

**The World Bank**



**ENVIRONMENTAL PROTECTION IN SERBIA**

**Progress since Kiev 2003 and Challenges Ahead**

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Cover picture: Waste disposal and scavenging on the Vinča waste disposal site (June 2003).

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## Acronyms and Abbreviations

ABPR	Animal By-products Regulation
AP	Autonomous Province
BAT	Best available technique
BREF	BAT reference document
BSAP	Biodiversity Strategy and Action Plan
CDM	Clean Development Mechanism
CEA	Country Environment Analysis
DEP	Directorate of Environmental Protection
EAR	European Agency for Reconstruction
EC	European Commission
EEA	European Environment Agency
EfE	Environment for Europe
EIA	Environmental impact assessment
EIONET	European Environment Information and Observation Network
ELV	Emission limit value
EPA	Environmental protection agency
EPS	Electric Power Industry of Serbia
EU	European Union
€	Euro
GEF	Global Environment Facility
GIS	Geographical information system
GDP	Gross domestic product
INP	Institute for Nature Protection
IPPC	Integrated Pollution Prevention and Control
LEAP	Local environmental action plan
LCP	Large combustion plant
LCPD	Large Combustion Plant Directive
MEA	Multilateral environmental agreement
MEP	Ministry for Environmental Protection
MSEP	Ministry of Science and Environmental Protection
NCSD	National Council for Sustainable Development
NES	National Environmental Strategy
NGO	Non-governmental organization
NIP	National Investment Plan
NO <sub>x</sub>	Nitrogen oxide
NRM	Natural resource management
NSWM	National Strategy for Waste Management
PA	Privatization Agency / Protected area
PCB	Polychlorinated Biphenyl
POP	Persistent organic pollutant
SDS	Sustainable Development Strategy
SEA	Serbian Energy Agency
SEEA	Serbian Energy Efficiency Agency
SEPA	Serbian Environmental Protection Agency
SESD	Secretariat for Environment and Sustainable Development
SIDA	Swedish International Development Agency
SO <sub>2</sub>	Sulphur dioxide
STAR	Serbia Transitional Agricultural Reform (Project)
TPP	Thermal power plant
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNIDO	United Nations Industrial Development Organization
US\$	US Dollar

## Executive Summary

Since the 2003 Kiev Environment for Europe Conference (EfE), Serbia has taken substantial steps to improve its environment and reduce pollution. This report outlines that progress and identifies future actions to continue this improvement. As requested by the Directorate of Environmental Protection (DEP) of the former Ministry of Science and Environmental Protection (MSEP), this report focuses on three key areas for future sustainable economic development: (i) waste management; (ii) biodiversity conservation and nature protection; and (iii) energy and environment linkages.

### Policy and Institutional Framework

Since the 2003 Kiev EfE Conference, the Government of Serbia has done a significant amount to improve the policy and institutional basis for better environmental management within the context of a growing economy. This includes the 2004 adoption of four new laws (Law on Environmental Protection, Law on Environmental Impact Assessment, Law on Strategic Impact Assessment and Law on Integrated Pollution Prevention and Control (IPPC)), the 2006 development of a National Environment Strategy, and strategies for the development of the agriculture, forestry and energy sectors that incorporate environmental concerns. 26 municipalities and districts developed local environmental action plans that reflect the communities' agreement on priority environmental issues. A comprehensive Sustainable Development Strategy has been developed with broad stakeholder participation under the guidance of the Deputy Prime Minister.

On the institutional side, the establishment of the Serbian Environmental Protection Agency in 2004 reflects Serbia's plans to gradually separate policy design functions from regulatory implementation and enforcement functions, consistent with practices in most EU countries. In the meantime, the Serbian Environmental Inspectorate's inspection and enforcement capacity improved as a result of training activities, participation in the Compliance and Enforcement Network for Accession, and use of modern information technology. The number of Ministry of Environmental Protection (MEP) staff in charge of inspection and enforcement

was increased in June 2007 by 50 percent from 90 to 137, a significant step in enhancing the Government's capacity for environmental management. However, the skill and equipment levels of municipal environmental inspectors are not commensurate with the significant responsibilities delegated to them by the Law on Environmental Protection. A National Council for Sustainable Development established in 2003 and headed by the Deputy Prime Minister clearly indicates the Government's sensitivity to mitigating the social and environmental impacts of the growth in the economic sectors. The Sustainable Development Strategy is expected to enhance the Council's effectiveness.

Serbia distinguishes itself in the Western Balkans through its progress in integrating environmental concerns in the privatization process. Recognizing that strategic investors will be reluctant to invest or will heavily discount their offer prices if there are significant unassigned environmental liabilities, the Government in 2003 amended the Law on Privatization to state that liability for environmental damage caused by a socially or state-owned enterprise up to the date of privatization rests with the state. In the process of privatizing the Copper Mining and Smelting Complex of Bor, one of Serbia's foremost environmental hot spots, this legal clarification has played an important role in determining financial responsibilities for cleaning up "historical pollution" and mitigating "current pollution" associated with the enterprise's ongoing operations. The Government is using World Bank support for cleaning up historical pollution at this site. An outstanding issue is the adoption of a bylaw defining the scope of state liability as the Law on Privatization requires.

### Waste Management

With successive governments making waste management a priority, significant progress has been made, particularly in terms of policy. A National Waste Management Strategy was adopted in 2003 and a new, EU-compliant Law on Waste Management has been drafted.

Central Government has also extended support to municipalities that cooperate on regional landfills, a more efficient solution than each of Serbia's 180 municipalities operating its own

dump site. Since the beginning of this initiative, MSEP/DEP and the Fund for Environment Protection have supported construction of several regional landfills by co-financing feasibility studies and construction. In the Uzice, Pirot and Prokuplje municipalities feasibility studies were co-financed with European Agency for Reconstruction (EAR), while in Kikinda, Nova Varoš and Vrsac republic and local funds were used only. In some regions including Kikinda, Leskovac, Jagodina and Despotovac joint venture companies were established between local public utility companies and foreign partners.

On the other hand, much needs to be done with tariffs for waste collection and disposal. These service charges remain below levels covering operations costs, let alone capital costs of replacing dilapidated collection equipment.

With regard to nonhazardous industrial waste, a Law on Packaging and Packaging Waste is under preparation and a Regulation on the Conditions and the Manner of Selection, Packaging and Storing of Secondary Raw Materials has been introduced. To provide an incentive to enterprises to reduce and/or recycle industrial waste (hazardous and nonhazardous), in 2005 the Government introduced a tax on the production of such waste by installations that are subject to the Law on IPPC. MEP has also begun licensing cement factories for incinerating appropriate industrial waste. An important short and medium-term priority is promoting industrial waste recycling.

Import of hazardous waste has been made illegal through the new Law on Environmental Protection. With financial and technical support under an EU CARDS project, an inventory of hazardous waste in IPPC installations has been prepared and guidelines for their handling have been published. Furthermore, the Government has begun to address the problem of Polychlorinated Biphenyls (PCBs) and other stockpiled persistent organic pollutants (POPs) by preparing an Inventory and National Plan for the Implementation of Stockholm Convention. The Government has also allocated in its National Investment Plan about € 2 million for replacement and decontamination of all devices containing PCB oil. The issue of non-treatment of hospital waste is being addressed through the acquisition of 78 mobile medical waste treatment units to be placed in hospitals around the country. Finally, the Government has begun

addressing slaughterhouse waste through the Serbia Danube River Enterprise Pollution Reduction Project.

Some substantial challenges remain. A key policy challenge is the regulatory vacuum regarding licensing for the handling, transportation, temporary storage and storage of hazardous waste. On the institutional side, clarification on the division of labor between AP Vojvodina and MEP would help implementation and enforcement. Furthermore, a substantial policy and institutional challenge for the near and medium term future is the lack of mechanisms for the state and civil society to work together and reach consensus on site selection for waste management facilities.

### **Biodiversity Conservation and Nature Protection**

Serbia has highly significant biodiversity treasures. Its protected areas have increased in size since 2000 and the number of Ramsar sites has increased to six. Progress made since 2003 also includes factoring biodiversity concerns into key sector development strategies, including forestry, agriculture, and to some extent, energy. However, the sustainability of the tourism strategy could be improved. Rigorous application of strategic and environmental impact assessments to economic sector plans and projects is the most effective tool for ensuring that biodiversity conservation and nature protection concerns are adequately taken into account.

Serbia has drafted a Law on Nature Protection which is in harmony with the EU Directive on the conservation of natural habitats, and of wild fauna and flora, the EU Directive on the conservation of wild birds, and the EU Regulation on the protection of species of wild fauna and flora by regulating trade therein. Implementing this law will require revising several regulations. Another key next step will be identifying "Special Areas of Conservation" and "Special Protection Areas," (which will collectively constitute Serbia's contribution to the Natura 2000 Network) in a manner consistent with the above-named EU directives.

While policy and institutional measures are crucial, the most successful implementation activities must be designed with local community participation and must yield local economic benefits. In fact, the challenge of

balancing economic development with nature protection requires a broad landscape approach not limited to protected and non-protected areas, but including diverse land use zones, The In-Situ Agro-biodiversity Conservation component of the WB-GEF supported Serbia Transitional Agricultural Reform Project implemented by MAFWM will aim to achieve this goal in the Stara Planina Region.

### **Energy and Environment Linkages**

The growing Serbian economy generates increasing demand for energy. While energy and environment linkages often seem to present zero-sum choices, a closer look at the Serbian situation, including progress made since 2003, indicate a number of win-win opportunities.

Serbia has substantially addressed two key linkage issues since 2003: inefficient use of energy and air pollution from thermal power plants. With regard to energy efficiency on the policy side, the new Energy Law of 2004 recognized the importance of energy efficiency in both production and consumption. In order to promote energy efficiency the Government intends to prepare special legislation along the lines of EU *Acquis*. On the institutional side, the Serbia Energy Efficiency Agency which was established in 2002, has promoted energy efficiency, provided policy advice to the Government, and given technical advice to the industry and the end users. Furthermore, five Regional Energy Efficiency Centers and the Serbian Industrial Energy Efficiency Network have been established.

With the support of bilateral donors and lenders, the Government has also carried out related investments. With the assistance of EAR several demonstration projects have improved energy efficiency in public buildings, street lighting, water supply and residential buildings connected to the district heating system. EAR also has supported training activities on energy auditing of industrial enterprises and energy management in municipalities and industry. With World Bank support, the Government is investing in retrofitting public buildings.

In cooperation with the private sector, local governments and consumer groups, the Government can support several actions to reduce the amount of energy consumed per Dollar of GDP. While this indicator has decreased in recent years, it is still much higher

than the corresponding figure in the EU-15. Government action may build on the experience gained and capacity built in the past four years. Specifically, further focus for demand management programs would be a priority. Examples include energy audits and energy management certification programs; energy efficiency standards and labeling of appliances; energy efficiency building codes; energy efficiency programs in government buildings; and financing schemes for energy efficiency investments.

The Government has taken significant policy steps with regard to air pollution from industry, including energy generation. Most notable are the enactment and submission to the Parliament in 2006 of a framework Law on Air Protection. Furthermore, Serbia signed the 2005 Energy Community Treaty according to which "... the construction and operation of new generating plants shall comply with the *acquis communautaire* on environment" upon its entry into force. Promising progress has been made in terms of implementation as well. A new electrostatic precipitator was installed in the Kostolac A Thermal Power Plant (TPP) resulting in a reduction of particulate matter emissions up to 24 fold.

However, the TPPs continue to be significant sources of SO<sub>2</sub> pollution which leads to substantial damages to public health, agricultural products and ecosystems. The annual cost to the Serbian economy of SO<sub>2</sub> NO<sub>x</sub> and particulate matter emissions from TPPs is estimated to range between €151 – 353 million. The one-time investment cost of installing mitigation equipment is about €610 million. While this one-time investment outlay is high; the returns to the economy in the form of reduced damage to human health, crops, ecosystems and buildings will compensate for this expense.

The energy sector is the main source of CO<sub>2</sub> emissions. Key areas of interventions which would lead to overall emission reductions include (i) renewable energy (new and rehabilitation of existing assets), (ii) renewable biomass energy, (iii) rehabilitation of thermal power plants; (iv) rehabilitation of district heating systems; and (v) energy efficiency in buildings and industries. Such interventions could partly be financed through carbon credits under the Clean Development Mechanism (CDM) of the Kyoto Protocol which Parliament ratified recently. In preparation for the

implementation of the Kyoto Protocol, several activities, including a strategy for the implementation of CDM projects in the energy sector and a project to set up the necessary legal and institutional framework for CDM implementation, have been carried out.

### **Conclusions**

In conclusion the review emphasizes the following overall approaches:

- Take time with the transposition of the EU *Acquis*. But once a directive or regulation has been transposed, adopt the accompanying secondary legislation for policy implementation. This needs to be done for waste management and IPPC.

- Build local enforcement and management capacity including municipal environmental inspectors and protected area management staff.
- Execute mitigation and cleanup actions such as installation of equipment to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions from TPPs, cleaning up fly ash accumulations at TPPs, safe disposal or incineration of PCBs and stockpiles of other POPs, and implementing management plans for national parks and other protected areas.
- Continue promotional activities with the general public, NGOs and industry on waste recycling, hazardous waste management, energy efficiency, socially sustainable biodiversity conservation, and financial sustainability of domestic waste management.



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## Introduction

Since the 2003 Kiev Environment for Europe Conference (EfE), Serbia has taken substantial steps to improve its environment and reduce pollution. This report outlines that progress and identifies priority actions to continue this improvement in harmony with the EU *Acquis*. As requested by the former Directorate of Environmental Protection (DEP) of the Ministry of Science and Environmental Protection (MSEP), the report focuses on three areas which will be of key importance for Serbia's future sustainable economic development: (i) waste management; (ii) biodiversity conservation and nature protection; and (iii) energy and environment linkages. To set the stage for these thematic discussions, this report first reviews recent developments in the overall environmental policy and institutional framework.

This report treats the 2003 status of the above-mentioned three areas as baseline. Conveniently, several environmental sector reviews were completed that year, including the Environmental Performance Reviews of the Federal Republic of Yugoslavia by UNECE, and the Serbia and Montenegro Country Environmental Analysis by the World Bank. This report examines the key issues identified in those reviews and sector specific studies and

strategies, and outlines measures taken since 2003 to address them. Evaluation of actions taken and remaining challenges is based on a review of recent environmental policy papers (notably the National Environmental Strategy (NES), including its background studies) in-depth consultations with Government stakeholders and bilateral financiers, and the World Bank's on-going project level engagement in Serbia's economic and social sectors. Measures discussed include strengthening policies and institutions and increasing investments for implementation. The latter category of measures is important as they translate policy documents into action. Finally the paper identifies the remaining challenges and suggests steps to address them.

This report's coverage of the paper is not exhaustive. Due to time constraints, it mainly focuses on actions of Government bodies and does not include many initiatives taken by Serbia's vibrant NGO community and private sector, except in the context of governmental action. Similarly, all internationally assisted activities were included. Nevertheless, we hope that this report contributes to the policy discussion in Serbia by highlighting key areas of progress and challenges ahead.



**Manure disposal in lagoon without any insulation (Šabac, October 2003)**

## Policy and Institutional Framework for Environmental Management

Since 2000, the Republic of Serbia has aspired to reach European Union (EU) standards in environmental protection and has made significant progress in reforming its policy and institutional framework towards this end. Successive governments have pursued the same objective. This section reviews policy and institutional issues pertaining to environmental management as a whole, while the following three sections will have topic-specific coverage.

### Policies<sup>1</sup>

In July 2003, the Serbian Government adopted the first *Action Plan for the Approximation of Domestic Laws with the Acquis Communautaire*. An update of the Action Plan has been formally adopted by the Government every year since then. Importantly, a new legal framework for environmental protection was introduced in 2004 through the enactment of the *Law on Environmental Protection, Law on Strategic Environmental Assessment, Law on Environmental Impact Assessment, and Law on Integrated Pollution Prevention and Control (IPPC)*. These laws are fully harmonized with the EU Directives on Environmental Impact Assessment, Strategic Impact Assessment, IPPC, and Public Participation.

*Implementation of the IPPC Law which represents a significant shift in regulatory philosophy will be demanding, but preparatory actions are underway.* The IPPC Law replaces medium (water, air, soil)-based environmental permitting and thus aims to prevent inter-medium transfer of pollution. A preliminary inventory indicates that 237 installations in Serbia will be subject to this law. Preparatory work to build capacity for implementation on the part of industry and regulatory agencies has included training more than 100 permit writers and environmental inspectors and adoption of six bylaws and drafting of four bylaws to facilitate implementation.<sup>2</sup>

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<sup>1</sup> “Policies” covers plans, strategies, laws, regulations and other instruments, such as economic and voluntary instruments.

<sup>2</sup> Annex 2 contains a list of training courses and seminars recently attended by environmental inspectors.

Furthermore, under CARDS 2003 MSEP implemented a pilot integrated permit development project with the Holcim Cement Factory which is listed in the National Environmental Strategy as one of the most significant industrial polluters in Serbia. This project helped strengthen the capacity of both Holcim employees and staff in MEP’s Inspectorate and IPPC Department.

Serbian regulators<sup>3</sup> have also benefited from participating in peer review exercises with their counterparts in new and aspiring EU member countries as part of the Compliance and Enforcement Network for Accession (ECENA). The Inspectorate published detailed and well illustrated guidebooks for inspectors and instituted an intranet which contains helpful guidance materials, serves as a coordination tool, and is also accessible to inspectors at the autonomous province and municipality levels.

The National Environmental Strategy (NES) is another major policy document. Its adoption by Parliament is considered imminent.<sup>4</sup> NES was developed in a highly participatory manner, including a number of workshops with a variety of stakeholders. It defines a series of environmental policy objectives for 2007 – 2016 and investigates the policy measures and financial resources needed for their achievement. After NES is adopted by Parliament, a National Environmental Action Plan will be prepared.

In addition, local environmental action plans (LEAPs) have been prepared in 26 municipalities. Being developed in a consultative manner and with technical input by experts, the LEAPs reflect consensus among local governments and other stakeholders on priority environmental issues. For example, the LEAP in the District of Bor helped the Government identify priority ongoing and past pollution

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<sup>3</sup> “Regulator” means implementer / enforcer of regulations (i.e. permit-writers, inspectors and enforcers), rather than “policy-makers” who draft laws and regulations for government and or parliamentary adoption.

<sup>4</sup> While the direct translation of the document’s title is “National Program for Environmental Protection,” this paper employs the commonly used English translation “National Environmental Strategy” to emphasize its content and distinguish it from the impending “National Environmental Action Plan.”

issues that are being addressed in the privatization process of Copper Mining and Smelting Complex Bor.

*Progress has also been made in integrating the principle of environmental sustainability in national and sector development strategies.* A Sustainable Development Strategy (SDS) has been developed and is currently in the public review phase. The objective of the initiative is to provide the framework for sustainable economic development of Serbia on the basis of three pillars – Knowledge-based Economy, Economic & Social Issues and Environment, and more than 15 policy areas. As the Deputy Prime Minister's Office which coordinated the effort reports, SDS relies on the key findings of the Poverty Reduction Strategy and EU Accession Strategy and offers options for resource savings while swiftly moving through some parts of the EU accession process. The Strategy was drafted in consultation with a large number of relevant stakeholders from diverse societal segments – above all the academic community, NGOs and numerous professional associations. The United Nations Development Program (UNDP) and the Swedish International Development Agency (SIDA) provided technical and financial support.

Furthermore, several sector strategies have been developed in recent years and are notable for internalizing environmental sustainability:

- The *Agricultural Development Strategy* (2005) that incorporates European agri-environment principles including agricultural pollution control, good agricultural practices, landscape management, and agro-biodiversity conservation;
- The *Energy Sector Development Strategy* (2005) that emphasizes (i) as “basic priority” technology modernization in the oil, gas and coal sectors, which is essential for improved environmental performance as discussed in the section on “Energy and Environment Linkages”, (ii) as “targeted priority” rational use of energy and energy efficiency; and (iii) as “special priority” selective use of new renewable energy resources and efficient production technologies and appliances<sup>5</sup>, and

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<sup>5</sup> MME's “Energy Strategy Implementation Program for the period 2007-2015” was adopted by the Government in January 2007. This Program is a

- The *Forest Sector Development Strategy* (2006) that incorporates biodiversity protection concerns, as elaborated under the “Biodiversity Conservation and Nature Protection” section of this paper.

The National Strategy for the Sustainable Use of Natural Resources and Goods whose drafting began in mid-2006 should also be mentioned. Being developed in a participatory manner under the coordination of MEP, the process has the potential to help the diverse government institutions involved in natural resource management (NRM) agree on a unified vision. As such, the Strategy would help ease the burden of fragmentation of responsibilities that characterizes NRM in Serbia.

*Serbia distinguishes itself in the Western Balkans through its progress in integrating environmental concerns in the privatization process.* In the early 2000s when the Government of Serbia embarked on an ambitious privatization program of its publicly-owned enterprises, including heavily polluting industrial enterprises, it realized that, like in Eastern and Central Europe in the 1990s, strategic investors will be reluctant to invest or will heavily discount their offer prices if there are significant unassigned environmental liabilities. Consequently, in 2003 the Law on Privatization was amended to state that liability for environmental damage caused by a socially or state-owned enterprise up to the date of privatization (“historical pollution”) rests with the state. In the process of privatizing the Copper Mining and Smelting Complex Bor, one of Serbia's foremost environmental hotspots, this legal clarification is playing an important role in determining the funding responsibilities for cleaning-up historical pollution and mitigating “current pollution” associated with ongoing operations. The Government is using World Bank support for cleaning up historical pollution. An outstanding issue remains the adoption of a bylaw defining the *scope of state liability*, as the Law on Privatization requires.<sup>6</sup>

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decree defining the conditions, method and time schedule of the Energy Strategy implementation with regard to the coal, oil, gas and electric power sectors, district heating, industrial energy, energy efficiency, renewable energy sources, energy efficiency fund and environmental protection in energy sector.

<sup>6</sup> A draft bylaw was prepared with World Bank and EU support under the Private Sector Development Technical Assistance Grant Project.

### **Addressing Environmental Liabilities in the Copper Mining and Smelting Complex (RTB) Bor**

The Government of Serbia is privatizing the core assets of RTB Bor, the public enterprise operating copper mines, a smelter and some downstream production facilities in Bor that produce copper and certain precious metals.

A prime issue in the privatization process is the heavy environmental impacts caused by ongoing pollution (in particular SO<sub>2</sub> emissions from the smelter and wastewater discharges to surface waters from the smelter and mine) and historical pollution (notably the mining tailings ponds, waste/overburden dumps, and soil, groundwater and river sediment contamination).

For the desperately needed reduction of the ongoing environmental emissions, notably at the smelter, the new owner will be bound to an investment program that was prepared by MSEP to bring environmental performance up to national and international emissions standards. The investment program will be secured by bonds.

By law, the state is responsible for liabilities and remediation requirements for all historical (pre-privatization date) pollution. An environmental assessment study carried out during privatization preparations proposed a cleanup program with cost estimates. However, the complexity of RTB Bor with many mining and production facilities made it difficult to obtain reliable data on soil and groundwater contamination levels and to establish a solid remediation budget. Therefore, further investigations will be required to establish in more detail historical pollution levels and remediation requirements for all RTB Bor facilities.

In the area that is part of the new investor's license, the new investor will be responsible for carrying out remediation works at competitive costs. Compensation by Government will be limited to an agreed maximum. An area of RTB Bor that is not currently productive but includes overburden dumps, waste disposal sites, and two tailings ponds is not slated for privatization and will remain with the state. In this area the Government will execute with World Bank support required remediation work worth around US\$ 29 million including: wastewater treatment for waste dump areas, stabilization and closure of tailings ponds, and rehabilitation of a river water collector underneath one of the tailings ponds. This rehabilitation program also includes an environmental monitoring and site investigations.

### **Priority Policy Challenges**

*A large body of the EU Environmental Acquis still needs to be transposed, but Serbia would be best advised to do this gradually.* The experience of the Eastern and Central European countries that acceded to the EU in recent years speaks against rush transposition in a "copy and paste" manner since this approach led to frequent amendments in the new legislation. Rather, as a recent World Bank study showed, the preferred approach is to first carefully adapt them to each country's conditions and put in place the necessary institutional framework. (World Bank, 2007.)

*On the other hand, the implementation of the IPPC Directive, which has already been transposed, makes a short-term priority the development of a full-fledged inventory of installations, the adoption of secondary legislation and the adaptation of best available techniques (BAT) to Serbian conditions.* A complete inventory will enable MEP to adequately plan the permitting process and guide installations. Installations can prepare implementation plans that are required by the

Law on IPPC only with a bylaw that defines the required the format and scope. In fact, the deadline for submitting such plans was the end of 2005. Finally, BATs as defined for best EU performers may be too costly for Serbian enterprises and thus significantly hinder IPPC implementation in Serbia. MEP in close cooperation with industry and the scientific and technological community would be best served by preparing (i) BAT Reference Documents that reflect Serbian conditions and (ii) sectoral guidelines for different industrial sectors. As this is a rather time consuming effort, it would be best to start it as soon as possible.

### **Institutions**

*The establishment of the Serbian Environmental Protection Agency (SEPA) in 2004 is notable.* At the present time, SEPA is at a nascent stage with its role being limited to developing environmental monitoring indicators and compilation and transfer of environmental monitoring data to the European Environment Agency (EEA) and the European Environment Information and Observation network (EIONET). However, policy makers envisage that in due time regulatory implementation functions (EIA, permitting, monitoring and

inspection) and enforcement functions will likely be transferred to SEPA. This would be in line with the general institutional trend in EU member countries of separating these from policy functions.

*Another favorable development is the reinstatement in May 2007 of a Ministry of Environmental Protection (MEP) following an intermittent phase as directorate. This higher political authority level is appropriate given the significant institutional capacity needed for the transposition and implementation of the EU environmental Legislation.*

*The establishment in 2003 of a National Council of Sustainable Development (NCSD) represented a first step to adequately coordinate and integrate environmental issues at the governmental level. The effectiveness of the Council has been somewhat limited. As a first measure to increase the Council's political significance, it was restructured in 2005 to be chaired by the Deputy Prime Minister and composed of five ministers, the Rector of the Belgrade University and the Chairman of the Serbian Academy of Science and Arts. The Council's impact is expected to further increase when it implements the to-be-adopted Sustainable Development Strategy. Strong political commitment by the Government will remain a pre-condition for the Council's effectiveness.*

#### ***Remaining Priority Institutional Challenges***

*The key institutional challenge is the remaining overlaps in policy and implementation responsibilities and lack of coordination, which hampers effectiveness. Water quality monitoring is a prime example. The implementation of the integrated permitting*

system for large installations and the EU Water Framework Directive will require significant improvement in institutional coordination and cooperation.

*In addition to increasing NCSD's effectiveness, harmonization of sector policies with national environmental policy will require capacity strengthening in Government agencies, notably those working on energy, transport, agriculture, privatization, industry, and tourism, at the central and local levels.*

*Further capacity building is needed to build on recent efforts in upgrading environmental inspection, especially at the level of the Autonomous Province of Vojvodina (AP Vojvodina) and municipalities. In particular municipal inspectors need training, vehicles, and information technology equipment (notably computers so all inspectors can access the Inspectorate's intranet). In-situ air quality monitoring equipment may also be needed to perform spot checks on monitoring results provided by "authorized services" hired by enterprises.*



**Untreated slaughterhouse wastewater (2003)**

## Waste Management

*Like a number of countries in the region, inadequate management of domestic, industrial and hazardous waste has been a key environmental problem in Serbia, posing considerable risk to public health, contributing to water and air pollution, and spoiling an otherwise picturesque rural landscape.* Following a brief section on institutional framework, this section reviews the main issues identified by the Government of Serbia's National Strategy for Waste Management (NSWM) of 2003 and UNECE and World Bank environmental reviews of Serbia in 2003, outlines progress made in addressing them, and discusses remaining challenges.

### Institutional Framework

MEP carries overall responsibility for policy on hazardous and domestic waste, which includes development of waste management strategy and action plan and harmonization of Serbian legislation with that of the EU. With regard to hazardous waste management, in addition to policy design, MEP is tasked with all EIA, permitting / licensing, inspection and enforcement functions. With regard to domestic waste management, in addition to MEP, local governments also develop waste management plans and issue decrees for their respective municipalities, and implement and enforce them. Their tasks include licensing of service providers, permitting for and inspection of disposal sites, and enforcement through fines to non-compliant service providers. Collection, transportation and disposal services are provided by municipal public utility companies. Some of MEP's mandate has been delegated to the AP Vojvodina Secretariat for Environment and Sustainable Development (SESD), however the division of labor is not entirely clear in all areas.

SEPA's function in waste management is that of collection, processing and transmitting of waste related data to EEA and EIONET. The Environmental Protection Fund provides funding to municipalities for waste management projects. The public Recycling Agency focuses on secondary materials by establishing and maintaining a database, conducting feasibility studies on recycled materials and promoting their use as industrial inputs, and providing training to

the general public on waste recycling. There are private enterprises that trade recyclable nonhazardous industrial waste.

### Key Waste Management Issues in 2003

This section reviews key issues characterizing the management of the three main waste categories, namely domestic waste, nonhazardous industrial waste and hazardous waste.

#### *Domestic waste*

*The above-mentioned documents emphasized that while collection of household waste was relatively well organized in urban areas, it was almost nonexistent in rural areas, leading to an overall collection rate of 60-70%. "Common problems related to collection include inadequate and often dilapidated collection equipment, including vehicles for collection and transportation, and insufficient frequency of transportation. Containers intended for collection of household waste only are used also for commercial and medical waste" (UNECE, 2003). Disposal was also a problem: none of the 180 municipal dumpsites met the standards of a "sanitary landfill" and caused soil and groundwater pollution. Collection or control of drainage water or methane was rare to nonexistent. Additionally there were numerous illegal dumpsites of various sizes, mostly on riverbanks in rural areas. Roma recycled waste paper, glass, plastic and metals from dumpsites in a way that subjected them to health hazards.*

*The economic damage associated with improper disposal of domestic waste was estimated by Jantzen and Pešić (2004) to range between €48 and 125 million annually. In their estimation, the economists took into account (i) air emissions to air from landfills and backyard burning and (ii) leachate from dumpsites to water bodies. The estimate would be higher if the impact of unpleasant odor and on the scenery had also been quantified.*

*Nearly each of Serbia's 180 municipalities had its own dumpsite and imposed inadequate levels of service charges. This scheme provided each municipality with a revenue stream and lowered transportation costs for waste collectors.*



However, it was an inefficient solution, as municipalities were not able to maintain the dumpsites at satisfactory technical, environmental and sanitary levels. NWMS clearly recognized this problem and envisaged the construction of 29 regional sanitary landfills across the country, with recycling centers and transfer stations; in parallel to the closing or re-cultivation of the existing waste dumps.

*Low service charges reflected the Government's policy to make such services affordable to households.* While this is a justified policy goal, insufficient funding for operating and maintenance (O&M), rehabilitation, and new capital investments resulted in inadequate collection and disposal services mostly affecting poor neighborhoods.

#### ***Nonhazardous industrial waste***

*The main problem with nonhazardous industrial waste was uncontrolled disposal on municipal or illegal dumpsites.* Another issue was lower than possible recycling, due in part to the lack of a facilitating legal framework (labeling, making producers responsible for collection of waste materials).

#### ***Hazardous waste***

Hazardous waste includes hazardous industrial waste (notably from the chemical, petrochemical, metallurgical, paper, leather and textile industries) and biohazardous waste, including medical, pharmaceutical, veterinary, farming and slaughterhouse waste which contain virulent pathogenic microorganisms with potential infectious disease causing impact (UNECE, 2003). In the absence of special treatment, incineration and disposal facilities, improper storage and disposal of hazardous waste posed risks to public health and the environment. With regard to hazardous industrial waste, industrial enterprises stored such waste with varying

degrees of isolation. UNECE (2003) reported that only few enterprises had storage sites equipped to prevent the spreading of toxic components or leaching into soils and groundwater. Furthermore, waste containing mercury and heavy metals was often buried without any treatment. There were also significant quantities of waste containing polychlorinated biphenyls (PCBs) stored at enterprises. Vojvodina had a specific problem with nearly 600,000 m<sup>3</sup> of waste from oil wells and pumps. With regard to biohazardous waste, 50% of the annually generated 9,600 tons originated from hospitals and was disposed on municipal dumpsites without any treatment. Similarly, slaughterhouse waste was often found in watercourses or on dumpsites. This phenomenon was due to weak enforcement of regulations and an insufficient number of rendering plants which process such waste into useable products.

A key policy issue in hazardous waste management was the regulatory vacuum regarding licensing for the handling, transportation, temporary storage, and storage of hazardous waste.



**Hazardous waste stored at an industrial enterprise (2003)**



### **Actions Taken since 2003 and Remaining Challenges**

*With successive governments making waste management a priority a number of important actions have been taken.* A substantial achievement was the preparation of a new Law on Waste Management whose adoption by the Parliament is expected soon. The draft Law prescribes institutional duties and responsibilities for waste management. It is in compliance with the European Council Framework Directive on Waste and the Council Directives on disposal of waste oils, hazardous waste, landfill of waste, incineration of hazardous waste, on packaging and packaging waste, batteries and accumulators containing certain dangerous substances, end-of-life vehicles, waste electrical and electronic equipment, and the disposal of PCBs and polychlorinated triphenyls. The implementation of the new Law will require a revision of existing bylaws according to EU *Acquis* and addition of new bylaws.

The below discussion focuses on specific actions taken to improve the management of domestic, nonhazardous industrial and hazardous waste. Annex 1 reproduces the list of actions recommended by NSWAM for 2003 – 15 together with comments on progress to date.

#### ***Domestic Waste***

*Between 2004 and 2006, the former DEP and the Environmental Protection Fund (EPF), provided support to municipalities for developing technical documentation for or carrying out rehabilitation and closure of landfills / dumpsites.* In 2006 EPF contributed RSD 728 million or approximately US\$12 million for municipal waste management. This represented about 80% of the Fund's revenues in 2006, indicating its emphasis on supporting improved waste management. Support was provided to

- Development of technical documentation for rehabilitation or closure of existing landfills/dumpsites for 22 municipalities;
- Remediation of existing landfills in 5 municipalities (Leskovac, Užice, Novi Knezevac, Vlasotince, Arilje);
- Development of technical documentation for construction of 3 regional landfills (Zrenjanin, Prokuplje, Zajecar); and

- Construction of 7 regional landfills. (Kikinda, Nova Varos Leskovac, Pirot, Smederevo, Sremska Mitrovica and Užice).

*The willingness of the Central Government and local entities to establish regional landfills is noteworthy.* To ensure financial sustainability and effective O&M, these efforts would best be accompanied by revisions in the governance structure, including the formation of a regional waste management utility, and determination of service fees. The utility should enjoy more independence in operational decisions and freedom to set service fees that better reflect service delivery costs (O&M and investment). Such new policy approaches would ensure the financial feasibility of regional waste management projects and attract financing for investments from international financial institutions or private operators.

#### ***Nonhazardous Industrial Waste***

*Efforts in this waste category have focused on increasing the prominence of recycling.* A Law on Packaging and Packaging Waste is under preparation. A Regulation on the Conditions and the Manner of Selection, Packaging and Storing of Secondary Raw Materials has been introduced. The regulation prescribes that all industrial waste is to be separated, characterized and categorized prior to disposal or processing. The Waste Catalogue annexed to this regulation is in compliance with the EU Waste Catalogue.

*To provide an incentive to enterprises to reduce and or recycle industrial waste (hazardous and nonhazardous) in 2005, the Government introduced a tax on the production of such waste by installations that are subject to the IPPC Law.* The level of tax is a function of the type, quantity and characteristics of waste produced or disposed of annually. Data for the tax calculations will be obtained from the Integrated Cadastre of Polluters.

MEP has also begun licensing cement factories for incinerating suitable industrial waste. To date the enterprise Holcim has obtained a license to incinerate old tires. MEP envisages that incineration in cement kilns could be extended to plastics and used oils as well as refinery waste. If carried out in compliance with relevant international guidelines on emissions, this practice represents a win-win situation for the cement

factories which gain an energy source and the environment, since these materials would otherwise be landfilled.

*An important priority for the short and medium terms is promoting the recycling industrial waste.*

### **Hazardous Waste**

An important development was outlawing the import of hazardous and radioactive waste to Serbia by the *Law on Environmental Protection (2004)*. Import, export and transit of waste are now subject to a permit issued by MEP in line with the Basel Convention.

Other important actions include the preparation of an inventory of hazardous waste in IPPC installations by the former MSEP/DEP. Furthermore, an Inventory and National Plan for the Implementation of the Stockholm Convention is in its final stage of preparation by MEP with

assistance from Global Environment Facility (GEF) and UNIDO. This inventory and plan for safely removing Persistent Organic Pollutants (POPs) will constitute the basis for potential implementation action by the Government and the private sector which may be partly grant-financed by GEF. As a matter of fact, the Government in its National Investment Plan has allocated about € 2 million for replacement and decontamination of all devices containing PCB oil.

The issue of non-treatment of medical waste is being addressed through the acquisition of 78 mobile medical waste treatment units to be placed in hospitals around the country. The units are funded through the reallocation of the EU CARDS funds of €7 million.

The Government, with GEF, World Bank and SIDA support, has begun addressing slaughterhouse waste through the Serbia Danube River Enterprise Pollution Reduction Project.

### **Managing Animal Waste**

Since late 2005, the Ministries of Agriculture, Forestry and Water Management (WAFWM) and Environment Protection (MEP) have been carrying out the *Serbia Danube River Enterprise Pollution Reduction Project* which aims at reducing nutrient (nitrogen and phosphorus) loads from livestock farms and slaughterhouses in the Danube Basin. The Project provides grant co-financing to such enterprises to adopt sustainable, EU *Acquis*-compliant manure and other animal by-product management practices and supports broad awareness raising activities to stimulate the replication of these activities across Serbia. The project promotes the concept that manure and other animal by-products are not “waste” but are instead resources that can generate value through recycling. Hence manure is stored and applied to land in accordance with plant nutrient needs. A Code of Good Agricultural Practices developed under the Project will lay out general principles that farmers across Serbia can follow voluntarily.

In slaughterhouses, the principal idea is separation of different categories of animal “waste” in accordance with the EU Animal By-products Regulation which Serbia is in the process of approximating. Special risk material, such as brain tissue and spinal cord, is treated separately. Blood is collected, stored separately and sent to rendering plants. Furthermore, an inexpensive screen in the wastewater stream separates pieces larger than 6mm, which significantly reduces the burden on the wastewater treatment process. Finally, manure and gut content are applied to land as fertilizer, rather than disposed on dumpsites, thus creating value and preventing groundwater pollution.

The project is expected to have piloted these practices in approximately 60 medium and large-size livestock farms and four slaughterhouses by 2010. MAFWM also piloted proper manure management activities in several small farms under the UNDP Danube Regional Project.

*A key policy change remains the regulatory vacuum regarding licensing for the handling, transportation, temporary storage and storage of hazardous waste.*

*Furthermore, a substantial policy and institutional challenge for the near and medium*

*term future is the lack of mechanisms for the state and civil society to work together and reach consensus on siting waste management facilities.*

This problem became evident when the Government unsuccessfully attempted to locate a hazardous waste treatment and disposal facility for which a €14 million grant had been secured

under the EU CARDS Program. All potential sites identified by the Government were rejected by the respective communities. The project had to be abandoned and funds allocated to another purpose. While site identification of waste treatment and disposal is a challenge worldwide, negotiations including compensation to the local community for real or perceived damage, may lead to workable solutions. Community opposition to the proposed treatment facility also indicated a lack of popular awareness of the benefits and safety of proper hazardous waste treatment as compared to the hazards of not having such facilities. The Government in cooperation with local governments and the NGO community would be recommended to institute an awareness raising campaign on responsible hazardous waste management and on mechanisms to reach compromises.

*On the other hand, the establishment of a hazardous waste incineration facility in Serbia does not appear to be a short-term priority or efficient in the presence of competing demands for public funds and alternative methods of incineration.* The latter include export to European countries which possess excess incineration capacity and use of industrial, notably cement kilns. Stricter inspection and enforcement; the introduction of a tax on industrial waste, and gradual conversion to cleaner production technologies will likely reduce the generation of hazardous waste from industry.

On the other hand, according to the EU Animal By-products Regulation, some slaughterhouse waste, such as special risk material, including brain and spinal cord, may not be disposed of in any way other than incineration. *In the medium term, the MEP would benefit from a careful feasibility study on the establishment of an incineration facility. This study should include an assessment of the total hazardous waste stream, evaluation of alternatives to incineration, a cost-benefit analysis of various alternatives, and the optimal size of the facility, if needed.*

*Serbia would also benefit from examining possibilities for recycling fly ash from thermal power generation (discussed in more detail in the chapter on “Energy and Environment Linkages”). This study should be a short-term priority due to the large quantity of fly ash and its environmental impact.* Fly ash is categorized as “hazardous waste” due to arsenic contamination. This designation will likely prevent its use in road construction, a common practice worldwide. The recommended study should also identify ways to solidify ash and immobilize its contents (such as calcium compounds) in order to decontaminate its leachate.

*On the institutional side, clarification of division of labor between MEP and AP Vojvodina SESD regarding hazardous waste will be important for the effectiveness of regulatory implementation and enforcement.* Presently, by law, competence for hazardous waste management is at the Republic level (MEP) but inspections are carried out by SESD. This situation has reportedly created confusion among the regulators and the regulated.



**Construction of manure storage facilities on Napredak Farm (Novi Sad, May 2007)**

## Biodiversity Conservation and Nature Protection

*Serbia is among key European hotspots for biological diversity.* It hosts a large variety of ecosystems including South European deciduous forests, and coniferous woods typical of the Euro-Siberian and North American regions, and freshwater ecosystems. This makes Serbia one of the six European and 158 global centers of biodiversity.

Serbia is a party to several multilateral environmental agreements (MEAs) related to biodiversity and nature conservation, including: the Ramsar Convention of Wetlands of International Importance; the Convention on the Protection of the World Cultural and Natural Heritage; the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES); the Convention on Biological Diversity (CBD); the Cartagena Protocol on Biosafety; and the International Convention for the Protection of Birds.

### Level and Types of Protection

Protected areas (PA) as defined by Serbian Legislation include five national parks, 72 nature reserves, 16 protected (natural) landscapes, 284 nature monuments, 15 nature parks and 37 cultural/historical landscapes. The area under protection increased between 2000 and 2006 and amounted to 6.1% of Serbia's land area in 2006. Serbia's objective, as declared in the National Environmental Strategy (NES), is to increase this area to 10% by 2010.

One biosphere reserve and six Ramsar sites also exist. Two of the Ramsar sites were designated in 2006. Serbia also has under protection 215 plant and 426 animal species as "natural rarities."

	2000	2005	2007*
National parks	159.0	159.0	159.0
Nature parks	157.4	234.0	238.1
Landscape protected areas	24.7	36.4	44.8
Nature reserves	82.5	83.5	89.2
Cultural-historical landscapes	4.1	4.1	3.6
Nature monuments	7.3	7.5	7.8
<b>Total</b>	<b>435.0</b>	<b>524.5</b>	<b>542.5</b>

Source: Serbian Environmental Protection Agency, 2006; MEP (2007)

\* September 2007

### Protected areas in Serbia (1,000 ha)

#### Institutional Framework

*Multiple institutions are involved in biodiversity and nature protection in Serbia.* The Law on Environmental Protection designates MEP (with its Nature Protection Department and Environmental Inspectorate) as the competent authority for biodiversity conservation and protected area management. In Vojvodina some of this competence is delegated to AP Vojvodina SESD. MEP and SESD supervise the state enterprises that manage the country's five national

parks or 30% of protected areas in terms of geographical area.<sup>7</sup>

At the same time, the Ministry of Agriculture, Forestry and Water Management (MAFWM) and the AP Vojvodina Secretariat for Agriculture, Forestry and Water Management, through forest enterprises (Srbijašume and Vojvodina šume) and

<sup>7</sup> 10% of Serbia's protected areas are managed by trade and joint-stock companies, local municipality public enterprises, tourism organizations, NGOs, and churches.

water enterprises that report to them respectively, are in charge of nature parks, nature reserves and other PA categories that make up at least 60% of Serbia's PAs in terms of geographical area.

Other institutions involved in biodiversity and nature protection are the Republic Agency for Spatial Planning which is responsible for preparing PA spatial plans and, notably, the Institute for Nature Protection (INP) which is an independent public expert organization with offices in Novi Sad and Niš. INP activities include approval of PA physical plans, research, advice to MEP on nature protection policy, proposals for new PAs, analysis of the impact of construction and other economic activities on nature, and biodiversity (species and ecosystem) monitoring. IPN also operates as the national reference centre for EEA. Furthermore, SEPA maintains a database on biodiversity and relays annual biodiversity monitoring results to EEA and EIONET. The Faculties of Biology and Forestry of the University of Belgrade and other scientific institutions carry out monitoring tasks for MEP.

MAFWM is the competent authority and responsible for conservation and management of domestic animal genetic resources, and conservation and management of cultivated plant genetic resources, including the management of the animal and plant gene bank. The AP Vojvodina Secretariat for Agriculture, Forestry and Water Management has authority over conservation and management plant and animal genetic resources in Vojvodina. The Agriculture Faculties in Zemun and Novi Sad carry out monitoring and researching tasks.

*The involvement of diverse institutions means diverse approaches and interests.* One of the challenges that Serbia faced in recent years is reconciling these approaches with each other and with international practices.

### Key Issues in 2003

The 2003 UNECE report stated that "... the problems of transition and almost ten years of isolation have caused Yugoslavia to lag behind other EU applicant countries, particularly in implementation of international conventions and programs." The World Bank CEA of 2003 identified these key pressures on Serbia's ecosystems and biodiversity.

- Unsustainable exploitation of forests, game, and fish;

- Use of improper methods for fighting "pests", such as pesticides, herbicides, and the poisoning of game;
- Mining practices that are not friendly to nature, notably open-cast lignite and copper ore mines;
- Expansion of agricultural lands to marginal lands and the drainage of swamps and marshes;
- Water, soil, and air pollution;
- Urbanization and the expansion tourism development into particularly vulnerable ecosystems;
- Infrastructure development (fragmentation of habitats), hydro melioration, and the construction of water accumulations in gorges (refuge habitats of relict and endemic species and communities); and
- Floods, fires, accidental spills and discharges of harmful substances by industry or during transportation.

These factors clearly indicate a lack of harmonization between economic needs of communities and protection of valuable ecosystems, in a way that serves both purposes.

Five key policy and institutional issues were at the heart of the above pressures.

#### *i. Weak integration of biodiversity concerns into economic sector activities*

Biodiversity concerns were not integrated in strategies and legislation for key sectors such as agriculture, tourism, infrastructure, and forestry. Furthermore, there was little coordination among environmental authorities and sectoral agencies. In 2003, the agency in charge of biodiversity conservation had just been upgraded from a Directorate to a Ministry, but still enjoyed little clout in the Government cabinet since biodiversity conservation was often considered a likely hindrance to economic development.

#### *ii. Weak legal framework*

Three key weaknesses with the legal framework were identified in 2003:

- Existing legislation was not harmonized with international standards on biodiversity management. This was particularly the case with respect to local community involvement and establishing intersectoral relationships in PA management.
- Segmentation of biodiversity and nature protection legislation into several laws and regulations did not provide for unified and efficient biodiversity management and control. For example, special regulations governed these topics: Control of wildlife use and trade, protected values, register, marking of PAs, natural monument protection, and natural rarities protection.
- Fines for violating wild flora and fauna protections were very low and enforcement procedures were drawn out. The Law on General Administrative Procedure allowed violators to appeal to the State. Furthermore, the decision of the State could be followed by administrative litigation which could take years. (UNECE, 2003)

### ***iii. Weak monitoring, out-of-date inventory***

In the early 2000s, Serbia did not have up-to-date information on species and ecosystems, which prevented further development of good biodiversity management practices. This was mainly due to inadequate public funding for this purpose (UNECE, 2003). There was also a lack of monitoring indicators and systematic monitoring of ecosystems and endangered species.

### ***iv. Unsustainable PA management***

UNECE (2003) observed that “[i]n general, protected area management is dominated by forestry and lacks park services, such as a visitor system, landscape management, and community services. Park staff do not now include biologists and environmental experts, and the interests of local communities in park management issues are not included in the current protection programs.”

The law required spatial plans for protected areas that identified allowable uses. However, these spatial plans had two main shortcomings. First, they did not detail the practices and infrastructure needed for effective ecosystem management.

Second, the mandated zoning and sanctioned activities rarely represented viable compromises between local economic needs and conservation objectives. PA management plans which include both of these elements did not exist. Furthermore, national park staff lacked skills and experience in involving local communities in ecosystem management.

Public enterprises, notably Srbijašume and Vojvodina šume, focused on managing PAs for natural resource (timber, water) extraction rather than for ecosystem maintenance. This was reflected in the PAs’ financing system. “[T]he income of national parks is obtained mainly from exploitation of natural resources, rather than through park services. This unsustainable management practice could undermine the main goals of nature protection policies.” (UNECE, 2003)

### ***v. Lack of prioritization in policy making.***

In 2003 Serbian biodiversity faced several challenges but limited resources hindered identification of priorities through stakeholder participation. Hence both reviews recommended developing a *biodiversity strategy and action plan* to guide policy makers and implementers in the short-, medium- and long-terms.

## **Actions Taken Since 2003 and Remaining Challenges**

Progress has been made in addressing these policy and institutional issues:

### ***i. Integration of biodiversity concerns into economic sector activities.***

*Recent development strategies of the Government take into account biodiversity conservation.*

- The *Strategy for Sustainable Development* which is under development will treat biodiversity as one of the key environmental issues.
- The *Strategy for Forestry Development* which was prepared by the MAFWM Forestry Directorate in consultation with the former MSEP/DEP and INP attempts to find a workable balance between biodiversity conservation and the economic development potential that Serbia’s

forestry sector offers. Prepared with FAO support, the Strategy has a special chapter on biodiversity and promotes forest management and utilization that enhance productivity and financial viability while preserving ecological functions and biodiversity. A Forestry Action Plan will “operationalize” the Strategy and be developed with stakeholder coordination.

- The *Strategy for Agricultural Development* incorporates agri-environment measures under the EU Common Agricultural Policy’s Pillar II. Specifically, it supports nature protection and biodiversity conservation in rural areas. For example, the Strategy’s agricultural support program provides small, economically unviable farmers with grants to retire from farming, convert to organic production, diversify into non-agricultural income sources such as tourism, or maintain autochthonous livestock breeds and plant varieties.
- While the *Energy Development Strategy* does not specifically address biodiversity, its measures to enhance energy efficiency and reduce pollution from energy sources will benefit biodiversity. *On the other hand, the development of hydroelectric energy sources may have significant adverse effects on sensitive ecosystems and should be subject to thorough environmental impact assessment.*

*Biodiversity protection would benefit from stronger integration into plans and programs of sectors significant impacting biodiversity, especially tourism and infrastructure. The Government’s 2006 Tourism Development Strategy lays out priorities for a ten year period. A review of the Strategy suggests integration of biodiversity and nature protection could be*

improved. The Strategy could recognize that (i) Serbia’s diverse ecosystems offer substantial potential for landscape-based tourism, such as rural tourism or eco-tourism and (ii) uncontrolled tourism development could harm fragile ecosystems and appropriate mitigation should occur. *Rigorous strategic impact assessments of economic sector plans and environmental impact assessments of projects are the most effective tools for ensuring that biodiversity conservation and nature protection concerns are adequately considered.*

*Institutionally, one measure that has been taken since 2003 to integrate biodiversity in economic sectors is the establishment of the Council for Sustainable Development with the mandate of horizontal coordination at the governmental level. As pointed out earlier however, the Council’s role has been limited. Effectiveness may be improved if the Sustainable Development Strategy laid out concrete procedures for its integration work.*

*While policy and institutional measures are crucial, on-the-ground implementation activities involving local community participation and yielding tangible economic benefits have the best chance of reducing pressure. In fact, the challenge of balancing economic development and nature protection requires a broad landscape approach not limited to protected and non-protected areas, but including diverse land use zones. The In-Situ Agro-biodiversity Conservation component of the WB-GEF supported *Serbia Transitional Agricultural Reform Project* aims to achieve this goal. The *Danube River Enterprise Pollution Reduction Project* will reduce the pollutants (especially, nutrients and biological oxygen demand) in Serbia’s canals and rivers in the Danube Basin watercourses. This reduction will help preserve Serbia’s aquatic ecosystems, while generating economic value from the use of manure as fertilizer.*



### **Biodiversity Friendly Rural Development in the Stara Planina Region**

MAFWM with support from the World Bank and GEF will soon implement the *Serbia Transitional Agricultural Reform (STAR) Project* which incorporates bio-diversity conservation in rural development. A component of the project targets the Stara Planina Region, where the traditional, but declining economic system of extensive livestock grazing and small-scale (garden) farming effectively maintained the biologically rich mosaic of forest and natural pasture. The Stara Planina Nature Park (SPNP) is managed by Srbijašume whose expertise is in timber production point of view and lacks experience in managing a protected landscape for multiple functions.

The Project has two complementary objectives: (1) to restore and develop economically viable activities in order to improve local livelihoods and stem the tide of out-migration, and (2) to support biodiversity conservation and sustainable use in accordance with the goals of SPNP. The project will achieve these objectives by developing incentives and capacity for sustainable land use management and *in-situ* conservation of agro-biodiversity. Particular emphasis will be placed on developing and marketing (i) environmentally friendly niche products based on indigenous livestock varieties grazing in mountain meadows, and (2) environmentally sustainable rural tourism as a supplementary source of income for the local population. The project will also train Srbijašume staff so forest management evolves from timber production to maintenance of diverse ecosystems and biodiversity.

#### ***ii. Strengthening the Legal framework***

Since 2003 the Government of Serbia has taken a number of actions to address weaknesses in the legal framework concerning biodiversity conservation and nature protection.

*A key development is the drafting of a Law on Nature Protection which is in harmony with the relevant EU legislation:* The Directive on the conservation of natural habitats and of wild fauna and flora; the Directive on the conservation of wild birds, and on keeping of wild animals in zoos; the Regulation on protection of flora and fauna by regulating their trade, the Convention on the conservation of European wildlife and natural habitats; and the Convention on the conservation of migratory species of wild animals.<sup>8</sup> The Draft Law provides for identification of sites of European importance and for special management plans to ensure that habitats and species are maintained at or restored to favorable conservation status. These sites, together with those of the Birds Directive will constitute Serbia's contribution to the Natura 2000 Network.

*The significance of the Draft Law is that for the first time Serbia would have a special and comprehensive law dealing with biodiversity conservation and nature protection. Until now*

this field has been regulated through provisions in the previous Law on Environment (1991 and later amendments) and the Law on National Parks (1993 and amendment). Presently in the process of regular consultations, the Draft Law mandates the preparation and enforcement of management plans for PAs.

*The implementation of the new Law on Nature Protection following its adoption will require revision of several regulations.* In particular, regulations containing national lists of protected species will need to be revised so they comply with both of the above-mentioned EU Directives and related MEAs. The latter include the Convention on Biodiversity, CITES, Convention for the Protection of World Cultural and Natural Heritage, Convention on Wetlands of International Importance especially as Waterfowl Habitat. Regulations should also ensure compliance with Council Directive on the keeping of wild animals in zoos.

Other efforts to harmonize Serbian legislation with international standards include the incorporation of international agreements in biodiversity protection related provisions of the new Law on Environmental Protection (2004); and enactment and submission to Parliament in 2006 of laws for the ratification of the following key international conventions:

- UN Convention to Combat Desertification in those Countries Experiencing Serious

<sup>8</sup> This statement is based on information received from Serbian authorities. The World Bank has not conducted a legal review of the Draft Law.



Drought and/or Desertification, Particularly in Africa (1994);

- Convention on the Conservation of Migratory Species of Wild Animals;
- The Convention on the Protection and sustainable development of the Carpathians;
- Convention on Environmental Impact Assessment in a Transboundary Context; and
- Convention on the Conservation of European Wildlife and Natural Habitats.

The Government has also taken some steps to discourage unsustainable use of wild flora and fauna. Specifically, the new Law on Environmental Protection significantly increased the level of fines for extraction and trade of wild plants and animals beyond permitted levels. On the other hand, the enforcement procedure continues to be long and slow. This coupled with weak inspection capacity, will likely continue to undermine enforcement.

### *iii. Establishment of Inventories*

*Improved inventory of species and ecosystems in need of protection is needed for better management and harmonizing with the EU Nature 2000 Network.* Serbian institutions have carried out several activities to strengthen this element since 2003:

- Harmonization of the national nomenclature for habitat classification with international standards;
- Completion of a Geographical Information System (GIS)-based mapping of nature protected areas;
- Preparation of a database for six areas in the Sava basin and the Carpathian region, namely Kopaonik, Obedska Bara, Gornje Podunavlje, Deliblatska pescara, Prokletije and Vlasina. In addition, INP developed a list of 60 potential EMERALD areas. This will allow Serbia to participate in the EMERALD Network of areas of special conservation interest for the EU. The Network covers member countries of the Bern Convention on the Conservation of European Wildlife and Natural Habitats which Serbia is expected to ratify soon.

- Completion of a flora inventory according to World Conservation Union (IUCN) criteria (using the international CORINE methodology and GIS technology) and incorporating it into the Serbian Red Book. Of the 3,665 taxa identified, 350-400 have been assessed as endangered and about 200 as being at low risk. Categorization is underway. The corresponding Red Book will be published in 2007.
- Preparation of the Red Book of vertebrates (ongoing).
- Development of action plans for the protection of large carnivores (ongoing).
- Development of an action plan for the control of import, monitoring and suppression of alien invasive species (ongoing).
- Preparation of an inventory of protected areas in the Danube Basin.
- Establishment of an information system for monitoring biodiversity using geo-referenced data sets, specific for each group of organisms. Data sets for plants, amphibians, reptiles, birds and mammals have been completed.

MAFWM has also regularly updated agrobiodiversity data and submitted them to relevant entities for inclusion in the European Research Information Catalogue for Plant Genetic Resources and the FAO Domestic Animal Diversity – Information System for Animal Genetic Resources.

*In harmonizing with the Natura 2000 Network, the key next step will be identifying so-called “Special Areas of Conservation” and “Special Protection Areas” in a manner consistent with the EU Birds and Habitats Directives.*

### *iv. Management plans for national parks and other PAs*

NES identified as a policy objective for the 2006 – 2015 period “[t]o ensure management of protected area of national and international significance.” Progress has been made in preparing management plans for three national parks incorporating the IUCN guidelines on zoning with different levels of protection and natural resource uses. The draft Law on Nature

Protection mandates management plans for all protected areas.

*Management plans will have to address the challenge of balancing economic interests of the community living in and around PAs and the conservation objectives.* This will necessitate a participatory process of deciding on the appropriate types of economic activities in different zones in and around PAs. Recently this issue needed to be tackled in the context of appropriate types and areas of tourism development in the Stara Planina Nature Park.



**Grazing land endangered by invasive plants in SPNP (2003)**

*Management plans also need to address natural disasters threatening ecosystems and economic uses derived from them.* These include floods, droughts, and forest fires. The recent extensive forest fires in the Stara Planina region demonstrate this need.

The “Special Areas of Conservation” and “Special Protection Areas” identified in compliance with the EU Birds and Habitats Directives may or may not overlap with the existing PAs. In any case, implementation of the Directives will require the development of management plans to ensure these sites are protected, and building the capacity of key implementing institutions to undertake Serbia's commitments to nature protection under the *Acquis*. Where Natura 2000 sites fall outside of formally protected areas, a scheme of compensatory payments to private landowners needs to be developed and implemented. Such a scheme would induce private landowners to put their land to uses compatible with protection objectives.

*The above measures will have financial implications.* The National Environmental Strategy estimates a total undiscounted cost of €29 million over 10 years under the budget item titled “nature.” As management plans are developed for existing and new PAs, including Natura 2000 sites, clearer estimates will emerge. It will be important to take into account not only initial investment costs (park boundaries, visitor center and interpreted pathways, monitoring equipment, training), but also recurrent O&M costs (staff salaries, monitoring, research). With regard to financing, investments costs will largely have to be funded publicly, as justified by the public good nature of biodiversity conservation. Co-financing may be available from the European Commission for Special Areas of Conservation under the Habitat Directive. With regard to recurrent costs, national parks may derive some revenues from visitor entrance fees and concession agreements for park services. However, as experience in the region has shown, revenue generation cannot become an overriding concern to the detriment of effective conservation. In most PAs, public funds contributed by responsible ministries will be needed to meet recurrent costs.

#### *v. Identification of policy priorities*

*Serbia commenced the preparation of a Biodiversity Strategy and Action Plan (BSAP) in 2004 with cooperation from GEF and UNDP.* The components of the project were: a) Stocktaking, inventory and analysis of existing information and preparation of a Country Study; b) identification and analysis of available options; c) preparation of a Strategy and Action Plan; and d) submission of the First National Report to the Convention on Biological Diversity and launching of BSAP.<sup>9</sup>

*While BSAP is still in an early stage of development, the Government of Serbia has worked on two other highly relevant strategies.* First, the NES which was developed in a highly participatory manner also elaborated priorities with regard to biodiversity and nature protection. Second, a *Strategy for Sustainable Use of Natural Resources and Goods* has been drafted with finalization expected by the end of 2007. Similar to the EU thematic Strategy for Sustainable Use of Natural Resources, the Strategy has a long-term policy vision. Its time frame is 25 years with 10-year objectives for biodiversity and natural resources.

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<sup>9</sup> Project description at [www.gefonline.org](http://www.gefonline.org).

*Considering the long time that has elapsed since the BSAP work was initiated and inventories and strategies were developed during that period, the Government, in coordination with UNDP, may find it useful to reevaluate the objective and content of the BSAP work. This would help optimize the use of scarce resources.*



**Autochthonous pig breed (Piroć, 2005)**



**Producing local cheese brand in the Stara Planina Region (Piroć, 2005)**



**Autochthonous sheep breed (Zaječar, 2005)**

## Energy and Environment Linkages

The growing Serbian economy generates increasing demand for energy. While energy and environment linkages often seem to present zero-sum choices, a closer look at the Serbian situation indicate several win-win opportunities.

### Institutional Framework

The Ministry of Mining and Energy (MME) sets energy policy. The energy market is regulated by the Serbian Energy Agency (SEA) which reports to the Parliament. SEA is also responsible for defining the tariff system which has to be approved by the Government. The Serbian Energy Efficiency Agency (SEEA) which reports to the Government is responsible for developing programs and measures aimed at improving energy efficiency and promoting renewable energy. Besides SEA and SEEA there are five Regional Energy Efficiency Centers that are independent units of universities and the Serbian Industrial Energy Efficiency Network. Their tasks are development of energy efficiency projects, transfer of innovative technologies, consulting to the industry and households, and related education and training. Two public enterprises, the Electric Power Industry of Serbia (EPS) and the Electric Transmission Company of Serbia (EMS), respectively generate and transmit electricity.

### Key Issues Prevailing in 2003

In the early 2000s, Serbia's energy sector faced severe problems related to the consequences of the past few years of conflict: sanctions that limited imports of equipment and fuel; NATO destruction of energy infrastructure; fiscal deficit; outdated and insufficiently maintained energy facilities; severe air pollution from thermal power generation; and the lack of modern regulation and legislation. Electricity sub-sector reform was of paramount importance. One of the key policy problems was the heavy underpricing of electricity that led to large quasi-fiscal deficits, the inability to adequately fund operations, inadequate maintenance or upgrading of dilapidated assets, and excessive use of energy by households and industry (World Bank, 2003).

Among the issues listed above, inefficient use of energy and air pollution from thermal power generation were key energy related environment

problems and are discussed in more detail in this section.

### *i. Inefficient use of energy*

Inefficient use of energy was a major concern in Serbia in the early 2000s. Consumption of primary energy for every dollar of GDP was almost thirteen times more than in Germany, ten times more than in France, five times more than in Slovenia, and almost twice that of Romania.

### *ii. Air pollution from thermal power generation*

*Lignite-fired thermal power plants in Serbia constituted severe air pollution hotspots causing significant damage to health and economic assets.* The lignite fired-TPPs Kostolac A and B (located in Kostolac), Nikola Tesla A and B (Obrenovac) and Kolubara A (Lazarevac) are significant sources of SO<sub>2</sub>, NO<sub>x</sub> and particulate matter (PM) emissions. This was due to the low quality, high ash content of the domestically mined lignite, inefficient combustion technology, and the lack of proper abatement equipment. Higher than average incidence of respiratory problems were reported in the areas surrounding the TPPs. The TPPs are also significant CO<sub>2</sub> emitters.

*In addition to stack emissions, the more than 5.5 million tons of fly ash annually generated by TPPs and improperly stored on an open area of about 1,800 ha caused secondary air pollution.* For ash deposits near watercourses, water pollution ensued. An estimated 170 million tons of fly ash had accumulated on disposal sites. Use in road construction or the cement industry was not practiced, in part due to arsenic contamination of the ash.

### **Actions Taken since 2003 and Remaining Challenges**

Serbia has made important progress in reforming and upgrading its energy sector since 2003. Assets damaged during the Kosovo crisis have been rehabilitated and the legal and institutional framework has been improved. The power utility EPS has made important improvements in its operations. Its financial position has been strengthened through significant tariff increases and by increasing payment collections from

electricity consumers. In parallel, EPS has made investments to rehabilitate critical assets. Furthermore, following EU guidelines on separation of generation from transmission, EPS was restructured and transmission assets were transferred to EMS. The Serbia Energy Agency was established in 2005. These measures have had a positive impact on environment, as discussed below.

***i. Improvements in energy efficiency.***

The Government followed a multi-dimensional approach in promoting energy efficiency.

On the policy side, the Energy Law of 2004 generally recognized the importance of energy efficiency both in production and consumption. MME has also initiated drafting a Law on the Rational Use of Energy and relevant secondary laws. This law will provide a legal framework for energy management and implementation of EU directives related to energy efficiency.

On the institutional side, SEEA was established in 2002 with the objective to promote energy efficiency, provide policy advice to the

Government, and give technical advice to industry and end users. Five Regional Energy Efficiency Centers and the Serbian Industrial Energy Efficiency Network were established with financial and technical support from the Government of Norway, which also helped organize several training activities on energy efficiency in industry. The Government is also planning to establish a fund for energy efficiency to support activities in this field.

The Government has also conducted a number of implementation activities with the support of bilateral and multilateral financiers. With the assistance of EAR, several demonstration energy efficiency projects have been implemented in public buildings, street lighting, water supply and residential buildings connected to the district heating system. EAR has also supported training of energy auditors in industry, and training in energy management in municipalities and industry. Since 2004 the World Bank has supported investments in the energy efficiency retrofitting of public buildings and the rehabilitation of the energy system of the Clinical Centers in Belgrade and Niš.

**Improving Energy Efficiency in Public Buildings**

Since 2004, the Government of Serbia has been implementing a World Bank supported project to improve energy efficiency in heating buildings in order to make heating more affordable as well as improve the functional and health environment of users. An important associated objective is to reduce the local and global environmental impact of such heating. To achieve these objectives the project supports three activities:

- (a) The replacement of inefficient lignite and heavy oil-fired boilers, which were at the end of their economically useful life, with a gas-fired co-generation plant at the Clinical Center of Serbia (CCS) in Belgrade. This was a high priority investment for by the Government and Belgrade City Administration. To this end, a gas pipeline to the CCS was extended from the nearest medium pressure gas pipeline about 4 kilometers away. The Project will replicate the approach used at the CCS at the Niš Clinical Center, with significant benefits expected in terms of environmental improvements, public health outcomes and cost savings.
- (b) Energy efficiency improvements in selected public buildings such as schools, hospitals and social care institutions throughout Serbia (approximately 116 public buildings).
- (c) Technical assistance for capacity building, energy audits and investment proposals, public outreach/communications, and training of municipal and government officials about evaluating capital expenditure decisions on energy efficiency investments.

*There are still a number of actions that the Government can support in cooperation with the private sector, local governments and consumer groups to reduce the amount of energy consumed per Dollar of GDP. While this indicator has*

decreased in recent years, it is still much higher than the corresponding figure in the EU-15.<sup>10</sup>

<sup>10</sup> MME estimates that between 2002 and 2005 the energy consumed (kg oil equivalent) per Dollar of GDP decreased from 0.9 to 0.58. MME also maintains that



Government action may build on the experience gained and capacity built in the past four years. Specifically, further focus for demand management programs would be recommended. Examples include: energy audits; energy management certification programs; energy efficiency standards and labeling of appliances; energy efficiency building codes; energy efficiency programs in government buildings; and financing schemes for energy efficiency investments.

## **ii. Reductions in air pollution from TPPs**

*The Government took significant policy steps with regard to air pollution from industry, including energy generation.* Most notable are the enactment and submission to the Parliament in 2006 of a framework Law on Air Protection and the 2004 adoption of the Law on IPPC and six bylaws which transposed the EU IPPC Directive. The Law introduces emission limits by pollutant, including ozone, and margins of tolerance for temporary excess emissions over emission limit values based on ambient pollution levels. The Law is in harmony with the EU Directive on ambient air quality assessment and management and certain daughter directives. The Government also introduced a tax on emissions to air from industrial enterprises. Furthermore, in 2005, the Government adopted a bylaw on the “polluter pays” principle and begun levying taxes on air polluters including TPPs.

*Furthermore, Serbia signed the 2005 Energy Community Treaty according to which “... the construction and operation of new generating plants shall comply with the *acquis communautaire* on environment” upon its entry into force.* This will mean that strict emission limits will have to be achieved through the application of best available techniques (BAT) as

directed by the EU Directives on the limitation of emissions of certain pollutants into the air from large combustion plants (LCPD) and the IPPC Directive. By the same treaty the LCPD will apply to existing TPPs only from the end of 2017.

*Promising progress has been made in terms of implementation as well.* In late 2006 EPS, which owns and operates the TPPs, installed a new electrostatic precipitator in the Kostolac A TPP at a cost of €5 million. The EU supported this investment. PM emissions have been reduced from 800-1,200 mg / m<sup>3</sup> to 50 mg / m<sup>3</sup> which is in line with the EU LCPD emission limit values. The PM emission reduction is expected to benefit approximately 100,000 inhabitants of Kostolac, in particular children who are more susceptible to asthma. EPS also plans to improve ash disposal at Nikola Tesla B at a cost of €27.5 million beginning in 2007-2008, which is also financed through a grant from the European Commission.

*On the other hand, fly ash deposits have not been eliminated and should be treated as a priority waste management issue, as discussed in the previous section.*



**Fly ash landfill at the Nikola Tesla B TPP**

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the latter value is still much higher than the corresponding values in the EU-15 (0.16), Germany (0.17), Denmark (0.13), Hungary (0.19), Croatia (0.19) and Romania (0.26).

	Pollutant		
	SO <sub>2</sub>	NO <sub>x</sub>	PM
Nikola Tesla A & B* and Kolubara A* (tons)	140,253	32,555	15,125
Kostolac* (tons)	88,188	8,336	4,097
<b>Total emissions (tons)</b>	<b>228,441</b>	<b>40,891</b>	<b>19,222</b>
Per ton annual damage (€)**	541 - 1,341	87 - 145	1,174 - 2,126
<b>Annual damage by pollutant (million €)</b>	<b>124 - 306</b>	<b>4 - 6</b>	<b>23 - 41</b>
<b>Total annual damage (million €)</b>	<b>151 - 353</b>		

Source: \*: Report on the State of the Environment in EPS for 2006 (2007); \*\*: Jantzen and Pešić (2005)

**Emissions from TPPs and damage estimates**

However, the TPPs continue to be significant sources of SO<sub>2</sub> pollution which leads to substantial damages to human health, crops, building materials, and ecosystems. Applying per ton damage estimates that were used by Jantzen and Pešić in “Assessment of the Economic Value of Environmental Degradation in Serbia” (2004) and multiplying these by annual emissions of particulate matter (PM), SO<sub>2</sub>, and NO<sub>x</sub> from TPPs as reported by EPS the annual damage to Serbia caused by these emissions is estimated to range between €151 – 353 million annually.<sup>11</sup> EPS estimated the total cost of retrofitting the TPPs with equipment to reduce SO<sub>2</sub>, and NO<sub>x</sub> emissions at about € 610 million and envisages completing rehabilitation investments by 2012 (EPS, 2005). While this one-time investment outlay is high; returns to the economy in the form of reduced damage to human health, crops, ecosystems and buildings will compensate for this expense.

### Greenhouse Gas Emissions and the Kyoto Protocol

While there are no official data exist on CO<sub>2</sub> emission values in Serbia, it is widely accepted that the energy sector is the main source of emissions.<sup>12</sup> Key interventions which would lead to overall emission reductions include (i) renewable energy (new and rehabilitation of existing assets), (ii) renewable biomass energy,

<sup>11</sup> Jantzen and Pešić derived the range annual damage estimates by pollutant from studies carried out for the Netherlands. They adjusted these estimates to Serbian circumstances by taking into account lower purchase power parity, lower population, higher per square kilometer deposition.

<sup>12</sup> An inventory of greenhouse gases is under preparation by the Government.

(iii) rehabilitation of thermal power plants, (iv) rehabilitation of district heating systems, and (v) energy efficiency in buildings and industries. Such interventions could partly be financed through carbon credits under the Clean Development Mechanism (CDM) of the Kyoto Protocol.

A number of preparatory activities have been carried out in the period leading to the ratification of the Kyoto Protocol. Notably, the Ministry of Mining and Energy is preparing a strategy document for the implementation of CDM projects in the energy sector. The strategy is expected to be finalized by the end of 2007. Furthermore, an ongoing UNDP supported project titled “Promoting investments for energy efficiency and renewable energy through carbon financing in the Republic of Serbia” aims at setting up the necessary legal and institutional framework for CDM implementation.

### Renewable Energy and Environment

Serbia has a variety of potential renewable energy resources, such as bio-fuels, hydroelectric power, wind and geothermal energy, and would benefit from exploring these from the points of view of economic, technical and environmental feasibility. As a matter of fact, the Government’s Energy Sector Development Strategy recognizes the selective use of renewable resources as a “special priority.” Furthermore, in order to encourage the use of renewable energy resources, the Energy Law of 2004 introduced subsidies, tax relief, custom relief, and other incentives to power and heat producers who exploit renewable energy resources, waste and combined heat and power technologies. The

World Bank has completed an ESMAP funded study on "Analysis of Policies to Promote Low Carbon Energy Alternatives" which recommends important policy actions to support new renewable energy projects in Serbia.

While the use of renewable energy is generally positive for the environment as it offsets fossil fuel based energy generation, it may also have negative impacts on the environment. Notably

hydroelectric power development can significantly alter the ecosystems in which they are built. Diligent environmental impact assessments of renewable energy development projects would identify and propose remedies for such effects. In this context the Ministry of Mining and Energy is congratulated for including in its Energy Strategy Implementation Program a chapter covering environmental protection in the energy sector and defining measures to decrease environmental impact.



## Conclusions

Since the 2003 Environment for Europe Conference in Kiev, the Government of Serbia has done a significant amount to improve the policy and institutional basis for better environmental management, including mitigating the environmental impact of a growing economy. This includes the adoption of the Laws on Environmental Protection, on EIA, Strategic Impact Assessment, and on IPPC as well as the development of a National Environmental Strategy and sectoral development strategies for agriculture, forestry and energy which incorporate environmental concerns. Several key laws, including notably a Law on Nature Protection and a Law on Waste Management, have been or are being drafted. A comprehensive draft National Sustainable Development Strategy has been developed under broad stakeholder participation under the supervision of the Deputy Prime Minister.

On the institutional side, a Council for Sustainable Development was established to facilitate horizontal coordination among Government ministries in environmental matters. The Serbian Environmental Protection Agency and the Energy Efficiency Agency have been established. The capacity of the Serbian Environmental Inspectorate has increased through training activities, participation in the Compliance and Enforcement Network for Accession, and the use of modern information technology for improved communication.

Some implementation activities to mitigate or cleanup pollution have been, are being, or will shortly be executed. Notable examples are: the installation of dust filters in the Kostolac A and the Nikola Tesla B lignite fired thermal power plants; the implementation of modern slaughterhouse and farm animal waste management practices on pilot enterprises in the Danube basin; the development of regional sanitary landfills in Kikinda and Nova Varos and final preparation for a sanitary landfill in Užice; improved energy efficiency in schools and hospitals; implementation of rural development measures in harmony with the protected landscape approach in the Stara Planina Region; and the cleaning up of contaminated soils in RTB Bor.

However, as policy makers agree, this is only the beginning and more needs to be done for the Serbian society to achieve European standards in

environmental protection. Emphasis should be placed on implementation, but further strengthening of the policy and institutional framework is needed. This review emphasizes the following overall approaches:

- Take time with the transposition of the EU *Acquis*. But once a directive or regulation has been transposed, adopt the accompanying secondary legislation for policy implementation. This needs to be done for waste management and IPPC.
- Build local enforcement and management capacity including municipal environmental inspectors and protected area management staff.
- Execute mitigation and cleanup actions such as installation of equipment to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions from TPPs, cleaning up fly ash accumulations at TPPs, safe disposal or incineration of PCBs and stockpiles of other POPs, and implementing management plans for national parks and other protected areas; and
- Continue promotional activities with the general public, NGOs and industry on waste recycling, hazardous waste management, energy efficiency, socially sustainable biodiversity conservation, and financial sustainability of domestic waste management.

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### **Note on pictures used in this report:**

All pictures were made by Tijen Arin, except for (i) "Construction of manure storage facilities", on page 10 which was made by the MAFWM Project Management Unit of the Danube Enterprise Pollution Reduction Project, and (ii) "Fly ash landfill at the Nikola Tesla B TPP" on page 21 which has an unknown source.

## Annex 1: National Waste Management Strategy. Status of Implementation of Prioritized Actions and Measures

<b>1. Legislative measures</b>			
	<b>Activity / Measure</b>	<b>Target</b>	<b>Achievements</b>
1	Adoption of the Law on System of environmental protection	Early 2003	End of 2004
2	Preparation of the Law on waste management	2003 / 2004	Draft submitted to Parliament in 2007
3	Preparation of the Law on packaging and packaging waste	2004	In preparation
4	Review and harmonization of existing bylaws	2004	Not yet
5	Regulations concerning criteria for locations for waste disposal landfills	2003	No
6	Review of existing decisions on public utility services	2004	No
7	Adoption of technical standards for specific types of waste	2005	No
8	Enforcement of manufacturers' responsibility to process/recycle specific types of waste (e.g. packaging, electronic devices, obsolete vehicles)	2005	Addressed in draft LWM
9	Draft proposal for different taxes levied for different methods/services relevant to waste management	2004	No
<b>2. Institutional and organizational measures</b>			
	<b>Activity / Measure</b>	<b>Target</b>	<b>Achievements</b>
1	Establish an inter-ministry Committee for coordination in implementing the strategy of waste management	Mid-2003	No
2	Establish primary and secondary responsibility in regulations	Mid-2003	No
3	Establish in detail the responsibility at the republic level, level of autonomous province and at local level	As each law is prepared	Lack of clarity persists re: hazardous waste competences and inspection between AP Vojvodina and MEP
4	Transfer responsibility for planning in waste management to regional level	With adoption of relevant laws	Included in the Draft LWM. 10 regions signed memoranda of understanding and cooperation and started to prepare technical documentation for construction of regional landfills
5	Introduce obligatory competitive tendering for procurement of public utility services (in compliance with the Law on Public Procurement)	2003	Not yet
6	Establish a tendering and contract model for procurement of services in waste management (in compliance with the Law on Public Procurement)	2003	No
7	Incorporate EU and national standards and objectives into the content of long-term contracts for waste management	2005-2015	No
8	Install separate collection of recyclable materials (including biodegradable materials) in regional / municipal plans and contracts for services in collecting municipal waste	2005-2015	Ongoing
9	Establish an independent professional body (association, chamber) for all stakeholders in waste management	Since 2003	No
10	Upgrade the introduction of Environmental Management System (ISO 14001 and EMAS schedules) and environmental labeling	2003/2004	No
11	Inclusion of the integral system of transport into regional plans for waste management	2004-2009	Planned when the regional landfills start operation

<b>3. Technical / Operative measures</b>			
	<b>Activity / Measure</b>	<b>Target</b>	<b>Achievements</b>
1	Organize collection stations for taking over bulk / hazardous / recyclable household waste	2004	No
2	Construction of «collection centers» for recyclable materials where citizens will bring their own waste	2004-2007	No
3	Close down all inadequate landfills	2006	Ongoing, with financial support of DEP and Env. Fund and municipalities
4	Rehabilitation of existing landfills, upgrading and monitoring for a longer time period (until regional landfills are built)	2010	
5	Recultivation of closed landfills	2005	
6	Establish regional plants for taking over, (re)-packing, labeling and temporary storing of potentially hazardous waste intended for processing in Serbia or for cross-border treatment or return	End of 2004	No
7	Establish regional plants for separate collection and treatment of medical waste	2005	Ongoing EAR projects
8	Construction of a national centre for high temperature incineration of combustible hazardous waste	2005	No
9	Construction of a national plant for physical-chemical treatment and stabilization of non-combustible hazardous waste	2005	No
10	Establish a plant to take over / treat used oils, used tires, used batteries and accumulators, obsolete vehicles and electronic devices	2004	Limited <sup>13</sup>
11	Construct a plant for treatment/processing/recycling of biodegradable waste (composting plant)	2009	No
12	Construct a plant for treatment of collected and separated packaging waste at source	2004	No
13	Construct a plant for treatment / stabilization of sludge from municipal waste water treatment plants	2004	No
14	Construct regional landfills for disposal of already treated, non-inert, nonhazardous waste in line with EU standards/best practices	2010	No
15	Construct a plant for disposal of certain (stabilized) hazardous wastes	End of 2004	No
16	Construct plants for incineration of municipal waste	2010	No
17	Construct transfer stations	2003-2010	Not yet
18	Use cement factories and iron works for incineration of hazardous waste, or for use of alternative waste fuel. Establish gasification plants.	2005	No
19	Assess the possibility of continued use of existing plants for treatment of hazardous waste	2003	No
20	Rehabilitation of existing storages of hazardous waste to the level of meeting minimum environmental requirements	2005	No
21	Use abandoned surface coal and ore mines to dispose of mining and flotation waste and ashes from power plants. On internal disposal sites of abandoned mines, cover the disposed ash with mining waste	2005	No
22	Increase the use of ash from power plants as secondary raw material (cement plants, construction materials). At best, it is possible in this way on annual basis to use about 2 million tons of ash in Serbia	2007	No
23	Replacement of all devices with PCB oil, decontamination of devices, destruction of all hazardous wastes with PCB	2015	Ongoing project defined in NIP
24	Construct a plant to recycle construction materials	2007	No
25	Closing down dirty technologies and their replacement with clean ones	2010	No
26	Remedying contaminated soil	2008	Remediation of South Serbian uranium contaminated site completed in 2006.
27	Reconstruction of existing rendering plants of open type	2005	Small investments

<sup>13</sup> Some private companies collect rubber, plastics, accumulators, and tires. Notably the Holcim cement factory collects and co-incinerates used tires.

			made
28	Construction of new rendering plants	2008	No

#### 4. Economic measures

	Activity / Measure	Target	Achievements
1	Implement new pricing methods for services	2003	No
2	Increase the level of fines for inadequate waste handling	2003	No
3	Upgrade the system of supervision, control, settling and collecting fines, including also establishment of «public utility police»	2004	No
4	Further upgrade the system for return packaging, and include in it a broader scope of products	2004	No
5	Establish a system of extended responsibility of the manufacturer aimed at establishing a system harmonized with EU	2005	No
6	Initiate restructuring of public utility enterprises, in terms of making direct ties with establishing entities, organize such enterprises into organizational-technical units, release them of accessory activities, and incorporate them	2004	No
7	Initiate granting of concessions to private and mixed-ownership enterprises, primarily for collection and disposal of waste	2005	Joint venture companies established between local PUCs and foreign partners in the Kikinda, Leskovac, Jagodina and Despotovac regions
8	Liberalize the sector, introduce competition and beneficiary right to choose the best service provider, and deregulate prices	2005	No
9	Privatize activities related to waste management, wherever viable	2005	No

#### 5. Building public awareness

	Activity / Measure	Target	Achievements
1	Introduce the formal-legal mechanisms such as getting qualification and professional standards in waste management	2005	No
2	Providing and upgrading of education and training for personnel in waste management, technology and operational staff	2005	No
3	Establish a national body responsible for development of education and training	2003	No
4	Establish and implement a program for continued communication with all stakeholders, especially manufacturers	Ongoing	No

## Annex 2. Training courses and seminars attended by inspectors

	<b>Training event<sup>14</sup></b>	<b>Organizer</b>
1.	Cadastre of polluters	Serbian Environmental Protection Agency
2.	TOT programme Train the trainers course	DHV
3.	Benchmarking and Setting Environmental Compliance and Enforcement Indicators“ Workshop	ECENA & World Bank
4.	"Train the Trainers course" part I, (minimum criteria, enforcement indicators, strategy and strategy planning, train the trainer)	«ISLE» project
5.	EU training course - Energy and Environment in the EU	EU accession office & Norway consultant agency The Brussels Office
6.	Inventory of POPs training	POPs - project
7.	"Train the Trainers course" part II, (minimum criteria, enforcement indicators, strategy and strategy planning, train the trainer)	«ISLE» project
8.	Capacity building programme; training on communication skills, strategy of Inspectorate and strategy planning, minimum criteria, presentation of the document: "Instruction for reporting system, for the local self governments environmental inspectors"	Ministry of Foreign Affairs of Italy, COOPI, Ministry of Environment and City Council Medijana Niš
9.	Training on public advent on media	MEP

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<sup>14</sup> List provided by MEP.