GMOs		
1998	(STRASBOURG) Convention on the Protection of Environment through Criminal Law		
2000	(FLORENCE) Convention on European Landscape	2011	Ra
2002	(KRANJSKA GORA) Framework Agreement on the Sava River Basin (FASRB)	2004	Ra
	2002 (KRANJSKA GORA) Protocol on the navigation regime	2004	Ra
	2004 (LJUBLJANA) Agreement on the Amendments to the FASRB and the Protocol on the navigation regime	2004	Ra
	2009 (BELGRADE) Protocol on prevention of the water pollution caused by navigation	2009	Si
	2010 (GRADIŠKA) Protocol on flood protection	2010	Si

Ac = Accession; Ad = Adherence; Ap = Approval; At = Acceptance; De = Denounced; Si = Signature; Su = Succession; Ra = Ratification.

Annex III

KEY DATA AND INDICATORS AVAILABLE FOR THE REVIEW

Air pollution	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Emissions of SO_2							
- Total (1,000 t)	287.08	289.64	299.75	290.24	318.33	287.27	..
- by sector (1,000 t)							
Energy	266.78	264.12	277.92	267.29	293.81	263.17	..
Industry	0.76	0.82	0.70	0.89	1.00	1.09	..
Transport	19.11	24.38	20.63	21.78	23.11	22.23	..
Other	0.43	0.33	0.51	0.28	0.41	0.77	..
- per capita (kg/capita)	38.89	39.24	40.61	39.32	43.12	38.92	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	3.92	3.75	4.01	3.86	4.17	3.81	..
Emissions of NO_X (converted to NO_2)							
- Total (1,000 t)	196.15	199.01	199.15	194.84	209.87	208.65	..
- by sector (1,000 t)							
Energy	115.63	117.89	119.56	114.80	128.74	117.34	..
Industry	1.91	1.09	1.04	1.70	2.27	2.46	..
Transport	66.30	69.04	64.86	71.29	73.21	81.96	..
Other	12.30	10.99	13.70	7.04	5.65	6.89	..
- per capita (kg/capita)	26.57	26.96	26.98	26.40	28.43	28.27	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	2.68	2.58	2.66	2.59	2.75	2.76	..
Emissions of ammonia ($NH_{3)}$							
- Total (1,000 t)	101.80	90.13	97.56	82.64	85.24	88.97	..
- by sector (1,000 t)							
Energy	0.05	0.05	0.04	0.05	0.05	0.04	..
Industry	5.67	2.69	2.44	4.51	6.15	6.83	..
Transport	0.46	0.47	0.53	0.56	0.59	0.73	..
Other	95.62	86.92	94.55	77.51	78.44	81.37	..
- per capita (kg/capita)	13.79	12.21	13.22	11.20	11.55	12.05	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	1.39	1.17	1.31	1.10	1.12	1.18	..

Air pollution	2007	2008	2009	2010	2011	2012	2013
Emissions of total suspended particles (TSP)							
- Total (1,000 t)	73.95	53.23	47.32	61.13	72.53	72.29	..
- by sector (1,000 t)							
Energy	23.18	23.25	21.47	21.75	22.71	19.62	..
Industry	44.13	23.83	20.67	34.50	45.16	48.59	..
Transport	2.09	2.25	2.25	2.18	2.25	2.16	..
Other	4.54	3.90	2.94	2.71	2.41	1.92	..
- per capita (kg/capita)	10.02	7.21	6.41	8.28	9.83	9.79	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	1.01	0.69	0.63	0.81	0.95	0.96	..
Emissions of non-methane volatile organic compounds (NMVOC)							
- Total (1,000 t)	161.80	160.39	152.31	154.68	154.65	146.46	..
- by sector (1,000 t)							
Energy	16.43	16.42	14.06	14.87	14.72	12.06	..
Industry	10.61	11.03	9.76	10.17	9.92	8.72	..
Transport	41.32	40.55	35.57	39.83	39.44	38.17	..
Other	93.45	92.40	92.91	89.82	90.57	87.51	..
- per capita (kg/capita)	21.92	21.73	20.63	20.96	20.95	19.84	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	2.21	2.08	2.04	2.06	2.03	1.94	..
Emissions of persistent organic pollutants (PCBs, dioxin/furan and PAH)							
- Total (1,000 t)	769.89	767.97	752.18	750.71	754.37	727.09	..
- by sector (1,000 t)							..
Energy	3.88	3.42	3.19	3.05	3.12	2.73	..
Industry	764.61	763.37	748.17	746.85	750.55	723.86	..
Transport	..	..	..	..	..	..	..
Other	1.41	1.17	0.82	0.80	0.70	0.50	..
- per capita (kg/capita)	5.68	5.67	5.55	5.54	5.57	5.37	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	10.51	9.95	10.06	9.98	9.89	9.63	..
Emissions of heavy metals							
- Total cadmium (t)	2.06	2.19	2.10	2.08	2.12	1.98	..
- Total lead (t)	256.50	269.34	228.68	146.74	160.37	115.49	..
- Total mercury (t)	1.91	1.95	1.85	1.82	1.89	1.66	..
Emissions of CO	..	..	..	..	..	..	..
- Total (t)	393.07	389.91	322.84	347.98	350.49	294.20	..

Source: Serbian Environmental Protection Agency

Climate Change *	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Greenhouse gas emissions (total of CO_2, CH_4, N_2O, CFC, etc.) expressed in CO_2 eq.							
- Total aggregated emissions (1,000 t) without LULUCF	..	..	..	..	..	..	..
- Total aggregated emissions (1,000 t) with LULUCF	..	..	..	..	..	..	..
- by sector (1,000 t)	..	..	..	..	..	..	..
Energy	..	..	..	..	..	..	..
Energy industries	..	..	..	..	..	..	..
Manuafacturing industries and construction	..	..	..	..	..	..	..
Transport	..	..	..	..	..	..	..
Other sectors	..	..	..	..	..	..	..
Other	..	..	..	..	..	..	..
Fugitive emissions	..	..	..	..	..	..	..
Industry	..	..	..	..	..	..	..
Solvent and other product use	..	..	..	..	..	..	..
Agriculture	..	..	..	..	..	..	..
Land use, land use change and forestry (LULUCF)	..	..	..	..	..	..	..
Waste							
Other	..	..	..	..	..	..	..
- per capita (t CO_2 eq/capita)	..	..	..	..	..	..	..
- per unit of GDP (t CO_2 eq/1,000 US$ (2005) PPP)	..	..	..	..	..	..	..
Total emissions (1,000 t) of	..	..	..	..	..	..	..
Cardon dioxide (CO_2)	..	..	..	..	..	..	..
Nitrous Oxide (N_2O)	..	..	..	..	..	..	..
Methane (CH_4)	..	..	..	..	..	..	..
Perfluorocarbons (PFCs)	..	..	..	..	..	..	..
Hydrofluorocarbons (HFCs)	..	..	..	..	..	..	..
Sulfur hexafluoride (SF_6)	..	..	..	..	..	..	..

** these indicators will be available in 2015.*

Ozone layer	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Consumption of ozone-depleting substances (ODS) (t of ODP)	63.80	88.00	29.70	7.80	12.54	10.95	8.06

Source: Ministry of Energy, Development and Environmental Protection

Water	2007	2008	2009	2010	2011	2012	2013
Renewable freshwater resources [1] (million m^3/year)	151,651.9	156,311.0	176,050.0	246,787.2	135,784.0	142,488.0	197,085.0
Gross freshwater abstracted [2] (million m^3/year)	3,957.6	4,013.7	4,126.9	3,885.4	4,233.1	3,869.4	4,152.1
- Share of water losses in total water abstraction (%)	5.1	5.4	5.3	5.6	5.2	6.1 [3]	5.1
Water exploitation index (water abstraction/renewable freshwater resources x 100)	2.6	2.6	2.3	1.6	3.1	2.7	2.1
Total water use by sectors (million m^3)	3,756.8	3,796.5	3,908.2	3,669.2	4,012.3	3,631.3	3,941.9
- Agriculture (ISIC 01-03)	136.8	86.4	85.6	103.6	98.4	137.5	120.8
- Households	354.7	348.0	340.5	330.6	319.5	323.2	324.3
- Mining and quarrying (ISIC 05-09)	8.8	6.5	8.8	10.0	11.1	10.9	13.1
- Manufacturing industry (ISIC 10-33)	132.3	130.0	106.8	98.9	89.2	73.9	71.2
of which water used for cooling	67.9	68.6	49.9	45.3	40.3	20.8	18.2
- Electricity, gas, steam and air conditioning supply (ISIC 35)	3,029.8	3,128.9	3,271.6	3,034.8	3,379.6	2,978.0	3,308.4
- Services (ISIC 45-96)	94.2 [4]	96.7	95.0	91.2	114.6	107.8	104.0
Household water use per capita (l/capita/day)	168.0 [5]	157.0 [5]	150.0 [5]	160.0	155.0	153.0	151.0

[1] Data on Renewable freshwater resources are provided by Republic Hydrometeorological Service of Serbia. In Renewable freshwater resources are included only surface water. (Ground water are

[2] Gross freshwater abstraction represents sum of abstracted water for industry purposes, drinking water and irrigation.

[3] Share of water losses since 2012 included and losses in irrigation network and losses from industry.

[4] Estimation.

[5] Data under revision.

Source: Statistical Office of the Republic of Serbia

Ecosystems and biodiversity	2007	2008	2009	2010	2011	2012	2013
Protected areas							
- Total area (km2)	5,438.71	5,438.71	5,184.39	5,190.39	5,234.30	5,225.59	5,357.06
- Protected areas by IUCN categories (% of national territory)	6.15	6.15	5.87	5.87	5.93	5.92	5.93
Ia Strict Nature Reserve	..	..	..	0.00	0.00	0.00	0.00
Ib Wilderness Area (zakasniks)	..	..	..	0.00	0.00	0.00	0.00
II National Park	..	..	..	0.58	0.58	0.58	0.58
III Natural Monument	..	..	..	0.07	0.07	0.07	0.07
IV Habitat / Species Management Area	..	..	..	1.53	1.53	1.53	1.53
V Protected Landscape / Seascape	..	..	..	2.68	2.68	2.68	2.68
VI Managed Resource Protected Area	..	..	..	0.16	0.16	0.16	0.16
Forests and other wooded land							
- Total area (km^2)	28,800.0	28,800.0	28,800.0	28,800.0	28,800.0	28,800.0	28,800.0
- Total area (% of total land area)	32.0	32.0	32.0	32.0	32.0	32.0	32.0
- Undisturbed by humans (1,000 ha)	1.2	1.2	1.2	1.2	1.2	1.2	1.2
- Semi-natural (1,000 ha)	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0
- Plantation (1,000 ha)	175.0	175.0	175.0	175.0	175.0	175.0	175.0
- Area of regeneration (1,000 ha)	10.5	3.3	2.2	2.2	2.8	2.2	2.2

Ecosystems and biodiversity	2007	2008	2009	2010	2011	2012	2013
Share of threateaned species (IUCN categories) in total number of species:							
- mammals (%)	8.00	8.00	8.00	8.00	8.00	8.00	8.00
- birds (%)	30.00	30.00	30.00	30.00	30.00	30.00	30.00
- fish (%)	12.00	12.00	12.00	12.00	12.00	12.00	12.00
- reptiles (%)	52.00	52.00	52.00	52.00	52.00	52.00	52.00
- vascular plants (%)	3.30	3.30	3.30	3.30	3.30	3.30	3.30

Source: Serbian Environmental Protection Agency

Land resources and soil	2007	2008	2009	2010	2011	2012	2013
Land area (km^2)[1)]	88,361	88,361	88,361	88,361	88,407	88,509	88,502
Built-up and other related area (% of total land area)[1)]	3.28	3.28	3.28	3.28	3.28	3.28	3.28
Built-up and other related area (% of total land area)[2)]	3.41	3.41	3.41	3.41	3.41	3.41	3.41
Soil erosion	..	..	..	..	..	..	..
- % of total land [3)]	86.39	86.39	86.39	86.39	86.39	86.39	86.39
- % of agricultural land	..	..	..	..	..	..	..
Total consumption of mineral fertilizers per unit of agricultural land (kg/ha)	..	..	..	..	..	..	..
Total consumption of organic fertilizers per unit of agricultural land (kg/ha)	..	..	..	..	..	..	..
Total consumption of pesticides per unit of agricultural land (kg/ha)	..	..	..	..	..	..	..

[1)] with Kosovo and Metohija region, according to CLC 2006

[2)] without Kosovo and Metohija region, according to CLC 2006

[3)] based on the available data from last version of Erosion map (1983). All erosion categories included.

Source: Serbian Environmental Protection Agency

Energy	2007	2008	2009	2010	2011	2012	2013 [2)]
Total final energy consumption (TFC) (Mtoe)	8.00	8.41	7.59	8.89	9.25	8.51	9.09
- by fuel							
Coal	0.64	0.94	0.78	1.00	1.27	0.83	0.88
Petroleum	3.15	3.06	2.69	2.71	2.74	2.67	2.96
Gas	0.89	1.03	0.80	0.93	0.91	0.92	1.10
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewables	1.03	1.18	1.17	2.05	1.84	1.83	1.89
- by sector							
Industry [1)]	2.41	2.83	2.04	2.39	2.71	2.45	2.60
Transport	2.58	2.36	2.33	2.24	2.02	1.79	2.03
Agriculture	3.01	3.22	0.11	0.18	0.12	0.18	0.20
Services			0.87	0.93	1.16	0.89	1.00
Households			2.25	3.15	3.25	3.19	3.27

Energy	2007	2008	2009	2010	2011	2012	2013 [2)]
Electricity consumption (million kWh)	25,257.0	27,258.5	26,810.4	27,569.0	27,991.0	27,166.9	27,557.0
Energy intensity TPES/GDP in PPS (ktoe/1,000 Euro PPS [3)])	271.38	236.93	235.42	251.85	250.15	220.74	..

[1)] with construction

[2)] estimation

[3)] The data were downloaded from the website Eurostat.

Source: Serbian Environmental Protection Agency

Transportation	2007	2008	2009	2010	2011	2012	2013
Passenger transport demand (million passenger km)	6,538	6,747	6,226	6,317	6,592	6,606	6,695
by mode:	..	..	..	..	..	..	..
private cars	..	..	..	..	..	..	..
road public transport	4,456	4,719	4,582	4,653	4,652	4,640	4,612
train	687	583	521	522	541	540	612
water transport	..	..	..	..	..	..	..
air transport	1,395	1,445	1,123	1,142	1,399	1,426	1,471
Freight transport demand (million ton km)	8,379	7,877	5,951	7,089	7,249	6,750	7,503
by mode:	..	..	..	..	..	..	..
road	1,161	1,112	1,185	1,689	1,906	2,474	2,823
rail	4,551	4,340	2,967	3,522	3,612	2,769	3,021
pipelines	1,083	1,056	927	1,003	1,005	902	957
inland waterways	1,584	1,369	872	875	726	605	702
Number of passenger cars	1,491,216	1,486,608	1,641,351	1,565,550	1,677,510	1,726,190	1,770,206
Average age of passenger cars	..	..	..	..	..	..	..

Source: Statistical Office of the Republic of Serbia

Waste	2007 [1)]	2008 [2)]	2009 [2)]	2010 [2)]	2011 [2)]	2012 [3)]	2013 [4)]
Waste generation (t)*	..	22,392,677	28,650,675	33,612,340	49,000,210	55,032,727	58,390,651
of which:							
- Hazardous waste (t) *	..	8,327,685	10,026,534	11,161,172	12,794,185	14,457,990	16,762,223
- Non-hazardous industrial waste (t) *	..	14,064,992	18,624,141	22,451,168	36,206,025	40,574,737	41,628,428
Municipal waste (t) [5)]**	2,070,000	2,550,000	2,630,000	2,650,000	2,710,000	2,620,000	2,410,000
of which from households (1,000 m^3)	..	..	..	..	..	..	..

[1)] Data for 2007 does not exist, because in 2007 no research was done on Industrial waste.

[2)] Total waste generation includes data from NACE Sections: B, C and D.

[3)] Total waste generation includes data from NACE Sections: B, C, D and F-S.

[4)] Hazardous and non-hazardous waste includes NACE Sections: B-S.

** Source: Statistical Office of the Republic of Serbia*

[5)] Municipal waste is shown in tons, not in 1,000 m^3 (as required)

*** Source: Serbian Environmental Protection Agency*

Demography and Health	2007	2008	2009	2010	2011	2012	2013
Total population (million inhabitants)	7.38	7.35	7.32	7.29	7.23	7.20	..
Birth rate (per 1,000)	9.20	9.40	9.60	9.40	9.00	9.30	..
Total fertility rate	11.02	11.45	11.88	11.51	10.77	11.40	..
Mortality rate (per 1,000)	12.84	13.50	14.16	13.62	12.54	13.50	..
Infant mortality rate (deaths/1,000 live births)	14.66	15.55	16.44	15.73	14.31	15.60	..
Female life expectancy at birth (years)	16.47	17.60	18.72	17.84	16.08	17.70	..
Male life expectancy at birth (years)	18.29	19.65	21.00	19.95	17.85	19.81	..
Population aged 0-14 years (%)	20.11	21.70	23.28	22.06	19.62	21.91	..
Population ages 15-64 (% of total)	21.93	23.75	25.56	24.17	21.39	24.01	..
Population ages 65 and above (% of total)	23.75	25.80	27.84	26.28	23.16	26.11	..
Proportion of population using an improved drinking water source, total (%)	..	..	..	..	..	..	..
- Urban (%)	..	..	..	98.34	..	98.63	..
- Rural (%)	..	..	..	95.53	..	95.66	..
Population with access to improved sanitation, total (%)	..	..	..	..	..	..	..
- Urban (%)	..	..	..	99.49	..	99.45	..
- Rural (%)	..	..	..	98.93	..	98.85	..

Source: Statistical Office of the Republic of Serbia

Macroeconomic context	2007	2008	2009	2010	2011	2012	2013
GDP	..	..	..	..	..	..	..
- in current prices and PPPs of current year (million National currency)	2,355,066.0	2,744,913.0	2,880,059.0	3,067,210.0	3,407,563.0	3,584,236.0	3,876,403.0
- in current prices and PPPs of current year (million US$)	40,498.9	49,165.3	42,610.5	39,035.1	46,719.1	40,733.6	45,648.5
- in prices and PPPs of 2005 (million US$)	73,235.0	77,165.0	74,761.0	75,198.0	76,252.0	75,478.0	77,429.0
- change over previous year (%)	5.9	5.4	-3.1	0.6	1.4	-1.0	2.6
- change (2005=100)	111.1	117.0	113.4	114.1	115.7	114.5	117.4
- per capita in current prices and PPPs of current year (US$)	10,444.0	11,893.0	11,850.0	11,807.0	12,638.0	12,632.0	13,246.0
- per capita in prices and PPPs of 2005 (US$)	9,921.0	10,498.0	10,212.0	10,313.0	10,541.0	10,484.0	10,808.0
Industrial output (annual 2005=100)	..	..	..	..	..	..	..
Industrial output (% change over previous year)	..	..	..	..	..	..	..
Labour productivity in industry (% change over previous year)	..	..	..	..	..	..	..
Agricultural output (% change over previous year)	..	..	..	..	..	..	..
Share of agriculture in GDP (%)	10.3	10.6	9.3	..	..	..	..
Employment in agriculture (%)	20.8	25.1	23.9	..	..	..	..
Consumer price index (CPI, 2005=100)	118.9	133.6	144.5	153.3	170.4	182.9	197.0
Consumer price index (CPI) (% change over the preceding year, annual average)	6.4	12.4	8.1	6.1	11.1	7.3	7.7
Producer price index (PPI) (% change over the preceding year, annual average)	6.2	13.1	5.6	12.7	14.8	5.6	3.1
Registered unemployment (% of labour force, end of period)	18.1	13.6	16.1	19.2	23.0	23.9	22.1
Labour force participation rate (% of 15-64 year-old)	..	..	..	..	..	..	..

Macroeconomic context	2007	2008	2009	2010	2011	2012	2013
Current account balance	..	..	..	..	..	..	..
- Total (million US$)	-6,889.8	-10,394.8	-2,866.5	-2,550.3	-3,834.4	-4,701.0	-2,789.7
- (as % of GDP)	-17.7	-21.8	-7.1	-6.9	-8.8	-12.4	-6.6
Exports of goods and services (million US$, at prices and PPPs of 2005)	22,357.0	24,456.0	22,773.0	26,191.0	27,501.0	27,722.0	33,619.0
Imports of goods goods and services (million US$, at prices and PPPs of 2005)	41,458.0	46,442.0	37,326.0	38,953.0	42,021.0	42,590.0	46,203.0
Balance of trade in goods and services (million US$, at prices and PPPs of 2005)	-19,101.0	-21,986.0	-14,553.0	-12,762.0	-14,520.0	-14,868.0	-12,584.0
Net foreign direct investment (FDI) (million US$)	..	..	..	..	..	..	..
Net foreign direct investment (FDI) (as % of GDP)	..	..	..	..	..	..	..
Cumulative FDI (million US$)	..	..	..	..	..	..	..
Foreign exchange reserves	..	..	..	..	..	..	..
- Total reserves (million US$)	11,122.9	14,769.2	12,714.6	14,877.2	13,584.8	14,802.9	11,371.5
- Total reserves as months of imports	..	..	..	..	..	..	..
Net external debt (million US$)	..	..	..	..	..	..	..
Ratio of net debt to exports (%)	..	..	..	..	..	..	..
Ratio of net debt to GDP (%)	..	..	..	..	..	..	..
Exchange rate, annual averages (National currency unit/US$)	58.2	55.8	67.6	78.6	72.9	88.0	84.9

Source: UNECE Statistical database 2015

Telecommunications	2007	2008	2009	2010	2011	2012	2013
Telephone lines per 100 population	40.7	41.8	42.8	42.5	42.1	41.5	..
Cellular subscribers per 100 population	114.5	119.7	135.4	136.0	140.8	126.9	..
Personal computer in use per 100 population	..	..	..	..	..	..	..
Internet users per 100 population	..	..	..	..	..	..	..

Source: Statistical Office of the Republic of Serbia

Education	2007	2008	2009	2010	2011	2012	2013
Literacy rate (%)	95.7	96.3	96.7	96.8	97.0	97.4	97.7
Literacy rates of 15-24 years old, both sexes, percentage	98.8	99.1	99.2	99.0	98.9	99.3	99.1

Source: Statistical Office of the Republic of Serbia

Gender Inequality	2007	2008	2009	2010	2011	2012	2013
Share of women employment in the non-agricultural sector (%) [1)]	42.5	42.4	43.7	43.5	43.1	43.1	43.1
Gender Parity Index in							
- Primary education enrolment (ratio)	1.0	1.0	1.0	1.0	1.0	1.0	..
- Secondary education enrolment (ratio)	1.0	1.0	1.0	1.0	1.0	1.0	..
- Tertiary education enrolment (ratio)	1.3	1.3	1.3	1.3	1.3	1.3	..

[1)] Share of females in the non-agricultural sector in total employment in the non-agricultural sector

Source: Statistical Office of the Republic of Serbia

Annex IV

LIST OF MAJOR ENVIRONMENT-RELATED LEGISLATION

Laws

1993
Law on National Parks (OG 9/93, 44/93, 53/93, 67/93, 48/94, 101/05, 36/09)

1997
Law on General Administrative Procedure (OG 33/97, 31/01, 30/10)

1998
Law on International Road Transport (OG 60/98, 5/99, 44/99, 74/99, 4/00, 101/05, 18/10)

2001
Law on Excise Duties (OG 22/01, 73/01, 80/02, 43/03, 72/03, 43/04, 55/04, 135/04, 46/05, 101/05, 61/07, 5/09, 31/09)
Law on Corporate Profit Tax (OG 25/01, 80/02, 43/03, 84/04)

2002
Law Determining Certain Competencies of the Autonomous Province of Vojvodina (OG 6/02, 101/07, 51/09)

2003
Customs Law (OG 73/03, 61/05, 85/05, 62/06, 9/10)

2004
Law on Free Access to Information of Public Importance (OG 120/04, 54/07, 104/09, 36/10)
Law on Environmental Impact Assessment (OG 135/04, 36/09)
Law on Environmental Protection (OG 135/04, 36/09, 72/09 and decision of the Constitutional Court 43/11)
Law on Forest Reproductive Material (OG 135/04, 8/05, 41/09)
Law on Integrated Environmental Pollution Prevention and Control (OG 135/04)
Law on Strategic Environmental Impact Assessment (OG 135/04, 88/10)

2005
Law on Seeds (OG 45/05, 30/10)
Law on Civil Servants (OG 79/05, 81/05, 83/05, 64/07, 67/07, 116/08)
Law on State Administration (OG 79/05, 101/07, 95/10)

2006
Law on Local Self-Government Financing (OG 62/06, 47/11, 93/12)

2007
Law on the Capital City (OG 129/07)
Law on Local Self-Government (OG 129/07)

2008
Law on Personal Data Protection (OG 97/08, 104/09, 68/20, 107/12)

2009
Law on Air Protection (OG 36/09, 10/13)
Law on Biocidal Products (OG 36/09, 88/10, 92/11)

Law on Chemicals (OG 36/09, 88/10, 92/11, 93/12)
Law on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (OG 36/09, 104/13)
Law on Ionizing Radiation Protection and Nuclear Safety (OG 36/09, 93/12)
Law on Nature Protection (OG 36/09, 88/10, 91/10)
Law on Non-ionizing Radiation Protection (OG 36/09)
Law on Protection from Environmental Noise (OG 36/09, 88/10)
Law on the Protection and Sustainable Use of Fish Stocks (OG 36/09, 32/13)
Law on Packaging and Packaging Waste (OG 36/09)
Law on Tourism (OG 36/09, 88/10, 99/11, 93/12)
Law on Waste Management (OG 36/09, 88/10)
Law on Agriculture and Rural Development (OG 41/09, 10/13)
Law on Food Safety (OG 41/09)
Law on Genetically Modified Organisms (OG 41/09)
Law on Associations (OG 51/09)
Law on Municipal Police (OG 51/09)
Law on the Budget System (OG 54/09, 73/10, 101/10, 101/11, 93/12, 62/13, 63/13)
Law on the Fundamentals of the Education System (OG 72/09, 52/11, 55/13)
Law on Planning and Construction (OG 72/09, 81/09, 64/10, 24/11, 121/12 and decisions of Constitutional Court 42/13, 50/13, 54/13)
Law on Social Housing (OG 72/09)
Law on Public Health (OG 72/09)
Law on Environmental Protection Fund (OG 72/09, 101/11)
Law on Emergency Situations (OG 111/09, 92/11, 93/12)
Law on Pipeline Transportation of Gaseous and Liquid Hydrocarbons and Distribution of Gaseous Hydrocarbons (OG 104/09)

2010
Law on Game and Hunting (OG 18/10)
Law on Metrology (OG 30/10)
Law on Air Transport (OG 73/10, 57/11, 93/12)
Law on Meteorological and Hydrological Activities (OG 88/10)
Law on the Transport of Dangerous Goods (OG 88/10)
Law on Navigation and Ports on Inland Waterways (OG 73/10)
Law on Forests (OG 30/10, 93/12)
Law on Waters (OG 30/10, 93/12)

2011
Law on Energy (OG 57/11, 80/11, 93/12, 124/12)
Law on Public Property (OG 72/11)
Law on Administrative Inspection (OG 87/11)
Law on the Prohibition of Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and their Destruction (OG 87/11)
Law on Mining and Geological Exploration (OG 88/11)
Law on Public–Private Partnerships and Concessions (OG 88/11)
Law on Communal Utility Activities (OG 88/11)

2012
Law on the Cessation of the Environmental Protection Fund (OG 93/12)
Law on Public Enterprises (OG 119/12, 116/12, 116/13, 44/14)

2013
Law on Incentives in Agriculture and Rural Development (OG 10/13)
Law on Concluding and Implementing International Agreements (OG 32/13)
Law on Efficient Use of Energy (OG 25/13)
Law on Primary Education (OG 55/13)

2014
Law on Ministries (OG 44/14)

Governmental Regulations

2005
Regulation on controlling the use and trade of wild flora and fauna species (OG 31/05, 45/05, 22/07, 38/08, 9/10, 69/11)
Regulation on the content of the programme of measures for adjustment of existing plants or activities to prescribed conditions (OG 84/05)
Regulation on type of activities and installations to be issued an integrated permit (OG 84/05)
Regulation on the types of pollutants, criteria for calculating compensation for environmental pollution, and amount and method of calculation and payment of fees (OG 113/05, 6/07, 8/10, 15/12, 91/12)

2006
Regulation on the amount of reimbursement of expenses for issuing copies of documents (OG 8/06)
Regulation on conditions for the delivery of natural gas (OG 47/06, 3/10, 48/10)

2008
Regulation on determination of integrated permit application submission dynamics programme (OG 108/08)
Regulation establishing the list of projects for which an environmental impact assessment is mandatory and the list of projects for which EIA can be requested (OG 114/08)

2009
Regulation on the amount and conditions for the allocation of subsidies (OG 88/09, 67/10, 101/10, 86/11, 35/12)
Regulation on determining certain types of hazardous waste that may be imported as secondary raw materials (OG 60/09)
Regulation on the lists for the transboundary movement of waste, the content and layout of documents accompanying the transboundary movement of waste with instructions for their completion (OG 60/09)
Regulation on conditions for acquiring the status of privileged power producers and the criteria for assessing the fulfilment of these conditions (OG 72/09)
Regulation of the amount and terms of the allocation of incentive funds (OG 88/09)
Regulation on establishing the Plan for reducing packaging waste for the period 2010–2014 (OG 88/09)
Regulation on incentive measures for power generation using renewable energy sources and co-generation of heat and power (OG 99/09, 114/12)
Regulations on the procedure for the management of waste tyres (OG 104/09, 81/10)
Regulation on determining the activities which affect the environment (OG 109/09)
Regulation on the criteria for determining the fee for the protection and improvement of the environment and the maximum amount of fees (OG 111/09)
Regulation on the environmental information system, methodology, structure, common ground, categories and levels of data collection, the contents of the information in public access (OG 112/09)

2010
Regulation on the criteria for the calculation of charges for packaging or packaged products and exemption from fees, payers, the amount of fees and the method of calculation and payment of fees (OG 8/10)
Regulation on monitoring conditions and air quality standards (OG 11/10, 75/10, 63/13)
Regulations on the criteria for determining the status of the endangered environment and priorities for rehabilitation and remediation (OG 22/10)
Regulation on detailed criteria, method of calculation and payment of fees for the use of protected areas (OG 43/10)
Regulation on the criteria and method of approving programmes and projects implemented under the Clean Development Mechanism (OG 44/10)
Regulation of products that after use become special waste streams, daily records of the quantity and type of produced and imported products and annual report, the method and time limits for the submission of the annual report by fee payers, the criteria for the calculation, the amount and method of calculation and payment of fees (OG 54/10, 86/11, 15/12)

Regulation on limit values for emissions of air pollutants (OG 71/10, 6/11-corr.)
Regulation on noise indicators, limit values, methods for evaluation of noise indicators, disturbance and adverse effects of environmental noise (OG 75/10)
Regulation on the methodology of data collection for the National Inventory of Accidental Discharges of Persistent Organic Pollutants (OG 76/10)
Regulation on the methodology of data collection for the National Inventory of Greenhouse Gas Emissions (OG 81/10)
Regulation on the programme of systematic monitoring of soil quality, indicators for assessing the risk of soil degradation and the methodology for the development of remediation programmes (OG 88/10)
Regulation on the disposal of waste at landfills (OG 92/10)
Regulations on the procedure for waste fluorescent tubes containing mercury (OG 97/10)
Regulation on the ecological network (OG 102/10)
Regulation on the Implementation Programme of systematic testing of non-ionizing radiation in the environment for the period 2011–2012 (OG 102/10)
Regulation on the list of non-hazardous waste for which a licence is not required, and the documentation accompanying transboundary movement (OG 102/10)
Regulation on the types of waste for which thermal treatment is carried out, and the conditions and criteria for determining the location, technical and technological requirements for the design, construction, equipment and operation of the facility (OG 102/10, 50/12)

2011
Regulation on the structure, methodology development, the method of alignment of the development documents, the manner of conducting public hearings, as well as the manner and conditions of public display of development documents in the area of regional development (OG 15/11)
Regulation on limit values for priority and priority hazardous surface water pollutants and deadlines for their achievement (OG 35/11)
Regulation on determination of zones and agglomerations (OG 58/11, 98/12)
Regulation on the air quality control programme in the national network (OG 58/11)
Regulation on emission limit values for pollutants in water and deadlines for their achievement (OG 67/11, 48/12)
Regulation of the amount and manner of payment of fees for applied geological mineral exploration and other geological resources for year 2012 (OG 100/11)
Regulation on the list of industrial installations and activities for controlling emission of volatile organic compounds, emission values of volatile organic compounds during the certain consumption of solvents and total allowed emissions, and emission reduction scheme (OG 100/11)
Regulation on the level of fee for the use of non-metallic raw materials for production of construction materials in 2012 (OG 100/11)

2012
Regulation on the means for funding or co-funding the programmes of public interest implemented by associations (OG 8/12, 94/13)
Regulation on the annual programme of use of budget funds for forests in 2012 (OG 9/12)
Regulation on the approval of the programme of work for the protection, development and use of agricultural land for 2012 (OG 17/12)
Regulation on the approval of the programme of funding for projects to improve energy efficiency in 2012 (OG 20/12)
Regulation on the adjusted amount of fees for environmental pollution (OG 22/12)
Regulation on the adjusted amount of fees for specific waste streams (OG 23/12)
Regulation on the approval of the General Plan for Flood Protection for the period 2012–2018 (OG 23/12)
Regulation on the protection regime (OG 31/12)
Regulation on limit values for pollutants in surface and groundwaters and sediments and deadlines for their achievement (OG 50/12)
Regulation on the preventive measures for safe and healthy operation because of risk from explosive atmospheres (OG 101/12, 12/13)

2013
Regulation on the allocation and use of funds to subsidize the protected areas of national interest in 2013 (OG 25/13)
Regulation on conditions and procedure for acquiring the status of privileged power producer (OG 8/13)
Regulation on incentive measures for privileged power producers (OG 8/13)
Regulation on the approval of the Water Management Programme for 2013 (OG 12/13, 56/13, 72/13)
Regulation on fees for water in 2013 (OG 16/13)
Regulation on the protection of vulnerable energy consumers (OG 27/13)
Regulation on the Implementation Programme of systematic testing of non-ionizing radiation in the environment for the period 2013–2014 (OG 35/13)
Regulation on the method for determining the highest and the lowest average price of thermal energy (OG 37/13)
Regulation on the approval of the annual programme of monitoring of water status for 2013 (OG 43/13)
Regulation on conditions of delivery and supply of electricity (OG 63/13)
Regulation on the types of products that affect energy consumption, and requiring labelling of energy and other resources (OG 92/13)
Regulation on ozone depleting substances management, as well as on conditions for licence issuance to import and export such substances (OG 114/13)
Regulation on fluorinated greenhouse gases management, as well as on conditions for licence issuance to import and export such gases (OG 120/13)

2014
Regulation on approval of the Programme for financing of activities and measures for the improvement of energy efficiency in 2014 (OG 4/14, 27/14)
Regulation on fees for water in 2014 (OG 15/14)
Regulation on determination of the list of air quality categories in zones and agglomerations (OG 17/14)
Regulation on the approval of the Water Management Programme for 2014 (OG 24/14)
Regulation on limit values for priority and priority hazardous surface water pollutants and deadlines for their achievement (OG 24/14)
Guidelines for participation of civil society in law-making procedures (OG 90/14)

Governmental Decisions

Decision on the establishment of the Council for Sustainable Development (OG 103/03, 12/06, 71/08, 94/08, 05/11)
Decision on determination of boundaries of water bodies (OG 73/10)
Decision on the establishment of list of waters of I category (OG 83/10)
Decision to open the budget for the Water Fund (OG 9/11)
Decision on the establishment of a national conference on water (OG 55/11)
Decision approving the work programme of the Chemicals Agency for 2012 (OG 8/12)
Decision approving the work programme of the Serbian Agency for Radiation Protection and Nuclear Safety for 2012 (OG 25/12)
Decision on the opening of a budget fund for the improvement of energy efficiency (OG 92/13)

Ministerial Rulebooks, Instructions and other documents

1983
Rulebook on the method and minimum number of tests for wastewater quality testing (OG 47/83, 13/ 84)

1994
Rulebook on permitted amounts of hazardous and noxious substances in soil and water for irrigation and methods for their testing (OG 23/94)

1998
Rulebook on the hygiene of drinking water (OG 42/98, 44/99)

2002
Rulebook on the content and data featured in the register of genetically modified organisms and products made of genetically modified organisms (OG 66/02)

2005
Rulebook on the conditions and criteria for the allocation of resources and methods of allocation of funds for financing the activities of general interest in the field of water management (OG 27/05)
Rulebook on the type of equipment and the content and appearance of the sign of environmental inspector (OG 35/05)
Rulebook on public access procedure, presentation and public debate about the environmental impact assessment study (OG 69/05)
Rulebook on the content of the environmental impact assessment study (OG 69/05)
Rulebook on the content, layout and methods of keeping a public register on conducted procedures and decisions made related to environmental impact assessment (OG 69/05)
Rulebook on the content and methods for filing the register of issued integrated permits (OG 69/05)
Rulebook on the work of the technical commission for environmental impact assessment study (OG 69/05)

2006
Rulebook on technical and other requirements for liquid fuels of bio-origin (OG 26/06)

2008
Instructions for projects on energy efficiency in the municipalities (2008)
Rulebook for defining and maintaining the sanitary protection of water supply sources (OG 92/08)

2009
Rulebook on conditions and procedure for obtaining the right to use the eco-label, elements, form and manner of use of environmental labelling of products and services (OG 03/09)
Rulebook on the content of documentation submitted in support of the application for the permit for import, export and transit of waste (OG 60/09, 101/10)
Rulebook on the criteria for determining what can be packaging, with examples of the application of the criteria and the list of Serbian standards relating to basic requirements that packaging must meet for marketing authorization (OG 70/09)
Rulebook on the manner of numbering and use of abbreviations and symbols in the system of identification and labelling of packaging materials (OG 70/09)
Rulebook on the type and annual amount of packaging used for packaged goods placed on the market for which the manufacturer, importer, packager/filler and supplier is not required to provide the management of packaging waste (OG 70/09)
Rulebook on the type of packaging with long service life (OG 70/09)
Rulebook on the application form for a permit for the storage, treatment and disposal of waste (OG 72/09)
Rulebook on the keeping of the register of issued permits for the management of packaging waste (OG 76/09)
Rulebook on the conditions to be met by the manager of the protected area (OG 85/09)
Rulebook on the approval of the programme of systematic monitoring of residues of pharmacological, hormonal and other harmful substances in animals, products of animal origin, food of animal origin and animal feed (OG 91/09)
Rulebook on the content and layout of the permit for the storage, treatment and disposal of waste (OG 96/09)
Rulebook on the transboundary movement and trade in protected species (OG 99/09, 06/14)
Rulebook on the sources of non-ionizing radiation of particular interest, types of sources, manner and time of their examination (OG 104/09)
Rulebook on limits of exposure to non-ionizing radiation (OG 104/09)
Rulebook on the contents of the records of the sources of non-ionizing radiation of special interest (OG 104/09)
Rulebook on the contents and form of the report on systematic testing of the level of non-ionizing radiation in the environment (OG 104/09)
Rulebook on the conditions that must be met by legal persons engaged in a systematic examination of the level of non-ionizing radiation, as well as the manner and methods of systematic examination of the environment (OG 104/09)
Rulebook on the conditions that must be met by legal persons engaged in testing of radiation sources of non-ionizing radiation of particular interest in the environment (OG 104/09)

Rulebook on the preventive measures for safe and healthy operation during exposure to chemicals (OG 106/09)

2010

Rulebook on the proclamation and protection of strictly protected and protected wild species of plants, animals and fungi (OG 5/10, 47/11)
Rulebook on compensation measures (OG 20/10)
Rulebook on the form for the report on the management of packaging and packaging waste (OG 21/10)
Rulebook on the content of air quality plans (OG 21/10)
Rulebook on the content of basic information on biocidal products (OG 23/10, 28/11)
Rulebook on the types of biocidal products (OG 23/10)
Rulebook on criteria for identification of substances such as PBT and vPvB (OG 23/10)
Rulebook on costs of information relating to the protection of the environment (OG 35/10)
Rulebook on criteria for issuing of habitat types, sensitive, vulnerable, rare and protected priority habitat types and on protective measures for their conservation (OG 35/10)
Rulebook on detergents (OG 40/10, 5/12)
Rulebook on the contents of the notification of a new Seveso installation or complex, existing Seveso installation or complex and permanent cessation of a Seveso installation or complex (OG 41/10)
Rulebook on hazardous substances and their amounts and the criteria for determining the types of documents to be drawn up by the operator of a Seveso installation or complex (OG 41/10)
Rulebook on the content of accident prevention policy and content and methodology of safety report and emergency plan development (OG 41/10)
Rulebook on categories, testing and classification of waste (OG 56/10)
Rulebook on the classification, packaging, labelling and advertising of chemicals and certain products (OG 59/10, 25/11, 5/12, 105/13)
Rulebook on the methodology for collecting data on the composition and quantity of municipal waste on the territory of the local government units (OG 61/10)
Rulebook on the classification, packaging, labelling and advertising of chemicals and certain articles according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (OG 64/10, 26/11, 105/13)
Rulebook on conditions for the establishment of a gene bank of wild plants, animals and fungi, the mode of handling of biological materials, the content of the request, the documentation to be submitted with the application for a licence to establish a gene bank (OG 65/10)
Rulebook on specific requirements for packaging, labelling and advertising of biocidal products (OG 59/10, 26/11)
Rulebook on the content of short-term action plans (OG 65/10)
Rulebook on the conditions, manner and procedure for the management of waste oils (OG 71/10)
Rulebook on the monitoring programme to monitor the state of the fish stock in the fishery waters (OG 71/10)
Rulebook on the conditions to be met by a professional organization for noise measurement and documentation to be submitted with the request for authorization for the measurement of noise (OG 72/10)
Rulebook on the methodology for the development of action plans (OG 72/10)
Rulebook on methods of measuring noise and the content and scope of the report on the measurement of noise (OG 72/10)
Rulebook on the methodology for determining the acoustic zones (OG 72/10)
Rulebook on special Technical and technological solutions that enable undisturbed and safe communication of wild animals (OG 72/10)
Rulebook on the contents of the certificate of exemption from the requirement to obtain a licence for the storage of inert and non-hazardous waste (OG 73/10)
Rulebook on the content and format of the application for the issue of water act and content of opinions in the process of issuing water conditions (OG 74/10)
Rulebook on the treatment of waste containing asbestos (OG 75/10)
Rulebook on medical waste management (OG 78/10)
Rulebook on the content and methods of developing strategic noise maps and their display in public (OG 80/10)
Rulebook on the content and manner of keeping the register of protected areas (OG 81/10)
Rulebook on costs of awarding rights to use the eco-label (OG 81/10)
Rulebook about exchange of information about measurement points in the state and the local network, measurement techniques, and ways to exchange data obtained by monitoring the air quality in the state and local area networks (OG 84/10)

Rulebook on the contents, manner of keeping and format of water books (OG 86/10)
Rulebook on manner and procedures for the management of waste batteries and accumulators (OG 86/10)
Rulebook on the import and export of certain hazardous chemicals (OG 89/10, 15/13)
Rulebook on the methodology for the development of national and local registers of sources of pollution, and the methodology for the type, manner and deadlines for data collection (OG 91/10)
Rulebook on the manner of storage, packaging and labelling of hazardous waste (OG 92/10)
Instructions for the establishment of preventive measures for safe keeping, storage or use of particularly hazardous chemicals (OG 94/10)
Rulebook on permits for placing on the market or permits for the use of particularly hazardous chemicals (OG 94/10, 55/11, 15/13)
List of surfactants for which the authorization is issued or act which allows use of surfactants in detergent in the EU is adopted and list of surfactants for which the authorization is rejected and surfactants which are banned in the EU (OG 94/10)
Rulebook on the form of daily records and annual reports on waste with instructions for its completion (OG 95/10)
Rulebook on the manner of administering and appearance of the register of issued permits for waste management (OG 95/10)
Rulebook on determination of surface and groundwater bodies (OG 96/10)
Rulebook on the management of waste fluorescent tubes containing mercury (OG 97/10)
Rulebook on the scope and content of the technical dossier for biocidal products, i.e. low-risk biocidal products (OG 97/10)
Rulebook on the conditions and manner of collection, transport, storage and treatment of waste that is used as raw material or energy recovery (OG 98/10)
Rulebook on the procedure for the management of waste vehicles (OG 98/10)
Rulebook on the list of electrical and electronic products, measures, prohibitions and restrictions on the use of electrical and electronic equipment containing hazardous materials, method, procedure management of waste from electrical and electronic equipment (OG 99/10)
Rulebook for establishing the programme of systematic examination of radioactivity in the environment (OG 100/10)

2011
Rulebook on establishing harmonized fee for environmental pollution (OG 7/11)
Rulebook on contents and manner of keeping the cadastre of water bodies (OG 11/11)
Rulebook on the chemicals adviser and conditions which must be fulfilled by legal person or entrepreneur conducting training and examination for the chemicals adviser (OG 13/11, 28/11, 47/12)
Rulebook on the records of the activities in the field of protection against ionizing radiation (OG 17/11)
Rulebook on reporting and recording of ionizing radiation (OG 25/11)
Rulebook on the manner of keeping records of nuclear materials (OG 27/11)
Common principles for the evaluation of biocidal products on the basis of the technical dossier (OG 28/11)
Rulebook on the manner of keeping records on biocidal products (OG 28/11)
Rulebook on the approval of the programme for additional training and training of occupationally exposed persons and entities responsible for the implementation of protection against ionizing radiation (OG 31/11)
Rulebook on the manner of keeping records on chemicals (OG 31/11)
Rulebook on closer conditions for keeping of hazardous chemical in retail facilities and manner of labelling of these facilities (OG 31/11, 16/12)
Rulebook on manner of conduction of chemicals safety assessment and content of chemicals safety report (OG 37/11)
Rulebook on conditions for obtaining a licence to perform nuclear activities (OG 37/11)
Rulebook of certain hazardous biocidal products that cannot be placed on the market for general use (OG 37/11)
Rulebook on implementation of nuclear activities (OG 37/11)
Rulebook on the national list of indicators of environmental protection (OG 37/11)
Rulebook on the treatment of devices and waste containing PCB (OG 37/11)
Rulebook establishing reclamation areas and their boundaries (OG 38/11)
Rulebook on the control of radioactivity of goods at import, export and transit (OG 44/11)
Rulebook on contents and manner of keeping the water information system (OG 54/11)
Rulebook establishing the boundaries of sub-basins (OG 54/11)

Rulebook on radioactive waste management (OG 60/11)
Rulebook on conditions for obtaining a licence to perform radiation practice (OG 61/11)
Rulebook on conditions for obtaining decision to perform activities in the field of radiation protection (OG 61/11)
Rulebook on energy efficiency in buildings (OG 61/11)
Rulebook on costs for issuing annual permits for recreational fishing (OG 65/11)
Rulebook on the list of POPs, methods and procedures for the management of POPs waste and limits on the concentration of POPs related to the disposal of wastes containing or contaminated with POPs (OG 65/11)
Rulebook establishing reference conditions for surface water body types (OG 67/11)
Rulebook on the approval of the programme for timely notification of an accident (OG 70/11)
Rulebook on the parameters of the ecological and chemical status of surface waters and the parameters of the chemical and quantitative status of groundwater (OG 74/11)
Rulebook on the limits of the radionuclide content in drinking water, food, fodder, medicines, articles of common use, building materials and other goods that are placed on the market (OG 86/11, 97/13)
Rulebook on limits of exposure to ionizing radiation and measurements to assess the level of exposure to ionizing radiation (OG 86/11)
Rulebook on radioactivity monitoring (OG 97/11)
Rulebook on the registration of sources of ionizing radiation, personnel exposed to ionizing radiation, the exposure of patients to ionizing radiation and radioactive waste (OG 97/11)
Rulebook on the content of the safety data sheet (OG 100/11)
Rulebook on the chemicals register (OG 100/11, 16/12, 47/12, 15/13, 115/13)

2012
Rulebook on the application of ionizing radiation in medicine (OG 1/12)
Rulebook on conditions for issuing a permit for air quality measurement and a permit for measurement of emissions from stationary sources of pollution (OG 1/12)
Rulebook on the procedure for the management of waste from titanium dioxide, and measures of surveillance and environmental monitoring at the location (OG 1/12)
Rulebook on technical measures and requirements relating to allowed emission factors for volatile organic compounds resulting from the storage and transport of petrol (OG 1/12, 25/12, 48/12)
Rulebook on determining the methodology for making a preliminary assessment of flood risk (OG 1/12)
Rulebook on technical and other requirements for plastic bags with additive oxidative degradation and biodegradation, on conformity assessment and the conditions to be met by designated body (OG 3/12)
Rulebook on the form and content of official identification, appearance and content of the sign, type of equipment and appearance of the uniform of a water inspector (OG 4/12)
Rulebook on the classification of fishing waters (OG 10/12)
Rulebook on conditions for issuing consents to operators for air quality measurement and/or measurement of emissions from stationary sources of pollution (OG 16/12)
Rulebook on the content of the information about hazards, measures and actions in the event of accident (OG 18/12)
List of biocidal products included in the Register of biocidal products (OG 28/12)
Rulebook on classification of motor vehicles and trailers, and their traffic technical specifications (OG 40/12, 102/12, 19/13, 41/13)
Rulebook on the approval of the annual programme of geological survey for 2012 (OG 46/12)
Rulebook on the content and application form for use in a closed system of genetically modified organisms, the way of protecting confidential data in applications, and the content of application for renewal of permits for use in closed systems (OG 69/12)
Rulebook on the methodology for elaboration and content of accident protection plan (OG 82/12)
Rulebook on the methodology for elaboration of risk assessment and protection and rescue plans in emergency situations (OG 96/12)
Rulebook on technical and other requirements for liquid fuels of petroleum origin (OG 123/12)

2013
Rulebook on types and quantities of hazardous substances, facilities and other criteria on the basis of which the accident protection plan shall be drafted and measures taken to prevent accidents and limit the impact of the accident on human life and health, material goods and the environment (OG 8/13)

Rulebook on the procedure of notification and exchange of information on a Seveso installation or complex whose activities may lead to chemical accidents with transboundary effects (OG 26/13)
Rulebook on the use of incentives for organic production (OG 38/13)
Rulebook on the content and manner of the keeping the Register of the companies and other legal persons handling dangerous substances (OG 53/13)
Rulebook on incentives for the conservation of plant genetic resources (OG 85/13)
Rulebook on incentives for conservation of animal genetic resources (OG 83/13)
Rulebook on bans and restrictions on the production, use and placing on the market of chemicals (OG 90/13)
List of substances of very high concern (OG 94/13)
Rulebook on the evaluation criteria and procedure of categorization of protected areas (OG 103/13)
Rulebook on the method of calculation and payment of fees for issuing act on the conditions of nature protection (OG 110/13)
Rulebook on methods for testing of chemicals' hazardous properties (OG 117/13)

2014
Rulebook on energy efficiency labelling of air conditioning (OG 25/14)
Rulebook on List of classified substances (OG 48/14)

Strategies, plans, programmes

Water Masterplan (OG 11/02)
National Strategy for Poverty Reduction (2003)
Energy Sector Development Strategy until 2015 (OG 44/05)
Agriculture Development Strategy (OG 78/05)
Forestry Development Strategy (2006)
Regional Development Strategy 2007–2012 (2007)
National Strategy for Sustainable Development (OG 57/08)
National Programme for Integration with the European Union for the period 2008–2012 (2008)
Programme of Implementation of the Energy Sector Development Strategy until 2015 for the period 2007–2012 (OG 17/07, 73/07, 99/09)
Strategy of Railway, Road, Inland Waterway, Air and Intermodal Transport Development for the period 2008–2015 (2008)
National Strategy for Cleaner Production (OG 17/09)
Children's Environment and Health Action Plan for the period 2009–2019 (OG 83/09)
Strategy for the Development of Electronic Government for the period 2009–2013 (OG 83/09, 5/10)
Plan on the Minimization of Waste Packaging in 2010–2014 (OG 88/09)
Public Health Strategy (2009)
Strategy for Safety and Health at Work 2009–2012 (2009)
Spatial Planning Strategy for the period 2009–2013–2020 (2009)
National Strategy for Incorporation into the Clean Development Mechanism of the Kyoto Protocol for the waste management, agriculture and forestry sectors (OG 8/10)
National Environmental Protection Programme (OG 12/10)
National Strategy for Scientific and Technological Development for the period 2010–2015 (OG 13/10)
National Waste Management Strategy for the period 2010–2019 (OG 29/10)
Strategy of Information Society until 2020 (OG 51/10)
Biomass Action Plan for the period 2010–2012 (OG 56/10)
National Programme for Agriculture 2010–2013 (OG 83/10)
Spatial Plan for the period 2010–2020 (OG 88/10)
First Energy Efficiency Action Plan for the period 2010–2012 (2010)
Biodiversity Strategy for the period 2011–2018 (OG 13/11)
National Rural Development Programme 2011–2013 (OG 15/11)
Action Plan for the implementation of the National Sustainable Development Strategy 2011–2017 (OG 62/11)
Strategy for the implementation of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters – the Aarhus Convention (OG 103/11)
Communication Strategy for the Accession to the EU (2011)
National Environmental Approximation Strategy (OG 80/11)
National Strategy for Protection and Rescue in Emergency Situations (2011)

National Strategy for Sustainable Use of Natural Resources and Goods (OG 33/12)
Education Strategy until 2020 (OG 107/12)
National Plan for the Adoption of the *Acquis* for the period 2013–2016 (2013)
Operational Plan for flood protection for 2013 (OG 8/13)
Air Quality Plan for Bor (OG Bor 7/13)
Second Energy Efficiency Action Plan for the period 2013–2015 (2013)
National Renewable Energy Action Plan (2013)
Operational Plan for Flood Protection for 2014 (OG 4/14)
Nuclear Safety and Security Programme (OG 39/14)
Strategy for Agriculture and Rural Development for the period 2014–2024 (OG 85/14)
Waterborne Transport Development Strategy for the period 2015–2025 (3/15)

Annex V

MINISTRY OF AGRICULTURE AND ENVIRONMENTAL PROTECTION AND SUBORDINATED INSTITUTIONS

Ministry of Agriculture and Environmental Protection

1. Department for Agricultural Policy
- 1.1. Section for Plant Production and Processing of Plant Products
  - 1.1.1. Group for Crop Farming
  - 1.1.2. Group for Fruit Farming, Vegetable Farming and Alcoholic Beverages
- 1.2. Section for Analytics and Statistics
- 1.3. Group for Quality, Declaration and Labelling of Food
- 1.4. Group for Animal Husbandry and Processing of Livestock Products
- 1.5. Group for Viticulture and Wine-growing

2. Department for Rural Development
- 2.1. Division for Rural Development
  - 2.1.1. Section for Programming and Promotion of Rural Development
    - 2.1.1.1. Group for Planning of Measures for Rural Development
    - 2.1.1.2. Group for Rural Development Support
  - 2.1.2. Advisory Group

3. Department for International Cooperation
- 3.1. Division for European Integration, Multilateral and Bilateral Cooperation in the Field of Agriculture
  - 3.1.1. Group for European Integration and International Multilateral Cooperation on Food Safety, Veterinary and Phytosanitary Affairs, and Fisheries
  - 3.1.2. Group for European Integration and International Multilateral Cooperation on Agriculture and Rural Development, Forestry and Water Management
  - 3.1.3. Group for Bilateral and Regional Cooperation in the Field of Agriculture
- 3.2. Division for European Integration and International Cooperation in the Field of Environment
  - 3.2.1. Section for European Integration in the Field of Environment
  - 3.2.2. Section for International Cooperation and Sustainable Development in the Field of Environment
- 3.3. Division for Project Management in the Field of Agriculture
  - 3.3.1. Group for Preparation of EU Funded Projects and International Assistance in the Field of Agriculture
  - 3.3.2. Group for Implementation and Monitoring of Implementation of EU Funded Projects and International Assistance in the Field of Agriculture
- 3.4. Division for Project Management in the Field of Environment
  - 3.4.1. Section for EU Funded Project Preparation and International Assistance in the Field of Environment
  - 3.4.2. Section for Implementation and Monitoring of EU Funded Projects and International Assistance in the Field of Environment
- 3.5. Section for Climate Change

4. Department for Legal and Regulatory Issues
- 4.1. Division for Regulatory Affairs and Legislative Harmonization in the Field of Agriculture
- 4.2. Division for Regulatory Affairs and Legislative Harmonization in the Field of Environment
- 4.3. Section for Human Resources
- 4.4. Section for Training and Development
- 4.5. Group for Administrative Affairs in the Field of Agriculture

4.6. Section for Administrative and Supervisory Affairs in the Field of Environmental Protection
4.7. Group for Legal Affairs

5. Department for Financial Management
5.1. Division for Economic and Financial Affairs
5.2. Division for Financial Programmes and Projects Monitoring in the Field of Environment
5.3. Group for Implementation and Credit Support in the Field of Agriculture
5.4. Group for Planning and Reporting on Public Procurement
5.5. Group for Monitoring and Implementation of Public Procurement
5.6. Section for Economic Instruments in the Field of Environmental Protection

6. Department for Environmental Protection
6.1. Division for Protected Areas and Ecological Network
6.1.1. Section for Protected Areas
6.1.2. Section for Ecological Network and Admissibility Assessment
6.2. Division for Permits in the Area of Biodiversity Protection
6.2.1. Section for Protection and Sustainable Use of Fish Stocks
6.2.2. Group for Permits for Collection, Use and Trade in Protected Species of Wild Flora and Fauna
6.2.3. Group for Implementation of CITES Convention
6.3. Division for Protection of Natural Resources
6.3.1. Group for Sustainable Use of Natural Resources
6.3.2. Section for Water Protection
6.3.3. Section for Protection of Air and Ozone Layer
6.3.4. Group for Soil Protection and Monitoring, Rehabilitation and Remediation of Consequences of Erosion and Torrents on the Environment

7. Department for Planning and Management on Environment
7.1. Section for Planning and Standards
7.1.1. Group for Strategic, Programme and Planning Documents
7.1.2. Group for Standards and Clean Production
7.2. Division for Environmental Impact Assessment
7.2.1. Group for Strategic Environmental Impact Assessment
7.2.2. Section for Environmental Impact Assessment of Projects and Activities
7.3. Division for Integrated Permits
7.4. Section for Protection from Large Chemical Accidents
7.5. Division for Waste Management
7.5.1. Section for Transboundary Movement of Waste
7.5.2. Section for Waste Management Permits
7.5.3. Section for Development of Waste Management System
7.6. Division for Chemicals
7.6.1. Section for Chemicals Management
7.6.2. Section for Integrated Chemicals Registry
7.6.3. Section for Risk Management of Biocidal Products
7.6.4. Group for Chemicals and Biocidal Products Hazard Assessment, Classification and Communication
7.7. Section for Protection against Noise, Vibration and Non-Ionizing Radiation

8. Department for Environmental Inspection
8.1. Division for Prevention and Control of Environmental Pollution
8.1.1. Section for Integrated Prevention and Control of Environmental Pollution
8.1.2. Section for Prevention of Environmental Pollution
8.2. Division for Protection of Soil, Ground and Surface Waters from Pollution
8.2.1. Section for Protection of Soil and Groundwater from Pollution
8.2.2. Section for Protection of Surface Water from Pollution
8.3. Division for Large Chemical Accidents, Chemical and Biocidal Products
8.3.1. Section for Large Chemical Accidents
8.3.2. Section for Chemical and Biocidal Products

8.4. Division for Protection from Ionizing and Non-Ionizing Radiation
8.5. Division for Waste Management Control
8.6. Division for Environmental Protection in the Field of Protection and Use of Natural Resources
8.7. Division for Environmental Protection in the Field of Protection of Fish Stocks

9. Department for Agricultural Inspection
9.1. Division for Agricultural Inspection for Agricultural Land
9.2. Division for Agricultural Inspection for Control of Pesticides in Agriculture, Organic Farming and Animal Husbandary
9.2.1. Group for Agricultural Inspection for Control of Pesticides in Agriculture and Animal Husbandary
9.2.2. Group for Agricultural Inspection for Organic Farming
9.3. Division of Agricultural Inspection for Food Safety and Control of Tobacco Producers and Manufacturers of Tobacco Products
9.4. Division for Agricultural Inspection for Wine, Brandy, Alcoholic and Non-Alcoholic Beverages
9.5. Group for Maintenance of Central Register

10. Secretariat
10.1. Section for General Affairs
10.2. Group for Administrative and Technical Affairs
10.3. Group for Information Technologies

11. Cabinet of the Minister

PUBLIC ADMINISTRATION AUTHORITIES WITHIN THE MINISTRY:

1. Plant Protection Administration
1.1. Section for Legal, General and Financial Affairs
1.2. Division for Plant Health and Quarantine
1.3. Division for Plant Protection and Nutrition
1.4. Division for Varietals
1.5. Group for Protection of Plant Varieties and Biological Safety
1.6. Group for Seeds and Seedlings
1.7. Division for Phytosanitary Inspection
1.8. Division for Phytosanitary Border Inspection

2. Forest Administration
2.1. Division for Participation in Strategic Planning and Sustainable Development in the Field of Forestry and Hunting
2.2. Section for Implementation Measures for Forestry and Hunting Improvement
2.3. Division for Forestry and Hunting Inspection

3. Veterinary Administration
3.1. Division for the Protection of Health, Wellbeing and Traceability of Animals
3.2. Section for Registration of Veterinary Organizations and Services
3.3. Division for Veterinary Public Health
3.4. Division for International Trade and Certification
3.5. Section for Legal and General Affairs
3.6. Section for Financial and Resource Affairs
3.7. Division for Veterinary Inspection
3.8. Division for Veterinary Border Inspection

4. Agricultural Land Administration

5. Republic Directorate for Water
5.1. Section for Administrative and Analytical Affairs and Standards in the Field of Water
5.2. Division for Legal, Financial and Administrative Affairs

5.3. Group for Participation in Strategic Planning and Management
5.4. Group for International Cooperation in the Field of Water
5.5. Group for Development and Use of Water and Protection of Water from Pollution
5.6. Group for the Management of Watercourses and Protection from Adverse Effects of Water
5.7. Division for Water Inspection

6. Directorate for Agrarian Payments

7. Directorate for National Reference Laboratories

8. Environmental Protection Agency
8.1. Department for Environmental Quality Control
8.1.1. Division for Air Quality Control
8.1.1.1. Section for Monitoring and Status of Air Quality
8.1.1.2. Group for Monitoring and Status of Pollen Allergy
8.1.2. Division for Water, Sediments and Soil Quality Control
8.1.2.1. Section for Monitoring and Water Quality and Sediments Control
8.1.2.2. Section for Water and Sediments Quality Control – Novi Sad
8.2. Department for State of the Environment
8.2.1. Division for Indicators, Reporting and Information System
8.2.1.1. Section for Indicators and Reporting
8.2.1.2. Section for Information System
8.2.2. Division for National Pollution Sources Register
8.2.3. Group for Non-Ionizing Radiation and Environmental Noise
8.3. Division for National Laboratory
8.3.1. Section for General Analytical Chemistry
8.3.2. Section for Instrumental Analytical Chemistry
8.3.3. Group for Calibration Laboratory
8.3.4. Group for Economic and Financial Issues
8.4. Section for Legal Affairs and Human Resources

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Serbia

Environmental Performance Reviews

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 Environmental Performance Review Programme assists countries to improve their environmental policies by making concrete recommendations for better policy design and implementation. Environmental Performance Reviews help to integrate environmental policies into sector-specific policies such as those in agriculture, energy, transport and health. Through the peer review process, the reviews promote dialogue among Governments about the effectiveness of environmental policies as well as the exchange of practical experience in implementing sustainable development and green economy initiatives. They also promote greater Government accountability to the public.

The third Environmental Performance Review of Serbia examines the progress made by the country in the management of its environment since the country was reviewed in 2007 for the second time. It assesses the implementation of the recommendations contained in the second review. The third review covers policymaking, implementation and the financing of environmental policies and projects. It discusses waste management and the protection of water resources, as well as impacts of and measures to address climate change. The review makes suggestions for strengthening efforts towards a comprehensive and systemic response to sustainable development challenges.

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