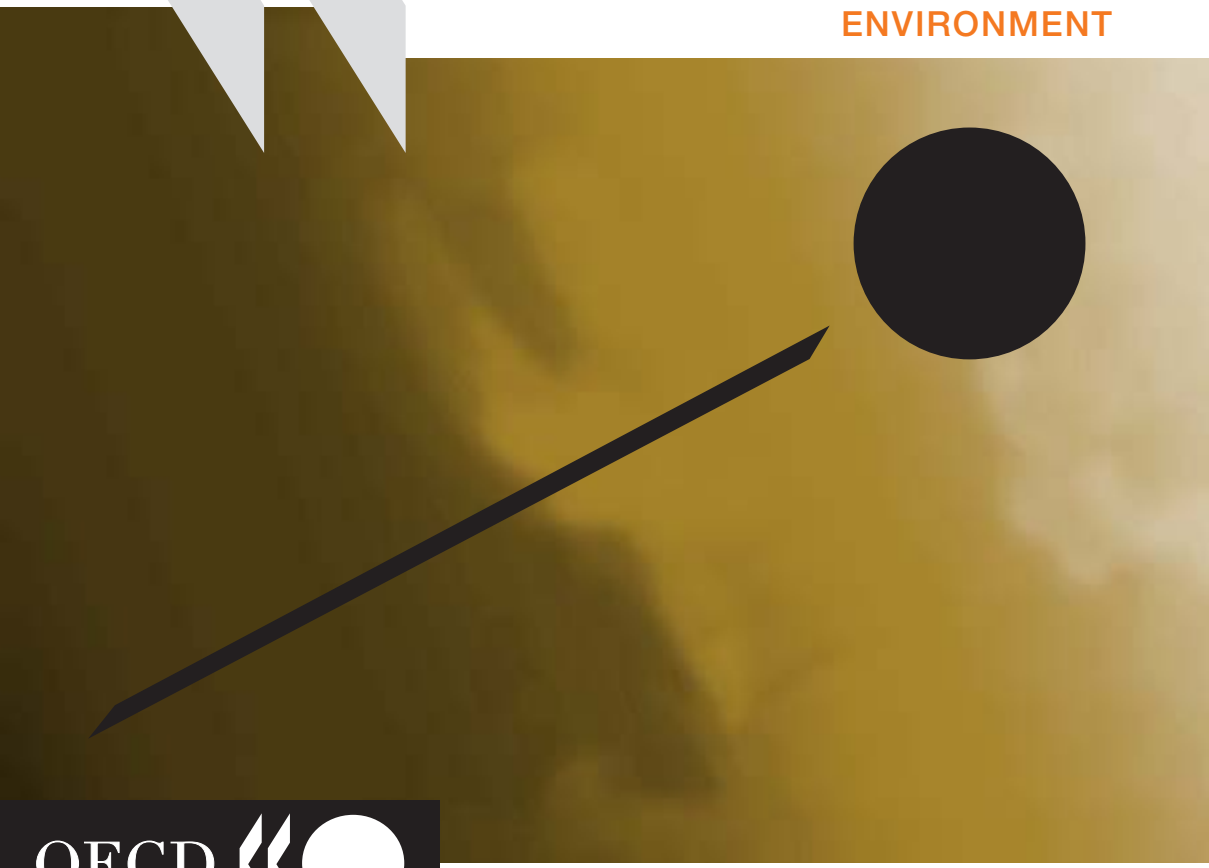
Environmental Performance Reviews

SLOVAK REPUBLIC

ENVIRONMENT



OECD

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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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Pursuant to Article 1 of the Convention signed in Paris on 14th December 1960, and which came into force on 30th September 1961, the Organisation for Economic Co-operation and Development (OECD) shall promote policies designed:

- to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the development of the world economy;
- to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development; and
- to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.

The original Member countries of the OECD are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became Members subsequently through accession at the dates indicated hereafter: Japan (28th April 1964), Finland (28th January 1969), Australia (7th June 1971), New Zealand (29th May 1973), Mexico (18th May 1994), the Czech Republic (21st December 1995), Hungary (7th May 1996), Poland (22nd November 1996), Korea (12th December 1996) and the Slovak Republic (14th December 2000). The Commission of the European Communities takes part in the work of the OECD (Article 13 of the OECD Convention).

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Examens des performances environnementales
RÉPUBLIQUE SLOVAQUE

FOREWORD

The principal aim of the OECD's Environmental Performance Reviews is to help *Member countries improve their individual and collective performances in environmental management.* The primary goals for this programme are:

– to help *individual governments* assess progress;

– to promote a continuous policy *dialogue among Member countries*, through a peer review process; and

– to stimulate *greater accountability* from Member countries' governments towards their public opinion, within developed countries and beyond.

Environmental performance is assessed with regard to the degree of achievement of *domestic objectives and international commitments*. Such objectives and commitments may be broad aims, specific qualitative goals, precise quantitative targets or a commitment to a set of measures to be taken. Assessment of environmental performance is also placed within the context of historical environmental records, the present state of the environment, the physical endowment of the country in natural resources, its economic conditions and demographic trends.

These systematic and independent reviews have been conducted for all Member countries as part of the first cycle of reviews. The OECD is now engaged in the second cycle of reviews directed at *promoting sustainable development*, with emphasis on implementation of domestic and international environmental policy, as well as on the integration of economic, social and environmental decision-making.

The report was peer-reviewed by the Working Party on Environmental Performance (Paris, January 2002). The conclusions and recommendations of the report are approved by the Working Party.

GENERAL INTRODUCTION

This review of the Slovak Republic's environmental performance *examines results* in the light of domestic objectives and international commitments. Two countries assisted particularly with this review: Czech Republic and Finland.

The report is organised in three parts:

– Part I is entitled: "Environmental Management" and focuses on the context, air, water, and waste management, as well as nature conservation and biodiversity;

– Part II is entitled: "Sustainable Development" and focuses on environment and the economy, and environment-social integration;

– Part III is entitled: "International Commitments" and focuses on international co-operation.

The OECD extends its most sincere thanks to all those who helped in the course of this review, to the representatives of Member countries to the Working Party on Environmental Performance, and especially to the examining countries (Czech Republic and Finland) and their experts. The OECD is particularly indebted to the Government of Slovakia for its co-operation in expediting the provision of information and the organisation of the experts' mission to Slovakia, and in facilitating contacts with many individuals both inside and outside administrative and governmental structures of the country.

The OECD Working Party on Environmental Performance conducted the review at its meeting on 9-11 January 2002 and approved its conclusions and recommendations. This report is published under the authority of the Secretary-General of the OECD.

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ABBREVIATIONS AND SIGNS

Abbreviations

AAMA	American Automobile Manufacturers Association
BOD	Biochemical oxygen demand
CESTAT	Central Europe co-operation in Statistics
CFCs	Chlorofluorocarbons
CH_4	Methane
C_xH_y	Hydrocarbons
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CO	Carbon monoxide
CPI	Consumer price index
DO	Dissolved oxygen
EAPSI	Emissions and Air Pollution Sources Inventory
ECMT	European Conference of Ministers of Transport
EGS	Environmental Grant Scheme
EIA	Environmental impact assessment
EMAS	Eco-management and Audit Scheme (EU)
EMEP	Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe
EMS	Environmental Management System
EU	European Union
FDI	Foreign direct investment
GEF	Global Environment Facility (UNEP)
GHG	Greenhouse gas
GMO	Genetically modified organism
ICJ	International Court of Justice
IPPC	Integrated Pollution Prevention and Control
IRF	International Road Federation
ISO	International Organisation for Standardisation
ISPA	Instrument for Structural Policies of Pre-Accession
IUCN	World Conservation Union
LPG	Liquefied petroleum gas
MoE	Ministry of the Environment of the Slovak Republic
NEAP	National Environmental Action Programme

NGO	Non-governmental organisation
NO_x	Nitrogen oxides
N_2O	Nitrous oxide
NPF	National Property Fund
NSDS	National Sustainable Development Strategy
O_3	Ozone
ODS	Ozone depleting substance
PAC	Pollution abatement and control
PAHs	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PHARE	Poland and Hungary: Action for the Restructuring of the Economy (EU)
PM_{10}	Particulate matter less than 10 micros in diameter
POPs	Persistent organic pollutants
PPP	Polluter pays principle
RBE	River Basin Enterprise
RISO	Regional Waste Information System
SAPARD	Special Assistance Programme for Agriculture and Rural Development
SEA	Strategic environmental assessment
SEF	State Environmental Fund
SEI	Slovak Environmental Inspection
SHMI	Slovak Hydro-Meteorological Institute
SIPH	State Institute of Public Health
SMEs	Small and medium-sized enterprises
SO_2	Sulphur dioxide
SWMF	State Water Management Fund
TSES	Territorial System of Ecological Stability
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value added tax
VOC	Volatile organic compound
WHO	World Health Organisation
WMO	World Meteorological Organisation
WRI	Water Research Institute

Signs

The following signs are used in Figures and Tables:
. .: not available;
– : nil or negligible;
. : decimal point.

Country Aggregates

OECD Europe: All European Member countries of the OECD, i.e. countries of the European Union plus the Czech Republic, Hungary, Iceland, Norway, Poland, the Slovak Republic, Switzerland, and Turkey.

OECD: The countries of OECD Europe plus Australia, Canada, Japan, Korea, Mexico, New Zealand, and the United States.

Country aggregates may include Secretariat estimates.
The sign * indicates that only western Germany is included.
The sign ** indicates that not all countries are included.

Currency

Monetary unit: Slovak koruna (SKK).
In 2001, SKK 48.31 = USD 1.

Cut-off Date

This report is based on data available up to July 2001.

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CONCLUSIONS AND RECOMMENDATIONS*

The Slovak Republic is undergoing two *major transitions*: a major economic transition and preparation for entry into the European Union. Slovakia's Gross Domestic Product fell by 23% before recovery began in 1994; overall, GDP has grown by 11% over the 1990s. Unemployment is higher than in most other European countries in transition. A number of industrial enterprises were privatised and land ownership changed significantly.

During the 1990s, the decline of economic activities such as industry and agriculture, changes in its energy supply, and environmental management have contributed to substantially reducing pressures on Slovakia's environment. The country is in the process of major legislative changes concerning the environment. Notwithstanding this progress, much of the accumulated contamination of the past is still in place and current emissions and discharges remain comparatively high. On several issues, the *road towards environmental convergence* with other European OECD countries will be a long one.

The *challenge* is therefore to: i) strengthen the level of effort to implement environmental policies cost-effectively and expand the environmental infrastructure; ii) better integrate environmental concerns in economic decisions in the context of sustainable development; and iii) meet the country's international environmental commitments.

This OECD report establishes a baseline for assessing future environmental progress and examines Slovakia's Environmental Performance, i.e. the extent to which its *domestic objectives and international commitments* are being met. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

* Conclusions and Recommendations reviewed and approved by the Working Party on Environmental Performance at its January 2002 meeting.

1. Environmental Management

Implementing efficient environmental policies and strengthening the environmental infrastructure

Slovak citizens have a constitutional right to a healthy environment. Accordingly, *environmental legislation* was reinforced through the 1990s (e.g. new Acts on air protection, waste management, nature and landscape protection, environmental impact assessment, access to environmental information). A major effort is ongoing to transpose EU environmental legislation in Slovak law. For instance, a new Act on water protection and water management is being prepared, devolving responsibilities to municipalities and promoting river basin management. *Environmental policies* are founded on solid environmental information (e.g. State of the Environment reports), high quality environmental expertise, and important programming efforts (e.g. National Environmental Action Programmes I and II). To implement environmental law and environmental policies, Slovakia uses a *wide range of policy instruments*. Regulatory ones are associated to economic instruments and the extensive system of emission charges has generated sustained revenues and landfill charges have provided effective incentives to improve landfill standards. Physical planning instruments were placed under the supervision of the Ministry of the Environment, and land use planning has been developed at the national and regional level since 1998 and is being developed at the municipal level, including disincentives to forestland encroachment. Environmental impact assessments were carried out for 350 projects and led to project revisions or withdrawal (e.g. dams). In 1997 industry introduced environmental management systems; many companies are certified ISO 14000 and a national programme of eco-labelling is well in place. Very significant *financial efforts* were devoted to pollution abatement and environmental protection in the 1990s: after large efforts in the early 1990s to deal with the most urgent pollution problems, the country reduced its pollution abatement and control expenditure to 2% of GDP by the mid-1990s and to 1.5% of GDP in 1999. Its environmental expenditure (i.e. PAC expenditure together with water supply and nature protection expenditure) were 2% of GDP in 1999. This evolution was accompanied by a gradual decrease in state support for environmental investment, and an increasing role of enterprises and municipalities. The devolution of responsibilities of waste, water, and waste water services to municipal governments will create opportunities to apply the polluter-pays principle and the user-pays principle more fully.

However, the *environmental institutional capacities of Slovakia* have gone, in the 1990s, through significant restructuring (e.g. end of the specific regional

environmental administrations in 1996, devolution of environmental responsibilities, planned elimination of state funds for 2002). It is important that this restructuring both preserves Slovakia's own environmental "acquis" and strengthens Slovakia's capacities to face the environmental challenges of EU accession. Environmental policy implementation can be significantly strengthened. The implementation of NEAP I has not been assessed. *Enforcement of and compliance with environmental regulations* appears relatively weak; the State Environmental Inspection (SEI) should be strengthened, compliance fines updated and increased, and environmental charges and fines collection rates improved; inspection fees should contribute to cover inspection costs and self-monitoring should be improved. Enforcement responsibilities between the SEI, regional, and district offices should be clarified. Enforcement of administrative procedures are not buttressed by judicial ones; there are no prosecutors specialised in environmental matters, no standing access to courts for recognised NGOs to represent the common interest in environmental cases, and no records of environmental cases. The introduction of legislation on integrated pollution prevention and control in line with the IPPC Directive is intended. *Economic instruments* (e.g. charges) should be given higher incentive effect; increases in cost-recovery levels concerning water supply, waste water services, and waste management is needed. Slovakia has started its *approximation process with the*

It is *recommended* to:

- strengthen *enforcement capacities*, raise the level of non-compliance fines and introduce inspection fees, increase the educational and incentive functions of the State Environmental Inspection;
- introduce *specialised prosecutors* for environmental cases and standing access to courts for recognised environmental NGOs;
- review and revise the *pricing of environmental services*, in light of the polluter pays and user pays principles, and of economic and social constraints;
- as part of the process of *devolution of power to regions and municipalities*, ensure that both obligations and revenues are adequately phased in;
- increase the use of environmental auditing to assess *environmental liabilities* arising from past operation of state enterprises, particularly within the context of privatisation;
- complete *land use planning* at municipal level (e.g. in the eastern part of Slovakia).

EU environmental "Acquis". A major legislative effort is underway. Beyond it, a major task will be to implement this new legislation, particularly in the areas of water supply and waste water related infrastructure and for the control of major risks involving dangerous substances. The National Programme for the Adoption of the "Acquis Communautaire" envisages more than a doubling of environmental investment for the period 2000-08 compared to the late 1990s level. Funding will have to come mostly i) from increased environmental charges for municipal waste water and waste infrastructure and ii) from enterprises for their own environmental investments; there will also be some additional funding: foreign funding (e.g. EU funds) and state support mostly to small and medium enterprises. The completion of a municipal waste water infrastructure responding to the EU Urban Waste Water Directive may require efforts spread over much more than one decade.

Air

During the 1990s, Slovakia achieved a *decoupling of most air pollutants emissions from economic growth*: while GDP increased by 11%, emissions of SO_2, NO_x, CO, suspended particulates, heavy metals, VOCs, and CO_2 decreased significantly. This reflects i) the decline in industrial output, ii) a decrease in energy intensity and fuel switching (e.g. from domestic brown coal to imported natural gas) as well as iii) some progress in air management. In the short and medium term, Slovakia should be able to fulfil its major commitments with respect to combating air pollution, stratospheric ozone depletion, and climate change. Slovakia has satisfactory *air legislation and institutions*, including air monitoring and good emissions inventories. Legislation on energy efficiency and an action plan on the use of renewable energy sources are under preparation. There are recent *strategies and programmes* for air management. A strategic environmental assessment of the energy policy was recently carried out with broad stakeholder participation. *Emission charges* are in use as well as domestic emissions trading system for SO_2; plans for starting CO_2 emissions trading are well advanced. However, the practical effect of the SO_2 emissions trading system has been limited. The energy intensity of the Slovak economy decreased by about 25% over the 1990s, partly as a result of changes in technology and in *energy prices*. Between 1998 and 2001, electricity and gas prices rose by 90% and 75% respectively, diesel prices by 60% and gasoline prices by 56%.

Nevertheless, *more efficient incentives and enforcement* are needed to reduce the environmental burden caused by air pollution, and to cut down on the frequent breaches of ambient air quality standards in major cities and industrial

areas. Total annual revenues of air pollution charges and non-compliance fines dropped, partly due to actual emissions reductions and partly due to somewhat lax enforcement. *Tax breaks and exemptions* on meeting environmental regulations have been subject to controversy and lack full transparency; some of them might be regarded as subsidies to foreign investors. The financing of air management projects in the first and second National Environmental Action Programmes should be clarified. The *energy intensity* of Slovakia is still 1.75 times higher than the OECD Europe average, even after the closure of plants using the most obsolete techniques. In addition to the major ongoing reforms of the energy sector, there is a great potential to improve energy efficiency in the industrial, residential, and services sectors, through appropriate programmes with quantitative targets. Despite the current excess capacity in electricity supply, the use of renewable energy resources (e.g. installed hydro-capacity, biomass) may be increased. In the transport sector, *freight traffic* increased significantly: 55% for road freight traffic.

It is *recommended* to:

- make the enforcement of *emissions charges and fines* more effective (e.g. through monitoring and reporting on enforcement and related revenues);
- review exemptions from *environmentally related taxes and environmental standards* to industry and energy producers, and ensure they are fully transparent and consistent with fair competition;
- clarify the sharing of *funding* and other responsibilities between the private and public sectors concerning air management projects under the National Environmental Action Programmes;
- include more *quantified targets and timelines* into strategies and programmes dealing with air management, energy, transport, and climate policy;
- continue adjusting *electricity and gas prices* to reflect costs and promote efficiency in the energy sector, taking into account social considerations;
- continue *fuel switching* from domestic brown coal to natural gas and renewable energy sources (e.g. biomass), taking into account employment and environmental implications;
- further *decouple energy use from economic output* in the Slovak economy by improving energy efficiency in different sectors through appropriate incentives and programmes.

Water

Overall pressures on *water quantities* are low and total annual water withdrawal fell due to the decline and restructuring of industrial production, reduced household consumption, and a decrease in irrigated area. *Pollution* loads in surface waters decreased in the 1990s, as a result of a contraction in industrial and agricultural outputs and restructuring of these sectors (e.g. less energy intensive industry and less agrochemical intensive agriculture). Overall, there was a *decoupling* of water withdrawal and pollution discharges from GDP growth. Slovakia has ratified key regional multilateral agreements in the area of water management.

However, river development has contributed to more acute flooding. *Surface water quality* improved very little over the 1990s, although eastern Slovakia, in general, reached quality parity with the western part of the country. Eutrophication of bathing water is a problem. Limit values for *drinking water* quality are often exceeded for some heavy metals and ammonia and there are persistent cases of nitrate pollution. The share of the population connected to *waste water treatment* increased only slightly over the 1990s, reaching nearly 50%. Nitrogenous fertiliser use decreased sharply, but the application rate of fertilisers remains high. A *major water reform* is being considered, to include transposition of EU water legislation (draft of new Act on water protection and

It is *recommended* to:

- adopt the proposed *new Act on water protection and water management* transposing EU legislation, and implement the new *institutional framework* for water management;
- prepare water *management plans by river basin*, taking into account flood prevention concerns;
- mobilise financial resources to upgrade and extend the *urban sewerage and waste water treatment infrastructure*;
- apply more fully the *user pays and polluter pays principles*, taking into account social considerations, aiming at full cost recovery for household water services pricing, and eliminating charge concessions and increasing pollution charges;
- identify areas vulnerable to *nitrate pollution* by agriculture.

water management). This reform is very much needed. Different ministries deal with water quantity and quality issues and water management responsibilities of local authorities are not clearly defined. Water management at the *river basin* level would greatly improve water management planning. A new water *pricing policy* should be established: the national government still sets water prices at low rates for households; various concessions apply to abstraction charges; pollution charges have little incentive function; the user pays and polluter pays principles should be applied progressively to the water sector. The implementation of the Drinking Water and Urban Waste Water Directives will require *large investments*, especially to upgrade piped water supplies and build new treatment plants. Much of investments into water supply, sewerage, and waste water treatment infrastructure is still funded through the state budget and state funds.

Waste

The 1991 Waste Act provides the *institutional framework* for waste management. This Act was fundamentally revised in 2001 to incorporate the most relevant EU Legislation. In 1993, the first *Waste Management Programme* already included specific and ambitious objectives regarding waste reduction, recovery and disposal, and cleaning of old, uncontrolled landfills and other contaminated sites. All uncontrolled dumps and landfills were closed down; a network of *landfills* meeting regulatory conditions was created; its present capacity is sufficient for the safe disposal of the waste generated in the country. *Separate collection of municipal waste* is being introduced and a recycling industry is developing. A number of *economic instruments* are in use; in addition to user charges and waste disposal charges the new Waste Act introduced the concept of product charges concerning a number of items which must be collected and processed separately from other waste, or for which increased recovery is considered desirable; the revenues go to a Recycling Fund, which will be used to support the necessary investment and operational costs of recovery activities. Small amounts of *hazardous waste*, for which no treatment facility exists in the country, are exported in compliance with the Basel Convention. Estimation of cost-recovery is not possible on the basis of available information.

The stated objectives in terms of *waste reduction* and *hazardous waste disposal* have not been fully met. No measures were taken to promote waste minimisation and cleaner technologies. The amount of materials separately collected from municipal waste is still rather low. *Separate collection* schemes have failed in a number of cases, due to insufficient consideration of possible outlets for the separate materials. Current incineration plants do not cover the

demand for hazardous waste elimination. Moreover, many existing facilities do not meet the technical requirements for air protection. No new large hazardous waste incinerator is under construction. Although a strategy and action plan are under development, no programme has been developed to systematically address old environmental burdens, *contaminated industrial sites* in particular. The *import of waste* destined for recovery operations is still restricted, with only a partial acceptance of the OECD Green List.

It is *recommended* to:

- promote *waste minimisation* initiatives;
- pursue efforts to develop *separate collection of municipal waste* and promote the processing of separated materials as secondary raw material or energy source, including use of the Recycling Fund;
- complete a national *survey of hazardous waste* incineration needs, proceed with the upgrading of technical standards for existing medical waste and other hazardous waste incinerators, and build the required additional *incineration capacity*;
- elaborate a comprehensive programme to map *contaminated sites* of industrial origin, assess the potential risks for the environment and propose remedial measures;
- fully adopt the OECD Green List for the *import of waste* destined for recovery operations.

Nature conservation and biodiversity

Overall, Slovakia's nature and biodiversity are in good condition. Total forest area has remained constant over the decade at 41.5% of the country. There is a rich array of flora and fauna with a number of species not found in many areas of Europe. There is a well-*developed legislative and strategic planning framework* covering nature, with the 1994 Act on nature and landscape protection and the 1997 National Biodiversity Strategy. An extensive network of protected areas exists, covering nearly 22% of the country; almost 800 species of plants and more than 800 animal species are afforded some level of protection. Slovakia has ratified most international conventions on nature conservation and biodiversity. Slovakia also has a budding *agro-tourism and eco-tourism* industry.

There are however, some points of concern. Tourist activities are over concentrated in some areas putting undue pressure on the landscape and animals (e.g. the mountain chamois). A lack of financial and personnel resources, allows for little *oversight of protected areas* and difficulty in implementing management plans. The government's land restitution plan of the 1990s has turned some protected lands over to private owners who now in turn carry out illegal activities on them. A decline in agriculture has negatively affected some species of birds. Poaching of some protected animals is an issue.

It is *recommended* to:

- increase *co-ordination and communication* between the ministries and state agencies involved in land management and nature protection;
- harmonise *hunting legislation* and nature conservation legislation to enhance biodiversity protection;
- develop incentives and voluntary initiatives with *private forest land owners* to integrate biodiversity conservation in forest management plans and forestry practices;
- enhance *protection of wetlands* and other key biotopes in grassland and forests;
- pursue efforts to develop *agro-tourism and eco-tourism* enterprises, including in under-used areas of the country.

2. Towards Sustainable Development

Integrating environmental concerns in economic and sectoral decisions

Following a period of GDP contraction, Slovakia's GDP was by 2000, 11% higher than its 1990 level. During the 1990s, Slovakia succeeded in *decoupling a number of environmental pressures from economic growth*. Pollutant emissions into air, discharges into water, and water abstractions were cut by as much as 30% to 70%; however, municipal waste generation increased at a rate close to the one of GDP. This was not only due to the *contraction of industrial production* (–16%) and energy use (–22%), but also to *changes in production*

and consumption patterns and sectoral structural reforms; for instance, fertiliser and pesticide use were reduced massively, mostly as a result of changes in agriculture production methods and agricultural land ownership; the energy sector went through major policy reforms and experienced increased energy efficiency, changes in energy supply mix, significant shifts in energy prices, overall translating in important environmental benefits. This was also due to *environmental policies* based on the 1993 strategy, which defined short, medium, and long-term objectives and key policy principles in environmental management. *Integration of environmental concerns in sectoral policies* was uneven, but institutional and market-based integration occurred in a number of instances, in the energy, transport and agricultural sectors. Excise taxes on fuels were introduced in 1994; leaded gasoline was phased out in 1997. Reduced vehicle tax for commercial cars equipped with catalytic converters encouraged changes in the composition of the car fleet. Reduced VAT applies to environmentally friendly fuels and equipment, income tax concessions to environmental services, and exemption from real estate tax to protected areas. Strategic Environmental Assessment of policies and programmes was usefully applied for the review and revision of energy policy in 1998. Overall, agricultural support has declined and agri-environmental payments are provided for converting arable land into permanent grassland and to support organic farming, although most direct payments to farmers are related to input use; a code of good agricultural practices has been completed. Most of these economic and sectoral changes have contributed to the strong decoupling achievements of Slovakia. A Sustainable Development Council was established in 1999, as an advisory body. A sustainable development strategy was approved by the government in October 2001.

Looking ahead, further progresses in the integration of environmental concerns in economic development are feasible and necessary. First, through *enhanced interministerial co-operation* concerning strategic planning, investment programming, annual budgeting, and project assessment; the latter applies also to foreign direct investments which should, inter alia, follow environmental charters and guidelines applying to multinational companies. Secondly, further promote the integration of environmental concerns in *agriculture, energy, and transport* sectors through market based integration and appropriate economic signals (e.g. reducing environmentally damaging subsidies, enhancing the incentive effects of current economic instruments and taxation). Given its high growth, the *transport* sector is of particular concern; road taxes only apply to commercial vehicles and not to private motor vehicles; modernisation of public passenger transport should be further pursued. Given the far ranging structural changes in these sectors during the ongoing economic transition of Slovakia, it is

of the utmost importance to include environmental concerns and win-win strategies in their design. Thirdly, the possibility of introducing a *green tax reform* should be further investigated, including an energy tax and a tax on the sulphur content of diesel oils. Fourthly, as households have already faced important price changes concerning their energy needs (heating, lighting, transport fuels) and will have to face further price changes concerning, inter alia water supply, waste water services, and waste services, attention should be given to the progressivity of these changes over time and to the *poorest segments of the population*. This will in turn bear on the capacity of investments in environmental infrastructure of Slovakia, in the context of both its economic transition and its accession process to the EU. This will require strategic decisions balancing economic, environmental, and social progress of the country and will imply a very high profile for environmental criteria in the EU accession negotiations.

It is *recommended* to:

- enhance *inter-ministerial co-operation*, to foster the institutional integration of environmental concerns in economic and sectoral policies;
- extend further *strategic environmental assessment* in sectors, such as energy, transport, tourism, and agriculture; continue environmental planning and programming efforts;
- enhance *market-based integration of environmental concerns* in sectors such as transport, energy, and agriculture;
- further investigate possibilities to introduce *eco-taxation*, e.g. by shifting the tax burden from labour to the environment;
- develop and implement *pricing of environmental service*s (e.g. water supply, waste water treatment, solid waste management), progressively moving towards full-cost pricing, with appropriate attention to social concerns and the balance between economic, social, and environmental progress.

Environment-social integration

Concerning *environment and health*, pollution was recognised as a main reason for the degradation of human health in Slovakia. A 1997 action plan for environment and health identified policy priorities, specific policy objectives, and action schedules. The plan, which was updated in 2001, also covers occupational

health. In the 1990s, life expectancy rose for a number of reasons, including significant improvements in pollution prevention and control. Concerning *environmental information*, a national monitoring and information system is in place. The environmental administration provides information actively on the Internet and through published reports (e.g. yearly state of the environment reports). Environmental NGOs are knowledgeable and have an important role to play especially in nature protection, EIA, and access to public information.

Nevertheless, life style improvements (relating to food, exercise, alcohol, tobacco, drugs) and environment related risks must receive more emphasis in future *health policies*. In particular, a quarter of the population still lives in areas with the poorest environmental quality. Progress in the effectiveness of *environmental monitoring* should continue, independent of institutional boundaries, with emphasis on multiple benefits and without compromise on information quality and timeliness. There are social and ethnic disparities concerning access to environmental services (e.g. drinking water, waste services) and environmental quality (e.g. environmental living conditions in black spots). *Public participation* and *access to courts in relation to environmental issues* are still largely unknown procedures to citizens; they should become an integral part of *environmental democracy*. However, the government has taken steps to increase awareness among citizens of their own legal rights. *Environment and employment* issues have not received proper attention: jobs could be offered by a more efficient and extensive use of renewable energy sources (e.g. forest biomass), by increased farm tourism and organic farming, and by nature conservation and management.

It is *recommended* to:

- continue to implement the action plan on *environment and health*;
- further review the effectiveness of *environmental monitoring* systems, regardless of institutional boundaries without compromising on the quality and timeliness of environmental information;
- continue to improve *access to environmental information*, public participation in decision-making, and access to justice in environmental matters;
- continue to foster *public environmental awareness* with a mix of instruments;
- explore possibilities of creating *environmentally related jobs* (e.g. biomass, eco-tourism, nature conservation).

Despite prevailing economic difficulties, environmental issues have remained high on the political agenda, because of their importance in the EU accession process rather than high *environmental awareness*.

3. International Commitments

Slovakia is now a party to most worldwide and relevant regional *environmental agreements* (Annexes II.A and II.B). The country is financially contributing to the UNEP, Montreal Protocol, Biodiversity Convention and CITES. Slovakia has promoted bi- and multilateral co-operation with its *neighbouring countries* and participates in the Danube basin management multilateral process. Slovakia is now a *Member of the OECD* and the Council of Europe: this had important effects in policy areas such as chemicals control, waste management, industrial accidents, public participation, and protection of endangered species. Slovakia easily fulfilled its commitments on *transboundary air pollution* (LRTAP), with considerable decreases in the emissions of classical air pollutants (e.g. SO_x, NO_x, suspended particulates, and VOCs). Concerning *climate change*, Slovakia has prepared two national reports to the meetings of the Contracting Parties. CO_2 emissions have been reduced and are well below their 1990 level in 2000; they may also be 8% below the 1990 level in 2010.

It is *recommended* to:

- ratify and implement relevant *international agreements*;
- continue the transposition of *EU environmental legislation*, with appropriate resources, and strengthen the implementation and enforcement of related new legislation and commitments;
- set national commitments for reducing *greenhouse gas emissions*, and develop and implement policies and measures accordingly, and improve energy efficiency;
- contribute to the effective implementation of international agreements concerning the *Danube and its river basin*, as well as the Black Sea;
- continue co-operation in the field of the environment with its *neighbouring countries*;
- make full use of opportunities for *foreign assistance and foreign direct investment*, with the aim of strengthening environmental infrastructure and contributing to the solution of international environmental problems.

However, Slovakia has not yet adopted a co-ordinated national strategy to combat climate change. Postponing the removal of all direct subsidies and cross-subsidies relating to electricity prices, partly for social reasons, has delayed further improvements in *energy intensity* and consequent reduction of greenhouse gas emissions. With a substantial increase in car and truck traffic between Slovakia and other European countries, sustainable transport is a concern. In the context of the *EU accession process*, EU legislation has already started being transposed into the national law. However, the remaining legislative task is still considerable, and concerns a number of topics dealt with by different ministries. Increased emphasis on *implementation and enforcement* of environmental law is much desirable in this respect. *Implementation* of some EU legislation will need *time, because of the cost of creating a new environmental infrastructure and of the social constraints*: Slovakia has requested transition periods for a number of EU environmental directives.

Part I

ENVIRONMENTAL MANAGEMENT

1

THE CONTEXT

1. Physical Context

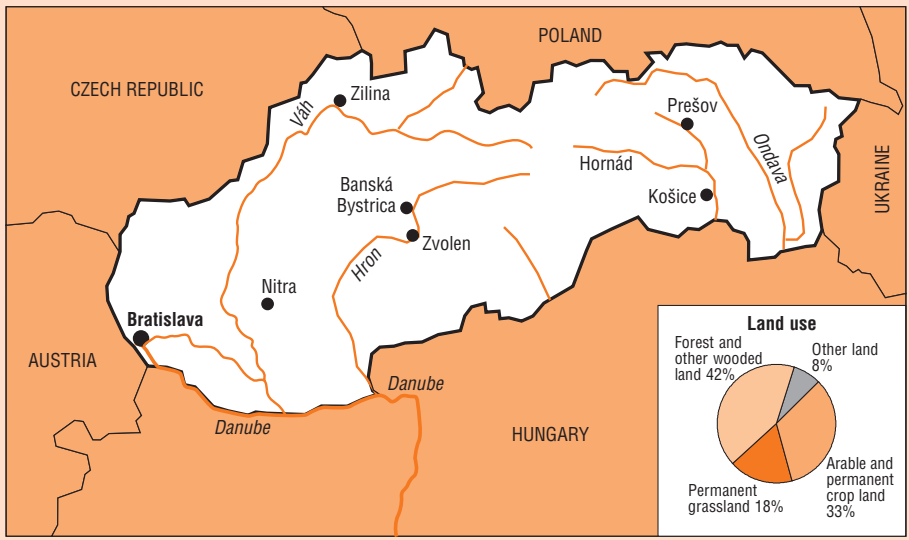
Located in central Europe, the *Slovak Republic or Slovakia* shares borders with Austria, the Czech Republic, Hungary, Poland, and Ukraine (Figure 1.1). The widest extensions of this landlocked country of 49 035 km^2 are 416 kilometres east-west and 208 kilometres north-south. The Danube River forms part of Slovakia's border with Hungary.

Slovakia is a *mountainous country*. The Carpathian Mountains extend across much of northern and north-western Slovakia and encompass the Little Carpathians, the White Carpathians, and the Tatry, which is the highest Carpathian range. The High Tatry house Gerlachovský Štít, the country's highest peak at 2 655 metres and one of Slovakia's largest national parks. Other important mountains include the Low Tatry and the Low and High Fatra ranges in central Slovakia. The Slovak Ore Mountains, in eastern Slovakia, are named for their mineral deposits. South-western Slovakia includes the fertile Danubian Lowlands.

Slovakia has a continental *climate*, with cold and dry winters and hot and humid summers. Average annual precipitation is 800 mm (with a minimum of 273 mm and a maximum of 2 130 mm). Scarcely 16% of Slovakia's *surface waters* have their origins in the country (Chapter 3). The Danube is Slovakia's main navigable river. Other important rivers include the Váh, Hron, Ipel, Nitra, Ondava, Laborec, and Hornád. Many small glacial lakes are located in the High Tatry Mountains.

Over 40% of Slovakia is forested (Chapter 5). Species of fir and spruce are common in most mountain areas. At lower elevations, oaks, birches, and lindens predominate. Slovakia's *forests* are home to foxes, rabbits, deer, bears, lynx, wild cats, squirrels, weasels, and muskrats; boars and wolves are occasionally seen in remote mountain areas. *Arable and permanent cropland* covers nearly 33% of the total land area, and permanent grassland 18%. Cropland is mainly cultivated with grains

Figure 1.1 **Map of Slovakia**



Source: OECD.

(wheat, barley, maize), oilseeds, potatoes, and sugar-beets. Livestock consists of 1 million cattle (a third dairy cows), 2 million pigs and 13 million poultry. Since 1990, more than 2% of cropland has been converted into grassland, the forested area remaining stable.

Slovakia mines several *mineral ores*, including iron, aluminium, copper and mercury. Only iron ore is produced in significant quantities, although annual extraction has declined to around 1 million tonnes and there is heavy dependence on imports from Ukraine. Slovakia has small deposits of oil, natural gas, and coal. Annual production of crude oil is roughly 60 000 tonnes and natural gas is 300 million cubic metres. About 3 million tonnes of brown coal (lignite) is exploited near the cities of Modrý Kameñ and Handlová. At least 89% of the country's primary energy requirements must be imported, mainly gas, oil, and nuclear fuel from Russia, coal from Ukraine and lignite from the Czech Republic.

2. Social Context

With a population of 5.4 million, Slovakia's population density averages 110 inhabitants per km^2. Population increased by 2.4% between 1990 and 2000. More than half the population (57%) live in urban areas, but *less than 20% live in cities of 100 000 or greater*. The capital, Bratislava, has a population of 500 000. Košice, an industrial city, has 250 000. Four other cities have close to 100 000 inhabitants: Prešov (known for electrical-engineering), Nitra (for food-processing), ilina (a business centre), and Banská Bystrica (in a mining and manufacturing area).

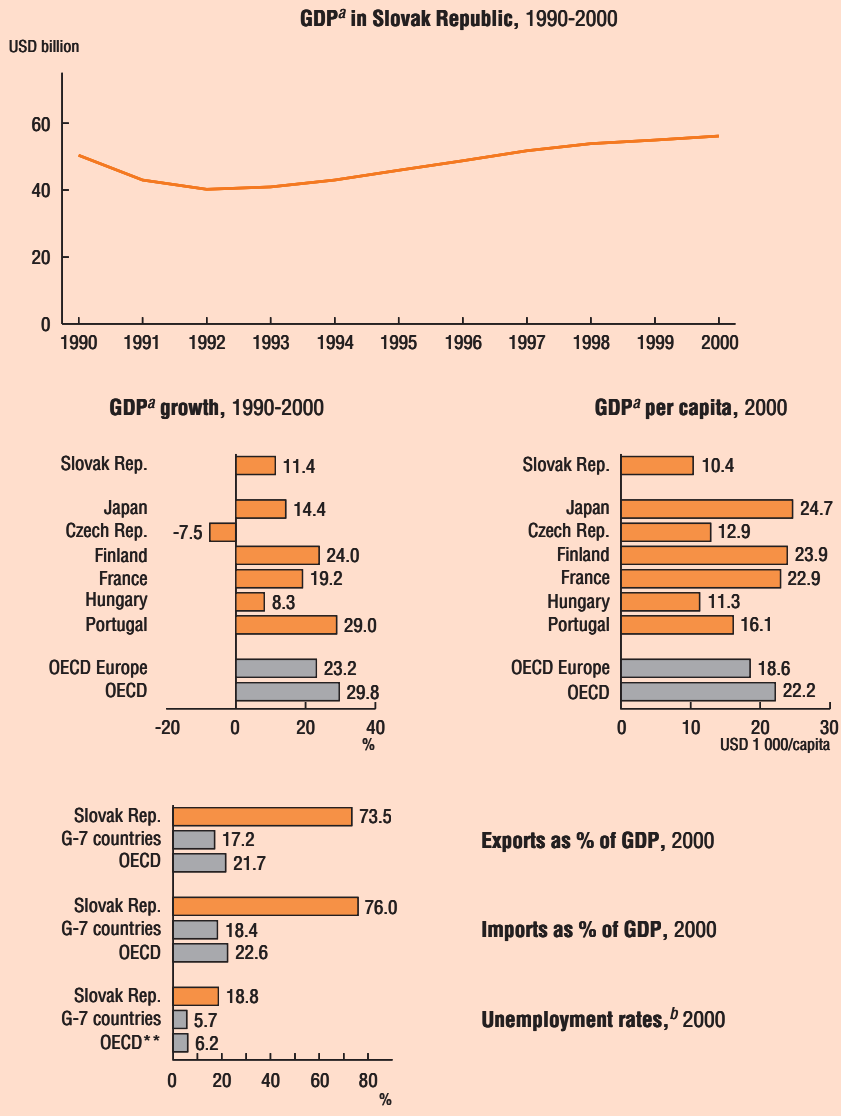
A significant share of the country's inhabitants are from *minority groups*. According to an official census in October 2001, Hungarians are close to 10% of the population (520 500) and live primarily in the southern parts of western and central Slovakia. Romanies (Gypsies) represent 1.7%. Persons over 60 years of age currently make up 15% of the population, in line with the OECD Europe average.

The *education* level of the labour force compares well to that of other OECD countries, and is even higher than in most Central and Eastern European countries. The educational system is well developed at all levels, and the number of university students has risen strongly over the 1990s. However, only 66% of students complete secondary school and only 25% of 18 year-olds continue onto higher education. The government has ambitious plans to raise these figures to 80% and 33%, respectively, over the next decade. Slovakia has 22 institutions of higher education. Commenius University of Bratislava, founded in 1467, is the country's oldest university. Technical universities are located in Bratislava, Košice, ilina, and Nitra. There is a high proportion of secondary school enrolment in technical fields.

At 73 years, average *life expectancy* is relatively low within OECD countries. The main causes are poor diet, little emphasis on preventive healthcare, and high rates of alcohol and tobacco use. The health care system is still largely run by the state, and citizens continue to receive low-cost health care. Low salaries and poor working conditions within the health sector have led to a large exodus of doctors from the profession.

Following a sharp decline in traditional economic activities in the early 1990s, especially in the heavy armament industry, unemployment increased. After reaching 14% in 1994, the rate of *unemployment* moderated in succeeding years, but rose again, reaching a new high of 18.5% in 2000 (Figure 1.2). Unemployment rates are lowest (5%) in Bratislava and are highest (more than 25%) in the southern agricultural regions and in the eastern districts. In part, this is caused by low labour mobility as a result of an underdeveloped housing market.

Figure 1.2 **Economic structure and trends**



a) GDP at 1995 prices and purchasing power parities.
b) Per cent of total labour force.
Source: OECD.

3. Economic Context

The *GDP per capita* of Slovakia is less than half the OECD average (as expressed in purchasing power parities) (Table 1.1). Converted using 1996 price levels and purchasing power parities, GDP per capita is USD 10 430, in the middle range of transition countries. Slovakia's *GDP* reached SKK 887 billion (USD 20 billion) in 2000 (at market prices).

Following a deep recession, when GDP contracted by 23% between 1990 and 1993, *real GDP growth* turned positive in 1994 as exports grew. GDP grew by more than 6% in 1995-97, by 4.1% in 1998, 1.9% in 1999, and 1.8% in 2000. Whereas strong industrial production and external demand drove GDP growth in 1994-95, expansion in 1996-98 was not sustainable. The government that took power in 1998 implemented a stabilisation programme that caused domestic demand to turn down sharply in 1999 and 2000, resulting in slower GDP growth. Overall, GDP grew by 11% between 1990 and 2000. Domestic demand recovered strongly in 2001, boosting GDP growth to 2.7% that year. Real GDP growth is expected to be 3.1% in 2002, as the domestic demand gradually recovers.

Both agriculture and heavy industry contracted as a share of GDP since the beginning of economic reforms in 1990/91 (Table 1.2). The economic transition caused a fall in real wages and in domestic demand for domestic products, as trade liberalisation allowed for foreign competition. In the agricultural sector, farm input

Table 1.1 **Economic trends in transition countries**

	Gross domestic product average annual growth (%) 1990-99	Consumer price index average annual growth (%) 1990-99	Unemployment share of total labour force (%) 2000	Foreign direct investment (USD million) 1990	1999	National income per capita (USD) 1999
Slovakia	*1.8*	*13.0*	*18.8*	0	354	10 430
Hungary	*1.0*	*21.5*	*6.5*	0	1 950	11 050
Czech Republic	*0.8*	*8.5*	*8.9*	207	5 093	12 840
Poland	*4.5*	*27.8*	*16.1*	89	7 270	8 390
Romania	*–0.8*	*108.9*	*7.2*	0	1 041	5 970
Slovenia	*2.4*	*28.0*	*7.1*		181	16 050
Bulgaria	*–2.7*	*129.3*	*14.4*	4	806	5 070

Source: World Bank; CESTAT.

prices were liberalised, however, most output prices remained under government control. Moreover, the freeing of interest rates caused a steep rise in financial costs. Government support, as measured by the Producer Support Equivalent, fell from 63% in 1986 to 19% in 1996. As a result, *agriculture share of GDP dropped* from 9.4% in 1989 to 4.1% in 1999.

Slovakia's industrialisation during the communist period was geared towards providing inputs (steel, paper, petrochemicals) for the production of finished goods in the Czech lands, as well as armament manufacturing. Emphasis was placed on heavy industry, creating a high dependency on raw material and energy import. The collapse of traditional markets increased competition through trade liberalisation, and a temporary federal ban on arms sales initially brought severe dislocation in 1990-92. Despite a *decline in industrial production share of GDP* (from 49% in 1990 to 26.4% in 1999), the decrease in overall industrial employment has been more gradual than in other transition economies (from 33.1% to 28.7% of total employment over the period), mainly owing to the lack of enterprise restructuring. The construction sector, which had developed quickly since the onset of economic reform, faced a dramatic collapse by the end of 1998, when there was a virtual halt of public investment in highway construction.

Until 1998, Slovakia's *foreign investment* regime was characterised by a mix of liberalisation and targeted regulation. Foreign capital was not allowed into strategic sectors such as gas, electricity, telecommunications, and armaments production. Special permission was required to establish foreign bank operations and acquisition of land by foreigners was permitted only through joint ventures. In contrast, after 1998, Slovakia implemented a general framework to attract greater inflows of foreign direct investment

Table 1.2 **Sectoral components of GDP**

(%)

	1993	1999
Agriculture	6.6	4.1
Industry	29.3	26.4
Construction	6.7	5.2
Market services	41.1	42.1
Non-market services	13.4	12.5

Source: Statistical Office of the Slovak Republic.

(FDI). The three largest state-controlled banks and 35% of the national telecommunication monopoly were sold-off to foreign investors by the end of 2000. Moreover, the government plans to sell gas, electricity, the gas pipeline, waterworks and intra and inter-city bus service. Though cumulative FDI remains below expectations, the amount in 2000 was very large (10.5% of GDP). The share of the private sector in GDP has grown steadily since the first wave of privatisation in 1991. However, large enterprises (particularly state-owned monopolies) continue to play a major role in the economy.

Slovakia initially made rapid progress in reducing *inflation* from more than 23% in 1993 to around 6% in 1996-98, giving it the lowest inflation rate among central European transition economies. In addition to a tightening of monetary policy, success in keeping inflation under control can be attributed to several administrative measures such as reducing the VAT to 10% on selected items and the temporary suspension of import duties on small automobiles. Most importantly, deregulation of

Table 1.3 **Trade by partner country**

(%)

	1993	2000
IMPORTS	100	100
Czech Republic	36	15
Russia	20	17
Germany	11	25
Austria	6	4
Italy	3	6
Rest of the world	24	33
OECD[a]	33	76
EU	20	49
EXPORTS	100	100
Czech Republic	42	17
Germany	15	27
Austria	5	8
Russia	5	1
Italy	3	9
Poland	3	6
Rest of the world	27	32
OECD[a]	33	92
EU	24	59

a) In 1993, the Czech Republic, Slovakia, Poland, and Hungary were not OECD Member countries.
Source: Statistical Office of the Slovak Republic; OECD.

a range of prices was delayed (mainly transport, utilities, and rents). Despite the devaluation of the koruna, inflation remained low in 1998, largely because of a tight monetary policy. Nevertheless, inflation began to rise at the start of 1999 as a result of price liberalisation. Inflation, as measured by the Consumer Price Index (CPI), was 10.5% in 1999 and 12% in 2000.

Between 1948 and 1989, Czechoslovak *trade* was almost exclusively with the Soviet Union and eastern Europe. As a relatively advanced socialist country, Czechoslovakia predominantly imported raw materials and exported machinery, becoming the seventh largest producer of armaments in the world (with much of the capacity located in Slovakia). Following the collapse of eastern markets, trade was rapidly reoriented towards the West, while the economic link with the Czech Republic was steadily weakened. The share of trade with the EU rose (59% of total exports, 49% of total imports), with Germany as the main trading partner (Table 1.3).

4. Institutional Context

From 1948 until 1989, Czechoslovakia was under a communist government. In 1989 the "Velvet Revolution" ended the communist regime. The country's first multiparty elections were held in June 1990. In 1992, the two republics decided to divide the federation into two independent nations. A new constitution of Slovakia, adopted on September 1, 1992, went into effect with *independence in January 1993*. Between 1993 and 1998, Slovakia's international image suffered, due to lack of transparency in the privatisation programme, and repression of the Hungarian minority's language and cultural rights. In March 2000, Slovakia began accession negotiations with the EU. Slovakia acceded to the OECD in December 2000.

Slovakia is a *parliamentary democracy* headed by the President of the Republic, now elected by the people for a five-year term. The Prime Minister is the head of government. Under the advice of the Prime Minister, the President appoints a Cabinet. Slovakia has a single-chamber Parliament called the Slovak National Council. Its 150 members are elected to four-year terms by popular vote. All citizens over the age of 18 are eligible to vote. The next legislative elections is planned for September 2002 and the next presidential election in May 2004. Executive power continues to be vested in the Cabinet.

Slovakia is divided into *eight administrative regions* (kraj). Each region is divided into districts (okres). There are 79 districts.

Citizens have a *constitutional right to a healthy environment*. Environmental legislation was revised and reinforced in the 1990s (Table 1.4). Accession to the European Union being a priority of the Slovak Republic, a major ongoing legal task is, inter alia, the transposition of EU environmental legislation into Slovak legislation.

4.1 National environmental administration: central level

From 1971 to 1990, the former Slovak Republic (which was part of Czechoslovakia) had a State Body for the Environment, but no single government institution with executive power focused on environmental issues. Environmental responsibilities were shared among a number of ministries and institutions. In 1990, an environmental administration (the *Slovak Commission for the Environment*) was created and in 1992, was transformed into the Ministry of the Environment.

Table 1.4 **Selected environmental legislation**

138/1973	Water Act, as amended
50/1976	Act on territorial planning and construction, as amended
51/1988	Act on mining activity, explosives and state mining administration, as amended
52/1988	Act on Slovak geological office and geological works
96/1990	Act creating the Slovak commission for the environment
595/1990	Act creating local administrations on the environment, as amended
23/1991	Charter of basic human rights
128/1991	Act creating the State Environmental Fund, as amended
238/1991	Waste Act, superseded by Act 223/2001
309/1991	Clean Air Act, as amended
318/1991	Act on the state water management fund of the Slovak Republic
494/1991	Act on state administration of waste management, superseded by Act 223/2001
17/1992	Environment Act, as amended
134/1992	Act on state administration of air protection, as amended
138/1992	Act on authorised architects and building engineers, as amended
303/1992	Act on charges for waste disposal, superseded by Act 327/1996
311/1992	Act on charges for air pollution, superseded by Act 401/1998
453/1992	Act creating the Ministry of the Environment of the Slovak Republic
460/1992	Constitution of the Slovak Republic
42/1994	Act on civil protection
127/1994	Act on environment impact assessment, as amended
272/1994	Act on the protection of people's health, as amended
287/1994	Act on nature and landscape protection, as amended
327/1996	Act on charges for waste disposal
59/1998	Act on Slovak chamber of mining
76/1998	Act on the protection of the earth's ozone layer, as amended
171/1998	Act on access to environmental information, superseded by Act 211/2000
401/1998	Act on charges for air pollution
264/1999	Act on technical requirements for products and on assessing the conformity of products
313/1999	Geological Act
211/2000	Act on free access to information
163/2001	Act on chemical substances and preparations
223/2001	Waste Act

Source: Ministry of the Environment.

The *Ministry of the Environment* is responsible for air pollution abatement and protection of the atmosphere, water resources management, waste and risk management, geology and natural resources management, nature and landscape protection, territorial planning and building management, environmental economics, environmental legislation, and environmental information.

The Ministry of the Environment supervises the *environmental administration* at the regional, district and local (municipal) levels. It also oversees national institutions dealing with the environment, the largest of which are the Slovak Environmental Agency, the State Nature Conservancy of the Slovak Republic, and the Slovak Environmental Inspection (Figure 1.3). The Slovak Environmental Agency is responsible for environmental planning, research and information. The Ministry of the Environment has around 270 employees at central level, and close to 2 000, when including its subordinate bodies.

The Slovak *environmental information system* is part of the State Information System and is maintained by the administrative bodies of the state, without formal participation from the territorial administration (municipalities).

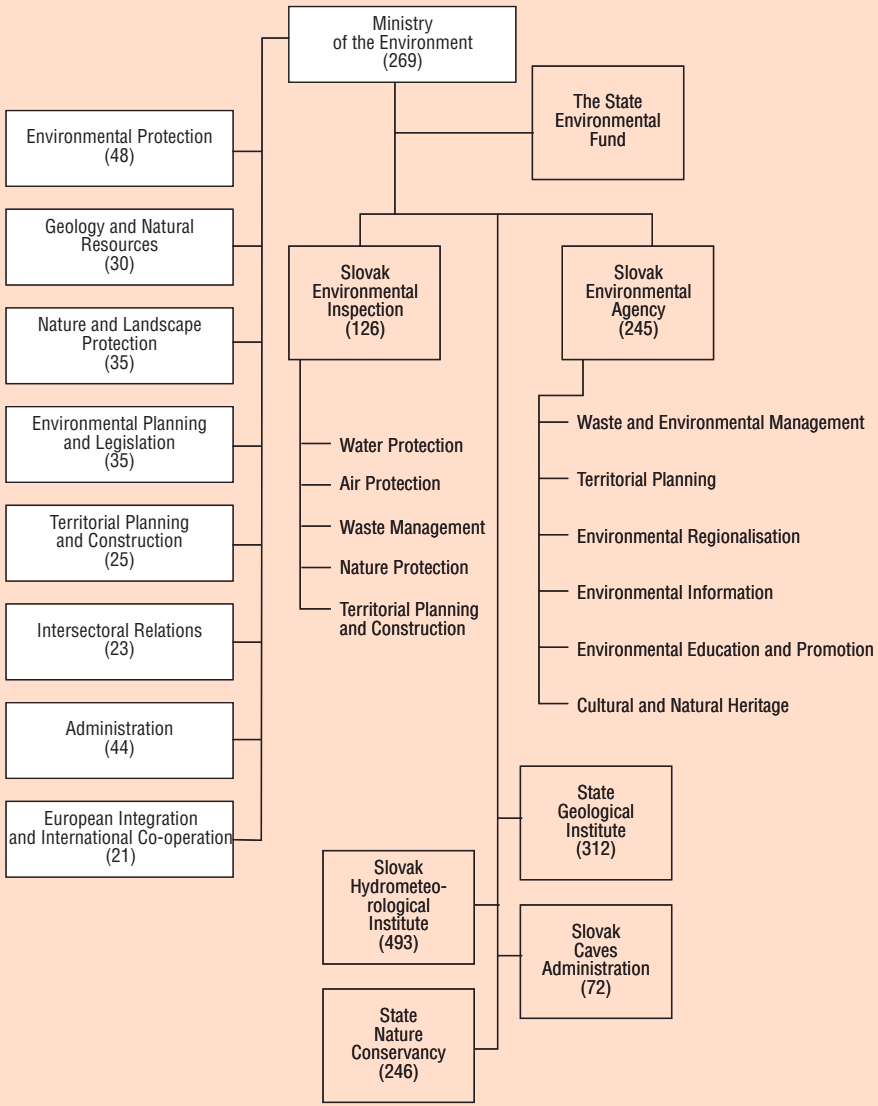
Other ministries concerned with environmental policy include the Ministry of Agriculture, which regulates water management, soil protection and forest management and is assisted by four River basins enterprises. The responsibility over chemical management is shared among the ministries of economy, health, environment, and agriculture. Co-ordination is ensured through cross-sectoral committees (for example, working groups for new legislation) and a consultation process for documents prepared for government approval. For pesticides, the government intends to establish a cross-sectoral working group which would also include NGOs.

4.2 National environmental administration: regional and district levels

The national environmental administration is also present at the regional and district level through *regional and district offices*. These offices cover a wide range of administrative matters including property registration, consumer protection, education, health care, permits and licences, agriculture, forestry, hunting, and regional development plans. Concerning the environment, they cover air management, quantitative and qualitative management of water resources, waste management, nature protection, building, and land use planning.

The national environmental administration's involvement at this level went through *changes in 1996*, as previously separate regional and district environmental offices were incorporated into the central government. As a result, the number of civil

Figure 1.3 **Organisation of the environmental administration**[a]



a) Staff number is in brackets.
Source: Ministry of the Environment.

servants working on environmental matters at the regional and district level was cut by one-third. This reduction of personnel might explain the lower environmental outlays in the state budget and the less effective environmental law enforcement since 1996.

The *reform of public administration* (enacted in 2001) devolved more power and responsibilities to regions and municipalities. Regions have been endowed with increased financial autonomy and their leaders are now elected.

4.3 Municipal environmental responsibilities

There are over *2 500 municipalities*, which according to the constitution are basic "independent territorial and administrative units of the Slovak Republic". The autonomy of the municipalities is strong. They may issue their own decrees and regulations in matters concerning territorial self-administration, provided they are in accordance with the constitution or national legislation. Municipalities may also create environmental strategies, plans, and programmes provided they are not contradictory to national environmental policy. The main responsibilities of the municipalities are in the field of administrative, technical, social, and environmental matters.

Municipalities also play a *role in managing local environmental issues* (e.g. air pollution, water and waste management, nature protection, environmental impact assessments, building, land use planning). They also provide and manage public services such as water supply, sewerage and water treatment, waste management, and public green spaces. As part of the water reform process (Chapter 3), a number of water management responsibilities are being devolved to the municipalities. Municipalities may impose fees (e.g. on operators of small air polluting activities) and charges (e.g. for waste disposal on landfills). They may also grant real estate tax exemptions on environmental grounds. Concerning implementation and environmental compliance and control, the executive power of municipalities is limited.

2
AIR MANAGEMENT

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of the Slovak Republic:

- make the enforcement of *emissions charges and fines* more effective (e.g. through monitoring and reporting on enforcement and related revenues);
- review exemptions from *environmentally related taxes and environmental standards* to industry and energy producers, and ensure they are fully transparent and consistent with fair competition;
- clarify the sharing of *funding* and other responsibilities between the private and public sectors concerning air management projects under the National Environmental Action Programmes;
- include more *quantified targets and timelines* into strategies and programmes dealing with air management, energy, transport, and climate policy;
- continue adjusting *electricity and gas prices* to reflect costs and promote efficiency in the energy sector, taking into account social considerations;
- continue *fuel switching* from domestic brown coal to natural gas and renewable energy sources (e.g. biomass), taking into account employment and environmental implications;
- further *decouple energy use from economic output* in the Slovak economy by improving energy efficiency in different sectors through appropriate incentives and programmes.

Conclusions

During the 1990s, Slovakia achieved a *decoupling of most air pollutants emissions from economic growth* : while GDP increased by 11%, emissions of SO_2, NO_x, CO, suspended particulates, heavy metals, VOCs, and CO_2 decreased significantly. This reflects i) the decline in industrial output, ii) a decrease in energy intensity and fuel switching (e.g. from domestic brown coal to imported natural gas) as well as iii) some progress in air management. In the short and medium term, Slovakia should be able to fulfil its major commitments with respect to combating air pollution, stratospheric ozone depletion, and climate change. Slovakia has satisfactory *air legislation and institutions*, including air monitoring and good emissions inventories. Legislation on energy efficiency and an action plan on the use of renewable energy sources are under preparation. There are recent *strategies and programmes* for air management. A strategic environmental assessment of the energy policy was recently carried out with broad stakeholder participation. *Emission charges* are in use as well as domestic emissions trading system for SO_2; plans for starting CO_2 emissions trading are well advanced. However, the practical effect of the SO_2 emissions trading system has been limited. The energy intensity of the Slovak economy decreased by about 25% over the 1990s, partly as a result of changes in technology and in *energy prices*. Between 1998 and 2001, electricity and gas prices rose by 90% and 75% respectively, diesel prices by 60% and gasoline prices by 56%.

Nevertheless, *more efficient incentives and enforcement* are needed to reduce the environmental burden caused by air pollution, and to cut down on the frequent breaches of ambient air quality standards in major cities and industrial areas. Total annual revenues of air pollution charges and non-compliance fines dropped, partly due to actual emissions reductions and partly due to somewhat lax enforcement. *Tax breaks and exemptions* on meeting environmental regulations have been subject to controversy and lack full transparency; some of them might be regarded as subsidies to foreign investors. The financing of air management projects in the first and second National Environmental Action Programmes should be clarified. The *energy intensity* of Slovakia is still 1.75 times higher than the OECD Europe average, even after the closure of plants using the most obsolete techniques. In addition to the major ongoing reforms of the energy sector, there is a great potential to improve energy efficiency in the industrial, residential, and services sectors, through appropriate programmes with quantitative targets. Despite the current excess capacity in electricity supply, the use of renewable energy resources (e.g. installed hydrocapacity, biomass) may be increased. In the transport sector, *freight traffic* increased significantly: 55% for road freight traffic.

1. Evaluation of Performance

1.1 Objectives and institutional framework

Legislative and institutional framework

The basic 1991 Clean Air Act was followed, inter alia, by a 1996 Governmental Ordinance with regulations on the implementation of the Act itself and a redefinition of administrative responsibilities. Further amendments were made in 2000 to include lists of basic and other air pollutants, emission limits for combustion and technological units, as well as air quality standards. The Ministry of the Environment issued a regulation on measuring emitted pollutants, monitoring and reporting compliance, and general operational conditions on air polluting activities. Air emissions charges are set by the 1998 Act on charges for air pollution and related regulations. New *legislation on air management* is being drafted.

The Ministry of the Environment, the Ministry of Economy, environmental departments of the regional and the district state administration offices, and the Slovak Environmental Inspection are responsible for *implementing* (including enforcement) legal texts concerning air protection. The Slovak Hydrometeorological Institute is in charge of monitoring and assessing air quality. The State Environmental Fund receives the collected emission charges and fines.

General objectives

In the 1993 Strategy of National Environmental Policy, global environmental safety and protection of the atmosphere against pollutants is a main priority. Based on these priorities, the first (1996) and the second (1999) *National Environment Action Programmes (NEAP I and II)* identify air management as one theme (out of ten); with more emphasis on limiting greenhouse gas emissions and protection of the ozone layer in the second NEAP. Each theme contains key goals and each goal detailed conceptual, strategic, administrative, educational, legislative, and funding measures (169 in total). With regard to air management, the key goals are:

– transpose *EU law* and complete Slovak legal regulations on air and ozone layer protection;

– reduce emissions of *basic pollutants* (SO_2, NO_x, CO, C_xH_y, suspended particulates), volatile organic compounds (VOCs), persistent organic pollutants (POPs), and heavy metals to a level complying with international conventions;

– prepare and implement national programmes aimed at reducing carbon dioxide and other *greenhouse gas* emissions;

– use *less polluting fuels and types of transportation* (e.g. gas, electricity, unleaded petrol);

– develop a comprehensive *monitoring and information system* on air pollution.

The implementation of the second key goal (reducing emissions of basic pollutants as well as VOCs, POPs, and heavy metals) is the most costly and belongs mainly to enterprises. The third key goal (fuel switching) is less expensive but still more than the others. The NEAP II is not very specific in pointing out the *financial sources for the different measures* under each key goal, leaving much to negotiations between the private and public (state, municipalities) sectors.

Slovakia's *international commitments* relating to air emissions include those under the 1979 UN-ECE Convention on Long Range Transboundary Air Pollution and its Protocols and the 1992 Framework Convention on Climate Change and its Kyoto Protocol (Chapter 8).

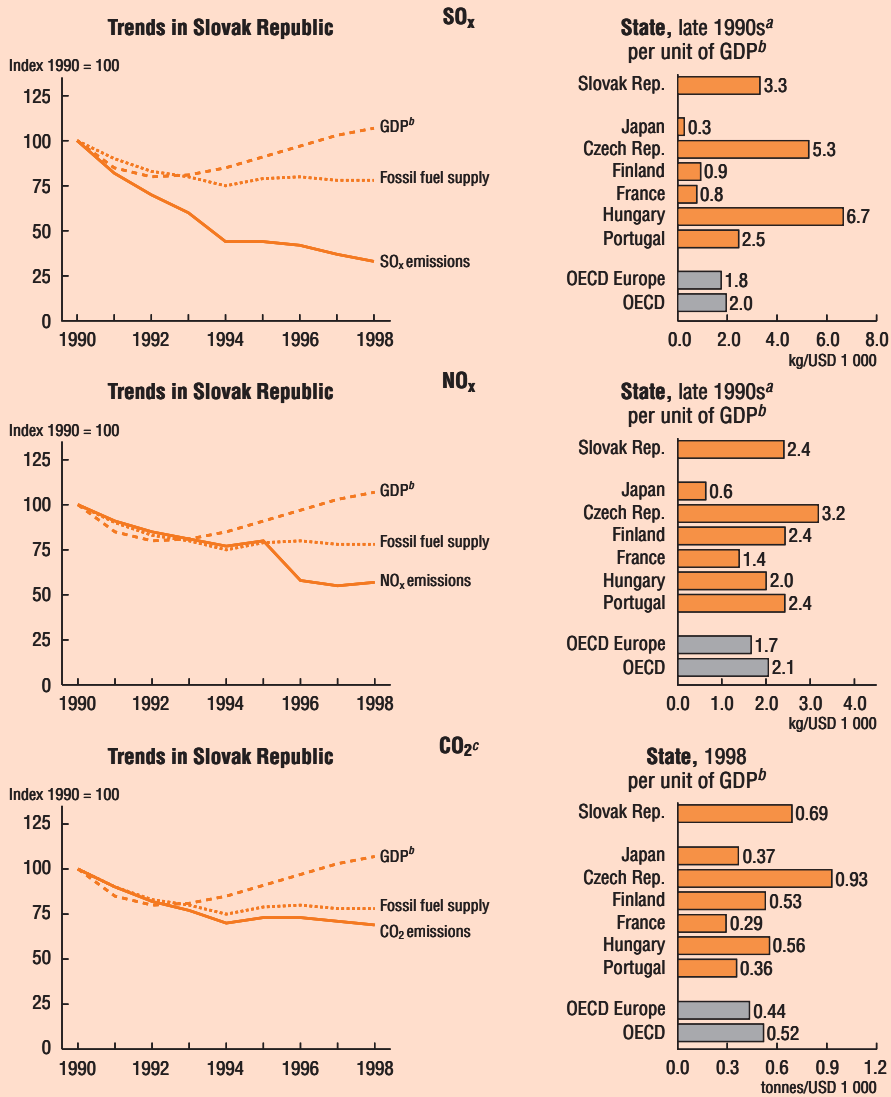
1.2 Air management

Trends in air emissions

Slovakia has a national *Emissions and Air Pollution Sources Inventory* (EAPSI). Its database is divided into three categories for fixed combustion facilities (heavy, medium, and small) and a fourth category for mobile sources. The 20 largest polluters account for 50% of the total suspended particulate matter emissions, 78% of SO_2, 45% of NO_2, and 36% of CO emissions, and all belong to the heavy category of the EAPSI.

Air emission trends for *SO_2, NO_X, CO, and total suspended particulates* decreased during the 1990s (Figure 2.1). The decline was more pronounced during the first half of the decade than during the last years. Energy production, including heating, accounts for 65% of total atmospheric emissions and vehicle traffic contributes to almost 20%. The 1999 shares (by weight) of major atmospheric emissions were: CO (47%), SO_2 (26%), NO_x (18%), and suspended particulates (9%). Emissions of sulphur dioxide fell by almost 70% in ten years (between 1989 and 1999). In 1999, emissions of SO_2 (171 000 tonnes) were still originating mostly from heating and power plants. Emissions of NO_x decreased by 47%, reaching 117 000 tonnes in 1999. Emissions of suspended particulates decreased by 80% (61 000 tonnes in 1999), and those of CO by 65% (305 000 tonnes in 1999). Emissions of ammonia were reduced by almost 50% since 1990.

Figure 2.1 **Air pollutant emissions**



a) Or latest available year.
b) GDP at 1995 prices and purchasing power parities.
c) Emissions from energy use only; excludes international marine and aviation bunkers.
Source: OECD; IEA.

Both the emissions and deposition of *heavy metals* show a clear downward trend during the 1990s; an average decrease of almost 70%. The largest reductions were for chromium, lead, quicksilver (87%), and manganese. Emissions of cadmium (22%) and selenium started to decline at the end of the 1990s. Very high concentrations of zinc in the precipitation were measured at the Liesek monitoring station. Leaded gasoline was phased out in 1997.

Emissions of *persistent organic pollutants* (POPs) were in 1997 as follows: 464.5 g of PCDD/PCDF, 137 kg of PCBs, and 29 tonnes of PAH. Incineration of wastes is uncommon in Slovakia (Chapter 4).

Emissions of *volatile organic compounds* (VOCs) were 148 000 tonnes in 1990 but dropped by more than one-third in the 1990s. Accordingly, Slovakia reached its targets regarding the VOC Protocol (Geneva, 1991). The main sources of VOCs are: transport (36%), use of solvents (26%), and industrial processes (25%). Slovakia requested from the EU, transition periods until the end of 2010 for the 1994 EU Directive on the control of VOCs emissions from petrol storage and distribution.

Total *greenhouse gas* (GHG) emissions declined drastically during the early 1990s, and have remained stable. Overall, they decreased by 30%; those of the energy sector by 32%. This was mainly due to i) the drop in industrial output, especially in heavy industry (e.g. iron and steel) during the first part of 1990s, ii) the gradual replacement of solid fuels by natural gas, and iii) technological developments in industrial processes. GHG emissions were around 52 million tonnes of CO_2 equivalent in the late 1990s. In 1998, the shares of the different GHGs emissions were: CO_2 (83%), CH_4 (10.5%), N_2O (6.2%), and the rest for rare industrial gases. GHG emissions originated mainly from electricity and heat production (53%), medium and small size sources (12%), transport (10%), industrial processes (9%), and agriculture (8%). Methane came mainly from transmission and distribution of natural gas (36%) and enteric fermentation (20%). CO_2 emissions per capita were 11 tonnes in 1990 and 8 tonnes in 1998, well below the OECD average. Yet, Slovakia is among the member countries with the highest emissions per unit of GDP.

The consumption of *ozone depleting substances* was negligible in 1999, (not exceeding 10 tonnes of ODS). In 1998, 10.2 tonnes of methylbromide were imported without licence, exceeding the limit by 200 kg.

Decoupling of air emissions from GDP

The decoupling of trends in main air pollutants emissions from GDP took place in 1992-94 and has since continued. Over the period 1990-98, while GDP growth was 10%, there was a decrease of SO_2 emissions by 68%, of NO_x by 47%, and of CO_2 by 27%: a *strong decoupling*.

The first *reason for the absolute decline in emissions of air pollutants* is the decline in GDP, and in particular industrial output. Between 1989-92, previous markets collapsed, industrial production tumbled, and Slovak GDP dropped by roughly 30% (Figure 1.2). Since 1993, the economy recovered, with a less severe recession after 1998 and an economic recovery which began in early 2000 (Chapter 6). There are two other reasons for the decline: fuel switching from brown coal, charcoal, and heavy crude oil to high-grade fossil fuels, notably natural gas and the introduction of more advanced technologies (e.g. separation of particulate matter and desulphurisation).

The decrease in *heavy metals emissions* was due to i) the closure of obsolete metallurgic facilities, ii) the introduction of effective dedusting and separation technologies, and iii) the elimination of leaded petrol. Leaded gasoline has been completely phased out of the market since 1997.

State funding for air pollution abatement and control *expenditure* was high in the early 1990s. It dropped in recent years. At the same time, private funding and joint funding (by state, municipalities, and the private sector) have increased. However, information on private or bi- and trilateral joint funding is not available in an aggregated form. In 1999, government air pollution abatement and control (PAC) expenditure was 30% of total government PAC expenditure.

Trends in air quality

There are 20 automatic stations *monitoring local ambient air quality*. Due to financial constraints, two-thirds of these stations, installed in 1995, were closed down during the past five years. The following pollutants are monitored: SO_2, NO_x, suspended particulates, CO, ozone, and H_2S. The SMHI uses an Air Pollution Index consisting of five classes and based on concentrations of basic pollutants (SO_2, NO_x suspended particulates). Not all Slovak ambient air standards conform to the relevant EU Directives, particularly for SO_2, NO_x, and suspended particulates (PM_{10}).

Bigger towns with heavy polluting industry, such as Bratislava, Banská Bystrica, Košice, and Prešov have problems concerning local ambient air quality. The average yearly *concentrations of* SO_2 have not exceeded the yearly standard (60 g/m^3) anywhere since 1993, but daily average concentrations have exceeded the standard (150 g/m^3): for instance, in parts of Bratislava, standards were exceeded during a few days in 1999 and peak concentrations reached high valves (500 g/m^3). The situation concerning NO_x is more serious: in some parts of Bratislava, yearly average concentrations regularly exceeded the standard (80 g/m^3), although the situation has been improving year by year since 1993. The daily limit (100 g/m^3) was exceeded during almost 60% of the days in Bratislava; similar cases can be reported for the other

industrialised towns mentioned above. *Suspended particulates* ($PM_{2.5}$) are currently measured only in Bratislava and Banská Bystrica. Growing cadmium and lead pollution is a local problem in places like Košice.

Extremely high concentrations of *polychlorinated biphenyls* (PCBs) in ambient air were measured in Strá ké, eastern Slovakia, at a site formerly hosting a chemical plant producing PCBs amongst other chemicals. The plant was closed down in the mid-1980s. Concentrations in ambient air of 11 ng/m^3 were measured in 1995, whereas concentrations between 0.2 and 4.3 ng/m^3 were usually measured elsewhere in Slovakia. High concentrations of *polycyclic aromatic hydrocarbons* (PAHs) in ambient air were measured in Košice (between 500 and 840 ng/m^3 in 1995) compared to usual concentrations measured in Slovakia (ranging from 50 to 250 ng/m^3).

The upper limit for tropospheric (ground-level) *ozone* (O_3) concentrations in Slovakia is 110 g/m^3. In 1999, this limit was exceeded 74 times in the town of Stará Lesná. There is an obligation to inform the public when ground-level ozone concentrations exceed 180 g/m^3 and to issue warnings when concentrations exceed 360 µg/m^3. Values have never reached the warning level. The AOT 40 value, indicating ground-level ozone concentrations considered damaging to agricultural crops and forests, is frequently exceeded at measuring stations all over Slovakia.

With respect to long-range *transboundary air pollution*, Slovakia was in 1998, a net exporter of both SO_x (by 4.7%) and NO_x (by 5.7%). Almost a quarter of the imported sulphur originated from Hungary, whereas Poland was the main exporter of nitrogen (15.6%) to Slovakia. Ukraine was the main transboundary receiver of both Slovak SO_x and NO_x (Table 8.1).

Although SO_2 emissions decreased by at least 30% across Europe during the 1990s, *critical sulphur loads* are still exceeded in Slovakia. According to EMEP data, the critical sulphur load for Slovakia (10-30 g/ha/year) is under the average sulphur deposition for Slovakia (30.4 g/ha in 1998). The monthly pH in Slovakia ranges from 5.1 to 4.5. Observed *forest damage* is due to a range of causes including air pollution. In 1999, defoliation was observed on 23% of the conifer growths and 20.4% of the deciduous growths. An estimated 21 000 hectares of coniferous and nearly 7 000 hectares of deciduous forest have been affected in 1999 by air pollutants, mostly in south-western Slovakia and in the vicinity of some heavily polluting industrial plants elsewhere in Slovakia.

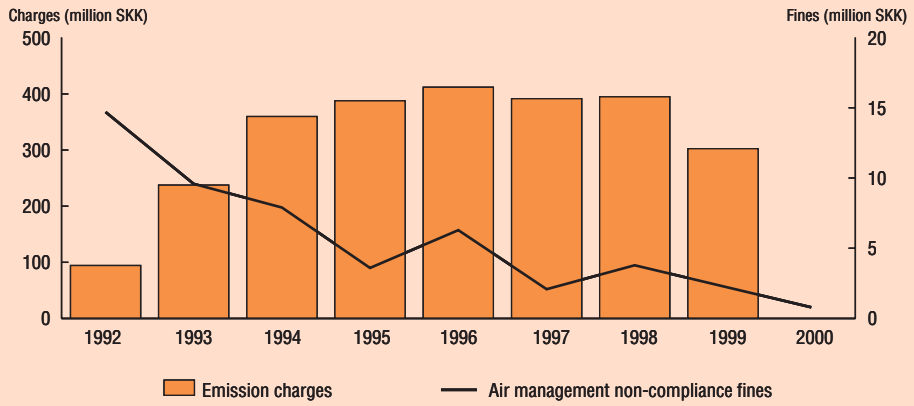
Economic instruments

Environmental charges on polluters are collected by the Slovak Environmental Inspection as an incentive to reduce or prevent pollution. Until 2002, they accrued to the *State Environmental Fund*, administrated by the Ministry of the Environment,

which financed investments in pollution prevention and control. The State Environmental Fund was abolished in 2002 and its revenues included in the state budget (Chapter 6, Section 1.4). The reporting on the enforcement and revenues of emissions charges and non-compliance fines has not been very transparent and accessible, although lately, some improvement can be demonstrated.

Current *emissions charges* are stipulated in the Act on charges for air pollution (401/1998). The pollution charge is based on the quantity and type of discharged substances. Although charges apply in principle to small, medium, and large pollution sources, only those paid by medium and large sources operate as an incentive to reduce pollution. The charges are payable according to two categories of pollutants: "basic pollutants" (SO_2, NO_x, CO, suspended particulates) and "other pollutants" (about 150 substances divided into four classes of toxicity). The charge is based on self-monitoring of emissions; the quality assurance and reporting of the monitoring data is unsatisfactory, due to the lack of regular inspections. For some large point sources, continuous monitoring of air emissions was introduced. Since 1998, the production and importation of CFCs has been charged. Yearly *revenue* of air emissions charges decreased recently, partly due to actual emissions reductions, partly to somewhat lax enforcement, especially regarding small pollution sources (Figure 2.2). Around 80% of the charges are actually collected, mainly from operators of medium

Figure 2.2 **Emission charges and air management non-compliance fines,** 1992-2000



Source: Ministry of the Environment.

and large pollution sources. Charges have not been adjusted for inflation. The fee was doubled in 2000 (compared to the charge in 1998) and during the subsequent period of five years it will increase by 20% each year. There are no inspection fees, and fines are not imposed for unsettled air emission charges. Implementation of the full rate (100%) of the air emission charge has been introduced gradually (60% in 1996, 80% in 1997, 100% in 1998-99).

There are also air emissions *non-compliance fines* to deter polluters from violating standards. The fines may vary from SKK 5 000 to 10 million depending on the degree of violation of the Clean Air Act. The revenue of non-compliance fines to the State Environmental Fund declined during the 1990s (Figure 2.2). In the mid-1990s, less than 40% of the fines were collected. Between 1996 and 1998, 71 to 83% of the fines were collected. In 2000 the Slovak Environmental Inspection carried out more than 2 000 inspections, 300 of which regarding air pollution. Non-compliance fines were SKK 13.7 million, of which SKK 0.8 million (5.6%) for air pollution, notably 26 cases of serious violations of emissions limits.

Other economic instruments are also in use (Chapter 6). For instance, small hydropower plants, combined heat and power plants, wind and solar power generation, heat pumps, biogas generators, and geothermal energy plants receive income tax exemptions for the first six years of operation. Reduced VAT is applied to fuels, such as natural gas, liquefied petroleum gas (LPG), biogas, low sulphur heating oil, and biomass. The introduction of an *energy tax* is under discussion and different options are being assessed. The first stage may be an adjustment of excise tax rates on hydrocarbon fuels and lubricants, followed by an electricity tax. Some experiments with emission trading have been tested (SO_x) or considered (CO_2) (Chapter 2, Section 2.3).

Tax breaks and exemptions on meeting environmental regulations have been subject to controversy and lack full transparency. Some of them might be regarded as subsidies to foreign companies.

1.3 Integration of air pollution concerns into sectoral policies

Transport

There are some 18 000 kilometres of public roads in Slovakia, of which almost 300 kilometres are motorways. In 1999, there were 1.7 million motor vehicles in Slovakia. More than 72% of them were private cars and some 6.2% lorries; the *number of private cars increased* by more than 30% during the 1990s; only a quarter of the private cars are equipped with catalytic converters. Significant *increases in diesel and gasoline prices* (about 60% and 56% respectively) took place between 1998 and 2001, mainly as a result of tax increases. A road toll was

introduced in 1996; the road tax is based on engine size and applies only on commercial vehicles, although there are plans to extend it to private cars. The State Fund of Road Development receives 70% of the revenues, while municipalities receive 30%. The revenues are used for road construction and maintenance. The geographical location of Slovakia explains the high share and growth of freight transit on its roads, but also on its rails, waterways, and in its gas and oil pipelines (Chapter 1).

The number of passengers using *urban public transportation* decreased (by 8% during the 1990s), but stabilised since 1999. Many Slovak towns have public transportation companies either owned by the municipality itself (especially in the bigger towns) or by private enterprises. Competition is rare in public transport services. There are no efficient inter-modal systems in operation. The number of passengers using railways also decreased (by 20% during the 1990s or by 35% if measured in passenger kilometres) (Figure 2.3). State-owned railways face heavy deficits. Slovak railways need restructuring, modernisation, and new investments. Privatisation plans have met with strong opposition, especially from trade unions.

There are some 210 kilometres of navigable *waterways* in Slovakia, mainly the Danube and some canals. The recent completion of the Rhine-Main-Danube waterway gives Slovak ports access to pan-European waterways. The number of passengers has dropped, but freight transport on the waterways increased by 94% over the 1990s.

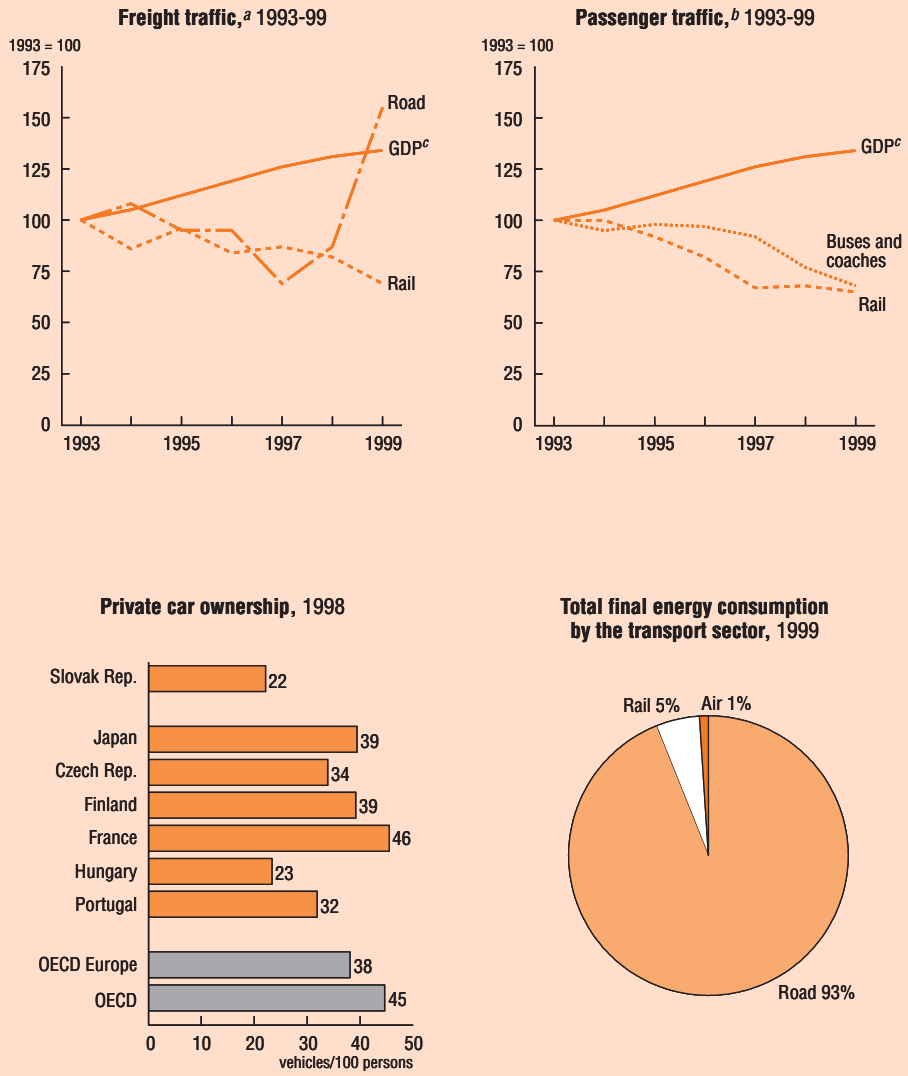
In the late 1990s, the transport sector share of total atmospheric *emissions* was: 2% for SO_2, 38% for NO_x, 45% for CO, 5% for suspended particulates, 32% for VOCs, and 11% for CO_2. The transport end use of energy is growing fast however, especially concerning road traffic (Figure 2.3).

In 1999, the Ministry of the Environment and the Ministry of Transport, Post and Telecommunication published a *Joint Action Plan on Transport and the Environment*. Within its 2000 Principles of the State Transport Policy, the government included improving road safety and decreasing environmental impacts among the key priorities. The Transport Policy refers in general terms to enhancing public transport, increasing the competitiveness of rail transport, and the importance of promoting sustainable transport. The environmental objectives are not expressed in quantitative and dated targets.

Energy

In the 1990s, there were deep reforms in energy policies and prices on Slovakia (Chapter 2, Sections 2.1 and 2.2). Overall, total energy supply declined by about 20% in the 1990s. Concerning energy savings, price increases have contributed to energy efficiency, but little has been done on sectoral energy efficiency programmes

Figure 2.3 **Trends in the transport sector**



a) Index of relative change since 1990 based on values expressed in tonne-kilometres.
b) Index of relative change since 1990 based on values expressed in passenger-kilometres.
c) GDP expressed in 1995 prices and purchasing power parities.
Source: ECMT; AAMA; IRF; OECD.

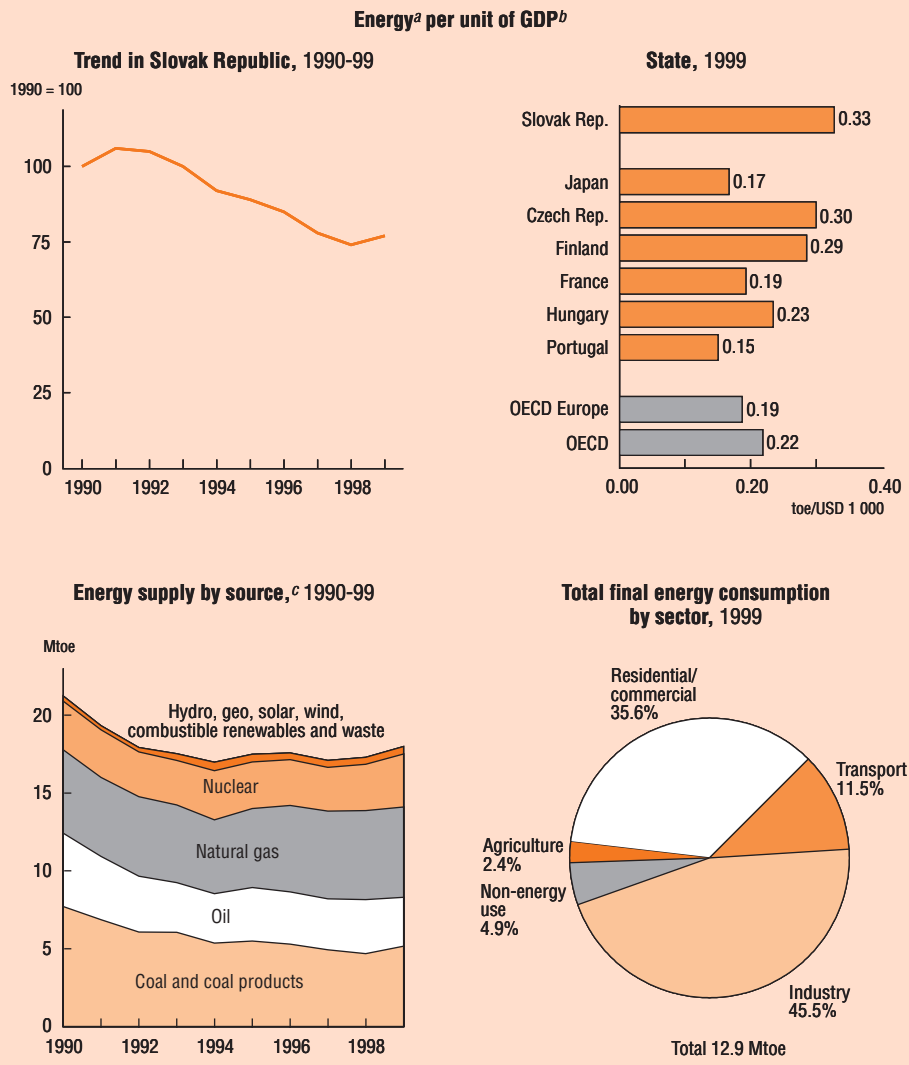
(e.g. industrial, transport, building sectors). Although *energy intensity* declined by 26% in Slovakia in the 1990s, it is still more than twice the EU average. Slovakia is poor in domestic energy resources: in 1999, domestic brown coal and hydropower covered 11% of its total primary energy needs. The rest (89%) was produced from imported fuels from the Russian Federation (65% as natural gas, crude oil, uranium), and from the Czech Republic (24% as brown coal). The use of renewable energy sources other than hydropower is negligible. During the 1990s, there was a fuel switch from solid fossil fuels (especially low-grade domestic brown coal) to natural gas (Figure 2.4).

Coal still is a basic fuel resource. Almost a third of the total primary energy consumption is based on coal. Most (75% in 1998) is domestic brown coal and the rest is hard coal imported mainly from the Czech Republic. The high sulphur content of the domestic brown coal (0.9-2.0% of the volume) creates environmental problems. Between 2002 and 2006, it will be possible to burn domestic brown coal only in boilers equipped with wet gas desulphurisation and in fluid combustion boilers. The decrease in brown coal mining has added to the already high unemployment in Slovakia. Without subsidies, domestic brown coal cannot compete with imported hard coal or gas. The total state funding to the domestic coal sector (direct price, production subsidies, retraining, early retirement programmes to miners) was around SKK 200 million per year in the late 1990s.

Gas consumption grew in the 1990s and reached one-third of the total energy consumption already in 1995. More than 90% of the population has access to the gas distribution network. There is a state monopoly for the entire gas sector (purchase, sales, transfer and distribution). The gas supply is almost totally dependent on imports from Russia. Domestic production covers less than 5% of consumption. However, one-fifth of the natural gas consumed in western European countries is transported through Slovakia, the second largest country in the world (after Ukraine) for gas transit. The Slovak transit gas pipelines are part of the international gas pipeline network, with the main route of the transit pipeline having four lines, including branch-offs to the Czech Republic and Austria; a fifth line is under construction. The Slovak transit gas system is also important because of its underground gas storage facilities. The gas transit revenues are used to subsidise the selling of gas to domestic consumers at less than the import price. The price for residential users is lower than that for industrial consumers.

Electricity consumption was unstable in the 1990s. Consumption decreased for five years until 1993, when it increased to 28.9 TWh in 1996 and then started to decrease again to 27.8 TWh until 1999 (Figure 2.4). Since 2000, Slovakia has been an electricity exporting country. Nuclear power covered 47% of the electricity

Figure 2.4 **Energy structure and intensity**



a) Total primary energy supply.
b) GDP at 1995 prices and purchasing power parities.
c) Breakdown excludes electricity trade.
Source: OECD; IEA.

production in 1999, conventional thermal power plants produced 35%, and hydropower 18%. The Slovak public utility (Slovenské Elektrárne) produces 90% of the county's electricity. It is also responsible for the distribution of electricity, including electricity generated by nuclear energy. Slovakia has lagged behind its neighbours in central Europe in the liberalisation and privatisation of its power sector, which is seen as vital in preparing for EU membership. In 2001, the government announced its intention to sell 49% of the three electricity distribution companies (the privatisation process is expected to be finalised in 2002). The government also plans to privatise 49% of the main power generator in 2002.

Six *nuclear power* plant units are currently operating: four in Jaslovské Bohunice and two in Mochovce. In 1999, the government decided, after negotiations with the EU, to shut down the two oldest units in Bohunice, in 2006 and 2008 respectively; the two newer units of Bohunice will be upgraded in 2001-08. There have been long discussions on the completion of the third and fourth units of the Mochovce nuclear power plant. In 2000, the government decided not to underwrite the cost of completing these two new units. The rationale is based on environmental and economic concerns, as there is already a large surplus of electricity production in the country for the years ahead.

About 40% of primary energy consumption is used for heat production and roughly half of the households are served by *district heating*. The main energy source for district heating is natural gas (more than 70%), often used in combined heat and power production.

2. Focus on Selected Topics

2.1 Energy policy

Drafting of the new Government Decree on the Slovak Energy Policy started in mid-1999, when a working group of experts from the energy sector as well as non-governmental organisations was established. A public hearing on the draft Energy Policy concluded the preparatory process a few months later. The government has yet to consider the new energy draft law. The *objectives* of the new Energy Policy are threefold: integration into the EU internal market, security of the energy supply, and sustainable development. The Policy document mentions as important goals i) the adaptation of cleaner technologies including desulphurisation and denitrification units, ii) fuel switching from coal to gas and renewables, and iii) energy savings.

EU accession requires a *restructuring of the energy sector*, regulatory and price adjustments, as well as liberalisation and opening of the domestic market. Four important measures are: establishing an independent regulatory body, completing the

new legislative framework, putting energy prices right for all consumers, and privatisation of the energy companies. So far, state-owned companies have dominated the electricity and gas sectors. Restructuring the energy sector will imply completing the separation of the production, transmission, and distribution.

On the basis of the Energy Act, which entered into force in 1998, the energy market was gradually liberalised, but at a slower rate than the government promised at the beginning. The government reiterated its intention to speed up this process to *promote competition* in the energy sector. A need for an independent regulatory body for the energy sector has been recognised for some years now. The regulatory body was finally established in August 2001. It has the competence in energy license issuing and authorisation, and from 2003, in price setting, including detailed cost regulation of regulated entities.

Concerning sustainable development, the country is engaged in a *fuel switch* from coal to gas, which must continue. The switch from coal and crude oil to renewables has hardly begun. The current share of renewables is 3% of the total energy production. According to regulations, all the energy produced by the use of renewables must be purchased. The country has great potentials to use biomass from its own forest as renewable energy sources. A research and development project on renewables is underway.

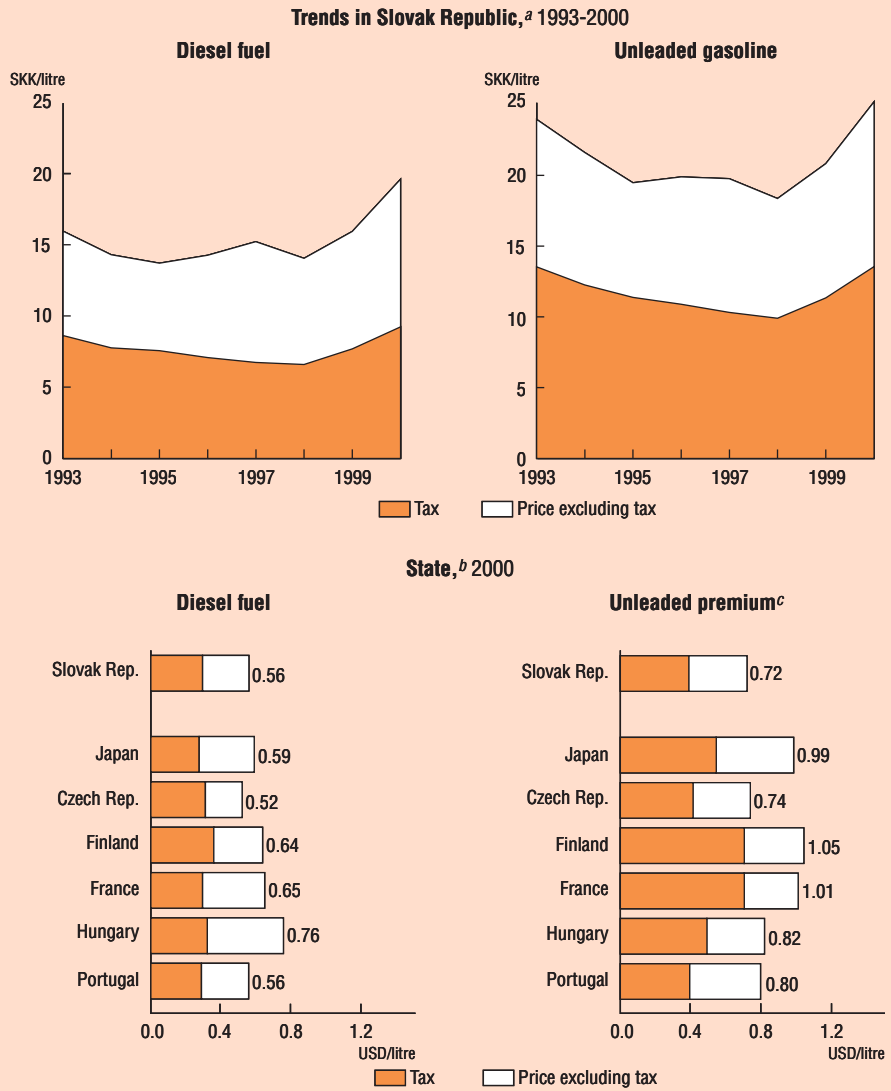
2.2 Energy prices

Energy intensity in Slovakia declined during the 1990s roughly by one-fourth, but it is still 1.75 times higher than the OECD Europe average (Figure 2.4). The explanations are mainly low productivity, a high share of heavy industry in GDP, and a high share of energy intensive industries compared to the EU average. Improving energy efficiency should be a clear policy priority. Adequate resources should be given to the Slovak Energy Agency and the Energy Centre Bratislava.

Although *energy prices* for all consumer groups have been rising between 1999 and 2000 (almost doubling of electricity and gas prices in real terms), household prices are still less than industrial prices, production costs and amongst the lowest in Europe (Chapter 6). Energy prices for household consumers (i.e. heating, electricity, transport fuels), however, represent around 20% of the average household budget (compared to 5% in western European countries or North America) (Table 2.1 and Figure 2.5).

In 2000, the government approved a plan to further raise the *tariffs for electricity and gas* until 2002. The rise is much higher for households (70% for electricity and 54% for gas during the 2000-02 period) than for industry (30% for electricity and

Figure 2.5 **Road fuel prices and taxes**



a) At constant 1995 prices.
b) In USD at current prices and exchange rates.
c) For Japan unleaded regular.
Source: IEA-OECD.

26% for gas). This means that concerning energy prices, cross-subsidies from large industrial consumers to households is being phased out. The government also decided to abolish a number of other subsidies, most notably that on heating.

The potential for energy savings in Slovakia is large, but relatively low energy prices and energy surplus capacity make it difficult to improve *energy efficiency* and develop renewable energy sources. In consequence, industrial and energy production are still energy inefficient. Consumption of energy is also wasteful (e.g. for heating, transport, outdoor lighting). Campaigns for energy savings, product certification and standardisation, energy audits, and other similar measures are rarely used. However, new legislation dealing with energy efficiency and related programmes are being prepared. Improving energy efficiency could increase the country's industrial and services competitiveness and improve living standards.

Table 2.1 **Energy prices[a] in selected OECD countries,** 1999

	Electricity		Oil		Natural gas	
	Industry (USD/kWh)	Households (USD/kWh)	Industry (USD[b]/tonne)	Households (USD[c]/ 1 000 litres)	Industry (USD/10^7 kcal)	Households (USD/10^7 kcal)
Slovak Republic	0.041	0.035	74.4	146.5	108.8	78.2
Japan	0.143	0.213	170.0	372.3	385.8	1 196.4
Czech Republic	0.048	0.051	75.3	332.4	142.8	185.1
Finland	0.046	0.091	. .	309.7	128.1	156.2
France	0.047[d]	0.129[d]	123.3	344.3	135.3	384.3
Hungary	0.055	0.073	96.0	. .	134.9	185.0
Portugal	0.078	0.141	154.8	. .	. .	. .
OECD Europe	0.065[d]	0.131[d]	146.5	341.8	151.8[d]	428.2[d]
OECD	0.063[d]	0.110[d]	146.8	326.7	133.5[d]	361.4[d]
Slovak/OECD Europe (%)	*63*[d]	*27*[d]	*51*	*43*	*72*[d]	*18*[d]
Slovak/OECD (%)	*65*[d]	*32*[d]	*51*	*45*	*81*[d]	*22*[d]

a) At current exchange rates.
b) High-sulphur oil.
c) Light fuel oil.
d) 1998 data.
Source: OECD; IEA.

2.3 Domestic emissions trading

Slovakia has a domestic *SO_2 Cap and Emissions Trade Programme*. The government is also considering a CO_2 trading programme. Plans to create a NO_x trading programme also exist. There are, however, very few concrete results of the SO_2 trading programme so far.

SO_2 emission trading

The *SO_2 quotas* are designed to bring Slovakia into compliance with the Gothenburg Protocol by 2010. The emission quotas for 2002-04 have been set. The government allocates quotas to districts based on past (historical) emissions data. The districts allocate the quotas to individual emissions sources, which may buy and sell quotas. However, buying quotas is not allowed in regions that are in non-compliance with ambient air quality norms. To ensure compliance with the Second Sulphur Protocol, no banking is allowed and the emissions limits are given for a particular year.

The SO_2 cap and trade programme concerns only *emission sources exceeding 50MW*, representing about 80% of the total SO_2 emissions. In the first phase of the programme (2002-04), the emissions quotas are higher than the present emissions. In the next phase, from 2006 onwards, the allowances will be lower than the present emissions, and by 2010 the quotas will be reduced by 45% compared to the present levels.

To reduce air pollution charges the operators of the sources have tended to underreport their SO_2 emissions. And consequently, because the allocated emissions of SO_2 for 2002-04 were based on data reported by the operator itself, the assigned quotas are usually smaller than the present emissions. Therefore, the operator must either reduce the emissions or buy the missing allowances on the market. Sources located in non-compliance regions cannot buy additional quotas and have only one option: emissions reduction. The authorities have been challenged for not being able to verify and *monitor emissions*, but this does not justify underreporting by operators of emission sources.

Proposed CO_2 emission trading

CO_2 emissions trading is under consideration and would include combustion sources with a capacity of more than 20 MWt and emissions from industrial processes. This would cover about 70% of the country's CO_2 emissions from less than 300 sources. There would be no sectoral criteria for source inclusion in the cap and trade as in the EU model. The pilot phase would be in 2005-06 and the programme would be fully operational in 2008.

The initial allocation of CO_2 allowances will probably be "grandfathered", based on the emissions of the last three years. The quotas would exceed the present CO_2 emissions, not restricting economic growth. Domestic trading would be unrestricted and companies could sell CO_2 allowances on the international market. The programme would of course, need strict reporting, *monitoring* and verification of emissions, and an accurate tracking system for each tonne of traded CO_2. The government would probably retain a given amount of allowances to cover potential risks for having underestimated the total emissions. If not needed during the first commitment period, these allowances may be sold on international markets or retained for the second commitment period.

3

WATER MANAGEMENT

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of the Slovak Republic:

- adopt the proposed *new Water Act on water protection and water management* transposing EU legislation, and implement the new *institutional framework* for water management;
- prepare water *management plans by river basin*, taking into account flood prevention concerns;
- mobilise financial resources to upgrade and extend the *urban sewerage and waste water treatment infrastructure*;
- apply more fully the *user pays and polluter pays principles*, taking into account social considerations, aiming at full cost recovery for household water services pricing, and eliminating charge concessions and increasing pollution charges;
- identify areas vulnerable to *nitrate pollution* by agriculture.

Conclusions

Overall pressures on *water quantities* are low and total annual water withdrawal fell due to the decline and restructuring of industrial production, reduced household consumption, and a decrease in irrigated area. *Pollution* loads in surface waters decreased in the 1990s, as a result of a contraction in industrial and agricultural outputs and restructuring of these sectors (e.g. less energy intensive industry and less agrochemical intensive agriculture). Overall, there was a *decoupling* of water withdrawal and pollution discharges from GDP growth. Slovakia has ratified key regional multilateral agreements in the area of water management.

However, river development has contributed to more acute flooding. *Surface water quality* improved very little over the 1990s, although eastern Slovakia, in general, reached quality parity with the western part of the country. Eutrophication of bathing water is a problem. Limit values for *drinking water* quality are often exceeded for some heavy metals and ammonia and there are persistent cases of nitrate pollution. The share of the population connected to *waste water treatment* increased only slightly over the 1990s, reaching nearly 50%. Nitrogenous fertiliser use decreased sharply, but the application rate of fertilisers remains high. A *major water reform* is being considered, to include transposition of EU water legislation (draft of new Act on water protection and water management). This reform is very much needed. Different ministries deal with water quantity and quality issues and water management responsibilities of local authorities are not clearly defined. Water management at the *river basin* level would greatly improve water management planning. A new water *pricing policy* should be established: the national government still sets water prices at low rates for households; various concessions apply to abstraction charges; pollution charges have little incentive function; the user pays and polluter pays principles should be applied progressively to the water sector. The implementation of the Drinking Water and Urban Waste Water Directives will require *large investments*, especially to upgrade piped water supplies and build new treatment plants. Much of investments into water supply, sewerage, and waste water treatment infrastructure is still funded through the state budget and state funds.

1. Evaluation of Performance

1.1 Policy objectives in the 1990s

Broad *strategic objectives* were part of the 1993 Strategy of National Environmental Policy. They included: i) complying with water quality standards, ii) ensuring safe drinking water supply for all residents of Slovakia, and iii) mitigating the negative impacts of flood hazards.

The *Water Management Policy*, prepared by the Ministry of Agriculture and endorsed by the Slovak Government and Parliament in 1995, contained key principles. Surface and ground waters are the property of the state, which is responsible for their good management. Integrated water supply systems should be developed to ensure continuous supply, rational use, and optimal distribution. Water pollution should be gradually reduced and an ecologically acceptable amount of pollutants in receiving waters should be achieved. Water pricing should be revised to recover management costs.

Recently, policy objectives and targets for water resource management were stated in the *National Environmental Action Programme II*, largely influenced by EU water legislation:

– transpose EU legislation and develop a comprehensive legal and institutional framework for water management in line with EU 2000 Water Framework Directive;

– prepare water management plans by river catchment;

– reduce the amount of pollutants discharged, through construction of sewerage and waste water treatment plants in line with EU 1991 Urban Waste Water Directive;

– identify vulnerable areas in line with EU 1991 Nitrate Directive;

– reduce leakage in drinking water supply systems;

– improve the monitoring of water quality.

1.2 Performance with respect to strategic objectives

Water quality

Surface water quality has been systematically assessed since 1963. Since 1993, the Slovak Hydro-Meteorological Institute (SHMI) has monitored around 7% of the river network (3 500 out of 50 000 kilometres) in more than 250 sampling sites. National standards include several criteria, systematically monitored are oxygen regime, chemical and physical properties, nutrients, biological, and microbiological quality. Heavy metals, toxic contaminants, and radioactivity are monitored only at specific sampling sites. Water quality is ranked according to five quality Classes I and II are very clean and clean; III is polluted; IV and V are heavily and very heavily polluted. Monitoring is carried out monthly or every two months.

The quality of surface water *has shown little improvement* over the 1990s (Table 3.1 and Figure 3.1). In 1998-99, 85% of monitored river length was in Class IV or V for coliform count, 53% for micro-pollutants, 33% for N and P budget, and 17% for oxygen budget. Water quality has improved in large rivers, but is still very poor in small watercourses. Rivers in eastern Slovakia (such as the Hornád) were by far the most polluted with ammonium and heavy metals until the mid-1990s; concentrations have decreased in recent years, as industrial production has fallen and waste water treatment has improved. Today they are on par with western rivers in dissolved oxygen (DO), which has remained above 4 mg/l, the critical value for fish. Nitrate levels and total phosphorus concentrations have been stable in the 1990s.

The SHMI has assessed the *quality of groundwater* (accounting for nearly 80% of the total amount of drinking water) since 1982. Monitoring is carried out once a year in 332 wells and springs, and two to four times a year in 34 stations in the itný Ostrov area (the most important source of drinking water in Slovakia). Antimony occurs naturally in certain groundwaters, often in association with arsenic. Violation of the arsenic standard occurred in five districts after a more stringent standard was introduced, in line with the new EU Drinking Water Directive. Samples exceeding national standards were found in 23 sources for benzene, 27 sources for nitrates, 34 sources for coliform bacteria, and 75 sources (supplying more than 250 000 people) for faecal bacteria. The supplies contaminated by arsenic have since been closed. This should also be the case for benzene. Closing of supplies contaminated by antimony and nitrates would also be the only economically feasible solution. In regards to bacteriological contamination, additional chlorination cannot be considered a long-term solution; the source of bacteria must be identified and the most cost-effective remedy determined.

There are 53 *bathing water locations*. Eutrophication, as a result of increased nitrogen and phosphorus pollution, is a main issue. In 1999, chlorophyll "α" concentrations exceeded the limit value of 25 $\mu.m^{-3}$ (Class III and above according to national standards) in several water reservoirs.

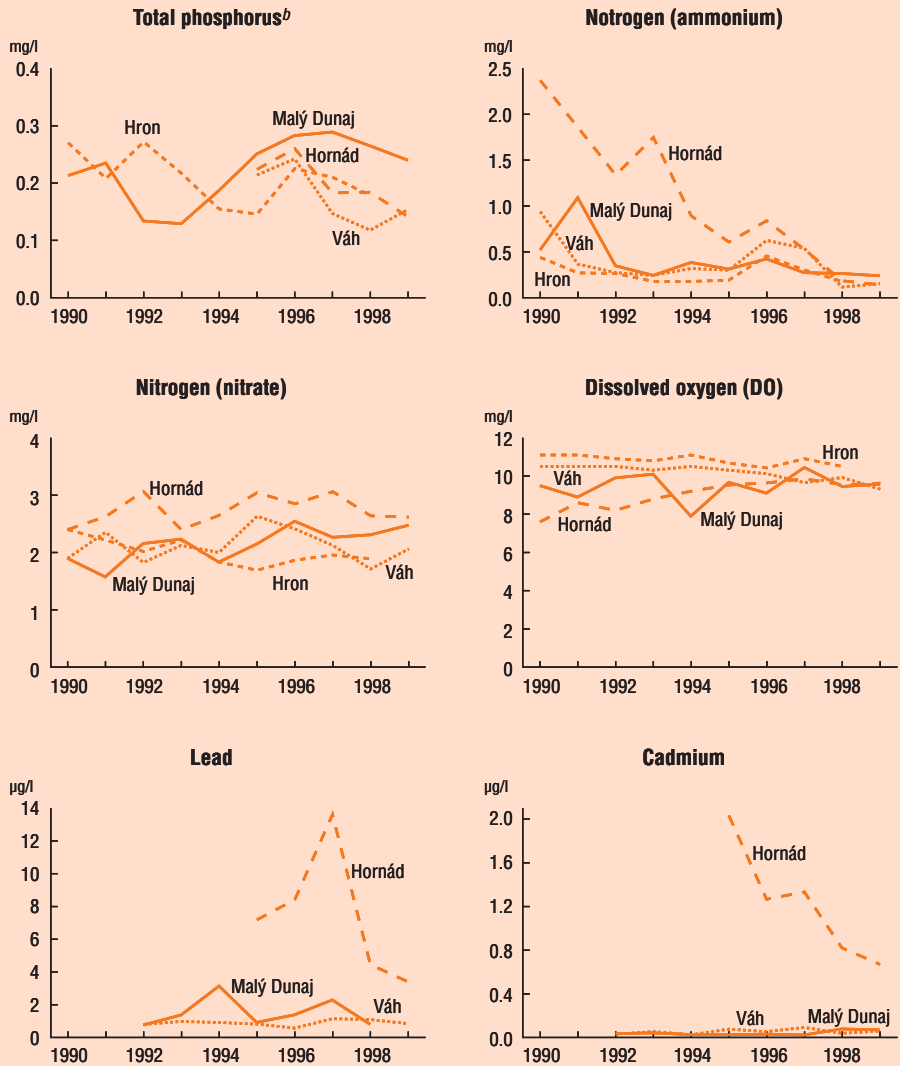
Table 3.1 **Surface water quality for the main river basins,** 1998-99

(% of monitored river length within Class V)

Parameters	Danube	Morava	Váh	Nitra	Hron	Ipel	Bodrog	Hornád	Poprad
Oxygen demand[a]	–	8	4	–	–	5	6	4	–
Basic chemical[b]	–	30	4	35	5	31	38	56	15
Additional chemical[c]	–	15	1	28	8	2	–	–	–
Heavy metals[d]	–	–	–	–	–	2	8	11	–
Biological and microbiological[e]	–	–	25	41	72	77	93	85	57
Assessed length (km)	172	234	708	286	323	224	572	485	140

a) BOD_5, COD, O_2.
b) Specific conductivity, soluble substances, insoluble substances, $N\text{-}NH_4$, N_{org}, P_{total}.
c) Non-polar extractable substances, SO_4.
d) Zn.
e) Coliform bacteria, saprobic index.
Source: Slovak Hydro-Meteorological Institute.

Figure 3.1 **Water quality[a] of selected rivers,** 1990-99



a) Annual mean concentrations measured at Kolárovo (Malý Dunaj), Komárno (Váh), Kamenín (Hron) and Zdana (Hornád).
b) Orthophosphate concentrations for Malý Dunaj.
Source: OECD.

Drinking water

Drinking water quality data, published by the Water Research Institute, are available for 90% of the population supplied by water utilities. Data are also available from the State Institute of Public Health (SIPH) for problem areas. Quality measurements are, in general, not made at the tap, as required by the EU Drinking Water Directive, but at the end of the distribution system. In problem areas, limit values according to national standards (which are close to WHO standards) are often exceeded for some heavy metals (iron, manganese) and ammonia (Table 3.2). There are also high concentrations of organic compounds and trace elements (Al, Ni, Cd and Pb) in some monitoring sites. Furthermore, there are persistent cases of nitrate pollution. Overall, 10% of the population has no access to public water supply services and a significant portion of those receiving services, have water below quality standards.

Table 3.2 **Drinking water quality**[a]

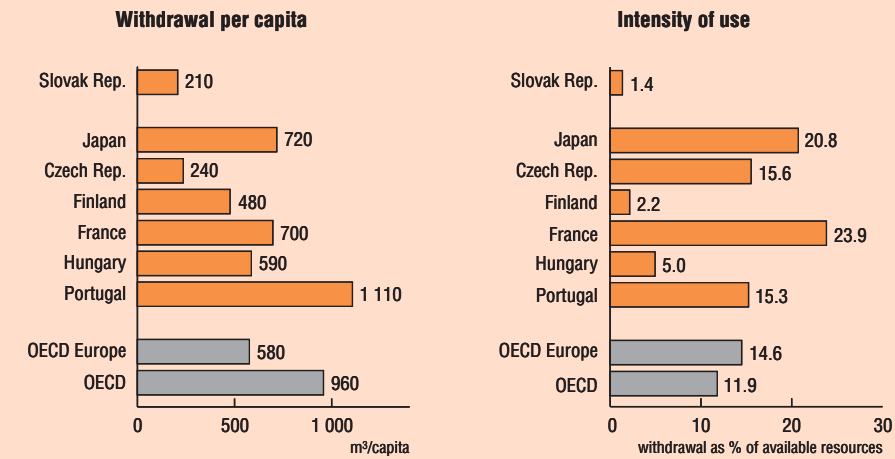
Parameters	1990	1995	1999
Manganese	35	27	38
Iron	33	35	36
NES[b]	9	30	16
Ammonium (NH_4)	9	15	9
Nitrates	7	10	7

a) % of samples exceeding national standards in problem areas.
b) Non-polar extractable substances.
Source: State Institute of Public Health.

Use of water resources

Slovakia has abundant water resources (Chapter 3, Section 2.1). At 210 cubic metres per capita, consumption is well below the OECD Europe average. Overall pressures on water quantities, as measured by a 1.4% *intensity of use*, are also well below the OECD average (Figure 3.2). About 60% of total withdrawals come from surface water with industry and energy accounting for almost 90%. The largest industrial users

Figure 3.2 **Water use,** late 1990s



Source: OECD.

Table 3.3 **Freshwater abstraction,** by major use

	1990		1999	
	(%)	(million m^3)	(%)	(million m^3)
Public water supply	*30*	635	*39*	455
Agriculture	*13*	275	*2*	21
Industry[a]	*57*	1 206	*59*	688
Total	*100*	2 116	*100*	1 164

a) Including electrical cooling.
Source: Ministry of the Environment.

of surface water in 1998 were a power plant (265 million m^3), a refinery in Bratislava (102 million m^3), a nuclear power plant (37 million m^3), a pulp and paper mill (27 million m^3), and an ironworks company (26 million m^3). Comparatively, agriculture uses very little water, accounting for only a few per cent of total surface water withdrawals. About 40% of total withdrawals come from groundwater, mainly for public water supply. Intensity of groundwater use has fallen from 30% to 20% over the 1990s.

Total annual *water withdrawal* fell from 2.1 billion cubic metres in 1990 to 1.2 billion cubic metres in 1999 due to the decline and restructuring of industrial production, reduced household consumption, and a decrease in irrigated area (Table 3.3). Population served by public water supply increased from 75% in 1990 to 82% in 1999, but household consumption of public water decreased from 185 litres per inhabitant per day in 1990 to 118 litres in 1999, due to water price increases. Water lost in piping decreased to approximately 15%, in line with the established target. Irrigation previously relied upon surface water, but related abstraction has sharply declined, as the total irrigated area fell from 350 000 hectares in 1990 to 190 000 in 1999 (or 12% of cropland), following the privatisation of irrigation schemes.

As the Slovak economy grows, it is likely that *household consumption will rise* again to levels prevalent in the EU (140-160 litres/capita/day), with higher equipment of households and extended water services to municipalities not yet served (40% of the municipalities in the Preov region).

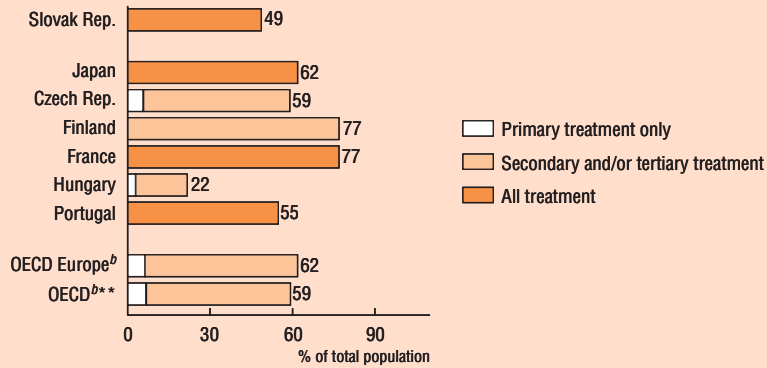
Flood hazards

Since the mid-1990s, the number of floods remained between 5 and 12 a year. Nevertheless, property damages increased to SKK 4.5 billion in 1999, especially after 180 000 hectares were temporarily flooded. The 1974 Act on the state administration in water management contains extensive provisions concerning *flood prevention and control*. This has prompted an engineering approach rather than an ecosystem (watershed) approach: about 580 000 hectares have been protected against floods (a 20% increase since 1990) by reservoirs and 3 000 kilometres of protection levees. But floods have increased as a result of river canalisation carried out by the state on 30 000 kilometres (i.e. 58% of the river network).

1.3 Trends in pressures on water resources

The share of the population connected to sewerage increased from 50% in 1990 to 55% in 2000. The share of the *population connected to public waste water treatment* increased from 43% in 1990 to 49% in 1994 and has remained unchanged since.

Figure 3.3 **Population connected to public waste water treatment plant,** late 1990s[a]



a) Or latest available year.
b) Secretariat estimates.
Source: OECD.

This rate is below the OECD average (Figure 3.3). Large efforts will be necessary to comply with the EU Urban Waste Water Directive. While most agglomerations of more than 15 000 p.e. have waste water treatment plants, most smaller municipalities have none. For instance, 291 municipalities between 2 000-5 000 p.e. have no sewage treatment plants. Overall, only 12% of municipalities have a waste water treatment plant (39% in the Bratislava region), most by treating effluents to secondary standard.

Pollution loads in surface waters decreased in the 1990s, mainly due to recession in *industry* (Table 3.4). Government Decree 242/1993 determines highest permissible pollution levels for municipal sewage and 29 kinds of industrial waste water, both in discharged waste waters and in receiving surface water. Concerning agriculture, *farm inputs* decreased sharply following changes in production methods and the decline in agricultural production (Table 3.5). At 4.5 tonnes/km^2, the application rate of nitrogenous fertilisers is below the OECD average (Figure 3.4). Impacts associated with manure disposal have generally been reduced with the privatisation and fragmentation of large pig farms. Intensity of pesticide use is about 2.3 kg of active ingredients per hectare of cropland, in line with the OECD average (Figure 3.4).

Nearly 70% of the 90 000 tonnes (dry matter) of *sludge* produced are used in agriculture (urban sludges), 18% are disposed of in landfills (mostly industrial sludges) and 12% stored temporarily. A study conducted by the Water Research Institute in 1996-98 showed that urban sludge from most urban waste water treatment plants met the guidelines of the Ministry of Agriculture for direct application to agricultural land.

Table 3.4 **Pollution loads in surface waters**

(tonnes)

Parameters	1992	1994	1999
Soluble substances	50 000	41 446	26 048
BOD_5	62 000	34 275	20 877
COD_{Cr}	150 000	106 960	63 783
Crude oil products[a]	1 100	772	360

a) Non-polar extractable substances.
Source: Ministry of the Environment.

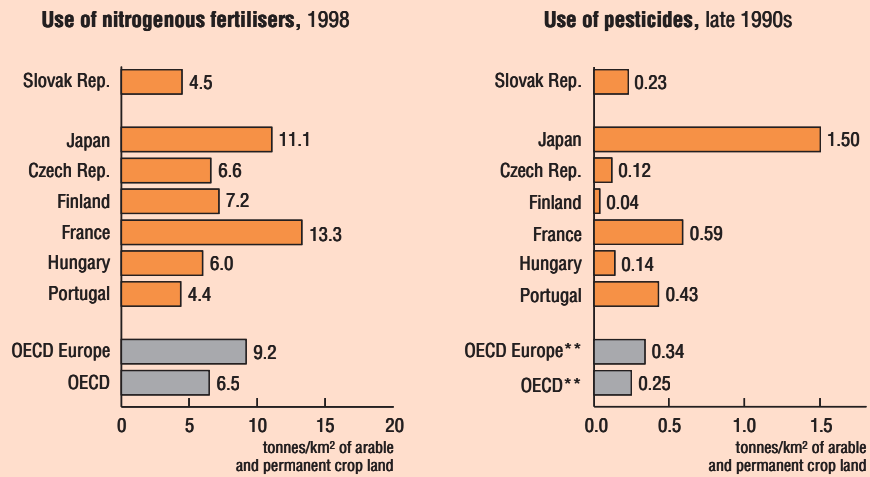
Table 3.5 **Fertilisers and pesticides use**[a]

(tonnes)

	1996	1999	Change 1996-99 (%)
Nitrogen fertilisers	74	65	*–12*
Phosphate fertilisers	20	13	*–35*
Potash fertilisers	17	11	*–36*
Pesticides[b]	4	3	*–24*

a) Excluding private farmers.
b) Active ingredients.
Source: Ministry of the Environment.

Figure 3.4 **Agricultural inputs**



Source: FAO; OECD.

1.4 Water management framework

Different ministries and agencies deal with water quantity and quality issues. As a result, *water management responsibilities* are not always clearly defined (Chapter 3, Section 2.2). There is a need for co-ordinated responses to water management objectives. This could best be achieved using a river basin management approach, building upon the long tradition of River Basin Enterprises (RBEs) in Slovakia. Such an approach will have to be generalised in response to the recent EU Water Framework Directive.

Progress is being made towards transposing EU water legislation (Chapter 3, Section 2.3). A *new Act on water protection and water management* is being prepared. At the same time, the Ministry of Agriculture is preparing a new Act on public water supply and sewerage (for adoption in 2002). The Act on the protection of people's health was amended (in 2001) to transpose the EU Bathing Water Quality Directive. A Health Protection Code will set requirements for drinking water quality and a Code of Good Agricultural Practices will regulate nitrogen into water.

A central *flood control commission* was established in 1995 as an inter-ministerial body and the RBEs currently implement mitigation measures according to flood emergency plans. Introducing rules for cost-sharing and the creation of basin-wide flood control commissions would improve co-ordination of emergency response during floods.

Slovakia must also place its water management in the context of *international co-operation*. Slovakia has been a party to the Sofia Convention on co-operation for the Protection and Sustainable Use of the Danube River Basin since 1998; that year, a national review of Slovakia was undertaken under the Danube pollution reduction programme, with UNDP/GEF assistance. Slovakia also ratified the Helsinki Convention of the Protection and Use of Transboundary Watercourses and International Lakes in 1999. Joint commissions were established with the five neighbouring countries, chiefly focussing on securing river flow. Diversion of the Danube in 1992 for hydropower generation has led to an environmental dispute with Hungary (Chapter 8, Section 2.1).

1.5 Water pricing

The level of *water prices for households* was constant until 1990. Since 1991, volumetric rates have increased significantly, and as a result water consumption decreased. About 80 to 90% of the water consumed by households is now metered and water prices for households are reaching about SKK 12/m^3. They are low by OECD standards and cover only about 60% of the costs, which water companies bear to provide the services (Table 3.6).

The Ministry of Finance still regulates water prices for households while *water prices for industry* are set by contract with suppliers. Industry do pay approximately the full marginal cost of water and waste water services, while rates are kept deliberately low (under marginal cost) for households (Table 3.6). For both households and industry, prices are based on constant volumetric rates (with no fixed charge element). Due to state fixed prices for drinking water supply and sewage treatment (the same rates apply nation wide) state-owned water companies (or "water works utilities") are operating at a deficit in some regions and with a profit in others. In 1999, 12 of the 38 sub-companies had a surplus on water sales. *State water companies are subsidised* via funds: SKK 700 million from the State Environmental Fund (SEF) and SKK 75 million from the State Water Management Fund (SWMF) in 1998. The SEF is financed at 70% by environmental charges (air, waste water, waste) and at 30% by the central budget. Waste water pollution charges that accrue to the SEF equally apply to municipal and industrial effluents (based on pollutant loads). The SWMF is financed mainly by groundwater abstraction charges, for which industry pays the full rate (SKK 2/m^3) while abstraction for public supply is exempted at

50% (it was fully exempted until 1996). In 1999, industry withdrew 63 million m^3 groundwater (paying SKK 126 million), against 364 million m^3 for public supply (equivalent to SKK 364 million) and 9 million m^3 for agriculture (SKK 18 million).

In 1997, a policy was launched to *devolve responsibility to municipalities* for water supply and waste water services from the state owned water companies (Chapter 3, Section 2.1). Since then, 10% of water supply facilities and 40% of municipal waste water treatment plants have been transferred to municipalities. Many municipalities will have to make (directly or indirectly as a shareholder of concessionary new water companies) a large financial investment to improve the secondary pipe network and to establish modern waste water treatment plants (Chapter 3, Section 1.6). This will involve loans that will imply raising water charges and prices to be repaid. In progressively implementing an overall water pricing policy, based on the polluter pays and the user pays principles, attention must be given to social considerations, to ensure that all households have access to water services.

There is a long tradition of using economic instruments in the water sector (Chapter 3, Section 2.4). However, concessions to *withdrawal charges* apply to agriculture (full exemption for surface water) and public water supply (preferential rate for ground water), surface water being the main source of irrigation water and ground

Table 3.6 **Water prices**[a]

(SKK/m^3)

	1996	1997	1998	1999
Households[b]				
Public water supply	4.71	4.99	5.66	7.26
Sewerage and waste water treatment	2.83	3.14	3.77	3.77
Industry[c]				
Public water supply	7.09	8.65	9.40	10.44
Sewerage and waste water treatment	6.07	6.85	7.46	7.85
Average cost for water companies				
Public water supply	7.77	9.76	10.45	10.80
Sewerage and waste water treatment	5.21	5.84	6.44	7.49

a) Excluding VAT.
b) Prices fixed by the government.
c) Prices set by contract with water companies.
Source: Ministry of Agriculture.

water the main source of drinking water. Since 1996, public water supply has no longer been fully exempted from the groundwater withdrawal charge, but it still benefits from a preferential rate (SKK 1/m^3 compared with SKK 2/m^3 for other uses).

According to the 1973 Water Act and the 1993 effluent discharge standards, each polluter is required to treat or pre-treat waste water, prior to discharging to public sewage network. The Ministry of the Environment sets maximum allowable concentrations for municipal effluents, selected industries' effluents, and for recipient waters. However, *pollution charges* give little incentive to polluters to undertake pollution control investments, as the charges have neither been revised since 1979, nor been adjusted for inflation. Moreover, the calculation formula (an exponent of less than one for BOD_5 and insoluble substances) makes the marginal cost decrease for heavy polluters. Additional charges (of up to 200% the base rate) may apply in the case of heavy pollution, but they have never been put into practice. Only about 50-60% of imposed charges have actually been collected. New legislation is needed to lead to a stepwise increase in this charge, with the amount to be set each year by the Ministry of Finance.

1.6 Investment and operating expenditure

Water related expenditure in 1999 was roughly SKK 4 billion; half to investments in water supply, sewerage, and waste water treatment infrastructure and half to operating expenditure (Tables 6.5 and 6.6). The approach chosen focused on large point sources first and then on diffuse pollution sources and waste water treatment in small towns. Overall investment in the water sector has been on the order of SKK 2 billion a year over the period 1996-2000, of which approximately 70% for public water supply and 30% for sewerage and waste water treatment. This included state transfer to the water sector (50%) and water companies' own revenues (50%). Thus, a large portion of total investments is funded through the state budget and state funds. The SWMF revenues increased from SKK 226 million in 1996 to SKK 748 million in 1998; around 10% was provided to water companies and the remaining 90% to: municipalities (31%), flood protection (27%), maintenance of public water infrastructure (e.g. dams, irrigation systems) (26%), and research (6%). The SEF contribution to water companies has regularly increased over the 1990s, to around SKK 700 million in 1998 (Table 3.7).

Implementation of the EU Drinking Water and Urban Waste Water Directives will require, in the future, *large investments*, in order to upgrade piped water supplies and build new treatment plants. The cost of full implementation for the Drinking Water Directive is estimated at SKK 5 billion. Currently, waste water treatment facilities do not meet the requirements for phosphorus and nitrogen removal. And

approximately 40% of municipal waste waters from agglomerations of more than 15 000 p.e. are not adequately treated. Full implementation of the Urban Waste Water Directive is estimated at SKK 139 billion. In regards to the Nitrate Directive, it is intended to delineate vulnerable areas and to elaborate action programmes by the end of 2002. The annual cost of compensating farmers operating in vulnerable areas is estimated at SKK 2 billion, on top of other related operating expenditures already at SKK 2 billion per year.

Table 3.7 **State Environmental Fund expenditure on water**[a]

(SKK million)

	1993	1994	1995	1996	1997	1998
Public water supply	131	153	200	222	189	264
Sewerage and waste water treatment	322	297	272	398	327	408
Other	7	30	25	30	17	34
Total	460	480	497	650	533	706

a) After 1998, the SEF has been replaced by funds earmarked to the Ministry of the Environment in the national budget.
Source: State Environmental Fund.

2. Focus on Selected Topics

2.1 Freshwater resources

Slovakia has abundant renewable *water resources* (83 billion cubic metres or about 15 000 cubic metres per inhabitant per year). Most (84%) are water flows from neighbouring countries. Renewable groundwater resources amount to only 2.3 billion cubic metres, but they provide 38% of total water abstractions. Water areas occupy 932 km^2 (nearly 2% of the territory). Located at the bottom of the Carpathian Mountains, the eastern and western Pannonian basins provide most of Slovakia's arable land and are *prone to floods*, following heavy rains and the melting of spring snow in the surrounding mountains. Irrigation takes place mostly in the fertile Danubian Lowlands, where average annual precipitation is between 400 and 600 mm.

Slovakia has 11 *river catchments*, each covering between 860 and 14 000 km^2. Ten (96% of the territory) belong to the Danube international river basin (draining into the Black Sea), one belongs to the Vistula international river basin (draining into the Baltic Sea). The major river that flows through Slovakia is the Danube, with a flow at the entry to Slovakia of 1 900 m^3/second. Other rivers with flow rates above 100 m^3/second are the Váh, the Bodrog and the Morava. The deepest natural lake is the Vel'ké Hincovo Lake, located in the Tatry National Park (20 hectares, 1.8 million cubic metres). There are 291 public water reservoirs (1.9 billion cubic metres), 54 with a volume over 1 million cubic metres. They are used mainly for water supply and flood control. There are 1 470 mineral water springs and 106 geothermal water sites under exploitation.

2.2 Institutional framework

The 1974 *Act on the state administration in water management* specifies three levels of state administration. At the national level, the Ministry of the Environment designs policy and prepares legislation for both water quality and water quantity, the Ministry of Agriculture manages water resources, and the Ministry of Health assesses the use of water sources for drinking water supply and recreational purposes. Regional and district offices control implementation of water legislation. They issue abstraction and discharge permits, as well as permits for the construction of facilities that might impact water quantity and/or quality. Since 1996, environment, water management, and health personnel in regional and district offices have been subordinate to the Ministry of Interior though expert supervision has continued to be carried out by the parent ministries. The Ministry of Health is assisted by 37 State Health Institutes that closely co-operate with district and regional hygienists.

District offices and environmental inspections may impose sanctions and penalties for violations of the 1973 Water Act and other water regulations (Chapter 6). The *1975 Regulation on penalties in water management* stipulates the levels of fines and remedial measures to be taken. Water management inspections of the Slovak Environmental Inspection are located in the five main cities. The territorial activity of the water management inspections is located within the borders of river basins.

Slovakia's four *River Basin Enterprises* (RBEs), for rivers Danube, Váh, Hron, Bodrog/Hornád, are public bodies under the Ministry of Agriculture. They manage river development and allocate surface water for various uses, including energy production, drinking water supply, industry and irrigation. They also monitor surface water quality. The RBEs were put under the supervision of the Slovak Water Management Enterprise, a state-owned enterprise created in 1997 and located in Banská

Štiavnica. The latter took over from the RBEs the responsibility of collecting payments for water withdrawal (partly transferred to the State Water Management Fund and partly used to finance RBEs operations) and waste water discharges (transferred to the SEF).

The *Slovak Hydro-Meteorological Institute* (SHMI), supervised by the Ministry of the Environment, collects data on quantity and quality of surface and ground waters, as well as on climate and air quality. It also monitors the natural environment at the Gabčíkovo dam. The *Water Research Institute* (WRI), supervised by the Ministry of Agriculture, provides research in the fields of hydrology, hydraulics, water resources, water and waste water treatment technology, and surface and ground water quality. WRI was designated as the national reference laboratory for analyses of water quality, sediments, and sludge.

Five state-owned *water companies* (in Bratislava, and for western, north, middle, and eastern Slovakia) and 38 separate sub-companies, operate and maintain local water supply, sewerage systems, and waste water treatment plants. In July 2002, the state will transform the five companies into 15 companies and transfer ownership of the water infrastructure to *municipalities* or groups of municipalities, upon request and according to regional divisions. This restructuring of the state water companies was initiated in the second half of 1997. A variety of arrangements concerning ownership and service delivery progressively took place in different parts of the country. Often, the ownership of piped networks and installations ("long-distance infrastructure") has remained public and service delivery has become the responsibility of municipalities and/or companies with public (e.g. municipal) and/or private shareholders. By the end of 2000, 40% of municipalities had applied for a free-of-charge transfer of facilities and services. The transfer will be difficult in eastern Slovakia where, due to water shortage, the cost of water supply and sanitation is much higher (SKK 30/m^3) than the regulated price (SKK 12/m^3). Some municipalities began building new sewerage systems and sewage treatment plants independently from the water companies. The share of population connected to waste water treatment plants directly administered by municipalities increased from 1.4% in 1994 to 4.4% in 1998; it remained 50% for plants administered by the water companies.

2.3 Transposing EU water legislation

Legislation on water management includes the 1973 Water Act (amended in 1993), the 1974 Act on the state administration in water management (amended in 1992), and the 1991 Act creating the state water management fund. Implementing regulations relate to penalties for violations (1975), protection against floods (1975),

drinking water protection areas (1978 and 1987), water charges (1979), and effluent discharge standards (1993). The 1994 Act on the protection of people's health includes provisions on drinking water quality.

Progress is being made towards transposing *EU water legislation*. The 1973 Water Act addresses protection of groundwater from pollution by dangerous substances (Directive 80/68) and drinking water quality (Directive 80/778). However, it only partially covers pollution by dangerous substances discharged to water (Directive 76/464) and urban waste water treatment (Directive 91/271). The national legislation contains no special regulation on the quality of surface water intended for abstraction of drinking water (Directives 75/440 and 79/869) and on water protection against nitrates (Directive 91/676). It contains no regulation fully compatible with Directive 78/659 on Water Quality for Fish Life and with Directive 76/160 on Bathing Water Quality. Slovakia has requested a transition period until 2015 for the Urban Waste Water Treatment Directive and until 2006 for the Pollutant Discharge Directive (Directive 76/464). No transition periods were requested for the new Drinking Water Directive (Directive 98/83) or for the Nitrate Directive.

The proposed *new Act on water protection and water management,* under preparation, and its implementing regulations, are intended to transpose all Directives concerning water protection including the 2000 Water Framework Directive. Identification of sensitive areas requiring tertiary treatment will be realised as well as designation of vulnerable areas for nitrate pollution. An action programme will be prepared for the protection of water from agricultural pollution. Bathing waters suitable for recreation will be identified. In regards to pollution caused by dangerous substances discharged to water, emission limits will have to be introduced, as well as changes in technology to comply with them. Programmes for monitoring discharges of the most dangerous substances (List I) will have to be drawn up.

2.4 Use of economic instruments

Water withdrawal and waste water discharge are subject to charges as per the 1979 Regulation on Fees in Water Management (as amended in 1988 and 1989). *Withdrawal charges* apply to anyone withdrawing more than 1 250 cubic metres per month or 15 000 cubic metres per year from surface and ground waters. The rate (SKK 2/m^3 for both surface and ground waters) is set uniformly across the country with lower rates for public water supply and for energy and healthcare (Table 6.10). For surface water, revenues are used to finance the administration of watercourses by the River Basin Enterprises (RBEs). For groundwater, they accrue to the State Water Management Fund, supervised by the Ministry of Agriculture.

Pollution charges apply to holders of a discharge permit. They are based on the municipality and industry monitoring the pollutant content of the effluent (BOD_5, insoluble substances, crude oil products, pH, dissolved inorganic salts). The charge rate varies according to the type of receiving (surface and ground) waters. The RBEs collect the charges; the revenues (which accrued to the SEF until 1998) are earmarked to the water sector (public water supply and waste water treatment).

According to the 1975 Regulation on Penalties in Water Management, *fines* are levied for lack or breach of a permit for (surface and ground) water withdrawal (SKK 1/m^3) and for waste water discharge (based on volume and type of pollutant). Fines are also imposed for illicit handling of hazardous substances (SKK 1 000 to 30 000) and, more generally, for violations of the 1973 Water Act (SKK 500 to 100 000). Fines are about 1% of the SEF. Payment discipline increased from 40% in 1995 to about 70% in 1999.

4

WASTE MANAGEMENT

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of the Slovak Republic:

- promote *waste minimisation* initiatives;
- pursue efforts to develop *separate collection of municipal waste* and promote the processing of separated materials as secondary raw material or energy source, including use of the Recycling Fund;
- complete a national *survey of hazardous waste* incineration needs, proceed with the upgrading of technical standards for existing medical waste and other hazardous waste incinerators, and build the required additional *incineration capacity*;
- elaborate a comprehensive programme to map *contaminated sites* of industrial origin, assess the potential risks for the environment and propose remedial measures;
- fully adopt the OECD Green List for the *import of waste* destined for recovery operations.

Conclusions

The 1991 Waste Act provides the *institutional framework* for waste management. This Act was fundamentally revised in 2001 to incorporate the most relevant EU Legislation. In 1993, the first *Waste Management Programme* already included specific and ambitious objectives regarding waste reduction, recovery and disposal, and cleaning of old, uncontrolled landfills and other contaminated sites. All uncontrolled dumps and landfills were closed down; a network of *landfills* meeting

regulatory conditions was created; its present capacity is sufficient for the safe disposal of the waste generated in the country. *Separate collection of municipal waste* is being introduced and a recycling industry is developing. A number of *economic instruments* are in use; in addition to user charges and waste disposal charges the new Waste Act introduced the concept of product charges concerning a number of items which must be collected and processed separately from other waste, or for which increased recovery is considered desirable; the revenues go to a Recycling Fund, which will be used to support the necessary investment and operational costs of recovery activities. Small amounts of *hazardous waste*, for which no treatment facility exists in the country, are exported in compliance with the Basel Convention. Estimation of cost-recovery is not possible on the basis of available information.

The stated objectives in terms of *waste reduction* and *hazardous waste disposal* have not been fully met. No measures were taken to promote waste minimisation and cleaner technologies. The amount of materials separately collected from municipal waste is still rather low. *Separate collection* schemes have failed in a number of cases, due to insufficient consideration of possible outlets for the separate materials. Current incineration plants do not cover the demand for hazardous waste elimination. Moreover, many existing facilities do not meet the technical requirements for air protection. No new large hazardous waste incinerator is under construction. Although a strategy and action plan are under development, no programme has been developed to systematically address old environmental burdens, *contaminated industrial sites* in particular. The *import of waste* destined for recovery operations is still restricted, with only a partial acceptance of the OECD Green List.

1. Evaluation of Performance

1.1 National objectives and specific targets

In the 1993 Strategy of National Environmental Policy, Slovakia identified *proper disposal or utilisation of waste and minimising its production* among its five priorities. Long-term strategic objectives in waste management were:

– minimise the negative impact of waste on the environment and public health, and ensure maximal valuation of waste as secondary raw material;

– establish secure landfills and incinerating plants for the disposal of unusable waste;

– cleaning and reclamation of landfill sites and contaminated areas threatening to the environment.

The first Waste Management Programme was also adopted in 1993 setting short-term and medium-term *objectives and targets*, such as those to be achieved by year 2000:

– reduce the quantity of hazardous waste designated for disposal by 20%;

– introduce the separate collection of municipal waste to reduce the quantity designated for disposal by 20%;

– process at least 20% of biological waste into compost;

– dispose 50% of all municipal waste in landfills meeting the proper technical conditions;

– create a regional network of medical waste disposal facilities, including the construction of eight incinerators.

These objectives and targets were reaffirmed and further developed in the second National Environmental Action Programme (NEAP II), adopted by the government in December 1999. NEAP II also gives priority to *transposition of EU Law* concerning waste management.

1.2 Development of regulatory and institutional framework

Between 1993-96, the necessary *institutional framework* was created, including the completion of the waste management state administration at local and regional levels, and the establishment of the Slovak Environmental Agency to provide a professional and informational basis for state administration authorities. A Regional Waste Information System (RISO) was established, enabling the updating and registration of waste generation and disposal. It allows for the place of origin, quantity, and place of discarding to be monitored for each waste. The regulation providing for the categorisation of waste and the establishment of a waste catalogue, and the Act on charges for waste disposal were adopted in 1996.

Starting in 1992, territorial waste *landfill maps* were elaborated to cover the whole country. They are used by the state administration in choosing landfill locations, based on geological and hydrological criteria. They are also used in the redevelopment process of old landfills.

In 2001, the 1991 Waste Act was fundamentally revised. The *new Waste Act*, which entered into force on 1 July 2001, incorporates most of the relevant EU legislation and focuses on waste processing and recovery preferably to disposal. It clearly defines the duties and responsibilities of the waste generators, the municipalities and the state authorities, and makes it obligatory for all the actors concerned to regularly

develop waste management programmes. It enforces particular rules for the handling and disposal of hazardous waste, and establishes a Recycling Fund to assist in promoting the recovery of specific types of waste.

1.3 Trends in waste generation and disposal facilities

Trends in *waste generation* are difficult to assess on the basis of available data: the large decrease between 1992 and 1999 is most probably due to regulatory changes in the definition and classification of waste (Chapter 4, Section 2.1).

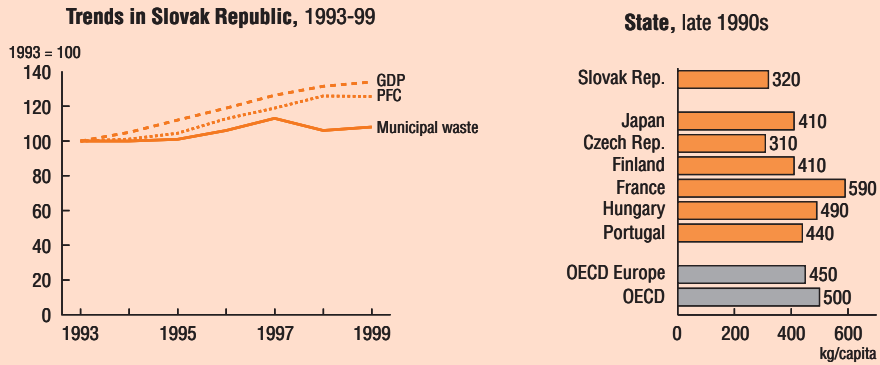
It appears that the amount of special waste has not drastically changed, about 9.5 million tonnes per year, while the quantity of *municipal waste* remained practically constant at 1.7 million tonnes per year (some 320 kg per capita) (Table 4.1 and Figure 4.1). Cesspool wastes represent a significant amount (18%) of municipal waste, since a large part of the population is not connected to sewerage systems and waste water treatment plants (Chapter 3). The largest share of *special waste* originates in agriculture (45%) and in industry (23%). Hazardous waste accounts for some 14% of the total quantity of special waste. Currently, there is no systematic initiative to promote waste minimisation nor to introduce cleaner technologies.

Most waste is deposited in *landfills*, apart from some physico-chemical treatment (especially for liquid waste) and some biological treatment (for agricultural waste and cesspool waste) (Tables 4.2 and 4.3). There were some 800 landfills in operation in 1991, most of them without a proper license. Many of these landfills continued to operate under special conditions until 2000, while a programme of closure and reconstruction was going on. The 141 landfills currently in operation meet the requirements of the former legislation, there are no landfills operating under special conditions. The capacity of the existing network is sufficient for present needs, but the conditions of operation will have to be reviewed in view of the requirements introduced by the new legislation. Disposal of liquid waste on sludge fields is practised by some industries (power and metallurgical).

The redevelopment and re-cultivation of abandoned landfills and dumpsites took place mostly at individual municipalities' expense. According to the new Waste Act, landfill operators will now be obliged to allocate a financial reserve for closure and aftercare. There is however, no programme directed at a systematic review of old environmental burdens, especially *contaminated industrial sites*, to assess environmental risks and define remedial measures.

A small amount (about 3%) of waste is *incinerated*. Only two incinerators, intended for municipal waste in Bratislava and Košice, have a capacity of more than 100 000 tonnes per year. Some 70 other small incinerators were operating in 2000,

Figure 4.1 **Municipal waste generation**[a]



a) In interpreting national figures, it should be borne in mind that survey methods and definitions of municipal waste may vary from one country to another. According to the definition used by the OECD, municipal waste is waste collected by or for municipalities and includes household, bulky and commercial waste and similar waste handled at the same facilities.

Source: OECD.

Table 4.1 **Waste generation**

(million tonnes)

	1992	1993	1994	1995	1996	1997	1998	1999
Special waste	9.0	8.0	7.5	6.2	10.1	9.7	9.7	9.5
of which:								
Municipal	1.6	1.6	1.6	1.6	1.7	1.8	1.7	1.7
Hazardous	3.4	3.3	3.3	2.5	1.5	1.5	1.4	1.4
Other waste	24.6	25.0	22.3	19.5	10.1	10.1	10.1	10.1
Total	33.6	33.0	29.8	25.7	20.2	19.8	19.8	19.6

Source: Regional Waste Information System.

Table 4.2 **Disposal of special and hazardous waste,** 1999

Disposal method	Special waste (without hazardous) ('000 tonnes)	(% of total)	Hazardous waste ('000 tonnes)	(% of total)	Total ('000 tonnes)	(% of total)
Total amount	8 138	*100*	1 365	*100*	9 504	*100*
Landfilling	2 086	*25.6*	203	*14.9*	2 289	*24.1*
Incineration	187	*2.3*	107	*7.8*	294	*3.1*
Physico-chemical	0	*0.1*	134	*9.8*	134	*1.4*
Biological	444	*5.5*	473	*34.7*	917	*9.6*
Recycling	5 221	*64.2*	288	*21.0*	5 509	*58.0*
Other method	105	*1.3*	65	*4.8*	170	*1.8*
Storage	61	*0.7*	38	*2.8*	99	*1.0*
Data not available	34	*0.4*	58	*4.2*	92	*1.0*

Source: Ministry of the Environment.

Table 4.3 **Disposal of municipal waste,** 1999

Disposal method	Amount of waste ('000 tonnes)	% of total
Landfilling	1 134	*65*
Incineration		
with energy production	169	*10*
without energy production	6	–
Recycling		
as secondary raw material	29	*2*
as energy source	1	–
as compost	83	*5*
Other method	310	*18*
Total amount	1 732	*100*

Source: Ministry of the Environment.

including 37 facilities intended for medical waste. Current incineration plants do not cover the demands for the elimination of hazardous waste in Slovakia. Many of these facilities do not meet the technical requirements for air protection and their operation is limited in time with regards to new emission limits to be enforced. The reconstruction of the Bratislava incinerating plant for municipal waste has been started, but no new large facility is presently under construction to deal with hazardous waste.

Radioactive waste from nuclear facilities is currently stored in the plants themselves. The storage capacity is estimated to be sufficient until 2030. It is anticipated that most waste from nuclear power plants can be processed at existing facilities, into a form suitable for final storage. Surface storage capacity has been built for processed low- and medium-active waste. The question of long-term storage has not been answered yet.

1.4 Separate collection, reuse, and recycling

Separate collection of municipal waste is now functioning in a number of municipalities (one out of five), including some districts in Bratislava (Table 4.4). However, the collection schemes have sometimes been introduced without giving due consideration to possible outlets for the separated materials and a number of such schemes have failed. The quantities separated are still rather low: data for 1999 refer to 44 000 tonnes of separated materials (some 2.6% of total municipal waste). The components concerned are mainly metals (26%), bio-waste (23%), paper (21%), and glass (16%).

A number of industrial enterprises specialise in the *recycling* of waste as secondary raw material. Iron scrap and waste paper industries are the most advanced but they are largely dependent on imported material, as the amount of recyclable materials collected in Slovakia are not always sufficient to meet demand (Table 4.5). Other material presently separated and reprocessed are lead accumulators (more than 7 000 tonnes in 1999), waste tyres, and to a lesser extent non-ferrous metals, plastics, and waste oils. Specific rules have been promulgated in the new Waste Act for the treatment of particular waste, including batteries and accumulators, waste oils, used tyres, and the processing of old vehicles. When technically and economically feasible, recycling methods or use as an energy source must be applied.

A *deposit-refund* scheme exists for glass and plastic bottles. The return rate is still very high, due to the long history and use of the programme. It is claimed that Slovak citizens consider it normal behaviour to return bottles. However, there is an increasing share of non-returnable bottles on the market, due mainly to imports.

Table 4.4 **Separate collection of municipal waste**

(tonnes)

Material	1996	1997	1998	1999
Paper	8 397	8 141	9 484	9 299
Glass	5 493	12 127	6 802	7 110
Textiles	687	239	243	285
Plastics	377	753	626	814
Metals	10 248	12 575	12 055	13 162
Bio-waste	8 104	7 964	8 439	10 241
Hazardous components	31	104	199	264
Other	5 069	477	4 128	2 899
Total	38 406	42 380	41 976	44 074

Source: Ministry of the Environment.

Table 4.5 **Collection and processing of specific waste materials**

('000 tonnes)

Material	1993	1995	1996	1998	1999
Paper					
collected	84	109	98	33	135
processed	127	175	117	127	251
Glass					
collected	. .	. .	. .	28	20
processed	. .	62	. .	44	26
Scrap iron					
collected	. .	. .	364	1 006	1 306
processed	. .	. .	1 325	1 195	1 142

Source: Ministry of the Environment.

1.5 Use of economic instruments

As in other environmental fields (air and water), charges are the most widely used economic instruments for waste management. *User charges* for the collection and disposal of municipal waste fall under the competence of the municipalities concerned. Companies that carry out this service operate on a commercial basis. Municipalities own most of them and sometimes subsidise their operation. Such user charges are made obligatory by the new Waste Act, and the corresponding financial means are to be treated as income of the municipality and used only to cover costs related to collection, transport, and disposal of municipal waste.

Waste disposal charges for landfills are paid by the waste generator to the operator of the disposal facility. The latter transfers part of the revenues to the budget of the municipality where the landfill is situated, and part to the Slovak Environmental Fund. While the network of landfills was under reconstruction, as an incentive to use properly designed landfills, the charge rate was different, depending on whether the waste was discharged at a landfill meeting the required technical conditions, or if it was discharged at a landfill still operating under special conditions. In the case of hazardous waste, the difference was one to fourteen.

The new Waste Act introduces the concept of *product charges* for materials which must be collected and processed separately from other waste, and to apply when these materials are discarded. Such charges, which are also to be paid by producers and importers (e.g. paper and glass), accrue to a Recycling Fund. The purpose of the fund is to support collection, processing, and recovery of specific materials, by covering part of the necessary investment and operating costs.

Other economic instruments include tax exemptions and reduced VAT rate. Activities related to the handling and disposal of hazardous waste (collection, transport, recycling, elimination) are excluded from income tax (if these activities generate a profit). A reduced VAT rate of 10% (as opposed to the normal rate of 23%) is applied to products made from recycled paper.

Penalties exist for non-compliance with waste management legislation. The revenue goes to the Slovak Environmental Fund. Penalties imposed in 1993 amounted to SKK 23 million. The figure for the last three years is about SKK 7.5 million, suggesting better compliance after a period of adaptation. The rate of collection of penalties was very low (about 3%) when courts enforced them; since mid-1999, the situation has greatly improved (reaching 70%) when enforcement through inspections was introduced.

1.6 Meeting international commitments

Since 1992, Slovakia has applied the *Basel Convention* on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Small amounts of hazardous waste, for which there are no treatment facilities in the country, are exported, principally to Germany, Norway, and Belgium. Exported quantities represented 0.6% of total hazardous waste generation in 1999 (Chapter 4, Section 2.2).

Slovakia is still in the process of complying with the *OECD Council Decision* on the Control of Transfrontier Movements of Waste destined for Recovery Operations. The free movements of waste destined for recovery operations is only allowed for some 30% of the waste types listed in the OECD Green List. Implementation of the complete OECD list is expected by the end of 2002.

A serious effort is being made to meet the requirements of relevant *EU Directives* by 1 January 2004. In most cases, partial harmonisation will be secured by the implementation of the new Waste Act. It is claimed that full harmonisation will be achieved through further amendments to the Waste Act in 2002. However, it will not be possible to meet all the requirements of the Directive regarding the incineration of hazardous waste before 2005. A national waste management plan is in preparation and will estimate the number and capacity of future incinerators needed. It has been estimated that expenses in the range of SKK 10 billion will be required for the disposal of hazardous waste through a combination of incinerators, cement kilns, and secure landfills.

2. Focus on Selected Topics

2.1 Waste generation and disposal

Waste generation dropped by more than 40% between 1992-99 (Table 4.1). For the most part, this drop is attributed to the category “other waste”. This was due to the redefining of waste, in particular with the introduction of the Waste Catalogue in 1996, more than to a real decrease in waste arising. In the Waste Catalogue, most agricultural residues used directly as fertiliser (such as straw and manure) are no longer considered as waste. This is also true for residues, which are used as secondary raw material or energy sources in the production process by the generator himself. In accordance with valid legislation, waste producers were not requested to report waste generation other than “special waste” after 1996. Figures concerning “other waste” for later years are expert estimates based on 1996 data.

The decrease noted in hazardous waste generation is also due to a *problem of definition*. Until 1995, all cesspool wastes were considered hazardous, including those generated in the municipal field and agriculture. Since then, only cesspool waste generated in the industry and medical sectors are categorised hazardous, the rest however is still considered as "special waste".

The amount of *municipal waste* generated has remained constant at 1.6 to 1.8 million tonnes per year, i.e. some 320 kg per capita. As in most other countries, the municipal waste structure changed over the last decade with the share of glass decreasing and the share of plastic increasing.

Some 60% of *special and hazardous waste* is recycled. This is mainly due to the fact that manure and other waste from livestock breeding account for more than 60% of the total amount of special waste and is largely used. About one third of the total amount of hazardous waste is biologically treated. Landfilling is still a very common disposal method, especially for special waste not classified as hazardous.

Landfilling is by far the most common *disposal method* of municipal waste. The category "other methods" refers almost exclusively to the disposal of cesspool waste through spreading over agricultural land.

2.2 Waste imports and exports

Imports and exports of waste are carried out in compliance with the *Basel Convention* on the Control of Transboundary Movements of Hazardous Waste and their Disposal.

The total amount of waste imported was in the order of 700 000 tonnes in recent years (Table 4.6). *Imported materials* mainly concern scrap iron, waste paper, used glass, and non-ferrous metal waste, for which the amounts supplied nationally are insufficient to meet the existing processing capacity. Hazardous waste can only be legally imported for recovery operations in the Slovak Republic.

Small quantities of hazardous waste, for which there is presently no treatment facility, are exported. The total amount of *hazardous waste exported* was in the order of 7 000 tonnes in recent years (Table 4.7). It is estimated that 50-60% of the hazardous waste is recycled. Exports are mainly to Germany, Norway, and Belgium. In 1999, the exported quantities were only about half a per cent of the total amount of hazardous waste generated in Slovakia.

Table 4.6 **Import of waste**

('000 tonnes)

Type of waste	1993	1994	1995	1996	1997	1998	1999
Total amount	141.0	499.0	680.8	505.2	626.5	773.5	702.5
of which:							
Paper	8.5	102.5	43.3	124.7	115.5	120.4	144.5
Glass	42.0	21.8	8.3	20.0	21.9	29.2	25.1
Scrap iron	75.0	343.3	533.3	282.9	420.2	502.8	385.0
Copper	–	13.7	28.5	20.4	23.9	25.4	13.2
Aluminium	–	–	0.2	1.2	11.5	19.3	9.2
Waste tyres	9.6	5.6	2.0	3.6	2.6	2.9	2.3

Source: Ministry of the Environment.

Table 4.7 **Export of hazardous waste**

('000 tonnes)

Type of waste	1996	1997	1998	1999
Total amount	13.6	15.9	6.3	7.7
of which:				
Lead accumulators	9.7	0.9	–	–
PCB waste	0.3	0.6	0.6	0.3
Waste oils	1.5	–	–	–
Waste catalysts	0.1	0.1	0.2	3.7
Aluminium dross	0.2	13.5	4.3	3.5
Filter dust containing non-ferrous metals	–	0.6	1.0	–

Source: Ministry of the Environment.

5

NATURE CONSERVATION AND BIODIVERSITY

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of the Slovak Republic:

- increase *co-ordination and communication* between the ministries and state agencies involved in land management and nature protection;
- harmonise *hunting legislation* and nature conservation legislation to enhance biodiversity protection;
- develop incentives and voluntary initiatives with *private forest land owners* to integrate biodiversity conservation in forest management plans and forestry practices;
- enhance *protection of wetlands* and other key biotopes in grassland and forests;
- pursue efforts to develop *agro-tourism and eco-tourism* enterprises, including in under-used areas of the country.

Conclusions

Overall, Slovakia's nature and biodiversity are in good condition. Total forest area has remained constant over the decade at 41.5% of the country. There is a rich array of flora and fauna with a number of species not found in many areas of Europe. There is a well-*developed legislative and strategic planning framework* covering nature, with the 1994 Act on nature and landscape protection and the 1997 National Biodiversity Strategy. An extensive network of protected areas exists, covering nearly

22% of the country; almost 800 species of plants and more than 800 animal species are afforded some level of protection. Slovakia has ratified most international conventions on nature conservation and biodiversity. Slovakia also has a budding *agro-tourism and eco-tourism* industry.

There are however, some points of concern. Tourist activities are over concentrated in some areas putting undue pressure on the landscape and animals (e.g. the mountain chamois). A lack of financial and personnel resources, allows for little *oversight of protected areas* and difficulty in implementing management plans. The government's land restitution plan of the 1990s has turned some protected lands over to private owners who now in turn carry out illegal activities on them. A decline in agriculture has negatively affected some species of birds. Poaching of some protected animals is an issue.

1. Evaluation of Performance

1.1 National objectives

Nature conservation is based on the 1994 Act on nature and landscape protection. The purpose of this Act is to "support the conservation of diverse living conditions and life forms on Earth, to create the conditions for sustainability, restoration and rational use of natural resources, preservation of natural heritage, characteristic landscape features and to reach and maintain ecological stability".

Slovakia's key *national objectives* for nature and biodiversity conservation are contained in the "1997 National Biodiversity Strategy of Slovakia" (approved by the government and Parliament). These include:

– conservation of all biodiversity, preferably in situ;

– compensation for induced loss of biodiversity to the highest possible extent;

– maintenance of diversified landscapes to sustain a variety of life;

– use of biological resources in a sustainable way;

– responsibility shared by everyone for conservation and sustainable use of biodiversity.

Specific, *short-term goals* are contained in the National Environmental Action Programme II (2000-02) with anticipated costs. They include:

– completing the system of protected areas on the basis of the General Plan of the Inter-regional Territorial System of Ecological Stability (SKK 455 million);

– revitalising damaged territories, especially in protected areas (SKK 188 million);

– halting the process of reduction of biological diversity (SKK 310 million);

– improving monitoring and information systems (SKK 7.5 million);

– reducing the area of threatened land and improving environmentally friendly forestry (SKK 11 billion).

Slovakia is preparing legislation to comply with the *EU Habitats and Bird Directives*; the legislation so far has only been partially transposed.

1.2 International commitments

Slovakia has ratified most *major international conventions* on nature conservation: the Ramsar Convention (in 1990), the Paris Convention concerning the Protection of the World Cultural and Natural Heritage (1991), the Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora (1992), the Rio Convention on Biological Diversity (1994), the Bern Convention on the Conservation of European Wildlife and Natural Habitats (1994), the Bonn Convention on the Conservation of Migratory Species of Wild Animals (1995), the London Agreement on Bats in Europe (1998), and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (2001). A number of cases of non-compliance with CITES have been reported in the 1990s.

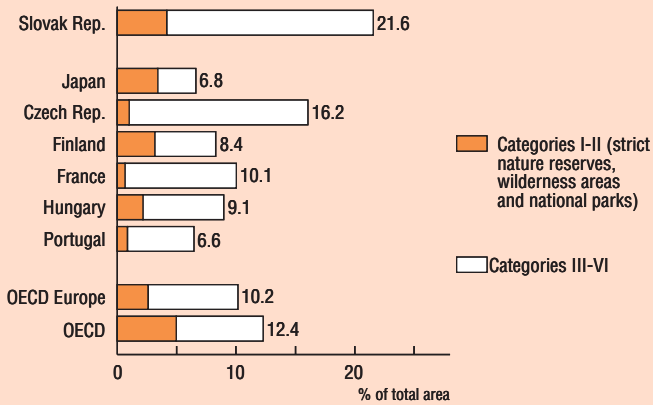
Slovakia is *not yet a signatory* to the new European Landscape Convention (Florence, 2000). The government plans to sign and ratify it in the near future.

1.3 Protected areas

Slovakia is rich in biodiversity (Chapter 5, Section 2.1). About *22% of Slovakia* belong to the national network of protected areas (Table 5.1 and Figure 5.1). Nature protection by the state dates back to the establishment of the Tatra National Park in 1949. Subsequently, throughout the decades Slovakia has created an extensive network of National Parks, Protected Landscapes and other protected areas. Three additional National Parks and 13 Protected Landscape Areas are proposed. The network of protected areas is representative of the diversity of Slovak ecosystems, including alpine terrain, coniferous and deciduous forests as well as grasslands and meadows.

Protected *natural areas of international significance* include 12 Ramsar sites (37 752 hectares) and four UNESCO Man and Biosphere sites. Slovakia also has four World Cultural Heritage Sites and one World Natural Heritage Site (the caves of the Slovak karst and Aggtelek karst) (Chapter 5, Section 2.2).

Figure 5.1 **Major protected areas,**[a] late 1990s



a) IUCN management Categories I to VI; national classifications may differ.
Source: IUCN; OECD.

Table 5.1 **National network of protected areas**

Type	Slovak category of protection	1995 Number	1995 Land area (ha)	2000 Number	2000 Land area (ha)
Protected Landscape Areas	II	16	660 93	16	623 971
National Parks	III	5	199 724	7	243 219
Protected Sites	IV	172	8 780	181	6 872
Nature Reserves	V	330	10 552	369	11 437
National Nature Reserves	V	229	82 22	231	85 745
Nature Monuments	V	210	1 304	227	1 514
National Nature Monuments	V	38	93	45	55
Total		990	963 068	1 076	972 813[a]

a) An additional 244 248 hectares are included in buffer zones, mostly around National Parks.
Source: Ministry of the Environment.

While the amount of *protected land has increased* slightly over the 1990s, the decade brought, with the institution of the 1994 Act on nature and landscape protection, a greater focus on the status and management of protected areas. Most notably, protected lands are categorised into five different levels of protection. Level I is the most general and applies country wide with 15 specific regulation or prohibitions. Level II applies to Protected Landscape Areas and has 14 additional regulations. Level III applies to National Parks and has 12 additional regulations. Level IV applies to Protected Sites and has 15 additional regulations. Level V, the highest level of protection, applies to Nature Reserves and Nature Monuments, and has 18 additional regulations.

In land of levels of Protection IV and V, no commercial activities are allowed. National Parks, which make up the majority of protected lands, contain a variety of commercial activities from tourist and ski resorts to logging and hunting. Throughout the 1990s, personnel managing protected lands has been decreasing thus affecting the *quality of oversight in areas*. In July 2000, the State Nature Conservancy was created to take over the responsibility for nature protection (under the Ministry of the Environment), and started to monitor and implement all aspects of landscape and nature protection, including the management of National Parks and Protected Landscape Areas.

Like other central and eastern European countries, Slovakia instituted a programme of *land restitution* during the 1990s. Land that was previously owned by the state was returned to owners who could show proper claim to it, including land in protected areas. Currently the state still owns 42% of forests, 52% of land in National Parks, 39% of the land in buffer zones to National Parks, 34% of the land in Protected Landscape Areas, and 62% of the land in Protected Landscape Area buffer zones. Land not owned by the state belongs to private landowners, churches, local communities, and agricultural organisations. In some areas, land remains either unclaimed or without clear ownership. The state usually manages such land.

While legislation dealing with protected lands applies to all areas despite ownership, this new ownership structure has had some negative impacts on nature and biodiversity. Under the Act on nature and landscape protection, owners of land where commercial activities are restricted are entitled to *financial compensation* by the state, and the government recently instituted a procedure for compensation. Some owners of protected land have begun to illegally harvest timber as a way of generating income. It is estimated that half a million cubic meters of wood is illegally cut each year (10% of total harvest). The state requires forest management plans from landowners and periodically monitors private forests. Only some forest owners, however, do work closely with the Ministry of Agriculture to manage their property. In general, the Ministry of the Environment has little contact with private landowners in protected areas and is called upon only in emergency cases (e.g. natural disasters).

Tourist activities, while relatively low when compared with other OECD countries, do exert pressure on landscape and on nature and biodiversity, most notably, in the most attractive National Parks of the north, where activities are concentrated (Chapter 5, Section 2.3). With the building of ski facilities, hotels, roads, and power lines, original habitats have been lost or altered and artificial barriers created, limiting the movement of species. The mountain chamois has seen a serious decline in population over the 1990s, from roughly 900 individuals to around 400.

As a result the National Environmental Action Programme II contains a number of measures to *revitalise and restore certain protected areas* at an estimated cost of SKK 125 million. The programme also highlights preventive measures such as a proposal to build entryways into protected areas by year 2003 at an estimated cost of SKK 1.3 million. The National Biodiversity Strategy is implemented through an action plan prepared in 1998.

1.4 Nature conservation outside protected areas

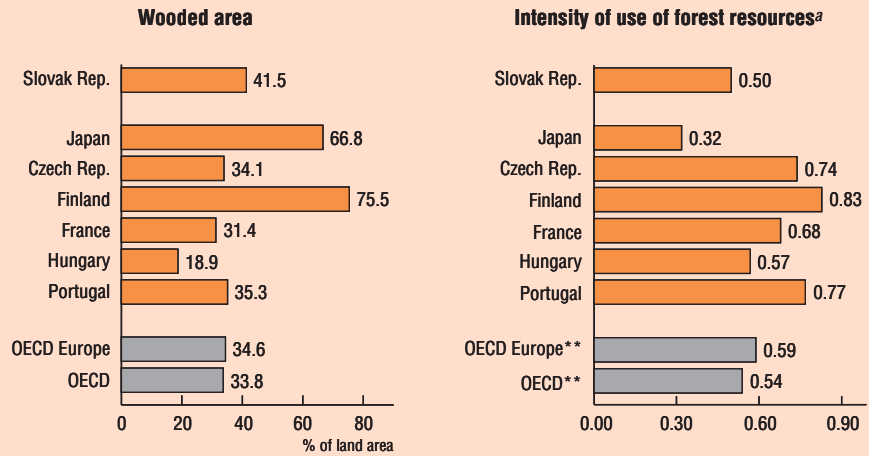
Forested areas

Forests cover 41.5% of total land area (2 million hectares). Out of this, 57% are deciduous forests and 43% are coniferous (Figure 5.2). Production forests make up 67%; protected forests 15% and forests for special purposes 18%. The annual forest harvest has remained at a sustainable rate throughout the decade, with an average of 5.1 million cubic meters felled per year well under the annual growth of approximately 13.5 million cubic metres. While there are no felling fees, the Ministry of Agriculture levies charges for the conversion or destruction of forested land, as a disincentive to reduce forested land.

While forested land has remained constant over the past decade, the *health of the trees appears to be deteriorating*. Exposure to emissions, especially transboundary, may have led to an increase of defoliation and death among many species. Transboundary air pollution represents some 70% of the overall air pollution and acid rain precipitation in Slovakia. Recent data show that 92% of elms, 41% of firs, 11% of oaks, and 10% of pines have been affected. On average, defoliation, over a seven year period, has reached 27% of the trees and affected more than 750 000 hectares in 1999.

The Ministry of Agriculture oversees forest management. Revision of the 1977 Forest Act is underway. *Priorities and principles of forestry* are outlined in the Principles of National Forestry Policy, the Strategy and Conceptions of Forestry

Figure 5.2 **Forest resources,** late 1990s



a) Harvest divided by productive capacity (measured as annual growth).
Source: FAO; OECD.

Development and the Programme for the Development of Forest Management until 2010. A main goal for forestry is the maintenance and gradual increase of acreage of forested land, in particular through afforestation of land unsuitable for agricultural purposes.

The National Environmental Action Programme II contains a section that focuses exclusively on the *protection and use of forested land*. This section lays out a series of short term goals, including: the reforestation of land affected by air pollutants, afforestation of land unsuitable for agriculture, planting to prevent land erosion, completion of a comprehensive monitoring system and programme for the preservation of biodiversity.

Hunting

Hunting is a popular activity in Slovakia and also contributes to game population management and forest protection. As of 1999, 4.4 million hectares of land were classified as hunting areas. The average area of hunting ground is about 2 500 hectares.

Hunting grounds are classified into quality classes for the main species of game, and standardised game stocks are defined according to them. Hunting management plans are elaborated for each hunting ground annually, and are approved by the Ministry of Agriculture.

One of the main issues is *poaching of some animal species protected under the Act on nature and landscape protection*. According to the Hunting Act, the killing of strictly protected species is prohibited; this applies to species such as chamois, bears, lynx, wildcats and otters. Seasonal hunting of some, partly protected, species (e.g. wolves, deers, hares) is permitted, in line with international conventions such as the Bern Convention (Annex III). Well-designed hunting plans would help to insure that their numbers remain at a sustainable level.

Agricultural land

Agricultural land makes up nearly 50% of Slovakia. The *total agricultural area is 2.4 million hectares* of which 60% is arable land, 35% permanent grassland and 5% permanent cropland. Over the 1990s, agricultural production dropped by 35% (as a result of land restitution and economic transformation of the sector). This led to a decrease in the agricultural pressures on nature and biodiversity. While fertiliser use declined, some surface and underground water bodies are still seriously contaminated (Chapter 3). As a result, fish and aquatic plant life have been negatively affected. The consumption of pesticides also dropped due to their rising cost since independence.

The *decline of agriculture* has affected some species of endangered birds that rely heavily on farmland. This includes the imperial eagle, of which there are 30 nesting couples, the great bustard which relies on cereals and is near extinction, and the corncrake. Populations of other non-endangered species, the partridge and the European hare have also been affected. Measures are planned to reintroduce the great bustard into its natural habitat. The Ministry of Agriculture has made it a priority to create grasslands on steeply sloping and erosion endangered arable land, with accompanying agri-environmental payments.

Wetlands

Slovakia's *wetlands have been under considerable strain* due to development. Some 450 000 hectares have been drained; this represents almost one-tenth of the country's territory. Few actions have been taken to protect remaining wetlands, except Ramsar sites.

2. Focus on Selected Topics

2.1 State of biodiversity

Fauna

Despite its small size, Slovakia has a *relatively large number of species* of mammals, birds, reptiles, amphibians, and fish and lamprey (Table 5.2 and Figure 5.3). For instance, chamois are present in the high alpine zone (400); brown bears (over 1 000), lynx (1 000), and wolves (over 1 200) in coniferous forests; wildcats (over 1 200) in deciduous forests. In the lowland meadows and grasslands, partridge, pheasants and hares are common. A large number of species can also be found in wetland areas, including various amphibians as well as beavers and otters.

However, *many species are under some form of threat* and some are already extinct. The most notable endangered mammal is the mountain chamois. For birds, the great bustard (only 30 individuals) and the peregrine falcon are also threatened. Due to changes in agricultural practices, hare and partridge communities have been on the decline.

In general Slovakia has given priority to animal protection. *More than 800 animal species and some 800 plant species are afforded some level of protection*. A list of species relevant to the EU Bird Directive has been proposed. The Ministry of the Environment in co-operation with the Society for Bird Protection also published a list of "Important Bird Areas" (IBAs) in March 2000. The National Environmental Action Programme II outlines several measures to protect specific species: the preparation of an action plan for the protection of wolves, lynx and bears; the preparation of regional lists of critically endangered species; the introduction of a system to identify and label selected species for the purposes of CITES and the construction of shelters for forfeited animals; protection and reintroduction of the great bustard into its natural biotopes.

Flora

Slovakia is also endowed with a *large diversity of plant life*. More than 3 000 vascular plant species have been recorded, 92 of which are classified as endemic. 334 species were included in the 1999 Red Book of endangered and rare flora species.

2.2 Caves

The country has a complex network of caves: *over 4 000 subterranean caverns*, only 12 of which are open to the public. All 12 caves are designated National Nature Monuments and four are UNESCO world natural heritage sites. Protection and

maintenance is under the Slovak Caves Administration, a subsidiary of the Ministry of the Environment. The caves are home to several species of bats, as well as various species of insects, molluscs, and crustaceans. All bat species have been protected since 1965.

Table 5.2 **State of fauna and flora**, 1998

(number of species)

	Total	Extinct	Threatened	Other endangered[a]	Insufficient knowledge	Not classified
Mammals	86	2	20	22	10	32
Birds	336	2	48	44	4	238
Freshwater fish	81	10	31	14	4	22
Reptiles	12	0	4	8	0	0
Amphibians	18	0	7	11	0	0
Vascular plants	3 352	37	747	223	47	2 298

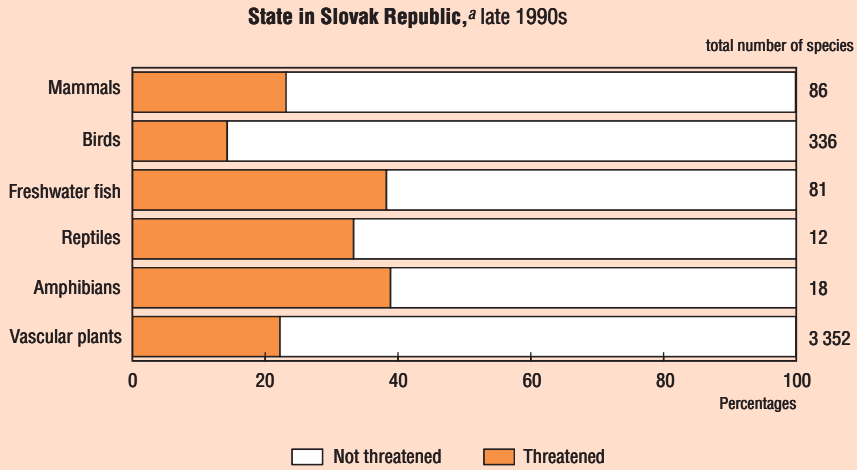
a) Other endangered than threatened.
Source: Ministry of the Environment.

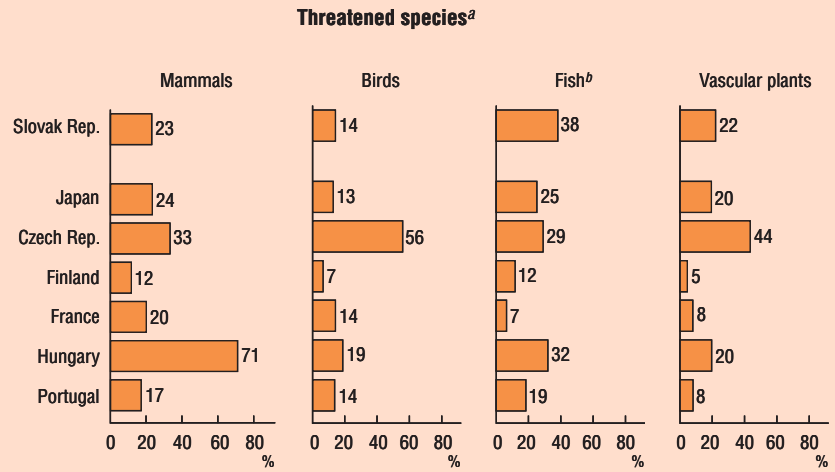
2.3 Tourism

Most domestic and international *tourism is geared towards outdoor activities*: hiking, camping, hunting, and skiing. National Parks are a primary destination. The most visited areas are the High Tatra National Park and the Pieniny National Park, both located in the north on the border with Poland. In 2000, one cross border entry point to the Pieniny National Park had nearly 500 000 entries (mostly day travellers). In contrast, there is very little tourist activity in the eastern part of the country though there is a budding agro-tourism and eco-tourism industry. There is a concept of free access to nature, so no entrance fees are levied for National Parks, cross border or internal. Entrance fees would help control the number of visitors while helping to raise revenue for park maintenance.

The Ministry of Economy oversees tourist activities. Construction of tourist facilities is regulated by the Act on territorial planning and construction, as well as by specific provisions in protected areas. Each year hygienic services lay down maximal capacity of tourist centres in relation to water resources. However, there is *no comprehensive sustainable tourism strategy*.

Figure 5.3 **Fauna and flora**





a) Categories "endangered" and "vulnerable" of the IUCN classification in % of known species; also includes species that may already be extinct but have been observed in the last 50 years.
b) Freshwater fish only, except for France.
Source: OECD.

Part II

SUSTAINABLE DEVELOPMENT

6

ENVIRONMENT AND THE ECONOMY

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of the Slovak Republic:

- enhance *inter-ministerial co-operation*, to foster the institutional integration of environmental concerns in economic and sectoral policies;
- extend further *strategic environmental assessment* in sectors, such as energy, transport, tourism, and agriculture; continue environmental planning and programming efforts;
- enhance *market-based integration of environmental concerns* in sectors such as transport, energy, and agriculture;
- further investigate possibilities to introduce *eco-taxation*, e.g. by shifting the tax burden from labour to the environment;
- develop and implement *pricing of environmental services* (e.g. water supply, waste water treatment, solid waste management), progressively moving towards full-cost pricing, with appropriate attention to social concerns and the balance between economic, social, and environmental progress;
- strengthen *enforcement capacities*, raise the level of non-compliance fines and introduce inspection fees, increase the educational and incentive functions of the State Environmental Inspection;
- introduce *specialised prosecutors* for environmental cases and standing access to courts for recognised environmental NGOs;
- review and revise the *pricing of environmental services*, in light of the polluter pays and user pays principles, and of economic and social constraints;
- as part of the process of *devolution of power to regions and municipalities*, ensure that both obligations and revenues are adequately phased in;
- increase the use of environmental auditing to assess *environmental liabilities* arising from past operation of state enterprises, particularly within the context of privatisation;
- complete *land use planning* at municipal level (e.g. in the eastern part of Slovakia).

Conclusions

Integrating environmental concerns in economic and sectoral decisions

Following a period of GDP contraction, Slovakia's GDP was by 2000, 11% higher than its 1990 level. During the 1990s, Slovakia succeeded in *decoupling a number of environmental pressures from economic growth*. Pollutant emissions into air, discharges into water, and water abstractions were cut by as much as 30% to 70%; however, municipal waste generation increased at a rate close to the one of GDP. This was not only due to the *contraction of industrial production* (–16%) and energy use (–22%), but also to *changes in production and consumption patterns and sectoral structural reforms*; for instance, fertiliser and pesticide use were reduced massively, mostly as a result of changes in agriculture production methods and agricultural land ownership; the energy sector went through major policy reforms and experienced increased energy efficiency, changes in energy supply mix, significant shifts in energy prices, overall translating in important environmental benefits. This was also due to *environmental policies* based on the 1993 strategy, which defined short, medium, and long-term objectives and key policy principles in environmental management. *Integration of environmental concerns in sectoral policies* was uneven, but institutional and market-based integration occurred in a number of instances, in the energy, transport and agricultural sectors. Excise taxes on fuels were introduced in 1994; leaded gasoline was phased out in 1997. Reduced vehicle tax for commercial cars equipped with catalytic converters encouraged changes in the composition of the car fleet. Reduced VAT applies to environmentally friendly fuels and equipment, income tax concessions to environmental services, and exemption from real estate tax to protected areas. Strategic Environmental Assessment of policies and programmes was usefully applied for the review and revision of energy policy in 1998. Overall, agricultural support has declined and agri-environmental payments are provided for converting arable land into permanent grassland and to support organic farming, although most direct payments to farmers are related to input use; a code of good agricultural practices has been completed. Most of these economic and sectoral changes have contributed to the strong decoupling achievements of Slovakia. A Sustainable Development Council was established in 1999, as an advisory body. A sustainable development strategy was approved by the government in October 2001.

Looking ahead, further progresses in the integration of environmental concerns in economic development are feasible and necessary. First, through *enhanced inter-ministerial co-operation* concerning strategic planning, investment programming, annual budgeting, and project assessment; the latter applies also to foreign direct investments which should, inter alia, follow environmental charters and guidelines

applying to multinational companies. Secondly, further promote the integration of environmental concerns in *agriculture, energy, and transport* sectors through market based integration and appropriate economic signals (e.g. reducing environmentally damaging subsidies, enhancing the incentive effects of current economic instruments and taxation). Given its high growth, the *transport* sector is of particular concern; road taxes only apply to commercial vehicles and not to private motor vehicles; modernisation of public passenger transport should be further pursued. Given the far ranging structural changes in these sectors during the ongoing economic transition of Slovakia, it is of the utmost importance to include environmental concerns and win-win strategies in their design. Thirdly, the possibility of introducing a *green tax reform* should be further investigated, including an energy tax and a tax on the sulphur content of diesel oils. Fourthly, as households have already faced important price changes concerning their energy needs (heating, lighting, transport fuels) and will have to face further price changes concerning, inter alia water supply, waste water services, and waste services, attention should be given to the progressivity of these changes over time and to the *poorest segments of the population*. This will in turn bear on the capacity of investments in environmental infrastructure of Slovakia, in the context of both its economic transition and its accession process to the EU. This will require strategic decisions balancing economic, environmental, and social progress of the country and will imply a very high profile for environmental criteria in the EU accession negotiations.

Implementing efficient environmental policies and strengthening the environmental infrastructure

Slovak citizens have a constitutional right to a healthy environment. Accordingly, *environmental legislation* was reinforced through the 1990s (e.g. new Acts on air protection, waste management, nature and landscape protection, environmental impact assessment, access to environmental information). A major effort is ongoing to transpose EU environmental legislation in Slovak law. For instance, a new Act on water protection and water management is being prepared, devolving responsibilities to municipalities and promoting river basin management. *Environmental policies* are founded on solid environmental information (e.g. State of the Environment reports), high quality environmental expertise, and important programming efforts (e.g. National Environmental Action Programmes I and II). To implement environmental law and environmental policies, Slovakia uses a *wide range of policy instruments.* Regulatory ones are associated to economic instruments and the extensive system of emission charges has generated sustained revenues and landfill charges have provided effective incentives to improve landfill standards. Physical planning instruments were placed under the supervision of the Ministry of the Environment, and land use planning has

been developed at the national and regional level since 1998 and is being developed at the municipal level, including disincentives to forestland encroachment. Environmental impact assessments were carried out for 350 projects and led to project revisions or withdrawal (e.g. dams). In 1997 industry introduced environmental management systems; many companies are certified ISO 14000 and a national programme of eco-labelling is well in place. Very significant *financial efforts* were devoted to pollution abatement and environmental protection in the 1990s: after large efforts in the early 1990s to deal with the most urgent pollution problems, the country reduced its pollution abatement and control expenditure to 2% of GDP by the mid-1990s and to 1.5% of GDP in 1999. Its environmental expenditure (i.e. PAC expenditure together with water supply and nature protection expenditure) were 2% of GDP in 1999. This evolution was accompanied by a gradual decrease in state support for environmental investment, and an increasing role of enterprises and municipalities. The devolution of responsibilities of waste, water, and waste water services to municipal governments will create opportunities to apply the polluter-pays principle and the user-pays principle more fully.

However, the *environmental institutional capacities of Slovakia* have gone, in the 1990s, through significant restructuring (e.g. end of the specific regional environmental administrations in 1996, devolution of environmental responsibilities, planned elimination of state funds for 2002). It is important that this restructuring both preserves Slovakia's own environmental "acquis" and strengthens Slovakia's capacities to face the environmental challenges of EU accession. Environmental policy implementation can be significantly strengthened. The implementation of NEAP I has not been assessed. *Enforcement of and compliance with environmental regulations* appears relatively weak; the State Environmental Inspection (SEI) should be strengthened, compliance fines updated and increased, and environmental charges and fines collection rates improved; inspection fees should contribute to cover inspection costs and self-monitoring should be improved. Enforcement responsibilities between the SEI, regional, and district offices should be clarified. Enforcement of administrative procedures are not buttressed by judicial ones; there are no prosecutors specialised in environmental matters, no standing access to courts for recognised NGOs to represent the common interest in environmental cases, and no records of environmental cases. The introduction of legislation on integrated pollution prevention and control in line with the IPPC Directive is intended. *Economic instruments* (e.g. charges) should be given higher incentive effect; increases in cost-recovery levels concerning water supply, waste water services, and waste management is needed. Slovakia has started its *approximation process with the EU environmental "Acquis"*. A major legislative effort is underway. Beyond it, a major task will be to implement this new legislation, particularly in the areas of water supply and waste water related infrastructure and for

the control of major risks involving dangerous substances. The National Programme for the Adoption of the "Acquis Communautaire" envisages more than a doubling of environmental investment for the period 2000-08 compared to the late 1990s level. Funding will have to come mostly i) from increased environmental charges for municipal waste water and waste infrastructure and ii) from enterprises for their own environmental investments; there will also be some additional funding: foreign funding (e.g. EU funds) and state support mostly to small and medium enterprises. The completion of a municipal waste water infrastructure responding to the EU Urban Waste Water Directive may require efforts spread over much more than one decade.

1. Towards Sustainable Development

1.1 Decoupling environmental pressures from economic growth

Economic transition

The GDP per capita of Slovakia is less than half the OECD average (at USD 10 430, as expressed in purchasing power parities) and in the middle range of OECD countries in transition. *Slovakia's economic development in the 1990s was unbalanced*: positive results (inflation rate within an acceptable range and moderate economic growth) were associated with negative ones (high unemployment: 19.2% in 1999 and large external debt as numerous state-owned companies financed their investments out of foreign sources. Overall, the 2000 economic performance measured by GDP, was 11% higher than in 1990.

Following the political change in Czechoslovakia, economic reforms were launched in 1990 towards creating a *transition to a market economy*. This "shock therapy" involved price liberalisation, large-scale privatisation, restrictive macroeconomic policy, and de-monopolisation. The first phase of economic reform in the period 1990-93 was characterised by a sharp downturn in economic performance (falling GDP, rising inflation, and unemployment). The social impact of these reforms was more severe in Slovakia where unemployment increased threefold by mid-1991.

In 1994, the economy of Slovakia then set out on a *growth trajectory* (Figure 1.2). Between 1994-96, economic recovery was tied to opening trade. In 1996-98, economic growth was driven almost exclusively by domestic demand, mainly as a result of government investment into large-scale infrastructure reconstruction and development projects. This in turn led to the re-emergence of signs of economic imbalance. In September 1998, parliamentary elections brought to power a broad-based coalition. EU membership and sustainable development became the

primary goals of the 1998 Government Programme. The changes in the direction of economic policy introduced in 1999 resulted in a considerable slowdown in GDP growth caused by the restrictions on domestic demand. Most of the GDP is now generated by private entities.

After ten years of economic reform, the primary goal to improve the efficiency of the Slovak economy by developing market mechanisms, has been only partly reached. In 1999, the government introduced several *revitalisation measures*, including significant price deregulation (electricity, gas, water, sewerage, transportation, house rents, etc.) that caused inflation to grow to 10.5% in 1999. Fiscal and monetary prudence contained inflation at 7% in 2001. Inflation is expected to be 6% in 2002. Foreign direct investment will probably increase with the envisaged privatisation of strategic companies (power generation and distribution, storage and distribution of gas, etc.). Real GDP growth was 2.7% in 2001 and is expected to be 3.1% in 2002, as the domestic demand gradually recovers.

Economic and environmental trends

By the end of the communist regime, some areas of Czechoslovakia were extremely polluted, in particular northern Bohemia and northern Moravia (parts of the Black Triangle) on the Czech side, but also Bratislava and Košice on the Slovak side. In contrast, it was possible to find remarkably well preserved habitats and biodiversity in rural or mountainous areas. For decades, Slovakia suffered from *serious environmental degradation*. By 1993, the government was publishing regular statistics on air, water, and soil pollution, and identified 12 particularly polluted areas. The two major urban areas, Bratislava and Košice and, more generally, agglomerations with a population above 15 000, suffered from what the authorities called a "strongly disturbed" or "extremely disturbed" environment. Brown coal, used in central heating and power plants, was the principal cause of pollution, followed by iron and steel, aluminium, and chemical industries, whose localisation in closed valleys tended to trap emissions.

In the 1990s, economic development was accompanied by a significant *reduction in pressures on the environment* (Table 6.1). This was particularly true in the period 1990-93, when GDP fell. Since 1994, air emissions have continued to decrease (SO_x, NO_x) or stagnate (CO_2), despite the growth of the Slovak economy (Figure 2.1). Effluents into water also continued to decrease (Table 3.4). Water abstraction fell due to the decline and restructuring of industrial production, reduced household consumption, and a decrease in irrigated area (Table 3.1). Overall, *some strong decoupling from GDP* occured in the air and water sectors. Waste generation however increased, but at a lower rate than GDP (Figure 4.1).

This decoupling can be attributed mainly to *changes in the GDP structure* over the 1990s: the proportion of services increased while industry and agriculture fell, from 29% to 26% and from 7% to 4.5% respectively. After a sharp decline in the early 1990s, industrial production experienced an average annual growth of 5% in the period 1994-99. The highest growth was in the transport sector, following the launch of the Volkswagen Bratislava plant; this was accompanied by substantial increases in road traffic. Price regulation in the energy sector helped to maintain very low levels of inflation and prevented industrial restructuring in favour of less energy intensive and material intensive production branches, which still account for a third of total industrial output, including metallurgy (16%), other non-metallic mineral products (4%), pulp and paper (7%), and, though with a declining share, chemicals (6%). The armament industry has declined. Energy intensity of the economy was reduced (Chapter 2). Between 1989 and 1993, gross agricultural production in Slovakia recorded a sharp downturn after dramatic changes in the economic situation of many farmers. This downward trend was halted in 1994. In spite of the recovery, the 1999 gross agricultural production remained at 1990 volume levels (Figure 6.1). Fertiliser and pesticide use decreased, following the decline in agricultural production, but also as a result of changes in production methods (Table 3.5).

1.2 Strategic planning

Strategic economic planning and sustainable development

The change from a centralised and publicly owned economy to a largely market based and privately owned one means a new role for government; including environmental management. This is an integral part of the *transition* and needs active co-ordination from different ministries (including economics, finance, environment, social). Strategic planning thus plays a key role in ensuring that sustainable development is integrated into its economic, environmental, and social dimensions.

Through its planning documents, it is clear that the Government of Slovakia has made environmental and sustainable development policies top programme priorities. The importance of the economic/environmental interface is recognised in the *guiding documents* produced by the Ministry of the Environment such as the 1993 Strategy of National Environmental Policy and the 1999 National Environmental Action Programme II (NEAP II). The medium-term economic strategy of the country, published in June 2001, broadly acknowledges the stated objectives of the NEAP II, making them an integral part of Slovakia's economic planning. Yet, in practice, the described measures have not been fully backed by financial resources and have often been placed under the sole responsibility of the Ministry of the Environment.

A *Sustainable Development Council* was established in 1999, chaired by the Vice-Prime Minister for Human Rights and Minority Rights. Similar councils operate at regional and district levels under Agenda 21. As advisory bodies, they helped in the preparation of the National Sustainable Development Strategy (NSDS) that was approved by the government in October 2001 (Chapter 8, Section 2.2).

Strategic environment planning

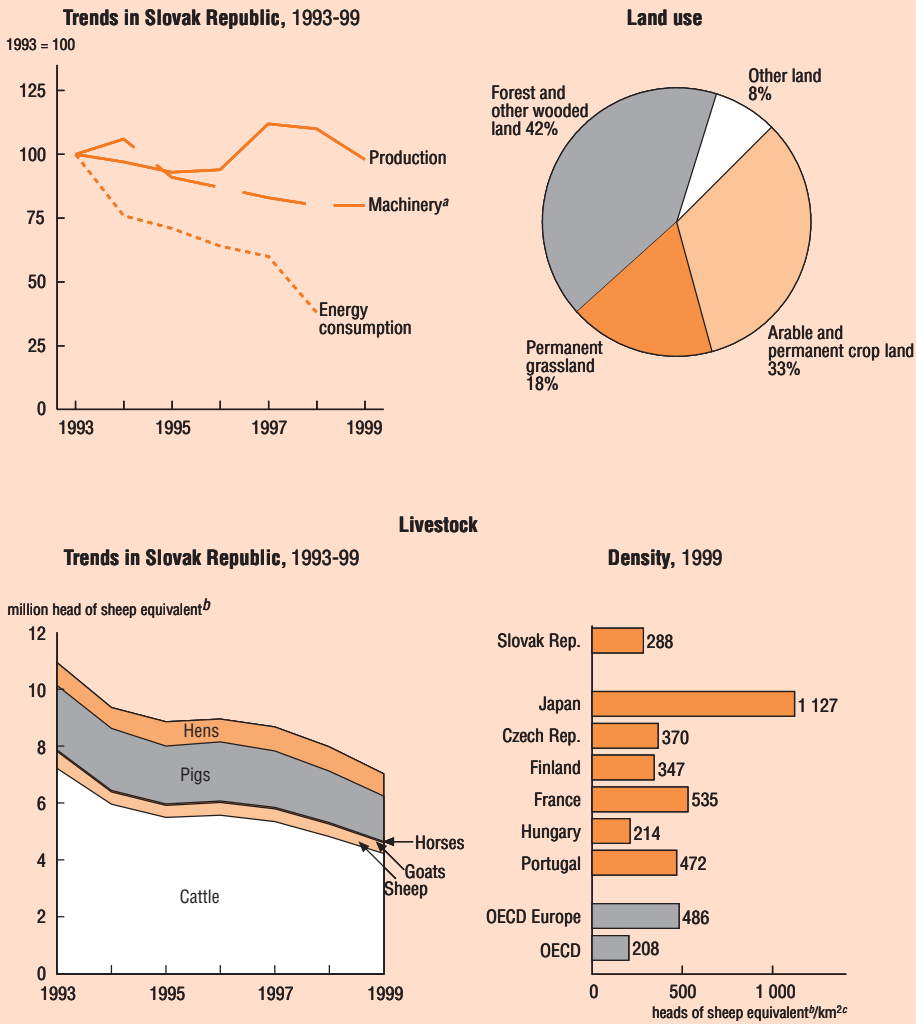
As a follow-up to the UNCED, the National Council and the Government of Slovakia approved the 1993 *Strategy of National Environmental Policy*. The document maps out the environmental situation in Slovakia and identifies the nine most endangered regions; it defines short- medium- and long-term objectives in air protection, rational use and protection of water, waste management, soil and forest conservation, preservation of nature and countryside, and other aspects of the environment. Key policy principles include the prevention principle, the integration principle, and the polluter pays principle.

Table 6.1 **Decoupling of environmental pressures from economic trends,** 1990-99

Selected economic trends		Selected environmental pressures	
GDP[a]	9	CO_2 emissions from energy use[b]	–31[c]
Population	3	SO_x emissions	–67[c]
Industrial production[d]	–16	NO_x emissions	–43[c]
Total primary energy supply	–21[c]	Municipal waste	8[e]
Energy intensity (per GDP)	–26[c]	Water abstraction	–46
Total final consumption of energy	–22[f]	Nitrogenous fertiliser use	–67[c]
Road freight traffic[h]	55[h]	Phosphate fertiliser use	–87[c]
Road traffic[i]	10[c, e]	Pesticide use	–37[j]
Agricultural production	–2[h]		

a) At 1995 prices and PPPs.
b) Excluding marine bunkers.
c) To 1998.
d) Includes mining and quarrying, manufacturing, gas, electricity and water.
e) From 1992.
f) To 1997.
g) Based on values expressed in tonne-kilometres.
h) From 1993.
i) Based on values expressed in vehicle-kilometres.
j) From 1991.
Source: OECD; IEA.

Figure 6.1 **Agriculture**



a) Tractors and combined harvester-threshers in use.
b) Based on equivalent coefficients in terms of manure: 1 horse = 4.8 sheep; 1 pig = 1 goat = 1 sheep; 1 hen = 0.1 sheep; 1 cattle = 6 sheep.
c) Of arable, permanent crop land and permanent grassland.
Source: FAO; OECD; IEA.

Two *National Environmental Action Programmes* (NEAP I and NEAP II) were approved in 1996 and 1999 respectively. They include a wide range of measures, mainly on air and water management (Table 6.2). NEAP II provides an extensive list of actions in different areas. While NEAP II briefly discusses NEAP I, it does not engage in an in-depth analysis of the obstacles faced in implementing NEAP I and does not revise NEAP I actions, nor attempts to indicate their level of success. The two programmes seem fairly independent of each other. There is also no attempt to link the NEAPs with traditional programming tools such as public investment and expenditure programmes, which in turn explain the absence of cost estimates for many specified actions.

Table 6.2 **Estimated implementation cost of the National Environmental Action Programmes**

(billion SKK)

	NEAP I (1996-99)	NEAP II (2000-02)
Air	42	52
Water	20	25
Waste	8	7
Nuclear safety	2	2
Nature	12	12
Minerals, soil and forests	18	15
Total	102	113

Source: Ministry of the Environment.

1.3 Integrating environmental concerns in economic and sectoral policies

Fiscal policies

Fiscal measures in the energy and transport sectors include excise taxes on fuels, vehicle taxes, and a road toll (Table 6.3). *Excise taxes on fuels* were first introduced in 1994 through Act No. 316/1993. More types of fuels have been included since and

Table 6.3 **Environmentally related taxes,**[a] 2001

Tax	Rate	Remarks
Excise tax on fuels for road transport		Same tax rate applies to premium and normal gasoline. Leaded petrol was phased out between 1994 and 1997 and replaced by UNI (a gasoline produced in Slovakia with special valve protection additive). Liquid natural gas includes propane (LPG) and butane. Compressed natural gas was exempted from tax in August 2000 (tax was 2 SKK/m^2 until then). Normal VAT applies to gasoline. Reduced VAT applies to natural gas.
Unleaded, including UNI	11.781 SKK/litre	
Diesel	12.308 SKK/litre	
Biofuel	2.529 SKK/litre	
Liquid natural gas	2.370 SKK/kg	
Compressed natural gas	No tax	
Excise tax on aviation gasoline		
Leaded	12.623 SKK/litre	
Unleaded	11.781 SKK/litre	
Kerosene	7.363 SKK/litre	
Excise tax on heating fuel		Ecological fuel is a mix of fats and oils that is (at least at 90%) biodegradable within 21 days. It is intended to phase out high sulphur content (> 2% S) fuel oil. Reduced VAT applies to low sulphur content (< 2% S) fuel oil, coal, natural gas, electricity, biogas and fuelwood.
Heating oil (< 2% S)	9.500 SKK/kg	
Heating oil (> 2% S)	0.300 SKK/kg	
Domestic ecological fuel	3.000 SKK/kg	
Coal	No tax	
Natural gas	No tax	
Electricity	No tax	
Commercial vehicle tax	1 200-4 200 SKK/vehicle/year	Revenue goes to State Road Fund (70%) and national budget (30%). Does not apply to private vehicles. Rate based on engine size. Are exempted: municipal waste collection, public transport, electric and solar vehicles, combined transport with road segment no longer than 80 km. Until 1997, 50% rebate (in the first two years after purchase) applied to vehicles equipped with catalytic converters or using liquid propane gas or compressed natural gas.
Road toll	400-800 SKK/vehicle/year	Revenue goes to State Road Fund. Rate based on engine size.
Import tariff for cars	10.42%	This is to be compared with the average import tariff of 3.42%. Are banned: imports of cars older than five years and those not equipped with catalytic converters.
Tax on electricity produced by nuclear power plants	10% of sale price	Revenue (SKK 3.9 billion) goes to state fund for the decommissioning of nuclear power plants and nuclear waste management. Applies to operators of nuclear power plants.

Table 6.3 **Environmentally related taxes,**[a] 2001 *(cont.)*

Tax	Rate	Remarks
VAT		Reduced VAT (10% instead of 23%) applies to paper with minimum 70% recycled fibres, household meters for heat and water, wastewater treatment and solid waste disposal services.
Income tax		Are exempted (for the first five years of operation): renewable energy facilities (small hydropower plants, windmills, solar equipment, heat pump, biogas generators, geothermal plants). Are permanently exempted: commercial activities related to hazardous waste collection, handling, transport, recycling, minimisation and disposal (landfill and incinerator).

a) Unless otherwise indicated, revenue goes to the national budget.
Source: Ministry of Finance; OECD.

rates have been revised (Table 6.4). When set at adequate levels, these taxes may encourage changes in the composition of the car fleet by increasing demand for fuel efficient cars relative to older more polluting ones, thereby promoting more efficient vehicle use. While Slovak taxes on vehicle fuels are low compared to those in most European OECD Member countries, the actual impact of these measures has not been estimated. A new type of gasoline without lead and with a special valve protection additive, called UNI, was introduced in 1997 to replace leaded gasoline. *Vehicle taxes* apply to commercial vehicles, with an annual tax based on engine size with some exemptions for those used in "environmentally friendly activities" such as municipal waste collection, public transport, electric or solar engines, and combined transport with road segment no longer than 80 kilometres. Until 1997, a 50% rebate, for a period of two years after the purchase, applied to vehicles with catalytic converters or using liquid propane gas or compressed natural gas. Reduced vehicle tax for commercial cars equipped with catalytic converters also seems to have encouraged changes in the composition of the car fleet. Road tolls based on engine size have been charged on a yearly basis since 1996.

Biofuels benefit from a lower tax rate than gasoline. The lower taxation also serves as an incentive to help farmers. Taxation of *diesel* is relatively high. There is a tax refund on the use of low sulphur heating oil (measure taken to avoid its use as

diesel for cars). Also noteworthy is a 10% tax on electricity generated by nuclear power facilities, which is earmarked to the state fund for the decommissioning of nuclear power plants and managing nuclear waste. The government plans to increase tax revenues by possibly implementing a tax on the sulphur content of fuels, an energy tax, and extending the vehicle tax to private vehicle owners.

Other environmentally motivated tax differentiations and exemptions exist. Concerning the *value added tax* (VAT), (set at 23% since 1993 and the largest source of revenues in the state budget), a reduced rate applies to environmentally friendly fuels (natural gas, low sulphur heating oil, biogas, LPG, fuelwood), certain types of ecological equipment (solar collectors, small waste water treatment plants, equipment for environmental monitoring systems), and products made of recycled paper. The reduced rate was raised in 1999 from 6% to 10% and will be reviewed as part of EU accession negotiations to prevent trade distortions.

Personal *income tax* and corporate income tax may be reduced and/or waived for the provision of environmental services explicitly mentioned in the law. This includes energy produced by small hydro plants and combined heat and power (10 MW), wind power plants, heat pumps, biomass, geothermal, solar equipment, among others. Tax

Table 6.4 **Excise taxes on fuel**, 1994-2000

(SKK/kg)

	1994	1997	1998	1999	2000
Transport fuel					
Leaded gasoline	10.90	11.40[a]	11.40[a]	14.40[a]	16.50[a]
Unleaded gasoline	9.80	10.30	10.30	13.30	15.40
Diesel	9.00	9.50	9.50	12.50	14.60
Kerosene	9.00	9.50	9.50	9.50	9.50
Liquid natural gas	2.37	2.37	2.37	2.37	2.37
Heating fuel					
Heating oil with low sulphur content (< 2%)	9.00[b]	9.50[b]	9.50[b]	9.50[b]	9.50[b]
Heating oil with high sulphur content (> 2%)	9.00[b]	9.50[b]	0.30	0.30	0.30
Domestic ecological (organic) fuel	–	1.00	1.00	1.00	3.00

a) Leaded gasoline for road transport was abolished in 1997.
b) Tax is refunded.
Source: Ministry of Finance.

exemptions are granted for six years from the start of the operation. Income tax exemptions may also be granted for hazardous waste management, including collection, recycling, treatment to reduce toxicity, landfilling, and incinerator operation. Donations for activities in the area of environmental protection are tax deductible, for up to 10% of the income tax base. *Inheritance tax and gift tax* concessions are granted if beneficiaries (legal entities, municipalities, NGOs) use the inheritance or gift for environmental purposes (Act 87/1993).

Exempted from real estate tax are wetlands, flat bogs, peat bogs, hedges, small woodland, wind-breaks, protection zones for water sources, protected areas, land with soil protection and ecological or landscape conservation functions, and reforested land (from plantation until the first thinning). To be tax exempted, the land must not be used for entrepreneurial or profit-making purposes. Buildings in which solid fuels were replaced by gas or electricity or, which rely on renewable sources of energy for heating water (solar, wind energy, biomass, etc.) may also be exempted, provided that these changes have significantly reduced energy consumption.

The Slovak tax system does not yet identify *environmental taxes*. The 1999 Tax Concept Draft and the 2000 Tax Reform Draft envisage possible application of a tax on sulphur content in diesel oils and of an energy tax. The revenues from these taxes could be used for environmental purposes. A tax of SKK 1/litre (SKK 200/kg SO_2) would apply to standard diesel oil (with S content over 2% by weight) to meet requirements of the 1999 Directive on reduction in the sulphur content of certain liquid fuels. This would require changing the present tax differentiation for heating oil (high-sulphur heating oil being currently taxed at a substantially lower rate than low-sulphur heating oil, thereby promoting pollution). The energy tax would be introduced progressively, starting with the adjustments in the rates of fuel tax, and later extended to electricity.

Thus far, adjusting individual taxes has been the primary way of incorporating environmental aspects into the tax system. The *"greening" of the tax system* (i.e. the shifting of the tax burden from labour to the environment) is currently the object of first analyses and discussions between the Ministry of Finance and the Ministry of the Environment.

Energy policy

Although the energy intensity of the Slovak economy decreased by 26% over the 1990s, it is still high and well above OECD Europe average. Currently, domestic energy resources (brown coal and hydro) only account for 11% of the energy supply. Imported energy resources (oil, gas, and nuclear fuel) mainly come from the Russian Federation below market prices, through a number of bi-lateral agreements. Energy

efficiency is low in part because energy prices do not reflect actual costs of production and distribution. The sector is still heavily dependent on the government, which owns the major companies. A recent document, *Energy Policy of the Slovak Republic*, presents a strategy to prepare for Slovakia's integration into the European Union internal market, and to foster sustainable development in the energy sector. This strategy was submitted to strategic environmental assessment (Chapter 2).

As household prices are well under production costs, *prices* of electricity, natural gas, and heat especially for households, are scheduled to increase significantly to reach economic levels by 2002. Energy companies are being prepared for privatisation in 2002. In 2001, an independent regulatory body was established together with the completion of the legislative framework. *Other measures* include a shift away from energy-intensive industries, regulations (low energy space heating in buildings), and supporting commercialisation of renewable sources of energy. The strategy's key measures to meet SO_2 and NO_x emission reduction objectives are i) installing flue-gas cleaning devices at power stations, and ii) increasing the use of low-sulphur oil and natural gas. Continued operation of nuclear power plants is considered essential for meeting the CO_2 reduction target (Chapter 2).

Transport policy

The transport sector is facing increases in freight traffic and transport infrastructure construction has been a priority since the mid-1990s. The *1993 State Transport Policy* aims at sustainable mobility through the integrated use of all modes of transport. Special emphasis is placed on inter-modality and support for selected modes of transport (rail, inland waterway, and combined systems) as well as public transport. However, public transportation has traditionally been affected by heavy losses, which were covered by different levels of government. For example, since independence the railroad system (under the central government) accumulated losses of approximately SKK 20 billion and the 17 bus companies (under regional authorities) accrued losses of about SKK 2.5 billion. Urban public transport was supported by the town budgets: 10% of purchasing cost for buses (40% for low-floor ones), 30% of purchasing cost for trams and trolleybuses (up to 50% for low-floor ones); up to 30% for modernisation and reconstruction of tram and trolleybus infrastructure. Financial performance of these transportation systems should improve as they are privatised and fare prices are liberalised. Yet, this may serve as an added disincentive to use public transportation relative to automobiles. Even with fuel prices such as gasoline in the range of most OECD countries, the car fleet increased 3% annually during the 1990s (Chapter 2, Figures 2.3 and 2.4). The State Transport Policy was updated in 2000 to reflect developments at the EU level. A chapter was included on transport and the environment.

The transport sector accounts in Slovakia for 38% of NO_x *emissions*, 32% of VOC emissions, and 11% of CO_2 emissions. Leaded gasoline was phased out in 1997 and old cars without catalytic converters use a domestic gasoline with additive (UNI). This achievement was the result of a mix of policy measures including tax differentiation between leaded and unleaded gasoline and reduced vehicle tax for commercial cars equipped with catalytic converters. Catalytic converters are to be made mandatory for new cars. Imported cars older than five years or without catalytic converters are banned (Chapter 2).

Agricultural policy

The *importance of agriculture in the economy* declined during the transition. After a rapid decline in the first years following transition (from 9.4% in 1989 to 5.7% in 1991), the sector share of GDP declined more progressively in the course of the 1990s (4.1% in 1999). Employment in agriculture was stable in 1989-91 (more than 12% of total labour force), but then fell to 8% in 1995 and 5% in 1999.

Agricultural output declined continuously from 1989 to 1993, when it amounted to 70% of the pre-reform average (1986-90, but since stabilised). Between 1990 and 1999, crop production declined by 30% and livestock production by almost 40% as economic reforms got underway. While crop output declined mainly in the first years of the decade, the downward trend in livestock production is still continuing. In 1999, livestock production (mainly pork and milk) accounted for 54% of total agricultural production and crop production (mainly wheat, maize, and barley) for the remaining 46%.

During the reform period Slovak agriculture underwent a process of *privatisation and transformation*. The emerging farm structure is dominated by production co-operatives and other forms of corporate farms with an average area of 1 400 hectares, operating almost 80% of the agricultural land. Individual farmers operate on less than 10% of agricultural land, with an average area of ten hectares. Almost half of the area operated by individual farmers is on farms of more than 100 hectares (average farm size 271 hectares). Privatisation of the upstream and downstream industries is completed, partly through foreign investment.

Agricultural production continues to benefit from *domestic support* and border protection. Both decreased in the 1990s: domestic support, as measured by the Producer Support Estimate, declined from 55% in 1986-88 to 22% in 2000, i.e. below the OECD average and close to the level of other central European OECD countries; import tariffs were lowered and minimum market access guaranteed through tariff quotas. There are still export restrictions.

Domestic support measures combine market regulation and direct payments. Minimum prices are guaranteed within a production quota for most commodities. In most recent years, *direct payments* were the single largest category of support to agriculture (SKK 9 billion in 2000) and included payments related to input use (47%), acreage payments (37%), payments based on output (13%), and headage payments (3%). In addition, agri-environmental payments are provided for converting arable land into permanent grassland (SKK 50 million in 2000) and to support organic farming (SKK 90 million). *Incentives to input use* apply to fertiliser, water, and fuel. However, payments to finance 30% to 50% of inputs (e.g. fertilisers) to crop production were replaced in 1999 by a payment per hectare for grains, oilseeds, leguminous, and permanent grassland. Farmers are exempted from water abstraction charges for irrigation water and are granted payments partly covering the costs of electric pumping and maintenance of irrigation facilities. Since 1996, part of the fuel tax is refunded to farms.

The 2000 Plan for agriculture and rural development will be co-financed by the *EU budget* in the framework of the Special Assistance Programme for Agriculture and Rural Development (SAPARD). A Code of Good Agricultural Practices was prepared, which includes legal requirements for environmental protection.

Tourism policy

The Council for Tourism of the Ministry of Economy, an advisory body regrouping various ministries, discusses the objectives and goals of *tourism policy*. The agreed objectives are then published in the Government Policy Statement. Development of tourism in Slovakia is seen as one of the economic policy priorities, for its capacity to create employment and to attract foreign currency. However, environmental concerns have not been included in the Policy Statement. An Act on tourism is being prepared to establish tourism as an industry and to make it compatible with EU legislation.

1.4 Environmental expenditure and its financing

PAC and environmental expenditure

Overall, pollution abatement and control expenditure (PAC expenditure) decreased during the transition period, both in absolute terms and as a share of GDP. In the early transition period of 1990-92, PAC expenditure was quite high (more than 2.5% of GDP), with much spending focusing on water and air pollution abatement. In the mid-1990s, PAC expenditure decreased progressively: falling below 2% of GDP in 1994 (1.95% and SKK 9.1 billion). In the same year, 75% of the PAC expenditure was for investment and 25% for current expenditure, 46% from central and local governments, and 54% from enterprises. After a marked and continuing decrease in

government PAC investment expenditure both concerning air pollution and water pollution (sewerage and waste water treatment), *total 1999 PAC expenditure was about 1.5% of GDP* (or SKK 9.8 billion). Total 1999 environmental expenditure (including PAC expenditure as well as water supply and nature protection expenditure) was about 2% of GDP (SKK 13.1 billion) (Tables 6.5 and 6.6).

Total PAC expenditure as a share of GDP is comparable to other OECD countries, but lower per capita (at around USD 40 per capita). Actual PAC and environmental expenditure concerning air, water, and waste are well below national commitments (SKK 18-28 billion a year), as defined by the two National Environmental Action Programmes (Table 6.2). As a proportion of total investment, *PAC investment diminished* from 6.8% in 1993 to 2.6% in 1998. Investment PAC expenditure represented around 70% of total PAC expenditure over the 1990s and was mainly related to end-of-pipe technology.

Financing of environmental expenditure

National budget outlays for environmental protection dramatically decreased, not only in absolute terms, but also as a share of the state budget (Table 6.7) from SKK 2.6 billion in 1995 to SKK 1.1 billion in 1999, or from 1.6% to 0.5% of the overall state budget. National government budget outlays have focused mainly on air and water pollution abatement. Municipalities' budget outlays have focused on waste management, while most end-of-pipe investments for air management come from companies (Table 6.6). The level of *public subsidies to environmental projects* is relatively small and decreased from 18% in 1994 to 11% in 1999, aiming at a progressive implementation of the PPP. The Ministry of the Environment's financial support to environmental projects through the State Environmental Fund (SEF) decreased from SKK 360 million in 1992 to SKK 146 million in 1999; it applies mainly to small and medium-scale investments. This partly reflects the priority given to improving drinking water supply in regions facing water shortages or in regions with poor quality ground water. Other ministries also contribute to projects of environmental importance: Ministry of Economy (hazardous waste incinerators), Ministry of Agriculture (drinking water supply schemes, agriculture, forestry), Ministry of Health, Ministry of Defence (nuclear waste), Ministry of Transport, Post and Telecommunication, and Ministry of Construction and Regional Development. This is done either through state funds (forest, agriculture, water management, culture, health, nuclear waste) or directly from the national budget.

The *State Environmental Fund* (SEF) was created in 1991 to support environmental policy goals by providing support (usually grants and soft loans) to co-finance priority environmental projects. It helped raised environmental funds from enterprises

Table 6.5 **Public pollution abatement and control (PAC) expenditure,**[a] 1990-98

(SKK billion)

	Air pollution		Water pollution		Waste		Total		Share in GDP[b] (%)
	Investment	Current	Investment	Current	Investment	Current	Investment	Current	
1990	2.8	0.8	5.0	1.4	1.5	0.4	9.3	2.5	*4.2*
1991	1.7	0.6	3.0	1.1	0.9	0.3	5.6	2.0	*2.4*
1992	1.3	0.6	2.4	1.0	0.7	0.3	4.4	1.9	*1.9*
1993	1.0	0.6	1.8	1.1	0.6	0.3	3.4	2.1	*1.4*
1994	0.9	0.3	1.7	0.6	0.5	0.2	3.1	1.1	*0.9*
1995	0.7	. .	2.0	0.6[c]	0.1	. .	2.8	. .	*0.5*
1996	0.7	. .	1.6	0.6[c]	0.4	. .	2.7	. .	*0.4*
1997	0.6	. .	1.3	0.6[c]	0.1	. .	2.0	. .	*0.3*
1998	0.6	0.1[c]	0.9	0.6[c]	0.8	0.3[c]	2.3	1.0	*0.3*

a) By central government and municipalities.
b) Includes current expenditure in 1990-94.
c) Secretariat estimates.
Source: OECD.

Table 6.6 **Total PAC investment,** 1994

(SKK billion)

	Air pollution	Water pollution	Waste management	Total[a, b]
Total PAC investment	2.5	3.4	1.0	6.9
of which:				
Business sector	1.6	1.7	0.5	3.8
Public sector	0.9	1.7	0.5	3.1
Local government	*0.3*	*1.2*	*0.3*	*1.8*
Central government	*0.6*	*0.5*	*0.2*	*1.3*

a) Environmental investment was SKK 8.2 billion in 1998.
b) 1% GDP = SKK 4.7 billion in 1994 and SKK 7.5 billion in 1998.
Source: Ministry of the Environment.

Table 6.7 **Environmental expenditure in the national budget**[a]

(SKK million current)

Ministry	1994	1995	1996	1997	1998	1999	Total 1994-99	*of which:* (% of PAC)		
								Air	Water	Waste
Environment[b]	817	1 200	1 035	1 072	967	640	5 731	*31*	*34*	*12*
Agriculture	268	970	508	377	335	23[c]	2 481	–	*24*	–
Justice	4	15	36	22	14	12	103	*58*	*23*	–
Labour, Social Affairs and Family	30	36	42	6	–	3	117	*49*	*34*	–
Defence	93	146	383	141	224	121	1 108	*23*	*27*	*1*
Culture	3	5	7	10	16	12	53	*100*	–	–
Health	148	147	184	114	218	208	1 019	*78*	*12*	*8*
Economy	26	33	85	33	18	4	199	*51*	*7*	*39*
Interior	17	30	18	–	12	32	109	*39*	*34*	*6*
Education	73	36	43	34	4	–	190	*83*	*7*	–
Transport, Post and Telecommunication	11	–	47	–	9	5	72	*83*	*3*	*11*
Finance	–	–	10	6	10	–	26	–	*23*	*77*
Total	1 490	2 618	2 398	1 815	1 827	1 060	11 208	*31*	*28*	*8*
State budget (%)	*1.07*	*1.57*	*1.26*	*0.87*	*0.95*					
GDP (%)	*0.32*	*0.48*	*0.40*	*0.26*	*0.24*	*0.13*	*0.13*			

a) Includes nature conservation and drinking water supply. From 1997, excludes regional and district authorities.
b) Includes the State Environment Fund and the state budget.
c) Excludes the Water Management State Fund, Forest Improvement State Fund, and State Fund for Agriculture and Soil Protection and Improvement.
Source: Ministry of the Environment.

Table 6.8 **State Environmental Fund,** 1995-99

(million SKK)[a]

	Income	Expenditure
Water	1 135	2 378
Air	1 907	1 320
Waste	880	473
Nature	15	104
Other	1 516[a]	719
Total	5 453	4 994

a) Mainly transfers from the national budget.
Source: Statistical Office of the Slovak Republic.

and municipalities and to prioritise environmental improvement. The fund, with its limited finances, could not serve as the main financial institution for environmental investments: for instance, in 1994 only one in twenty applicants could obtain a contribution. The SEF was restructured in 1995 into a revolving fund, to allow larger financial resources: the annual envelope in 1995-99 was of around SKK 1 billion (Table 6.8). The financial resources of the fund came from i) transfers from the state budget (30%) and ii) environmental charges and fines on air emissions (35%), waste water discharges (20%), and solid waste disposal (15%). Between 1994 and 1999, the SEF mainly financed water management activities (waste water treatment plants, water supply schemes) and programmes to switch heating of flats to gas. Earmarking environmental charges as revenues to the SEF has been much debated in recent years. Consequently the *SEF and most other state funds were abolished* on 1st January 2002 and their revenues included in the national budget. Only two state funds remain: one for nuclear waste management and one to grant low-rate loans for housing.

The *National Property Fund* (NPF) (established under the Privatisation Act to collect payments generated from the sale of state properties) and *EU pre-accession funds* played a relatively small role in environmental expenditure. The main use of the NPF is to finance pension schemes. EU pre-accession funds include the PHARE programme, the Instrument for Structural Policies of Pre-Accession (ISPA), and the Special Assistance Programme for Agriculture and Rural Development (SAPARD). Slovakia will receive 3.5% to 5.5% of these EU funds. The total budget of these EU funds for the period 2000-06 is about EUR 3 billion (50% PHARE, 33% ISPA, and 17% SAPARD). PHARE is to be used at 70% for investments and at 30% for capacity building. ISPA must be equally shared between transport and environmental projects. Slovakia could only use part of its ISPA allocation (EUR 13 million in 2000), in particular because these funds are only granted for large projects (of more than EUR 5 million). Part of the PHARE grants were spent on environmental projects (EUR 15 million in 2000). The Ministry of the Environment participates in the implementation of six twinning projects with Austria (air), Denmark (inspection), Germany (waste and EIA), Italy (approximation), and the Netherlands (water).

Concerning *foreign direct investment*, environmental investments are generally less profitable than other ones, and are considered long term. That is why most loans to finance environmental foreign direct investments require governmental guarantees, often up to one and a half to two times the size of the loan. Because Slovakia has a tight state budget, a young banking sector, and has not been able to eliminate past environmental damages on sites, the government simply cannot afford to play the role of general guarantor. In 1999, it was decided to provide ten-year corporate tax exemptions to foreign investors, and allow zero tariff import for high technology, which may have environmental benefits.

Environmental convergence in the EU

The National Programme for the Adoption of the Acquis Communautaire (NPAA) envisages an average yearly environmental investment for the period 2000-08 of about SKK 22 billion in current prices and an increase of environmental expenditure from 1.5% of GDP in 2002 to 2.5% in 2008. Part of present operating environmental expenditures are not included in these figures. Accordingly, *environmental investment in the coming years should more than double* and will require increased expenditure mostly by enterprises and municipalities. Increased environmental funding will have to come mostly from significantly increased environmental charges for municipal waste water and waste infrastructure, and from enterprises for their own environmental investments. Foreign sources (e.g. EU structural funds) and state support to small and medium size enterprises and municipalities should also facilitate the transition. The completion of a municipal waste water infrastructure responding to the Urban Waste Water Directive is likely to require continuing efforts (over more than one or two generations depending of the level of annual investment).

2. Environmental Policy Implementation

2.1 Legal framework and regulatory instruments

Legal framework

Citizens have a *constitutional right to a healthy environment*. The Constitution of the Slovak Republic of 1 September 1992 lays down the right of each citizen to get early and complete information on the status of the environment, and its likely causes and consequences, hereby enacting the environmental provisions of the Convention on Basic Rights and Fundamental Freedom.

Environmental legislation was reinforced in the 1990s. In 1991, new Acts on air protection and waste management were adopted, subsequently complemented by related Acts on charges (Table 1.4). In 1994, legislation on environmental impact assessment and on nature and landscape protection was enacted. Ozone layer protection and access to environmental information have been regulated by a specific Act since 1998.

EU accession is a priority in Slovakia. A major task in the *EU approximation* is to adopt, implement and enforce EU environmental legislation and policies (Acquis Communautaire). This was already achieved for EIA and access to environmental information. Transposition of EU environmental legislation into Slovak legislation was done for waste (with the 2001 Waste Act), but is to be done for water (with the

preparation of a new Act on water protection and water management). Priorities are to transpose the Water Framework Directive and the Directive on the control of major accident hazards involving dangerous substances (Seveso II). Phased-in implementation is likely to be unavoidable for some Directives, such as the Urban Waste Water Directive.

Environmental permitting

District offices issue permits relating to air pollution, waste water discharge, noise and waste, as well as building permits. Concerning air, they grant approvals for the location, construction, and modification of large and medium air pollution sources, and of small facilities which use new technologies. Concerning waste, they issue approvals for waste storage and treatment facilities, and maintain records on waste; they must approve the transport of hazardous waste (with further approval from the Ministry of the Environment if more than one district is crossed). Concerning water, river basin enterprises (RBEs under the Ministry of Agriculture) issue water use permits, while district offices issue waste water discharge permits (subject to approval by RBEs). The district hygienists issue a binding decision during an application for a building permit; this decision includes provisions for the safe handling of chemicals.

Regarding changes in *land use*, district offices must approve the removal of land from agricultural use in the context of the application for the siting and building permit. Projects permanently or temporarily taking forestland out of use, or limiting the economic use of forests, require approval from forest authorities. However, district offices are competent for forests plots of less than two hectares, and for decisions that affect forests (e.g. territorial decisions, building permits, mining permits, and transport decisions within the district). The Ministry of Agriculture takes decisions on restricting the use of forest in designated protected and special purpose forests.

By 2003, it is intended to introduce *integrated pollution prevention and control* (IPPC) in line with the corresponding EU Directive. Responsibilities to issue building permits will soon be transferred from district offices to municipalities and the Slovak Environmental Inspection will be entrusted to control compliance of new constructions with building codes.

Compliance and enforcement

The Ministry of the Environment has overall responsibility for the enforcement of environmental laws. Until 1996, the *professional environmental staff* from the regional and district state administration was 1 800. In 1996, 600 staff were lost

following the integration of environmental departments in regional and district offices (subordinate to the Interior Ministry). This has weakened environmental policy implementation, including charge collection. The recent devolution of power and responsibilities to regions and municipalities for physical planning, nature protection and construction permitting is expected to result in a transfer of some 500 environmental staff from the regional and district state administration to regions and municipalities.

In contrast, the *Slovak Environmental Inspection* (SEI) staff has slightly increased over the decade (from 126 in 1992 to 157 in 2001). The SEI is entitled to impose penalties for violations of the laws. The regional and district offices (carrying out 10 to 20% of the inspections) can also impose penalties and, in addition, can order facilities to take remedial action. Both bodies are authorised to enter property for the purpose of inspecting and carrying out monitoring and otherwise supervising compliance with the law. If there is overlapping jurisdiction with respect to a particular violation, the SEI has priority over regional and district offices. The SEI's initial field of competence (air and water) was progressively extended to waste (1992), nature (1995), building (2001), and it will include GMOs in 2002.

SEI field inspectorates act as a first level administrative appeal body, SEI headquarters as second level, and the Ministry of the Environment is the final appeal body. Companies which believe they have been heavily fined can turn to the Supreme Court, which often decides to lower penalties. The Ministry of Justice has no data available on court cases concerning the environment (e.g. their numbers, amounts of indemnities, sentences pronounced). There are no prosecutors specialised in environmental matters. There is no enterprise environmental liability. There is no standing *access to courts* for recognised NGOs concerning environmental cases.

The level of fines for non-compliance with environmental laws is set in legislation. Most cases of non-compliance relate to waste water discharge not meeting the 1993 effluent standards and to trade in exotic species (CITES). The amount of fines on hazardous waste disposal decreased significantly in the 1990s, while for air pollutants there was no major violation of the law in recent years. The fines for illegal waste water discharge have remained unchanged since 1975. Overall, the amount levied dramatically decreased (Table 6.9); possibly because of better implementation of the law, or from *weak monitoring and enforcement*. In practice, regional and district SEI offices do not have sufficient staff to regularly monitor facilities and there are no inspection fees. Fines are not commonly imposed when a polluter exceeds the permitted emission limit. Charges are usually based on self-reported emissions. Payment collection efficiency is low.

2.2 Economic instruments

Environmental charges were introduced in Slovakia, in their current form, in 1992 (Table 6.10). Emission charges are used primarily in association with pollution permits. A base rate applies to emissions below the permitted level and a penalty factor is added for emissions above that level. Rates usually are correlated with differences in pollutants' toxicity. The system is rather extensive and has generated sustained revenues, which accrue to the SEF (Table 6.11). Charge rates were phased in progressively, but the rising rates provide an incentive to cheat, primarily via inconsistent monitoring of emission sources. The 1998 Act on charges for air pollution attempted to address certain inconsistencies in the air sector by mandating continuous monitoring. As is the case for waste, it is intended to rank air pollution sources into two classes (A and B), with the B class paying higher fees. This proved successful in improving landfill standards. For air, it may create an incentive to self-monitor, yet ultimately this largely depends on the enforcement capacity of the government.

Emission charges are primarily revenue-raising: they are mainly seen as instruments to address increasing financial needs, especially in the context of EU approximation. Water related charges (for water supply services, waste water services, and abstraction charges) as well as waste disposal charges provide the bulk of the revenues from environmental charges. However, they also have an incentive function which should be strengthened. The government is implementing an *emission trading*

Table 6.9 **Fines levied by the Slovak Environmental Inspection,** regional and district offices

	1996 (million SKK)	2000 (million SKK)	1996-2000 (% change)
Air	6.3	0.8	*–87*
Water	9.7	4.8	*–51*
Waste	15.1	7.5	*–50*
Nature	8.5	0.6	*–93*
Total	39.6	13.7	*–65*

Source: Slovak Environmental Inspection.

Table 6.10 **Economic instruments,** 2001

Instrument	Rate	Remarks
WATER		
User charge for public water supply		Revenue (SKK 3.0 billion). VAT applies to the charge.
Household	5.66 SKK/m^3	The government regulates charges for households.
Industry	9.40 SKK/m^3	For industry, charges are subject to contract agreement with the supplier.
User charge for sewerage and sewage treatment		Revenue (SKK 2.3 billion). VAT applies to the charge.
Household	3.77 SKK/m^3	The government regulates charges for households.
Industry	7.46 SKK/m^3	For industry, charges are subject to contract agreement with the supplier.
Pollution charge		Revenue (SKK 0.2 billion) goes to SEF. Charge based on permit or direct discharges by industry.
Dissolved inorganic salts	120 to 600 SKK/t	
pH	135 SKK/kmol	
BOD_5	21.5 SKK/t	
Crude oil	2 to 3 SKK/m^3	
Suspended solids	2.34 SKK/t	
Abstraction charge		Revenue (SKK 1.5 billion) goes to State Water Management Fund (groundwater) and river basin enterprises (surface water). Charges apply to withdrawal of surface and ground water in excess of 15 000 m^3/year or 1 250 m^3/month. These maximum rates are uniform across the country. Overall exemptions apply to withdrawal for aquaculture and for special purposes related to health. Exemptions to withdrawal of surface water apply to agriculture and public water supply.
Groundwater for public supply (from 1996)	1 SKK/m^3	
Groundwater for energy and healthcare (from 2000)	0.2 SKK/m^3	
Groundwater for other purposes	2 SKK/m^3	
Surface water	2 SKK/m^3	
Fines		Revenue (SKK 6.7 million) goes to SEF. Fines apply to withdrawal, discharges and handling of dangerous substances. Payment discipline is 70%.
NATURE		
Entrance fee		Applies to entrance, transit and parking of motor vehicles in designated protected areas.
Deterioration fee		Applies to a list of protected plants and animals and protection of trees outside forests. Payment is often in kind (e.g. tree planting).
Stumpage fee		Administration fee. The revenue was high (SKK 8 million) in 1996 because of highway construction in forest regions.
Fines	500 000 SKK	Revenue (SKK 1.7 million) goes to SEF. This is a maximum rate.

Table 6.10 **Economic instruments,** 2001 *(cont.)*

Instrument	Rate	Remarks
AIR		
Emission charge (large and medium pollution sources)		Revenue (SKK 0.3 billion) goes to SEF and is used mainly to help municipalities switch from coal to natural gas. Large sources are thermal units above 50 MW, coke, steel, iron, cement and heavy chemical industries. Medium sources are thermal units from 0.2 to 50 MW. Charge rates were phased in gradually, from 20% in 1992 to 100% in 1999. Payment discipline is 80%. CO_2 emissions are regulated through the charge on total organic C.
Total organic C (from 2000)	4 000 SKK/t	
Solid particles	5 000 SKK/t	
SO_2	2 000 SKK/t	
NO_x	1 500 SKK/t	
CO	1 000 SKK/t	
Selected heavy metals and organic pollutants		
Class I (asbestos, Cd, Hg, etc.)	40 000 SKK/t	
Class II (As, Pb, Zn, etc.)	20 000 SKK/t	
Class III (Cl, H_2S, phenol, etc.)	10 000 SKK/t	
Class IV (NH_3, acetone, etc.)	2 000 SKK/t	
Emission charge (small pollution sources)	10 000 SKK/year and/or per source	Small sources are thermal units and any stationary facilities up to 0.2 MW. This is a maximum rate: charges are set according to the size of sources and the amount of fuel used. In practice, this instrument is rarely used.
Product charge on ODS (from 1998)		Revenue (SKK 4.1 million) goes to SEF. Applies to the production and import of ozone depleting substances (ODS).
Per kg ODS	100 SKK/kg	
Per piece of cooling equipment:		
Based on its volume in litres	40 to 200 SKK	
Based on its cooling capacity in kW	100 to 1 000 SKK	
Fines	10 million SKK	Revenue (SKK 2.3 million) goes to SEF. This is a maximum rate for breach of license. Up to 50% increase to the air pollution charge applies where the permitted emission limit is exceeded. In practice, this instrument is rarely used.
Emission trading on SO_2 (from 2002)		Quotas allocated to districts based on historical emissions.
WASTE		
User charge for municipal waste collection and disposal	4.42-33.3 SKK per 110 litres	Charges consist of a standard rate per small (110 litres) or large (1 100 litres) container. Under the new (2001) Waste Act, charges are negotiated between the municipality and the waste company.
Waste disposal charge (from 1996)	Rate A / Rate B	Revenue (SKK 1.1 billion) goes to municipality (rate A), and to municipality and SEF (rate B). Rate A applies to landfills that meet technical requirements. Rate B applies to other (often temporary) landfills. For industrial waste, payment of the charge may be delayed (not more than one year) if measures are taken to reduce waste toxicity. Payment discipline is 70%.
Organic matter	1 / 3 SKK/t	
Municipal waste	20 / 300 SKK/t	
Special waste	40 / 480 SKK/t	
Hazardous waste	250 / 3 500 SKK/t	
Other waste	10 / 100 SKK/t	

Table 6.10 **Economic instruments,** 2001 *(cont.)*

Instrument	Rate	Remarks
Product charge (from 2001)		Revenue accrues to a Recycling Fund and is used to support separate collection and waste treatment.
Lamps with mercury	15 SKK/kg	
Consumer electronics	12 SKK/kg	
Tyres	8.2 SKK/kg	
Batteries	8 SKK/kg	
Composite materials	7 SKK/kg	
Plastic	5 SKK/kg	
Glass	0.62 SKK/kg	
Paper	0.6 SKK/kg	
Lubricant oils	0.5 SKK/kg	
Deposit-refund system for glass and plastic bottles	5 SKK/glass bottle 10 SKK/plastic bottle	High return rate due to the long history and use of the scheme.
Fines	10 million SKK	Revenue (SKK 7.0 million) goes to SEF. This is a maximum rate. Applies mostly to illegal dumping. Payment discipline is low (30%).
LAND AND MINERALS		
User charge for mining		Revenue (SKK 0.1 billion) goes to national budget and are usually allocated to the mining office. Concessions or exemptions (up to three years) may apply in some cases.
Based on area of land mined	5 000 SKK/km^2/year	
Based on minerals extracted	0.3-10% market value	
Charge for removal of agricultural land from agricultural production		Revenue (SKK 0.6 billion) goes to State Fund for the Protection of Agricultural land. Rate according to land use and quality. 100% increased rate for hop fields, vineyards and orchards and to establish a sub-standard landfill. 50% rebate to housing construction. Are exempted: water reservoirs, flood control areas, sewage treatment plants and standard landfills.
Charge for removal of forest land from forestry use		Revenue (SKK 0.1 billion) goes to State Fund for Forest improvement. Rate according to land price and forest function.

Source: Ministry of the Environment; OECD.

quota on SO_2 which could be extended to other gases (Chapter 2). A beverage container *deposit-refund system* is also in place with some rates as high as 35% of product price; yet, non-returnable bottles, mainly imports, are increasing their market share.

Before 1989, *public services* such as health care, education, energy, and water were either free or at reduced prices. There were few, if any, taxes on final consumption and wages were set at a low level. Increases in income for large segments of the population are well below price increases resulting from recent subsidy decreases in public services. Nonetheless, many public services are still provided at prices below full cost recovery. For example, sanitation including water and waste management are key areas where a gradual movement toward full cost recovery pricing is needed. Even if full cost recovery in the financial sense is achieved, user charges that satisfactorily incorporate environmental considerations may be needed. As Slovakia is undergoing a process of decentralisation and privatisation in its public services, which may lead to better services, it is important in this process to adequately take into account past environmental liabilities, to prepare appropriate and transparent regulatory frameworks, and to decentralise both obligations and revenue generation.

Table 6.11 **Revenues from environmental charges**[a]

(million SKK)

	1996	1999	(%) change 1996-99	Use of revenue[b]
Air pollution	412	303	*–26*	SEF
Water pollution	234	198	*–15*	SEF
Waste disposal[c]	220	102	*–54*	SEF
Groundwater abstraction	130	792	*509*	SWMF
Surface water abstraction	915	896	*–2*	RBE
Conversion of farmland	567	767	*35*	SFFP
Conversion of forestland	125	18	*–86*	SFFI
Minerals extraction[d]	130	127	*–2*	National budget
Ozone depleting substances	–	–	*. .*	SEF
Total (SKK million)	2 733	3 203	*17*	

a) Excluding user charges on waste and water and deposit-refund systems.
b) RBE: River Basin Enterprise; SFFP: State Fund for Farmland Protection; SFFI: State Fund for Forest Improvement; SWMF: State Water Management Fund.
c) Excludes the part of revenues accruing to municipalities and waste disposal charges on sludge fields.
d) Excluding charge for use of mining area.
Source: Ministry of the Environment.

Finally, a variety of user charges are also in force in several sectors such as *agriculture, forestry, and mining*. These include land use charges (on the use of agricultural or forest land for purposes other than agriculture or forestry) and charges on natural resources extraction and/or mining.

2.3 Environmental impact assessment

Environmental impact assessments (EIA) of projects have been carried out since 1994. The list of activities subject to an EIA is included in Annex 1 of the 1994 Act on environmental impact assessment. The Act was amended in 2000 to include more activities. Approximately 350 projects have been assessed to date. Most EIAs were related to road and highway construction, waste disposal, industrial sewage treatment, and water management. Cases where projects were stopped mainly include dam construction. In many instances, the project design had to be revised. Projects decided prior to 1994 did not receive EIAs, although the 1976 Act on territorial planning and construction includes provisions on EIAs.

International developments concerning *Strategic Environmental Assessment* (SEA) have stimulated Slovakia to consider strengthening its own procedures for environmental evaluation of proposed governmental policies and to use such procedures to assess national policies, programmes, and plans. The 1994 Act on environmental impact assessment contains the requirements to assess policies and legislative proposals in relation to their assumed impact on the environment; it presents a procedure for environmental assessment, which is obligatory for proposed development policies in the areas of energy supply, mining, industry, transport, agriculture, forestry, water management, waste management, and tourism. The SEA of Slovakia's energy policy was done in 1997-98, and provided a vehicle for mobilising public awareness. The result was a reduced reliance on nuclear energy and an increased use of alternative energy sources; neighbouring countries could also express views. SEAs are not legally binding, their role being to help policy formulation. However, no SEA was carried out for the amendment in 2000 of the National Transport Policy.

The *EIA legislation* is being revised to include a list of "concepts" which will be subject to EIAs. The new legislation will be consistent with the 1997 EU Directive on EIAs and the Espoo Convention. The 1991 Espoo Convention on EIA in a transboundary context was ratified, and Slovakia became a party to it in 2000.

2.4 Spatial planning

Spatial planning is a basic instrument of environmental protection. As stated in the 1976 Act on territorial planning and construction, "territorial planning approves

co-ordination of activities affecting the environment, ecological stability, cultural and historical values of the territory, territorial development, and landscape management in accordance with principles of sustainable development". The 1998 *Territorial Development Concept* prepared by the Ministry of the Environment provides the national basis for territorial development. Based on population growth and employment outlooks, it includes recommendations for urban development and the related transport network (settlement structure) as well as for ecological stability (landscape structure) and assesses the spatial impact of sectoral policies. It has no time horizon and may be amended at any time, for instance for the development of new industrial zones. To become binding, elements of the national concept must be published in government decrees. Integration of nature conservation and territorial planning at the national level is formally achieved through the Territorial System of Ecological Stability (TSES). TSES identifies ecological core areas and corridors, part of which are not yet included in the national network of protected areas, but could be included as part of Natura 2000.

The *interface between rural development and environmental policies* is receiving increased attention. In 2001, the government adopted a national programme on regional development prepared by the Ministry of Construction and Regional Development, for the period until 2006. This programme will play an important role in enhancing interministerial co-operation once new regions have been formally established and EU co-financing secured (Structural Funds). Both the national territorial development concept and the national programme on regional development were subject to an environmental impact assessment.

Territorial planning at the regional level was also carried out in 1998. An amendment to the Act on territorial planning and construction in 2001 provides for devolution of power and responsibilities for physical planning to regions. At the municipal level, since 2000, each municipality of more than 2 000 inhabitants must prepare its own land use plan, not only on urbanised land, but on all its territory. About 30% of municipalities have already adopted a land use plan and another 30% have prepared a draft plan. Planning is less developed in the eastern part of the country (Prešov and Košice regions). The regional and municipal plans require state approval and are binding documents. For instance, the creation of a new landfill was included in the territorial plan of the Bratislava region and must be implemented by the Bratislava municipality.

To protect the most fertile soils from construction, use of *agricultural land* for non-agricultural purposes must be evaluated and approved in accordance with the 1992 Act on protection of registered agricultural land resources. This is a complex and costly process as farmers have to be compensated according to land quality.

Thus, municipalities tend to give priority to the re-use of abandoned land (e.g. re-use of former industrial land for new developments). To protect land resources and cultural heritage in mountainous areas, farmers receive payments to maintain traditional forms of cultivation. This is part of the Programme of Rural Rehabilitation (amended in 1996), which started in 1998. On the other hand, the government wants to reduce farming activity where growing conditions are most unfavourable and threaten the environment. To reduce the area subject to high or very high soil erosion (160 000 hectares) by half, the conversion of arable land to pasture or meadowland has started on steep slopes.

2.5 Role of industry

Environmental management systems (EMS) were introduced and certified ISO 14001 in 40 organisations. Five foreign and one national company are accredited as EMS certifying bodies by the Slovak National Accreditation Service. Training courses are organised for advisors, auditors, and assessors on ISO 14000 series, accreditation, and eco-labelling. Ten local and international consulting firms are currently helping Slovak companies to introduce EMS. Basic prerequisites for introducing EMS were created in Slovakia in 1997, on the initiative of the Ministry of the Environment: issuance of an environmental management standard by the Slovak Office for Technical Standards and creation of a Waste Management and Environmental Management Centre in the Slovak Environmental Agency. Pursuant to EU 1999 Council Resolution on the role of standardisation, it was decided to gradually transpose European standards into the system of Slovak technical standards (STN) in all sectors, including environment. The 1999 Act on technical requirements for products and on assessing the conformity of products was adopted in the framework of the National Programme for the Adoption of the Acquis in effect from 1 January 2000. Central state administration authorities, including the Ministry of the Environment, may pursue claims that arise from their competencies through standardisation proceedings as their "legitimate interests". The Act on environmental management and audit system, currently under preparation, will transpose the 1993 EC Council Regulation on the Community scheme enabling the voluntary participation by companies in the industrial sector in the eco-management and audit scheme (EMAS) and its amendments.

An "environmentally friendly product" label (EVV) was introduced in 1997 through a national programme of environmental assessment and *eco-labelling*. Fifteen products have the EVV label to date. The Act on eco-labelling of products currently being prepared will transpose into the Slovak legal system the principles of environmentally-friendly products and the 2000 EC Council Regulation on the revised Community eco-label award scheme.

When setting industrial assets, there are two types of *environmental liabilities*: those arising from past pollution caused by the former operation of state enterprises, and those associated with the current operation of a facility. In the first case, there is no stated policy for setting indemnities whether the context of a privatisation or of a public-private partnership: issues are being dealt with on a case-by-case basis. There is no provision for the State Environmental Fund to contribute to finance the clean-up of sites contaminated as a result of former operation of state enterprises, but indemnities have sometimes been provided by the National Property Fund. In the second case, relating to environmental liabilities (civil, administrative, and criminal) from current facility operation, provisions are found in legislation passed by the former federal government. The 1993 Act on bankruptcy requires a bankrupted firm to report on its environmental assets and liabilities. This includes information on the cost of compliance with environmental legislation, on pollution and extraction charges, and non-compliance fees, as well as the amount of environmentally related unsettled payments. Finally, it was recently decided (for the second wave of privatisation) to require an environmental audit in the privatisation procedure. Unfortunately, this is rarely done. It raises several questions: how to assess environmental liability and future responsibility? How to factor them into the price of the enterprise for sale, and what tools to use to ensure that environmental commitments are fulfilled by the new owners?

7

ENVIRONMENT – SOCIAL INTEGRATION

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of the Slovak Republic:

- continue to implement the action plan on *environment and health*;
- further review the effectiveness of *environmental monitoring systems*, regardless of institutional boundaries without compromising on the quality and timeliness of environmental information;
- continue to improve *access to environmental information*, public participation in decision-making, and access to justice in environmental matters;
- continue to foster *public environmental awareness* with a mix of instruments;
- explore possibilities of creating *environmentally related jobs* (e.g. biomass, eco-tourism, nature conservation).

Conclusions

Concerning *environment and health*, pollution was recognised as a main reason for the degradation of human health in Slovakia. A 1997 action plan for environment and health identified policy priorities, specific policy objectives, and action schedules. The plan, which was updated in 2001, also covers occupational health. In the 1990s, life expectancy rose for a number of reasons, including significant improvements in pollution prevention and control. Concerning *environmental*

information, a national monitoring and information system is in place. The environmental administration provides information actively on the Internet and through published reports (e.g. yearly state of the environment reports). Environmental NGOs are knowledgeable and have an important role to play especially in nature protection, EIA, and access to public information.

Nevertheless, life style improvements (relating to food, exercise, alcohol, tobacco, drugs) and environment related risks must receive more emphasis in future *health policies*. In particular, a quarter of the population still lives in areas with the poorest environmental quality. Progress in the effectiveness of *environmental monitoring* should continue, independent of institutional boundaries, with emphasis on multiple benefits and without compromise on information quality and timeliness. There are social and ethnic disparities concerning access to environmental services (e.g. drinking water, waste services) and environmental quality (e.g. environmental living conditions in black spots). *Public participation* and *access to courts in relation to environmental issues* are still largely unknown procedures to citizens; they should become an integral part of *environmental democracy*. However, the government has taken steps to increase awareness among citizens of their own legal rights. *Environment and employment* issues have not received proper attention: jobs could be offered by a more efficient and extensive use of renewable energy sources (e.g. forest biomass), by increased farm tourism and organic farming, and by nature conservation and management. Despite prevailing economic difficulties, environmental issues have remained high on the political agenda, because of their importance in the EU accession process rather than high *environmental awareness*.

1. Evaluation of Performance

The *population* of Slovakia grew by 2.4% during the 1990s. The natural growth rate has been declining for decades and has lately been slightly negative (–0.70% in 1999). Slovak families have 1.4 children on average.

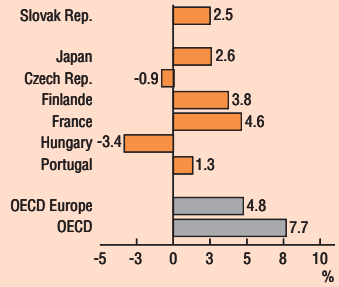
More than one half of the population lives in urban areas and *urbanisation* has been a major feature during the last decade. There are 11 towns with more than 50 000 inhabitants. On the other hand, rural development has become a challenge, especially in the most remote areas of the country (Chapter 1 and Figure 7.1).

As in most OECD countries, the environment – social integration is a *recent concept*. In Slovakia, priorities in this domain are related to environment and health, and to environment and employment, in particular.

Figure 7.1 **Social indicators**

Population and ageing

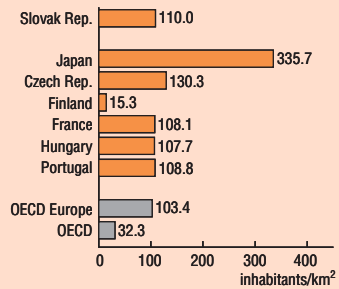
Population trends, 1990-2000



Population change		1980	1999
Natural increase	‰	8.9	0.7
Net migration	‰	0.0	0.3
Foreign population		1993	1999
	%	0.2	0.5
Ageing		1993	1999
Over 65/under 15	rates	. .	0.58

Settlement and mobility

Population density, 2000

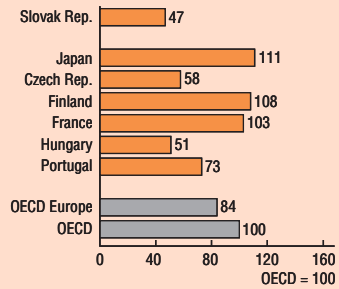


Population by type of region	1999 % population	1999 % area	1999 density
Urban	11.5	3	380
Intermediate	76.2	78	107
Rural	12.3	18	74

Mobility		1993	1998
Car ownership	veh./100 inh.	19	22
Rail traffic	billion de pass.-km	5	3

Income and employment

GDP per capita, 2000



Labour force participation		1994	1999
Total rate	%	74.8	69.3
Female rate	%	68.8	52.0
Unemployment		1994	1999
Total rate	%	13.7	16.4
Female rate	%	14.1	16.4

Source: Statistical Office of the Slovak Republic; OECD.

1.1 Environment and health

One of the ten principles of the 1993 Strategy of National Environmental Policy is to "consider environmental protection a fundamental condition for stopping the unfavourable development in the health of the population". According to the 1995 Human Development Report, pollution in Slovakia in 1989 reached a level where it became the *main reason for the degradation of human health*. The Ministry of Health and the Ministry of the Environment jointly published, in 1997 and in 2001, an Action Plan for Environment and Health of the Population of the Slovak Republic (Chapter 7, Section 2.1).

The *average life expectancy* of the Slovak population continued to rise during the 1990s; 69 years for men and 77 years for women. Circulatory diseases (56%) and cancer (23%) are the most common causes of death. Perinatal conditions improved significantly in the 1990s. The infant mortality rate in 1999 was 8.3 deaths/1 000 live births.

There are *local and regional disparities* in Slovakia with regard to the environmental quality and health risks. According to the Slovak Environmental Agency, the country's geographic areas are classified into five levels of environment quality, especially environmental pollution and health risks. A quarter of the population lives in areas (5% of the total territory) with the worst environmental quality: "heavily deteriorated environment"; these are often heavily industrialised areas. On the other hand, 12% of the population lives in areas (33% of the total territory) with the best environmental quality: "hygienically suitable areas without negative impact of human activity and with highly suitable environmental and residential conditions".

1.2 Environment and employment

The *unemployment rate* in 2000 was 18.5% of the total labour force, and 34% of the labour force under 25 years. Amongst the countries applying for EU membership, Slovak unemployment rates are among the highest. More than half of the unemployed are classified as long-term unemployed, having looked for jobs for more than 6 months. Another important feature of Slovak unemployment is the decreasing percentage of the working population in the total population: from 46% in 1990 to 39% in 1999. This decrease was very steep (5%) between 1990 and 1991. There are significant disparities concerning employment in Slovakia (regional, social, ethnic) (Chapter 7, Section 2.2).

A number of Slovaks are moving abroad to seek jobs. For example, the number of Slovaks working in the Czech Republic more than doubled between 1994 and 1998, reducing the unemployment rate by 1.5% alone. On the other hand, domestic *labour*

mobility is very low, as people own their dwellings (especially in rural areas), and as there is a shortage of flats in urban areas near potential workplaces.

Unemployment in the 1990s resulted mainly from outdated industrial structures, the breakdown of markets in the eastern Europe, and inadequate attention to small and medium-sized enterprises. It may be defined as primarily *structural unemployment*, as it was more the result of inadequate economic structure than economic recession. Since 1998, the cut in large infrastructure projects, the crises of a number of industrial enterprises, and the relatively slow privatisation process contributed to further unemployment.

Thus far little attention has been given to *jobs related to environmental protection* and nature conservation. Promoting small-scale energy production based on local renewable energy sources (forest biomass) would create new jobs for a number of people currently living in rural areas, villages, and small towns. The Slovak industry should also be able to provide combustion units and other equipment for power plants. Agro-tourism and organic farming might also create new jobs and strengthen rural development.

1.3 Environmental information

The Constitution of the Slovak Republic gives every citizen the right to current and complete information on the quality of the environment and the causes and consequences of its state (Article 45). Slovakia has transposed the 1990 EU Directive on environmental information into its Act on access to environmental information (171/1998) and has taken recent measures to facilitate access to environmental information. However, the country has not yet signed the 1998 Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters. Before being able to ratify and fully implement the Aarhus Convention the country has to continue transposing its legislation to meet the requirements of the revised EU Directive on *public access to environmental information* (2000/402) concerning industrial and commercial confidentiality, administrative or court appeals, and other questions related to access to justice.

In 1992, the government adopted the objective of creating an *environmental monitoring* and integrated environmental information system. A Co-ordination Council on Environmental Monitoring was established in the Ministry of the Environment, especially for methodological co-ordination and institutional co-operation. Progress has been slow in this respect.

According to the initial plan, information on the state of environment should be provided by 12 *national monitoring programmes* dedicated to air, water, soil, biota

(flora and fauna), forests, geology, radiation, waste, urban and rural communities, land use, contaminants in food, and impacts of environmental pressure on human populations. In Slovakia, these programmes are referred to as "partial monitoring systems". Due to lack of resources and institutional difficulties the plan has not been fully completed, but the most relevant parts are in place and were updated in 2000. The government's long-term objective is to achieve an integrated environmental monitoring and information system. In addition to national monitoring there are regional and local monitoring programmes, though more limited in time and scope.

The *Ministry of the Environment* should be authorised, together with other suppliers of environmental information, to further review all monitoring programmes, to identify a core monitoring system, with an integrated approach regardless of institutional boundaries. It should address funding, relevance to decision-making, information of the public, as well as prioritisation of information needs. The review could be done seeking common benefits and knowing that at least the current relative level of funding environmental monitoring is secured.

The Ministry of the Environment publishes a report on the *state of environment* every year and issued in 2000 a new edition of the Environment of the Slovak Republic and a report on Slovak Environmental Indicators. Other environmental information is published regularly. The Public Relations Office of the Ministry of the Environment provides information on decision making in environmental matters, state of the environment, and other environmental issues. Information is also given through Internet and a green phone line. The Statistical Office has published the Environmental Statistics 1995-99 and the recent Statistical Yearbook 2000. There are no data available on the number of legal cases concerning the environment. There are no specialised environmental prosecutors.

1.4 Environmental awareness and education

Apart from EIA processes, *participation in local decision making* is relatively weak and citizens are not always aware of their rights to participate. There are some 150 environmental NGOs in Slovakia. The Slovak Union of Nature and Landscape Protectors (SZOPK) and the Tree of Life (Strom Oivota) are perhaps the most well known. They also act as umbrella organisations. Many of the environmental NGOs are closely affiliated with universities and research institutions. The Slovak Society for Sustainable Living, ETP Slovakia, the Daphne Institute for Applied Ecology, and the Ekopolis Foundation are important non-governmental partners in the EU accession process. They are also helping to enhance environmental awareness and sustainable development in Slovakia. The Ministry of the Environment and the largest environmental NGOs co-operate informally through an institution

called "Ekoforum". In regards to industry, the Association of Industrial Ecology (ASPEK) provides industry (mainly its own members) with environmental information, education, and consulting services.

The highest co-ordinating body for environmental education is the *Central Council of Environmental Education*. It was established with the Ministry of Education in 1995. The government approved a resolution (846/1977) on environmental education, identifying five target groups or areas of environmental education: children and students (from day-care and pre-school to universities); general public (museums, libraries, mass-media, pamphlets); working population (employees of public and private sectors); state of the environment reporting; international co-operation in environmental education. Slovakia has 18 universities. There is at least one degree programme in ecology or in environmental protection and management in 13 of them.

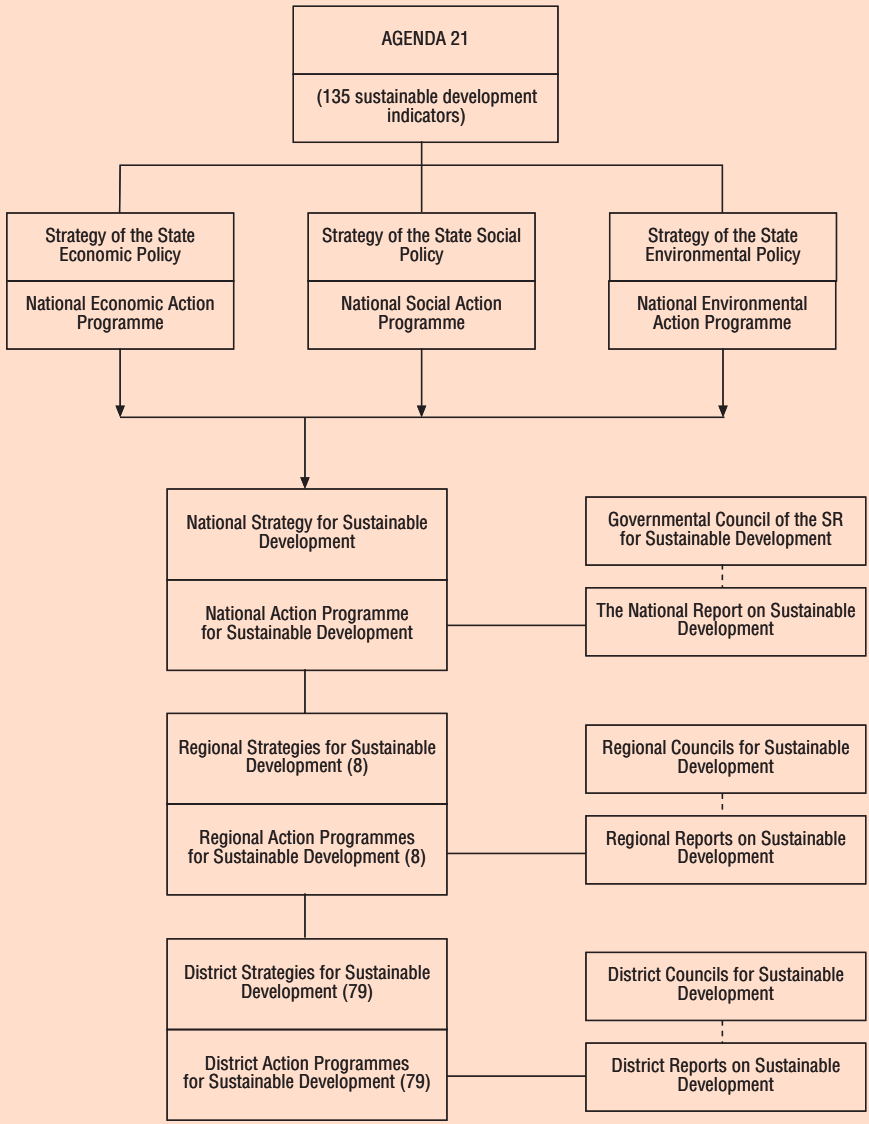
In 1997, the *Environmental Education and Promotion Centre* was established within the State Environment Agency in Banská Bystrica, with the aim of promoting environmental awareness in schools, workplaces, and amongst the public. The Centre is involved in creating environmental education programmes for target groups (teachers and other educators, researchers, journalists, students); producing and disseminating teaching and demonstration material; organising seminars, workshops, nature camps, and other special events to promote environmental awareness and education. Among the special events, the yearly international festival for environmental films, television programmes, and videos (ENVIROFILM) should be noted.

The government adopted in 1996 the National Programme of Environmental Assessment and Ecolabelling. Some 15 environmentally friendly products (mainly papers and paints) have been awarded the Slovak *ecolabel*.

1.5 Local Agenda 21

In 1992, Slovakia joined the Rio Declaration on the Environment and Development, and Agenda 21. In 1997, the government approved a plan for the implementation of Agenda 21 and the evaluation of sustainable development indicators, and in 1999, the government established the Slovak Republic Government Council for Sustainable Development. The complete Agenda 21 was published in 1996 including some comparable information on other Central and Eastern European countries. The 2001 National Strategy for Sustainable Development contains problem analysis, orientations, priority settings, and objectives for different time perspectives. According to the *implementation plan* for Agenda 21 (Figure 7.2), the National Strategy will be followed by a cross-sectoral National Action Plan for Sustainable Development.

Figure 7.2 **Implementation of Agenda 21 and evaluation of sustainable development**



Source: Ministry of the Environment.

The *implementation of Agenda 21 has been slow*. However, in 1997 the Ministry of the Environment arranged a series of seminars and courses in an effort to enhance the preparation of local and regional Agenda 21s. The Ministry launched a nation-wide campaign together with regional and local environmental offices to engage NGOs and municipalities to work on local Agenda 21s. As an additional support to this activity, the United Nations Development Programme (UNDP) in 1998, granted USD 450 000 to the Ministry of the Environment. The money was partly used to promote local and regional capacity building for sustainable development, and Agenda 21 in particular, through the so called "small grants" programme.

In many cases the *public response was positive*, as exemplified by the Regional Agenda 21 for the Central River Hron basin, which contains a development plan for the districts of Banská Bystrica, Zvolen, and iar nad Hronom, which are among the most polluted industrial areas in Slovakia. The preparation of the development plans brought together all relevant public and private players.

2. Focus on Selected Topics

2.1 Action plans for environment and health

The Ministry of Health and the Ministry of the Environment prepared jointly an *Action Plan for Environment and Health* of the Population of the Slovak Republic, which was approved by the government in 1997. The plan identifies seven priority areas: food safety; ambient air pollution; public drinking water supply; occupational health; health promotion at workplaces; radiation load; environmental quality in urban and rural residential areas. In each priority area a number of environmentally related health problems are described, objectives to solve them are offered, and actions are suggested for responsible authorities. According to the second Action Plan for Environment and Health in 2001, some of the actions suggested in the first Plan, have been carried out, some have not. The latter because of lack of funds and other resources or insufficient co-operation between relevant authorities.

The number of *respiratory and allergic diseases* has been growing. Severe onco-logical diseases (cancers) became more frequent. Cancer mortality more than doubled since 1965. At the same time air pollution in heavily industrialised areas (e.g. Nováky and iar nad Hronom) and large cities is a constant environmental problem. Water and food chain pollution (by nitrates, pesticides, and heavy metals, especially mercury and cadmium) is another environmental problem. Numerous epidemiolo-gical studies (in Slovakia and elsewhere) demonstrated that there exists a positive correlation between the occurrence of the diseases and the pollutants mentioned.

However, these studies do not present precise quantitative data on the relationship between human health and environmental quality. The results are also influenced by life-style (alcohol, smoking, diet, exercise) and by genetic heterogeneity.

The Action Plan for Environment and Health also presents data on *occupational health*. Workers in heavy industry are more exposed than others to risk factors in the working environment. Noise is the most important occupational risk factor, followed by dust and chemicals. The occurrence of occupational asthma rose dramatically during the 1990s.

Concerning *drinking water* and food safety, the incidences of salmonellosis and most other alimentary bacterial infections grew over the period 1975-1998, whereas the incidences of dysentery and viral hepatitis-A decreased.

2.2 Disparities

Employment disparities

There are large *regional disparities in unemployment rates*, the rate being lowest in the capital and highest in outlying districts (e.g. eastern and southern parts of the country). For example, in 1995 the unemployment rate was 4.7% in Bratislava and 26.4% in Rimavská Sobota. In 1999, the range was from 3% to 34%. These disparities can be partly explained by the loss, since 1989, of more than half of the agricultural jobs due to the "elimination" of agricultural co-operatives; today agriculture accounts for only 5% of the labour force (Chapter 6).

In the past, the monopoly position of the state and bigger municipalities in providing public *transport services* helped to lessen regional disparities. But now, unprofitable routes are being closed, as public transport is progressively privatised, adding to the regional disparities and difficulties in commuting.

Unemployment also contributed to the deepening of *social disparities*, as it hits hardest socially weaker groups, such as young untrained graduates, middle aged low-skilled workers, and certain ethnic minorities. In 2000, the unemployment rate was more than 30% among the untrained or low-skilled job-seekers and over 20% of the unemployed were Roma. Jobs related to environmental protection or nature conservation have not been created for low-skilled workers.

Income disparities and energy prices

Over the 1990s, the Slovak GDP grew by 11% and *GDP per capita* now reaches USD 10 430. The development of energy prices illustrates the social problems countries in transition have in trying both to improve the standard of living and "put the prices right" at the same time.

Energy prices rose over the past five years and now make up around 20% of the average household budget (compared to less than 5% for an average household in Germany). For instance, during only a few months in 1999, the price of electricity grew in Slovakia by 135% and heating by 112%, while water prices increased by 88% and rents by 70% (Chapter 6). Poorer customers are unable to pay market prices for energy, although energy prices are still below the real costs. The government announced the phase out of all its subsidies to energy; but if done too fast and too soon, it may create economic and social problems for the poorest households. Another way would be to eliminate hidden *cross-subsidies* from large industrial consumers to households and replace them for the time being with explicit government subsidies for those who cannot pay.

Environmental disparities and ethnic minorities

The largest minority group in Slovakia, *Hungarians*, represents a tenth of the population. The social disparities between the majority of Slovak people and the Hungarian minority are nowadays relatively small. There seems to be no significant discrimination related to access to environmental quality and natural resources. Nevertheless, they face the same difficulties that most ethnic minorities in Europe face, in preserving their own culture.

The second largest minority group in Slovakia, *Roma people* (Gypsies), represents, according to the official statistics, 1.7% of the population, although there are higher estimates. They are the poorest, the most unemployed, the least educated, the shortest-lived, the most welfare-dependent, the most imprisoned, and they have the most children (4.2 children in average per Roma family compared to 1.5 amongst the rest of the population). At least 6 million Romas live in various parts of Europe, mostly in Central and Eastern Europe or around the Mediterranean. Four out of five Roma in Slovakia have no job. Illiteracy among the Romas is rising: only 3% of them finish secondary school and only part of them speak Slovak fairly. Contrary to the rest of the Slovak population (including the Hungarian minority), the life expectancy of the Roma population is falling. For instance tuberculosis is again common in Roma communities, demonstrating the poor quality of the Roma's ambient environment.

The Roma minority population lives out of reach of basic *environmental services*, such as safe drinking water or organised waste management. They are often without good access to most other public social services (education, health care). They usually camp in places that are least suitable for dwelling, because of the inferior environmental quality: very close to heavy traffic (motorways, railway yards, airports) or to waste dumps and polluting industries.

Part III

INTERNATIONAL COMMITMENTS

8

INTERNATIONAL CO-OPERATION

Recommendations

The following recommendations are part of the overall conclusions and recommendations of the Environmental Performance Review of the Slovak Republic:

- ratify and implement relevant *international agreements*;
- continue the transposition of *EU environmental legislation*, with appropriate resources, and strengthen the implementation and enforcement of related new legislation and commitments;
- set national commitments for reducing *greenhouse gas emissions*, and develop and implement policies and measures accordingly, and improve energy efficiency;
- contribute to the effective implementation of international agreements concerning the *Danube and its river basin*, as well as the Black Sea;
- continue co-operation in the field of the environment with its *neighbouring countries*;
- make full use of opportunities for *foreign assistance and foreign direct investment*, with the aim of strengthening environmental infrastructure and contributing to the solution of international environmental problems.

Conclusions

Slovakia is now a party to most worldwide and relevant regional *environmental agreements* (Annexes II.A and II.B). The country is financially contributing to the UNEP, Montreal Protocol, Biodiversity Convention and CITES. Slovakia has promoted bi- and multilateral co-operation with its *neighbouring countries* and participates in the Danube basin management multilateral process. Slovakia is now a *Member of the*

OECD and the Council of Europe: this had important effects in policy areas such as chemicals control, waste management, industrial accidents, public participation, and protection of endangered species. Slovakia easily fulfilled its commitments on *transboundary air pollution* (LRTAP), with considerable decreases in the emissions of classical air pollutants (e.g. SO_x, NO_x, suspended particulates, and VOCs). Concerning *climate change*, Slovakia has prepared two national reports to the meetings of the Contracting Parties. CO_2 emissions have been reduced and are well below their 1990 level in 2000; they may also be 8% below the 1990 level in 2010.

However, Slovakia has not yet adopted a co-ordinated national strategy to combat climate change. Postponing the removal of all direct subsidies and cross-subsidies relating to electricity prices, partly for social reasons, has delayed further improvements in *energy intensity* and consequent reduction of greenhouse gas emissions. With a substantial increase in car and truck traffic between Slovakia and other European countries, sustainable transport is a concern. In the context of the *EU accession process*, EU legislation has already started being transposed into the national law. However, the remaining legislative task is still considerable, and concerns a number of topics dealt with by different ministries. Increased emphasis on *implementation and enforcement* of environmental law is much desirable in this respect. *Implementation* of some EU legislation will need *time, because of the cost of creating a new environmental infrastructure and of the social constraints*: Slovakia has requested transition periods for a number of EU environmental directives.

1. Evaluation of Performance

During the 1990s, Slovakia adapted to the changes that took place in its relations with other countries after the Velvet Revolution in 1989 and after the federation had dissolved in 1993. Because these changes occurred over a short period of time, *challenges related to international co-operation have been considerable*.

The main goals of international environmental co-operation have been i) to contribute to resolving international environmental problems and ii) to prepare for membership to international organisations. After acceding to the OECD in 2000, Slovakia is now giving *priority to accession to the European Union.*

Slovakia has ratified and implemented a large number of international agreements, strengthened its bilateral relations with its neighbours, and contributed to the solution of regional environmental problems (e.g. air pollution, Danube basin management) as well as global ones (e.g. biodiversity, climate change). It is in the process of harmonising its legal system with those of other OECD countries and with the European Union.

1.1 Multilateral agreements

At the end of the 1980s, a significant number of international environmental agreements had not been signed or ratified by Slovakia (or its predecessor the Czechoslovak Federation). The situation began to change in the early 1990s, and the country has now signed and ratified most pertinent agreements (Annexes II.A and II.B). However some outstanding environmental agreements should be incorporated in the national legal system. Regarding *worldwide multilateral agreements* relevant to Slovakia, the country has not signed the:

– 1960 Paris Convention on Third Party Liability for Nuclear Damage;

– 1963 Vienna Convention on Civil Liability for Nuclear Damage;

– 1988 Vienna Joint protocol, relating to both the above Conventions;

– 1983 Geneva International agreement on tropical timber (revised 1994);

– 1997 New York Convention on Non-navigational Uses of International Rivers;

– 1997 Vienna Convention on Supplementary Compensation for Nuclear Damage.

In 2001, Slovakia ratified the 1996 Hague Agreement on Conservation of African-Eurasian Migratory Waterbirds.

Concerning relevant *regional multilateral environmental agreements*, Slovakia has not signed the:

– 1992 Helsinki Convention on Transboundary Effects of Industrial Accidents;

– 1993 Lugano Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment;

– 1998 Aarhus Convention on Access to Environmental Information and Public Participation in Environmental Decision-making;

– 1998 Strasbourg Convention on Protection of the Environment Through Criminal Law;

– 2000 Florence European Landscape Convention.

As a landlocked country, Slovakia is not a party to most maritime conventions. It nevertheless contributes to the pollution of the Black Sea from land-based sources located on the Danube or its tributaries. Slovakia has participated actively in the preparation and follow-up of *conventions in the field of biodiversity*, such as:

– 1971 Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat;

– 1979 Bonn Convention on Conservation of Migratory Species of Wild Animals and especially its 1991 London Agreement on Conservation of Bats in Europe;
– 2000 Cartagena Protocol on Biosafety (under the 1992 Rio Convention on Biological Diversity).

Slovakia has given general *support* to UNEP, the Montreal Protocol, the Biodiversity Convention, and CITES. In 2000, the UNEP Environmental Fund received a voluntary contribution from Slovakia.

1.2 Accession processes

Membership in the OECD and the Council of Europe

Slovakia established ties with the OECD in 1991, when participating together with the Czech Republic, Hungary, and Poland in a programme of co-operation initiated by the organisation, called "Partners in Transition". The Slovak government applied for accession to the OECD in 1994. Slovakia reported on the willingness and ability of the country to meet the obligations of OECD membership in the field of environment in 1996 and 2000. Having reported on the incorporation of the OECD Decisions and Recommendations in its legal system, Slovakia *became a Member of the OECD in December 2000*. While Slovakia fulfilled most of its OECD commitments regarding the environment, further steps are still required concerning several decisions of the OECD Council on instruments in the field of waste and chemicals.

Slovakia *became a member of the Council of Europe in 1993* and signed the 1979 Bern Convention on the Conservation on European Wildlife and Natural Habitats in 1996.

Process of accession to the EU

The *European Agreement on Association* between the European Community and its member states on the one side and Slovakia on the other was signed in 1993 (Luxembourg). Slovakia declared its interest to join the European Union and applied for membership in 1995. Since then, co-operation with the EU has been intensive. The country's highest priority with regard to environmental policy and international co-operation is to harmonise its environmental legislation with that of the EU. The present Slovak government has also been actively promoting co-operation up to the level of prime-ministers between the so called Visegrád-group (V4: Czech Republic, Hungary, Poland, and Slovakia) to address matters of common interest, notably EU accession.

Studies on the legal and economic aspects of implementing EU legislation were intensified in 1998. They showed that the work involved is very considerable and that

many modifications of Slovak legislation will be needed in order to arrive at harmonisation. When implementation of a Directive requires joint work by more than one ministry, the harmonisation process can be fairly slow (e.g. for the Seveso II and IPPC Directives). It should also be noted that certain areas of current Slovak legislation on air management and nature conservation is, in some respects, more stringent than the corresponding EU legislation. While Slovakia has not requested any derogation from the implementation of the Acquis Communitaire, it has requested fairly long transition periods in a number of areas.

The reasons for *transition periods* are mainly economic and institutional. The country needs to improve its economic and social performance. It also requires more time to make all the necessary investments and fully implement the legislation of the EU. In addition to agriculture, it is not surprising that major transition periods have been requested for the environment and energy sectors. The high investments and complex technical solutions as well as the institutional restructuring needed in the environment and energy sectors must be spread over a number of years.

Concerning the environment, transition periods have been requested for seven EU-Directives. They are commonly known as the Directives on: emissions from large combustion plants, emissions of volatile organic compounds (VOCs), urban waste water treatment, dangerous substances in the aquatic environment, incineration of waste, integrated pollution prevention and control (IPPC), and packaging and packaging waste. The *duration of the requested transition periods* range from 5 to 14 years, i.e. from 2006 to 2015.

Estimates of the *total environmental costs of qualifying for accession* are unclear. According to one Slovak estimate they could amount roughly to SKK 220 billion or EUR 5 billion over a period of 35 years, making 1% of GDP per year over the 35 years period.

The multilateral environmental assistance at Slovakia's disposal was SKK 419 million in 2000 (Figure 8.1). More than 85% of the funding comes from the *EU PHARE programme*, namely the PHARE Environmental Grant Scheme (EGS) and the PHARE Cross-Boundary co-operation (CBC) fund. The latter is not directly under the responsibility of the Ministry of the Environment.

1.3 Bilateral and regional relations

Poland

There are intergovernmental agreements with Poland on water management and transboundary co-operation existing since 1958. An agreement on co-operation in

environmental protection was signed in 1993. Slovakia and Poland have been co-operating since 1991 on bilateral *nature conservation* in the Tatra Mountains, where tourism especially from Poland puts considerable local pressure on the nature. There is a joint National Park (Beskides) in the Carpathian Mountains on both sides of the Slovak and Polish border.

Ukraine

Bilateral co-operation with Ukraine has been hampered mainly because of their economic and institutional difficulties. *Exchange of experts* is perhaps the most feasible type of co-operation for the moment. A bilateral agreement on transboundary waters exists between Slovakia and Ukraine. There is also a joint UNESCO biosphere reserve in the east Carpathians, covering parts of Poland, Slovakia, and Ukraine since 1998. Slovak experts have participated in the international research and development project on the Dnieper river basin management.

Hungary

The fact that Slovakia has a strong Hungarian minority makes environmental co-operation between these two countries particularly important. The bilateral agreement on co-operation in the field of the environment was renegotiated in 1999. One of the main issues between the two countries is a *dispute over a joint hydropower project (Gabčíkovo-Nagymaros dam)* on the Danube (Chapter 8, Section 2.1). The main issue for Hungary was the environmental damage, notably to the wetlands, caused by diverting the Danube in Slovakia. An International Court of Justice decision has to be implemented soon by the two countries in a spirit of good neighbourliness. Looking for a compromise, Slovakia has already considerably changed the way the Gabčíkovo dam is operated, and Hungary decided not to build the dam in Nagymaros, near the historic Visegrád castle. Slovakia and Hungary are now co-operating in a joint monitoring programme on the Danube ecosystem, and in managing common transfrontier protected areas (Aggtelek National Park and the Slovak Kerst Landscape Protection Area). There is another joint protected area (Danube-Ipel/Ipoly) on both sides of the Slovak and Hungarian border. There is a bilateral agreement on early warning in case of a radiation accident.

Austria

Environmental co-operation with Austria is based on a *bilateral agreement*, renegotiated in 1996. There is a bilateral commission on land use planning between the two countries. In addition a bilateral agreement on early warning in case of a radiation accident exists. Austria, during the 1990s, supported environmental protection in

Slovakia by financing air pollution prevention technologies (e.g. in Nováky), sewage water treatment facilities, waste management projects, and monitoring and research related to nature protection, notably concerning areas around the Danube.

Czech Republic

The co-operation in the field of environmental protection and planning with the Czech Republic is based on an agreement from 1992. This agreement was followed by an *implementation protocol* in 1996 establishing six joint working groups (air protection, water protection and usage, waste management, chemicals and risk assessment, nature protection, and environmental impact assessment). An agreement on transboundary waters was negotiated in 1999. At the start, progress in environmental co-operation with the Czech Republic was perhaps not as straightforward as in the case of some other neighbouring countries, but now co-operation has improved substantially.

Bilateral co-operation with other countries

There are bilateral agreements on environmental co-operation between Slovakia and each of its five neighbours (Austria, the Czech Republic, Hungary, Poland, and Ukraine) as well as with 19 other countries or states (Belarus, Belgium, Bulgaria, Canada, Croatia, Cuba, Denmark, Germany, Lithuania, the Netherlands, Norway, Romania, the Russian Federation, Switzerland, Turkey, United States of America: State of Maryland, and Uzbekistan). The purpose of these agreements is generally to *share know-how and technical expertise* in the field of environmental protection.

Multilateral regional co-operation

The Ministry of the Environment has initiated and actively promoted multilateral environmental co-operation among countries of the *Visegrád group* (V4), i.e. the Czech Republic, Hungary, Poland, and Slovakia. Since 1999, the environment ministers of the Visegrád group have met twice a year to discus issues related particularly to regional co-operation and the EU accession. Common principles applied to physical planning are an example of the type of regional co-operation pursued among the environmental and planning authorities and experts of these four countries.

Slovakia is a participant of the *Inter-Regional Association of the Carpathian Euroregion (CE)* together with Hungary, Poland, Romania, and Ukraine. The aim of the Euroregions is to promote further integration within at the regional level by extending democracy, overcoming isolation, promoting economic growth, and improving standards of living. The participation of Slovakia in this type of co-operation has been slow, although the country has ratified the European Outline Convention on Transfrontier co-operation Between Territorial Communities or Authorities (Madrid, 1980)

and its additional protocol. The regional cross-border co-operation between Slovakia and Poland has been more active concerning the environment, than with the other three member countries of the Carpathian Euroregion.

In 1997, Slovakia signed the *Torun declaration* together with Belarus, Bulgaria, Estonia, Latvia, Lithuania, Poland, Republic of Moldova, Romania, and Ukraine. The signatory countries have committed themselves to co-operating in various fields of environmental protection, including general and institutional issues of environmental policy, climate change, energy and health issues, environmental impact assessment, monitoring, and regional sustainable development strategies (Chapter 8, Section 2.2). Representatives of the signatories meet annually to share information and experience.

1.4 Transfrontier European co-operation

Transfrontier air pollution

Slovakia has suffered from serious *air pollution of domestic as well transboundary origin* for at least 25 years. Acidity contributes to significant damage, especially in forests. Emissions have been reduced in the neighbouring countries Austria, the Czech Republic, Hungary, Poland, and Ukraine, as well as in Slovakia itself (Chapter 2). Consequently the acid deposition levels in the country have diminished considerably.

Slovakia signed the UN *Convention on Long-range Transboundary Air Pollution* (Geneva, 1979) in 1984, and its successive protocols (Geneva, Helsinki, Sofia, Oslo, Aarhus, and Göteborg). The Convention on LRTAP and its protocols are aimed at reducing and monitoring emissions of SO_2, NO_x, volatile organic compounds (VOCs), heavy metals, persistent organic compounds (POPs), acidification, eutrophication, and tropospheric ozone.

It *fulfilled all its commitments under these protocols* by bringing down SO_2 emissions by almost 70%, and NO_x as well as VOCs emissions both by 47%, in the ten years between 1989 and 1999 (Figure 2.1). In addition to the drop in industrial production in the early 1990s, the reductions resulted mainly from the fuel switch from domestic brown coal to imported natural gas and the introduction of more environmentally friendly combustion techniques. Nevertheless, because of the very energy intensive economy and fairly low energy efficiency, the per capita or per unit of GDP emissions are higher than the European OECD average. Emissions of NO_x are also higher, in particular per unit of GDP. Further abatement efforts are needed, especially in areas where air quality is poor.

According to data published in 1998, Slovakia is a *net exporter of both SO_2 and NO_x*. Ukraine is the main transboundary receiver of both sulphur and nitrogen emitted from Slovakia (Table 8.1). Deposition of SO_x and NO_x is mostly from foreign sources. One quarter of the sulphur deposited originates from Hungary and the major contributor to the NO_x received is Poland. There are large combustion sources especially in Hungary and Poland, which have transboundary effects on Slovakia.

Transfrontier water pollution

International co-operation regarding the use of the *Danube river* is based upon the Sofia Convention on co-operation for the Protection and Sustainable Use of the Danube (1994). Slovakia (as well as other Danube states) is a party to the convention and actively participates in its working groups. An interim commission of the convention is in the process of preparing co-operative activities. The effective implementation of this convention is also essential for the protection of the Black Sea.

Transfrontier movements of hazardous waste

Slovakia has ratified and implemented the *Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal* and the OECD Decisions on hazardous waste (Chapter 4).

Table 8.1 **Acid deposition,** 1998

(100 tonnes)

Country of origin or recipient	Acid deposition from Slovakia		Acid deposition to Slovakia	
	SO_x	NO_x	SO_x	NO_x
Slovakia	149	48	149	48
Austria	17	5	8	17
Czech Republic	33	12	56	42
Hungary	79	40	224	48
Poland	99	43	177	57
Ukraine	108	46	10	3
Other sources	421	150	239	150
Total	863	344	906	365

Source: EMEP.

The Secretariat of the Basel Convention and the Slovak government, with the support of the Swiss government, agreed in 1997 to establish the *Regional Training Centre* for the implementation of the Basel Convention and transfer of technologies for the region of Central and Eastern Europe. This training centre is at the Waste Management Centre of the Slovak Environmental Agency's branch in Bratislava.

1.5 Climate change

In the 20th century, Slovakia has experienced an *increase of mean annual air temperature* by about 1 °C, a 5-15% decrease of annual precipitation totals as well as a significant decrease in relative air humidity and snow cover. The 1993 Strategy of National Environmental Policy states as priority "global environmental security and protection of the atmosphere against pollution".

The share of world anthropogenic *greenhouse gases emission* in Slovakia is less than 0.2%. The annual greenhouse gas emissions per head have been decreasing during the 1990s and were in 1998 about 8 tons, still ranking Slovakia among the countries with the highest per capita GHG emissions in the world (Chapter 2). The principal GHG were in 1998 CO_2 (83%), CH_4 (11%), and N_2O (6%). Energy production is responsible for more than a half of the CO_2 emissions.

The total GHG emissions *decreased* by 25% between 1990 and 1994 (as GDP did by 23%) and have been more or less stable since then. Between 1990 and 1998, CO_2 emissions decreased by 27%, CH_4 by 26%, and N_2O by 46%.

Slovakia ratified and acceded to the *UN Framework Convention on Climate Change* (New York, 1992) in 1994 and signed as an Annex I party the 1997 Kyoto Protocol of the Convention (1997). Thus Slovakia has agreed under the Protocol (not yet in force) to stabilise its greenhouse gas (GHG) emissions at the 1990 level by the year 2000 and to reduce its GHG emissions by 8% by the period 2008-12. The government approved and submitted two national communications on climate change to the UNFCCC and just finished its third one. The first national communication was submitted in 1995 and the second in 1997. Slovakia is also committed to the "*Toronto target*" i.e. a 20% CO_2 emission reduction in 2005 compared to 1988.

The UNFCCC report on the in-depth review of the *second national communication* of Slovakia (in 1999), noted that though the achievements of the "Toronto target" was earlier considered almost sure, because of the economic recession associated with the transition, additional measures might now be needed to meet the target: i) strong energy saving measures, or ii) substantial industrial restructuring aiming at reducing the energy intensity of industry, or iii) both. The review concluded also that stabilising the GHG emissions at the "Toronto target" in a longer run (2010 and beyond) would, in addition

to the policies and measures mentioned earlier, call for a more intensive use of renewable energy sources. Moreover, it was noted, that no co-ordinated national strategy for combating climate change and achieving domestic targets existed.

To improve *energy pricing*, for instance, electricity tariffs for households and industry have been raised several times (Chapter 6). Further government measures to reach full deregulation of the electricity market are still necessary. Nevertheless, such price rises are politically unpopular and create unwanted social problems. Other measures, especially energy savings and the use of renewable energy sources, have only started to be implemented. An on-going energy shift from coal to gas has already brought significant reductions in CO_2 emissions.

Overall, Slovakia had no difficulties in presenting 2000 CO_2 emissions well under the stabilisation target. Likewise, it should be relatively easy to *achieve an 8% reduction* for the period 2008-12 as compared to 1990, even if only modest measures are taken to reduce the CO_2 emissions.

1.6 Other global issues

Protection of the ozone layer

Since 1990, Slovakia has applied the 1985 *Vienna Convention for the Protection of the Ozone Layer* and its 1987 Montreal Protocol on Substances that deplete the ozone layer. In 1996, the Slovak government approved the Action programme for the Gradual elimination of the use of substances depleting the ozone layer. There are no facilities that produce ozone depleting substances in Slovakia, and the consumption of these substances has decreased by roughly 98% in the 1990s.

Slovakia has adopted strong legislation to restrict the general use of the most important ozone depleting substances (ODS). It *fulfilled its international commitments under the Montreal Protocol* by reducing CFC consumption from 1 979 ODP tonnes in 1989 to 381 ODP tonnes in 1995 and 1 ODP tonne in 1997 (laboratory use only) and by reducing halon consumption from 47 ODP tonnes in 1986 to less than one ODP tonne in 1994 (and thereafter). It has also greatly reduced the consumption of carbon tetrachloride and methyl chloroform. Producers and importers of ODS must obtain a permit and must pay a charge of SKK 100/kg to the State Environmental Fund. Sprays containing hydrochlorofluorocarbons (HCFCs) and HCFC production have been banned since 2001.

Chlorofluorocarbons (CFCs) are being recuperated for recycling and there is apparently no shortage of CFCs for existing installations. Projects are being implemented for gradual withdrawal of existing ODS with financial assistance from the

Global Environment Facility (GEF) (USD 2.3 million) and the State Environmental Fund (SKK 47 million in 1996). Further progress is needed in order to collect and recycle or destroy all regulated substances from existing refrigeration and air-conditioning facilities and from fire-fighting equipment. Much existing ODS is still being lost.

Biological diversity

Nature and biodiversity are major assets for Slovakia. Slovakia has *ratified most international conventions on nature protection*. It has also adopted implementing legislation for a series of conventions that had been ratified for several years. The 1979 Bern Convention on the Conservation of European Wildlife and Natural Habitats was only ratified in June 1996 and the implementing law for the 1973 Convention on International Trade in Endangered Species (CITES), ratified in 1992, is from 1997. Slovakia submitted its latest report to CITES in 1996 and has prepared its National Biodiversity Conservation Strategy in 1997 (Chapter 5).

1.7 Development assistance

Assistance from Slovakia

The Slovak government has approved the *provision of assistance to developing and transition countries*. Contributions by Slovakia have been made (e.g. to the UNEP Environmental Fund, the trustfunds of the UNFCCC, and the Montreal Protocol). Bilateral environmental financial aid has been given to Ukraine and Uganda (equipment for the WMO monitoring network).

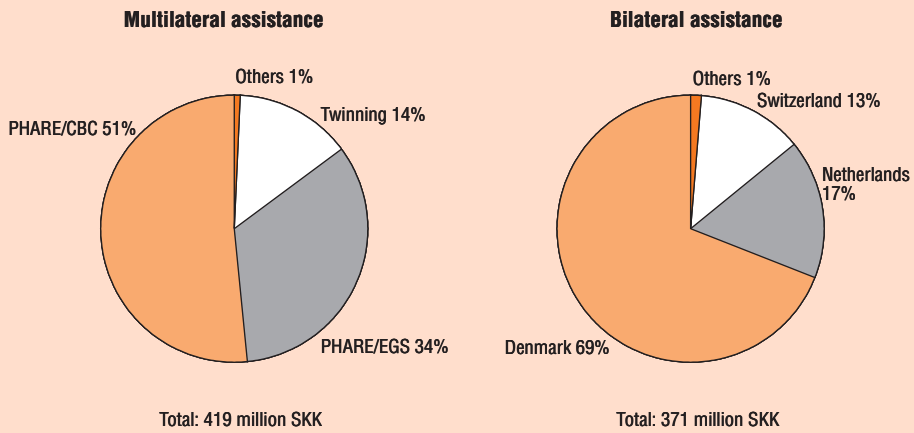
Assistance to Slovakia

Slovakia has received *foreign assistance* to promote its economic development and, in particular, to improve its performance on pollution prevention and control (Figure 8.1). Among Central and Eastern European countries, Slovakia received in 1994-97 a fourth of the amount received by the Czech Republic in terms of environmental assistance, Slovakia being the third largest recipient per capita.

In 1998, EUR 15 million was provided by the *PHARE programme of European Union*. Part of this funding has been used for the environment. Slovakia was also granted EUR 14 million from the EU's Instrument for Structural Policies of Pre-Accession (ISPA) (Chapter 6).

The *European Bank for Reconstruction and Development* has given financial support for the aluminium plant in iar nad Hronom. The plant is a major point source for air pollution and the aluminium industry is very energy intensive.

Figure 8.1 **Development assistance to Slovakia,** 2000



Source: Ministry of the Environment.

In 2000, the *total international funding* for environmental purposes amounted to SKK 790 million (including EU funding). Of this total assistance to Slovakia the multilateral part was SKK 419 million and the bilateral part SKK 371 million (Figure 8.1). Many countries provide bilateral aid to Slovakia. In 2000 Denmark (69%), the Netherlands (17%), and Switzerland (13%) were the most important donors. The Ministry of the Environment takes part in six on-going twinning projects on air (with Austria), water (with the Netherlands), waste and environmental impact assessment (with Germany), inspection (with Denmark), and approximation (with Italy).

2. Focus on Selected Topics

2.1 The Gabčíkovo-Nagymaros dam dispute

In 1992, *Slovakia diverted the Danube* at Cunovo (in Slovak territory) for the purpose of increasing electricity generation capacity, for flood control, and improved navigation (Gabčíkovo dam). Their decision to build the Gabčíkovo dam came after Hungary backed out of a 1977 treaty between the two countries to build a joint dam

system. In 1989, Hungary halted construction of the Nagymaros dam, further downstream, and has repeatedly pressed for suspension of the treaty. Hungary alleged that the dam would cause environmental harm and disrupt the water supply of Budapest. Slovakia has denied these allegations and insists that Hungary carry out its treaty obligations. Subsequently, the Gabčíkovo dam has asserted Hungary's access to Danube waters.

In 1997, *Hungary and Slovakia went before the International Court of Justice* (ICJ). This was the first environmental case to be heard by the ICJ. In its judgement, the Court found that both Hungary and Slovakia had breached their legal obligations. It declared that the treaty was still in force, while taking into account the factual situation that had developed since 1989. Negotiations about a Framework Agreement, in accordance with the Court's judgement, are still ongoing. A special task force was created in Slovakia, with participation of the Ministry of the Environment, as well as expert committees in both countries.

By diverting the Danube, *water flow in the original river was reduced* to 10% of its average. Dead trees litter the old river bed and numerous species of flora and fauna have died out. Environmental damages have affected the last inland delta in Europe, specifically two large islands, the Szigetkov in Hungary and Zitny Ostrov in Slovakia. Both are several hundred square kilometres and support a unique array of wetlands. The affected area is also central Europe's largest, high quality underground water reserve, providing 45% of the drinking water to both Slovakia and Hungary. Most (80%) of the Gabčíkovo dam construction was completed before the creation of the Ministry of the Environment in 1992. Since 1994, this type of project must undergo an environmental impact assessment.

2.2 Follow-up to Rio

Slovakia endorsed the Rio Declaration and its 20 principles, and is including them in its environmental policies. However, it has taken few measures so far to implement a number of principles, such as the precautionary principle and the principle of public participation, in its legislation. The new *Act on free access to information* (211/2000) should facilitate access to environmental information which was not released in the past, partly because the legal framework lacked clarity in respect to issues such as commercial or business confidentiality. Little progress has been made on public participation, and much effort will be needed before Slovakia is in a position to ratify the Aarhus Convention in this regard. Concerning *liability for new environmental damage*, regulations to implement the principles adopted in the 1992 Environment Act have not been prepared and there is uncertainty as to whether Slovakia is in favour of the principles adopted by the Council of Europe (Lugano

Convention). The polluter pays principle, a cornerstone of both OECD and EU environmental policies, is mentioned in the second National Environmental Action Programme (NEAP II) approved in 1999. However, environmentally harmful subsidies, tax reliefs, and other instruments are still used for economic and social (employment) reasons.

Integrating economic, social, and environmental considerations in practice has been difficult, as in a number of other OECD countries. Nevertheless, some progress has been made in promoting a dialogue among social groups, in engaging all partners on future development. Attempts to promote a new approach at the ministerial level involving closer integration between ministries are also positive. Slovakia has prepared its *National Sustainable Development Strategy (NSDS)* in 2001. Based on the NSDS and after inserting the principles of sustainable development within sectoral (economic, social, environmental, and information) strategies, a National Action Plan of Sustainable Development (NAPSD) will be prepared. UNDP granted in 1998 USD 450 000 to the Ministry of the Environment to support capacity building for sustainable development in Slovakia.

The complete Agenda 21 was issued in Slovakia in 1996. The document contains some comparable information on other Central and Eastern European countries as well. In 1997, the preparation of *local and regional Agenda 21s* was encouraged by the Ministry of the Environment using courses and seminars. The Ministry agreed, together with the help of the regional and local offices, to promote local Agenda 21s, to launch a nationwide campaign, and to consult NGOs and municipalities. Several cities and local NGOs have responded positively and have taken action to contribute to sustainable development at their level. This has resulted in a number of local and regional Agenda 21 reports (Chapter 7).

ANNEXES

ANNEX I.A: SELECTED ENVIRONMENTAL DATA (1)

		CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN
LAND													
Total area (1000 km^2)		9971	1958	9364	378	99	7713	270	84	31	79	43	338
Major protected areas (% of total area)	*2*	9.6	8.2	21.2	6.8	6.9	7.7	23.5	29.2	2.8	16.2	32.0	8.4
Nitrogenous fertiliser use (t/km^2 of arable land)		3.9	4.7	6.3	11.1	23.4	1.7	37.4	8.7	18.4	6.6	11.0	7.2
Pesticide use (t/km^2 of arable land)		0.07	0.13	0.21	1.50	1.29	0.23	0.85	0.25	0.92	0.12	0.15	-
FOREST													
Forest area (% of land area)		45.3	33.4	32.6	66.8	65.2	19.4	29.5	47.6	22.2	34.1	10.5	75.5
Use of forest resources (harvest/growth)		0.4	0.2	0.6	0.3	0.1	..	0.6	0.6	0.9	0.7	0.6	0.8
Tropical wood imports (USD/cap.)	*3*	1.6	0.2	2.2	10.7	6.1	4.0	3.4	0.5	24.3	0.3	3.8	1.4
THREATENED SPECIES													
Mammals (% of species known)		19.2	33.2	10.5	23.5	17.0	14.9	15.2	35.4	31.6	33.3	24.0	11.9
Birds (% of species known)		10.8	16.9	7.2	12.9	15.0	6.4	25.3	37.0	27.5	55.9	10.6	6.7
Fish (% of species known)		6.4	5.7	2.4	25.3	1.3	0.4	0.8	65.5	54.3	29.2	18.2	11.9
WATER													
Water withdrawal (% of gross annual availability)		1.7	17.4	19.9	20.8	35.6	4.3	0.6	2.7	42.5	15.6	15.7	2.2
Public waste water treatment (% of population served)		78	22	71	62	53	..	80	75	27	59	87	77
Fish catches (% of world catches)		1.1	1.3	5.1	5.6	2.3	0.2	0.6	-	-	-	1.5	0.2
AIR													
Emissions of sulphur oxides (kg/cap.)		89.7	24.5	68.9	6.7	32.9	100.6	12.3	7.1	23.6	68.0	20.7	19.5
(kg/1000 USD GDP)	*4*	3.7	3.3	2.3	0.3	2.3	4.7	0.7	0.3	1.1	5.3	0.9	0.9
% change (1990-late 1990s)		-19	..	-14	-5	-7	-3	3	-37	-25	-63	-50	-61
Emissions of nitrogen oxides (kg/cap.)		67.8	17.3	79.8	15.5	27.6	118.3	45.9	21.3	32.8	41.1	46.9	50.5
(kg/1000 USD GDP)	*4*	2.9	2.3	2.7	0.6	1.9	5.5	2.6	1.0	1.5	3.2	2.0	2.4
% change (1990-late 1990s)		-5	..	-	6	36	-4	23	-12	-3	-43	-12	-13
Emissions of carbon dioxide (t./cap.)	*5*	15.8	3.7	20.0	8.9	8.0	16.6	8.1	7.6	12.0	11.7	10.8	11.6
(t./1000 USD GDP)	*4*	0.64	0.49	0.65	0.37	0.58	0.72	0.46	0.33	0.52	0.93	0.44	0.53
% change (1990-1998)		13	20	12	8	59	20	27	5	15	-20	12	12
WASTE GENERATED													
Industrial waste (kg/1000 USD GDP)	*4, 6*	..	51	..	41	56	106	28	63	62	288	22	118
Municipal waste (kg/cap.)	*7*	500	310	720	410	400	690	350	510	480	310	560	410
Nuclear waste (t./Mtoe of TPES)	*8*	6.5	0.1	0.9	1.8	2.3	-	-	-	2.8	1.0	-	2.2
PAC EXPENDITURE (% of GDP)	*9*	1.1	0.8	1.6	1.6	1.7	0.8	..	1.7	0.9	2.0	0.9	1.1

.. not available. - nil or negligible. x data included under Belgium.

1) Data refer to the latest available year. They include provisional figures and Secretariat estimates. Partial totals are underlined. Varying definitions can limit comparability across countries.

2) Data refer to IUCN categories I to VI; AUS, HUN, LUX, TUR: national data.

3) Total imports of cork and wood from non-OECD tropical countries.

4) GDP at 1995 prices and purchasing power parities.

Source: OECD Environmental Data Compendium.

OECD EPR / SECOND CYCLE

FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	**SLO**	SWE	CHE	TUR	UKD*	OECD*
549	357	132	93	103	70	301	3	42	324	313	92	506	**49**	450	41	779	245	34777
10.1	26.9	2.6	9.1	9.5	0.9	7.3	6.5	11.6	6.4	9.4	6.6	8.4	**21.6**	8.1	18.0	3.8	20.4	12.4
13.3	15.8	7.6	6.0	9.4	47.4	7.7	x	35.6	12.4	6.3	4.4	5.5	**4.5**	6.4	12.8	5.2	20.1	6.5
0.59	0.29	0.29	0.14	..	0.25	0.78	x	1.06	0.09	0.07	0.43	0.18	**0.23**	0.06	0.37	0.13	*0.58*	*0.25*
31.4	30.1	22.8	18.9	1.3	8.8	23.3	34.4	9.2	39.2	29.7	37.9	32.3	**42.2**	73.5	31.7	26.9	10.5	33.9
0.7	0.4	0.6	0.6	-	0.6	0.3	0.5	0.6	0.5	0.6	0.8	0.5	**0.5**	0.7	0.5	0.4	0.7	0.5
6.8	1.8	2.8	0.1	2.8	11.2	7.1	-	15.6	3.6	0.3	17.9	6.3	**0.1**	2.2	0.6	0.5	2.7	4.0
20.2	36.7	37.9	71.1	-	6.5	32.2	51.6	15.6	5.9	15.5	17.3	21.2	**23.3**	18.2	34.2	22.2	*22.2*	..
14.3	29.2	13.0	18.8	13.3	21.8	24.7	50.0	27.1	7.7	16.6	13.7	14.1	**14.3**	8.6	42.6	6.7	*6.8*	..
6.6	68.2	24.3	32.1	-	33.3	..	27.9	82.1	-	27.1	18.6	29.4	**38.3**	12.7	44.7	9.9	*11.1*	..
23.9	24.4	12.1	5.0	0.1	2.6	32.2	3.4	4.9	0.7	18.7	15.3	36.8	**1.4**	1.5	4.9	15.2	*14.6*	*11.9*
77	89	45	22	16	61	61	88	97	73	47	55	48	**49**	93	94	12	*88*	*59*
0.6	0.3	0.1	-	1.9	0.3	0.3	-	0.6	2.8	0.3	0.2	1.3	**-**	0.4	-	0.6	0.9	28.5
16.2	15.8	48.3	64.7	32.1	48.7	23.1	8.4	8.0	6.9	61.3	37.6	49.1	**33.2**	10.3	4.6	29.8	34.5	39.2
0.8	0.7	3.6	6.7	1.3	2.1	1.1	0.2	0.4	0.3	8.2	2.5	3.2	**3.3**	0.5	0.2	4.8	1.8	2.0
-24	-76	-	-35	6	-3	..	-76	-38	-42	-26	4	..	**-67**	-33	-24	..	-46	-24
29.1	21.7	35.2	19.4	105.6	33.9	30.9	39.6	28.5	50.5	29.9	37.0	31.7	**24.1**	38.1	18.2	14.5	35.0	41.1
1.4	1.0	2.6	2.0	4.4	1.5	1.5	1.1	1.3	2.0	4.0	2.4	2.1	**2.4**	1.9	0.7	2.3	1.8	2.1
-10	-34	8	-17	9	6	..	-27	-23	2	-10	17	..	**-43**	-13	-22	37	-25	-3
6.4	10.4	7.9	5.7	7.7	10.4	7.4	16.8	10.9	7.7	8.3	5.4	6.5	**6.9**	6.0	5.7	2.9	9.3	10.9
0.29	0.47	0.56	0.56	0.31	0.45	0.35	0.45	0.47	0.30	1.00	0.36	0.38	**0.69**	0.28	0.22	0.45	0.46	0.52
2	-11	18	-15	5	19	6	-31	9	21	-8	36	20	**-31**	3	-	36	-4	9
84	38	47	72	1	65	19	136	26	27	72	3	24	**81**	86	8	87	53	70
590	460	370	490	650	560	460	590	560	600	320	440	390	**320**	360	600	330	480	500
4.6	1.3	-	3.2	-	-	-	-	0.2	-	..	-	0.9	**..**	4.5	2.4	-	3.7	1.6
1.4	1.5	0.8	0.7	..	0.6	0.9	..	1.8	1.2	1.1	0.9	0.8	**..**	1.2	1.6	..	1.0	..

* UKD: pesticides and threatened species: Great Britain; water withdrawal and public waste water treatment: England and Wales.

5) CO_2 from energy use only; international marine and aviation bunkers are excluded.

6) Waste from manufacturing industries.

7) NZL: household waste only.

8) Waste from spent fuel arising in nuclear power plants, in tonnes of heavy metal, per million tonnes of oil equivalent of total primary energy supply.

9) Household expenditure excluded; HUN, POL: investments only.

ANNEX I.B: SELECTED ECONOMIC DATA (1)

		CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
GROSS DOMESTIC PRODUCT												
GDP, 2000 (billion USD at 1995 prices and PPPs)		818	814	9141	3126	774	470	71	196	254	133	137
% change (1990-2000)		30.6	41.0	38.9	14.4	80.8	42.7	29.1	24.2	23.4	-7.5	25.7
per capita, 2000 (1000 USD/cap.)		26.6	8.2	33.2	24.7	16.4	24.5	18.4	24.2	24.8	12.9	25.6
Exports, 2000 (% of GDP)		45.8	31.4	11.0	10.8	45.0	21.7	35.7	48.9	88.1	73.2	42.4
INDUSTRY	*2*											
Value added in industry (% of GDP)		33	28	26	36	45	26	26	33	27	43	26
Industrial production: % change (1990-2000)		29.1	48.4	49.0	2.2	131.8	27.5	30.8	45.6	16.6	-23.8	39.1
AGRICULTURE												
Value added in agriculture (% of GDP)	*3*	3	5	2	2	5	3	7	2	2	4	3
Agricultural production: % change (1990-1999)		26.6	25.5	19.7	-8.4	22.9	23.4	19.2	5.3	19.0	..	2.9
Livestock population, 1999 (million head of sheep eq.)		102	266	795	56	29	289	101	18	30	16	25
ENERGY												
Total supply, 1999 (Mtoe)		242	149	2270	515	181	108	18	28	59	39	20
% change (1990-1999)		15.6	20.0	17.9	17.5	97.5	23.3	30.0	12.7	21.1	-18.6	12.4
Energy intensity, 1999 (toe/1000 USD GDP)		0.31	0.20	0.26	0.17	0.25	0.24	0.27	0.15	0.24	0.30	0.15
% change (1990-1999)		-7.3	-9.1	-10.9	4.4	18.9	-10.4	3.8	-6.3	2.1	-9.3	-7.9
Structure of energy supply, 1999 (%)	*4*											
Solid fuels		15.8	9.8	27.4	18.0	21.6	48.8	12.4	22.0	14.1	49.5	30.8
Oil		35.4	62.6	38.9	51.7	55.0	33.0	35.5	41.7	41.3	21.3	46.1
Gas		28.8	20.8	23.0	12.0	8.4	16.9	26.5	23.9	22.8	19.9	21.8
Nuclear		7.8	1.8	8.9	16.0	14.8	-	-	-	21.8	9.0	-
Hydro, etc.		12.2	5.2	1.8	2.2	0.2	1.4	25.6	12.4	0.1	0.4	1.3
ROAD TRANSPORT	*5*											
Road traffic volumes per capita, 1998 (1000 veh.-km/cap.)		9.3	0.6	15.6	6.0	1.6	10.0	7.7	7.5	8.3	3.0	8.3
Road vehicle stock, 1998 (10 000 vehicles)		1804	1389	21443	7082	1047	1126	216	471	499	377	219
% change (1990-1998)		9.0	40.6	13.6	25.4	208.4	15.2	16.9	27.6	17.1	45.5	15.7
per capita (veh./100 inh.)		60	15	79	56	23	60	57	58	49	37	41

.. not available. - nil or negligible. x data included under Belgium.

1) Data may include provisional figures and Secretariat estimates. Partial totals are underlined.

2) Value added: includes mining and quarrying, manufacturing, gas, electricity and water and construction; production: excludes construction.

Source: OECD Environmental Data Compendium.

OECD EPR / SECOND CYCLE

FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	**SLO**	SWE	CHE	TUR	UKD	OECD
124	1362	1905	158	113	7	103	1266	19	395	117	348	161	717	**56**	203	198	421	1254	24860
24.0	19.2	20.5	25.0	8.3	27.3	98.2	17.0	76.2	33.3	38.9	43.2	29.0	29.6	**11.4**	18.7	9.3	41.9	24.3	29.8
23.9	22.9	23.2	14.9	11.3	26.3	27.2	22.0	42.7	24.8	26.1	9.0	16.1	18.2	**10.4**	22.9	27.6	6.3	21.0	22.2
42.5	28.9	33.3	22.1	61.6	34.3	95.2	28.4	119.7	67.1	46.3	26.8	31.3	29.9	**73.5**	47.4	45.1	23.8	27.2	21.7
34	25	31	24	34	29	36	30	20	27	36	36	31	30	**35**	29	30	30	30	30
64.9	17.7	13.9	12.5	48.2	..	223.5	15.7	26.6	21.7	41.4	63.6	21.8	23.5	**-7.7**	42.6	25.8	51.3	11.5	27.9
4	3	1	8	5	10	4	3	1	3	2	4	4	4	**5**	2	2	15	1	3
-16.0	7.5	-4.1	14.9	-21.3	1.5	12.4	10.6	x	-0.4	-7.6	-15.0	5.4	8.0	**-19.8**	-9.7	-5.8	7.7	-0.7	..
9	165	128	21	14	1	56	71	x	47	10	64	18	93	**7**	14	12	118	131	2705
33	255	337	27	25	3	14	169	3	74	27	93	24	118	**18**	51	27	70	230	5229
15.8	12.8	-5.2	23.5	-11.1	51.3	33.6	11.5	-2.2	11.4	23.9	-6.5	43.9	30.9	**-17.0**	9.5	6.5	33.6	8.1	15.9
0.29	0.19	0.18	0.18	0.23	0.44	0.15	0.14	0.20	0.19	0.23	0.28	0.15	0.17	**0.33**	0.26	0.14	0.18	0.19	0.22
-1.2	-2.3	-19.0	2.9	-13.7	23.1	-25.1	-1.9	-39.8	-13.2	-8.9	-32.0	15.1	5.1	**-23.9**	-4.5	0.8	0.9	-10.4	-7.0
35.7	10.2	24.8	36.4	18.3	1.8	19.0	8.3	4.9	12.0	9.5	69.1	21.1	19.8	**29.1**	21.7	5.8	38.3	16.3	23.7
32.1	34.6	40.1	57.1	27.8	26.5	58.9	54.1	73.0	38.8	33.8	21.1	67.6	54.0	**17.5**	27.8	48.0	41.9	36.2	41.3
10.3	13.2	21.4	4.5	39.3	-	21.5	33.6	21.8	47.7	17.8	9.5	8.2	11.3	**32.2**	1.4	8.9	15.1	36.3	21.1
18.5	39.4	13.1	-	14.6	-	-	-	-	1.4	-	-	-	13.0	**19.0**	37.1	24.5	-	11.0	11.0
3.4	2.5	0.7	2.0	0.1	71.7	0.6	4.1	0.3	0.1	38.9	0.2	3.1	1.9	**2.2**	12.1	12.9	4.7	0.2	2.8
8.7	8.1	7.3	5.6	3.2	6.5	8.1	8.6	9.0	6.9	7.0	4.0	5.5	4.1	**2.2**	8.2	7.1	0.8	7.7	7.9
231	3231	4427	365	273	16	138	3433	28	732	221	1055	425	1927	**136**	415	367	516	2997	56605
4.4	13.5	18.7	44.8	24.3	17.8	45.3	12.3	33.6	27.7	13.9	64.9	93.4	33.4	**..**	5.6	11.2	118.5	14.0	20.1
45	55	54	35	27	58	37	60	66	47	50	27	43	49	**25**	47	52	8	51	51

3) Agriculture, forestry, hunting, fishery, etc.

4) Breakdown excludes electricity trade.

5) Refers to motor vehicles with four or more wheels, except for Japan and Italy, which include three-wheeled goods vehicles.

ANNEX I.C: SELECTED SOCIAL DATA (1)

		CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
POPULATION												
Total population, 2000 (100 000 inh.)		308	991	2754	1268	472	192	38	81	102	103	53
% change (1990-2000)		11.0	22.0	10.2	2.6	10.1	12.3	13.9	4.8	2.8	-0.9	3.8
Population density, 2000 (inh./km^2)		3.1	50.6	29.4	335.7	475.2	2.5	14.2	96.4	335.5	130.3	123.8
Ageing index, 1998 (over 64/under 15)		62.4	14.9	53.6	107.6	29.9	58.2	51.4	90.4	91.3	79.3	82.5
HEALTH												
Women life expectancy at birth, 1998 (years)		81.4	77.3	79.4	84.0	78.1	81.5	80.4	80.9	81.1	78.1	78.6
Infant mortality, 1998 (deaths /1 000 live births)		5.5	15.8	7.2	3.6	7.7	5.0	6.8	4.9	6.0	5.2	4.7
Expenditure, 1998 (% of GDP)		9.5	4.7	13.7	7.6	5.0	8.5	8.1	8.3	8.8	7.6	8.3
INCOME AND POVERTY												
GDP per capita, 2000 (1000 USD/cap.)		26.6	8.2	33.2	24.7	16.4	24.5	18.4	24.2	24.8	12.9	25.6
Poverty (% pop. < 50% median income)		10.3	21.9	17.0	8.1	..	9.3	..	7.4	7.8	..	5.0
Inequality (Gini levels)	*2*	28.5	52.6	34.4	26.0	..	30.5	25.6	26.1	27.2	..	21.7
Minimum to median wages, 2000	*3*	42.5	21.1	36.4	32.9	23.8	57.9	46.3	x	49.2	30.4	x
EMPLOYMENT												
Unemployment rate, 2000 (% of total labour force)		6.8	2.3	4.0	4.7	4.1	6.6	6.0	4.6	7.0	8.8	4.8
Labour force participation rate, 2000 (% 15-64 year-olds)		77.4	56.3	67.2	78.1	65.2	75.3	65.4	77.5	63.7	79.7	80.5
Employment in agriculture, 1998 (%)	*4*	3.7	19.4	2.7	5.3	12.2	4.8	8.5	6.6	2.4	5.5	3.6
EDUCATION												
Education, 1998 (% 25-64 year-olds)	*5*	79.7	21.2	86.5	79.9	65.4	56.0	72.7	73.3	56.7	85.3	78.4
Expenditure, 1997 (% of GDP)	*6*	6.5	5.5	6.9	4.8	7.4	5.6	..	6.5	5.2	5.2	6.8
OFFICIAL DEVELOPMENT ASSISTANCE	*7*											
ODA, 2000 (% of GNP)		0.25	..	0.10	0.27	..	0.27	0.26	0.25	0.36	..	1.06
ODA, 2000 (USD/cap.)		56	..	35	103	..	52	30	57	79	..	312

.. not available. - nil or negligible. x not applicable.

1) Data may include provisional figures and Secretariat estimates. Partial totals are underlined.

2) Ranging from 0 (equal) to 100 (inequal) income distribution; figures relate to total disposable income (including all incomes, taxes and benefits) for the entire population.

3) Minimum wage as a percentage of median earnings including overtime pay and bonuses.

Source: OECD.

OECD EPR / SECOND CYCLE

FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	**SLO**	SWE	CHE	TUR	UKD	OECD
52	594	821	106	100	3	38	576	4	159	45	386	100	394	**54**	89	72	668	596	11219
3.8	4.6	3.4	4.6	-3.4	10.2	8.1	1.6	14.1	6.2	5.9	1.3	1.3	1.5	**2.5**	3.7	6.9	18.9	3.6	7.7
15.3	108.1	229.9	80.0	107.7	2.7	53.9	191.3	169.6	382.4	13.9	123.5	108.8	77.9	**110.0**	19.7	173.8	85.7	243.5	32.3
79.1	82.6	107.1	95.2	83.3	49.0	50.4	106.6	76.1	73.0	79.3	56.8	90.3	105.2	**57.5**	93.3	86.0	16.8	81.7	60.4
80.8	82.2	80.5	80.5	75.2	81.5	78.5	81.6	80.0	80.7	81.1	77.3	78.8	82.4	**77.0**	81.9	82.5	71.3	79.7	..
4.2	4.7	4.7	6.7	8.9	2.6	6.2	6.2	5.0	5.2	4.0	9.5	6.0	5.0	**9.9**	3.6	4.8	36.3	5.7	..
6.9	9.6	10.5	8.3	6.8	8.4	6.1	8.4	5.9	8.6	8.9	6.3	7.8	7.1	**..**	8.4	10.4	4.0	7.0	..
23.9	22.9	23.2	14.9	11.3	26.3	27.2	22.0	42.7	24.8	26.1	9.0	16.1	18.2	**10.4**	22.9	27.6	6.3	21.0	22.2
4.9	7.5	9.4	13.8	7.3	..	11.0	14.2	..	6.3	10.0	..	..	..	**..**	6.4	6.2	16.2	10.9	..
22.8	27.8	28.2	33.6	28.3	..	32.4	34.5	..	25.5	25.6	..	..	..	**..**	23.0	26.9	49.1	32.4	..
x	60.8	x	51.3	35.6	x	x	x	48.9	46.7	x	35.5	38.2	31.8	**..**	x	x	..	x	..
9.8	9.7	7.8	11.3	6.5	1.3	4.3	10.7	2.6	2.4	3.4	16.1	4.0	14.1	**18.8**	4.7	2.0	6.4	5.5	6.2
74.5	68.6	74.7	61.8	58.8	77.6	69.6	60.0	64.3	66.4	80.9	65.3	75.0	65.6	**69.3**	76.2	81.2	51.7	76.1	68.4
6.5	4.4	2.8	17.7	7.6	8.6	9.1	6.6	2.3	3.3	4.7	19.2	13.6	8.0	**7.4**	2.6	4.6	42.3	1.7	7.8
68.3	60.7	83.8	44.1	63.3	54.8	51.3	41.0	..	64.3	83.0	54.3	20.1	32.9	**..**	76.1	81.5	17.7	60.2	61.2
6.3	6.3	5.7	4.9	5.2	5.7	5.0	4.8	..	4.7	..	..	5.8	5.7	**..**	6.9	6.0	..	..	5.8
0.31	0.33	0.27	0.19	..	..	0.30	0.13	0.70	0.82	0.80	..	0.26	0.24	**..**	0.81	0.34	..	0.31	0.22
72	71	61	20	..	..	63	24	265	194	281	..	26	34	**..**	204	124	..	75	63

4) Civil employment in agriculture, forestry and fishing.

5) Upper secondary or higher education; OECD: average of rates.

6) Public and private expenditure on educational institutions; OECD: average of rates.

7) Official Development Assistance by Member countries of the OECD Development Assistance Committee.

ANNEX II.A: SELECTED MULTILATERAL AGREEMENTS (WORLDWIDE)

Y = in force S = signed R = ratified D = denounced

			CAN	MEX	USA	JPN
1946	Washington	Conv. - Regulation of whaling	Y D	R	R	R
1956	Washington	Protocol	Y R	R	R	R
1949	Geneva	Conv. - Road traffic	Y R		R	R
1954	London	Conv. - Prevention of pollution of the sea by oil	Y R	R	R	R
1971	London	Amendments to convention (protection of the Great Barrier Reef)	R			
1957	Brussels	Conv. - Limitation of the liability of owners of sea-going ships	Y S			D
1979	Brussels	Protocol	Y			
1958	Geneva	Conv. - Fishing and conservation of the living resources of the high seas	Y S	R	R	
1960	Geneva	Conv. - Protection of workers against ionising radiations (ILO 115)	Y	R		R
1962	Brussels	Conv. - Liability of operators of nuclear ships				
1963	Vienna	Conv. - Civil liability for nuclear damage	Y	R		
1988	Vienna	Joint protocol relating to the application of the Vienna Convention and the Paris Convention	Y			
1997	Vienna	Protocol to amend the Vienna convention				
1963	Moscow	Treaty - Banning nuclear weapon tests in the atmosphere, in outer space and under water	Y R	R	R	R
1964	Copenhagen	Conv. - International council for the exploration of the sea	Y R		R	
1970	Copenhagen	Protocol	Y R		R	
1969	Brussels	Conv. - Intervention on the high seas in cases of oil pollution casualties (INTERVENTION)	Y	R	R	R
1973	London	Protocol (pollution by substances other than oil)	Y	R	R	
1969	Brussels	Conv. - Civil liability for oil pollution damage (CLC)	Y R	D	S	D
1976	London	Protocol	Y R	R		R
1992	London	Protocol	Y R	R		R
1970	Bern	Conv. - Transport of goods by rail (CIM)	Y			
1971	Brussels	Conv. - International fund for compensation for oil pollution damage (FUND)	Y R	D	S	D
1976	London	Protocol	Y R	R		R
1992	London	Protocol	Y R	R		R
1971	Brussels	Conv. - Civil liability in maritime carriage of nuclear material	Y			
1971	London, Moscow, Washington	Conv. - Prohibition emplacement of nuclear and mass destruction weapons on sea-bed, ocean floor and subsoil	Y R	R	R	R
1971	Ramsar	Conv. - Wetlands of international importance especially as waterfowl habitat	Y R	R	R	R
1982	Paris	Protocol	Y R	R	R	R
1987	Regina	Regina amendment	Y R	R		R
1971	Geneva	Conv. - Protection against hazards of poisoning arising from benzene (ILO 136)	Y			
1972	London, Mexico, Moscow, Washington	Conv. - Prevention of marine pollution by dumping of wastes and other matter (LC)	Y R	R	R	R
1996	London	Protocol to the Conv. - Prevention of marine poll. by dumping of wastes and other matter			S	

OECD EPR / SECOND CYCLE

Y = in force S = signed R = ratified D = denounced

KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	**SLO**	SWE	CHE	TUR	UKD	EU
R	R	R	R			R	R	R	R			D	R	R		R	R			R		R	R		R	
R	R	R				R		R	R			R	R			R	R			R		R	R		R	
R	R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	**R**	R	S	R	R	
R	R	R	R	R		R	R	R	R	R		R	R	R		R	R	R	R	R		R	R		R	
	R	R				R	R	R	R	R				R			R					R	R		R	
	D			D		D	D	D	D			R		S	R	D	D	R	R	R		D	R		D	
	R			R			S		S						R			R	R	R			R		D	
	R	S		R		R	R	R				S	S			R			R	R			R		R	
				R	R	R	R	R	R	R	R			R		R	R	R	R	R	**R**	R	R	R	R	
				S					S				S			R			R							
					R						R							R		S					S	
				S	R	R	R	S	S	S	R			R		R	R	R	S	S		R	S	S	S	
					S						S			S				S								
R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	S	R	**R**	R	R	R	R	
				R		R	R	R	R			R	R			R	R	R	R	R		R			R	
				R		R	R	R	R			R	R			R	R	R	R	R		R			R	
S	R	R		R		R	R	R	R	S		R	R	R		R	R	R	R	R		R	R		R	
	R	S		R		R	R	R	R				R	R		R	R	R	R	R		R	R		R	
D	D	R		R		D	D	D	D	D		R	D	R	R	D	D	R	R	D		D	D		D	
R	R			R		R	R	R	R	R		R	D	R	R	R	R	R	R	R		R	R		D	
R	R	R		R		R	R	R	R	R		R	R			R	R	S		R		R	R		R	
			R	R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	R	**R**	R	R	R	R	
D	D	R		R		D	D	D	D	D		R	D	R		D	D	R	R	D		D	D		D	
	R			R		R	R	R	R	R		R	D	R		R	R	R	R	R		R			D	
R	R	R		R		R	R	R	R	R		R	R			R	R	S		R		R			R	
				R		R	R	R	R					R		R	R		S	R		R			S	
R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	
R	R	R	R	R		R	R	R	R	R	R	R	R		R	R	R	R				R	R	R	R	
					R		R	R	R	R	R			R						R	**R**		R			
R	R	R		R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		R	R		R	
	S	S		S		R	S		R			S				S	R			R		S	S		R	

ANNEX II.A: SELECTED MULTILATERAL AGREEMENTS (WORLDWIDE) (cont.)

Y = in force S = signed R = ratified D = denounced

			CAN	MEX	USA	JPN
1972 Geneva	Conv. - Protection of new varieties of plants (revised)	Y	R	R	R	R
1978 Geneva	Amendments	Y	R	R	R	R
1991 Geneva	Amendments	Y			R	R
1972 Geneva	Conv. - Safe container (CSC)	Y	R	R	R	R
1972 London, Moscow, Washington	Conv. - International liability for damage caused by space objects	Y	R	R	R	R
1972 Paris	Conv. - Protection of the world cultural and natural heritage	Y	R	R	R	R
1973 Washington	Conv. - International trade in endangered species of wild fauna and flora (CITES)	Y	R	R	R	R
1974 Geneva	Conv. - Prev. and control of occup. hazards caused by carcinog. subst. and agents (ILO 139)	Y				R
1976 London	Conv. - Limitation of liability for maritime claims (LLMC)	Y		R		R
1996 London	Amendment to convention		S			
1977 Geneva	Conv. - Protection of workers against occupational hazards in the working environment due to air pollution, noise and vibration (ILO 148)	Y				
1978 London	Protocol - Prevention of pollution from ships (MARPOL PROT)	Y	R	R	R	R
1978 London	Annex III	Y			R	R
1978 London	Annex IV					R
1978 London	Annex V	Y		R	R	R
1997 London	Annex VI					
1979 Bonn	Conv. - Conservation of migratory species of wild animals	Y				
1991 London	Agreem. - Conservation of bats in Europe	Y				
1992 New York	Agreem. - Conservation of small cetaceans of the Baltic and the North Seas (ASCOBANS)	Y				
1996 Monaco	Agreem. - Conservation of cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area					
1996 The Hague	Agreem. - Conservation of African-Eurasian migratory waterbirds	Y				
1982 Montego Bay	Conv. - Law of the sea	Y	S	R		R
1994 New York	Agreem. - relating to the implementation of part XI of the convention	Y	S		S	R
1995 New York	Agreem. - Implementation of the provisions of the convention relating to the conservation and management of straddling fish stocks and highly migratory fish stocks		R		R	S
1983 Geneva	Agreem. - Tropical timber	Y	R		R	R
1994 New York	Revised agreem. - Tropical timber	Y	R		R	R
1985 Vienna	Conv. - Protection of the ozone layer	Y	R	R	R	R
1987 Montreal	Protocol (substances that deplete the ozone layer)	Y	R	R	R	R
1990 London	Amendment to protocol	Y	R	R	R	R
1992 Copenhagen	Amendment to protocol	Y	R	R	R	R
1997 Montreal	Amendment to protocol	Y	R			
1999 Beijing	Amendment to protocol		R			

OECD EPR / SECOND CYCLE

Y = in force S = signed R = ratified D = denounced

KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	**SLO**	SWE	CHE	TUR	UKD	EU
	R	R	R	R	R	R	R	R	R		R		R	R		R	R	R	R	R	**R**	R	R		R	
	R	R	R		R	R	R	R	R		R		R	R		R	R	R	R		**R**	R	R		R	
	R					R			R							R						R			R	
R	R	R	R	R	R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	**R**	R	S	S	R	
R	R	R	R	R		R	R	R	R	R	R	S	R	R	R	R	S	R		R		R	R		R	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	
R	R	R	R	R	R	R	R	R	R	R	R	R	S	R	R	R	R	R	R	R	**R**	R	R	R	R	
				R	R	R	R	R	R		R	R	R	R			R		R		**R**	R	R			
	R	R		R		R	R	R	R	R			R			R	R	R		R		R	R	R	R	
						S	S	S	S							S	S					S			S	
				R	R	R	R	R	R		R			R			R		R	R	**R**	R			R	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R		R	
			R	R	R	R	R	R	R	R	R			R	R			R	R	R	**R**	R	R		R	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	
																	S					S				
	R			R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	R	**R**	R	R		R	R
				S	R	R		S	R		R		R		R	R	R		S			R			R	
				S		R		S	R							R						R			R	S
								S		S				S						S	S			S		S
						R	R	S	R	S	S		S		S	R					R	**R**	R	R		R	S
R	R	R	R	R	R	S	R	R	R	R	S	R	R	R	S	R	R	R	R	R	**R**	R	S		R	R
R	R	R	R	R	R	S	R	R	R	R		R	R	R	S	R	R	R	R	R	**R**	R	S		R	R
S	S	S	S	S		S	S	S	S	S		R	S	S	S	S	R		S	S		S			S	S
R	R	R	R	R		R	R	R	R	R			R	R	R	R	R		R	R		R	R		R	R
R		R	R	R		R	R	R	R	R			R	R	R		R		R	R		R	R		R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	R
R	R	R	R	S	R	R			R		R	R		R	R	R	R	R		R	**R**	R				R
					R										R											

ANNEX II.A: SELECTED MULTILATERAL AGREEMENTS (WORLDWIDE) (cont.)

Y = in force S = signed R = ratified D = denounced

			CAN	MEX	USA	JPN
1986 Vienna	Conv. - Early notification of a nuclear accident	Y	R	R	R	R
1986 Vienna	Conv. - Assistance in the case of a nuclear accident or radiological emergency	Y	S	R	R	R
1989 Basel	Conv. - Control of transboundary movements of hazardous wastes and their disposal	Y	R	R	S	R
1995 Geneva	Amendment					
1999 Basel	Prot. - Liability and compensation for damage					
1989 London	Conv. - Salvage	Y	R	R	R	
1990 Geneva	Conv. - Safety in the use of chemicals at work (ILO 170)	Y		R		
1990 London	Conv. - Oil pollution preparedness, response and co-operation (OPRC)	Y	R	R	R	R
1992 Rio de Janeiro	Conv. - Biological diversity	Y	R	R	S	R
2000 Montreal	Prot. - Biosafety		S	S		
1992 New York	Conv. - Framework convention on climate change	Y	R	R	R	R
1997 Kyoto	Protocol		S	R	S	S
1993 Paris	Conv. - Prohibition of the development, production, stockpiling and use of chemical weapons and their destruction	Y	R	R	S	R
1993 Geneva	Conv. - Prevention of major industrial accidents (ILO 174)	Y				
1993	Agreem. - Promote compliance with international conservation and management measures by fishing vessels on the high seas		R	R	R	R
1994 Vienna	Conv. - Nuclear safety	Y	R	R	R	R
1994 Paris	Conv. - Combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa	Y	R	R	S	R
1996 London	Conv. - Liability and compensation for damage in connection with the carriage of hazardous and noxious substances by sea		S			
1997 Vienna	Conv. - Supplementary compensation for nuclear damage				S	
1997 Vienna	Conv. - Joint convention on the safety of spent fuel management and on the safety of radioactive waste management	Y	R		S	
1997 New York	Conv. - Law of the non-navigational uses of international watercourses					
1998 Rotterdam	Conv. - Prior informed consent procedure for hazardous chemicals and pesticides (PIC)				S	S
2001 Stockholm	Conv. - Persistent organic pollutants		R	S	S	

Source: IUCN; OECD.

OECD EPR / SECOND CYCLE

Y = in force S = signed R = ratified D = denounced

KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	**SLO**	SWE	CHE	TUR	UKD	EU
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	S	R	R	R	R	R	**R**	R	R	R	R	
R	R	R	R	R	R	S	R	R	R	R	R	S	R	R		R	S	R	S	R	**R**	R	R	R	R	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	R
			R		R	R	R								R		R		R	R	**R**	R			R	R
															S								S			
	R					R	S		S	R			R	R		R	R	S		S		R	R		R	
																	R					R				
	R					R	R	R	R	R		R	R	R		R	R	S		R		R	R		R	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	R
S		S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	R	S	S	S	**S**	S	S	S	S	S
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R		R	R
S	S	S	S	S	S	S	S	S	S	S			S	S	S	S	S	S	S	S	**S**	S	S		S	S
S	R	R	R	R	R	R	R	R	R	R	R	S	R	R	S	R	R	R	R	R	**S**	R	R	S	S	
				S												R						R				
																	R					R				R
R	R		R	R	R	R	R	R	R	R	R	S	R	R	R	R	R	R	R	R	**R**	R	R	R	R	
R	S		R	R		R	R	R	R	R	R	R	R	R	R	R	R		R	R		R	R	R	R	R
						S	S		S							S	S					S			S	
	S				S									S												
S	S		R	S	R	R	R	R	R	R	R		R	S	R	R	R	R		R	**R**	R	R		R	
							R		S		R				S	S	R		S			R				
S	S	S	S	S	S	S	S	S	S	S	S			S	S	S	S	S	S	S		S	S	S	S	S
S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	**S**	S	S	S	S	S

ANNEX II.B: SELECTED MULTILATERAL AGREEMENTS (REGIONAL)

Y = in force S = signed R = ratified D = denounced

			CAN	MEX	USA	JPN
1957 Geneva	Agreem. - International carriage of dangerous goods by road (ADR)	Y				
1975 New York	Protocol	Y				
1958 Geneva	Agreem. - Adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipments and parts	Y				
1958 Bucharest	Conv. - Fishing in the waters of the Danube	Y				
1959 Washington	Treaty - Antarctic	Y	R		R	R
1991 Madrid	Protocol to the Antarctic treaty (environmental protection)	Y	S		R	R
1979 Bern	Conv. - Conservation of European wildlife and natural habitats	Y				
1979 Geneva	Conv. - Long-range transboundary air pollution	Y	R		R	
1984 Geneva	Protocol (financing of EMEP)	Y	R		R	
1985 Helsinki	Protocol (reduction of sulphur emissions or their transboundary fluxes by at least 30%)	Y	R			
1988 Sofia	Protocol (control of emissions of nitrogen oxides or their transboundary fluxes)	Y	R		R	
1991 Geneva	Protocol (control of emissions of volatile organic compounds or their transboundary fluxes)	Y	S		S	
1994 Oslo	Protocol (further reduction of sulphur emissions)	Y	R			
1998 Aarhus	Protocol (heavy metals)		R		R	
1998 Aarhus	Protocol (persistent organic pollutants)		R		S	
1999 Gothenburg	Protocol (abate acidification, eutrophication and ground-level ozone)		S		S	
1980 Madrid	Conv. - Transfrontier co-operation between territorial communities or authorities	Y				
1995 Strasbourg	Additional protocol	Y				
1998 Strasbourg	Second protocol					
1980 Bern	Conv. - International carriage of dangerous goods by train (COTIF)					
1991 Espoo	Conv. - Environmental impact assessment in a transboundary context	Y	R		S	
1992 Helsinki	Conv. - Transboundary effects of industrial accidents		S		S	
1992 Bucharest	Conv. - Protection of the Black Sea against pollution	Y				
1992 Bucharest	Protocol (combatting pollution by oil and other harmful substances in emergency situation)	Y				
1992 Bucharest	Protocol (protection of the Black Sea marine environment against pollution from dumping)					
1992 Bucharest	Protocol (protection of the Black Sea marine env. against poll. from land based sources)					
1992 Helsinki	Conv. - Protection and use of transboundary water courses and international lakes	Y				
1999 London	Prot. - Water and health					
1992 La Valette	European Conv. - Protection of the archaeological heritage (revised)	Y				
1992 Vienna	Agreem. - Forecast, prevention and mitigation of natural and technological disasters					
1993 Lugano	Conv. - Civil liability for damage resulting from activities dangerous to the environment					
1994 Lisbon	Treaty - Energy Charter	Y				S
1994 Lisbon	Protocol (energy efficiency and related environmental aspects)	Y				S
1994 Sofia	Conv. - Co-operation for the protection and sust. use of the Danube river					
1998 Aarhus	Conv. - Access to envtal information and public participation in envtal decision-making					
1998 Strasbourg	Conv. - Protection of the environment through criminal law					
2000 Florence	Conv. - European lanscape convention					

Source: IUCN; OECD.

OECD EPR / SECOND CYCLE

Y = in force S = signed R = ratified D = denounced

KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	ESP	**SLO**	SWE	CHE	TUR	UKD	EU
			R	R	R	R	R	R	R	R	R			R	R	R	R	R	R	R	**R**	R	R		R	
			R	R		R	R	R	R		R			R	R	R	R	R	R	R		R	R		R	
			R	R	R	R	R	R	R		R			R	R	R	R	R	R	R	**R**	R	R		R	
											R															
R	R	R	R	R	R	R	R	R	R	R	R			R		R	R	R		R	**R**	R	R	R	R	
R	R	R	S	R	S	S	R	R	R	R	S			R		R	R	R		R	**S**	R	S		R	
			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	R
			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	R
			R	R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	**R**	R	R	R	R	R
			R	R	R	R	R	R	R		R			R	R	R	R					**R**	R	R			
			R	S	R	R	R	R	R	R	R		R	R	R	R	R	S		R	R	**R**	R	R		R	R
			R	R	R	R	R	R	R	S	R			R	R	R	R		S	R	R	**R**	R	R		R	S
			R	S	R	R	R	R	R	R	S		R	R	R	R	R	S		R	R	**R**	R	R		R	R
			S	S	S	S	R	S	S	S	S	S	S	S	R	R	R	S	S	S	S	**S**	R	R		S	R
			S	S	S	S	S	S	S	S	S	S	S	S	R	R	R	S	S	S	S	**S**	R	R		S	S
			S	S	S	S	S	S	S	S	S		S	S	S	S	S		S	S	S	**S**	S	S		S	
			R	R	R	R	R	R	R		R	S	R	R	R	R	R	R	R	R	R	**R**	R	R	S		
				S				R	R			S			R	R			S		**R**	R	R			
								S				S			R	R			S		**S**	R				
											R															
			R	R	S	R	R	S	S	R	R	S	S	R	R	R	R	R	R	R	R	**S**	R	R		R	R
			R	S		S	S	S	R	R	R			S	R	S	R	S	S	R		S	R		S	R
																								R		
																								R		
																								R		
																								R		
			R	R	R	R	R	R	R	R	R			R	R	R	R	R	R	R	R	**R**	R	R		S	R
				S	S	S	S	S	S	S	S	S		S	S	S	S	S	S	S	S	**S**	S	S		S	
					S	S	R	R	S	S	R		R	S	S	S	R	R	R	S	S	**S**	R	R	S	S	
	S									S				S				S								
							S			S		S		S	S	S			S							
	S		R	R	R	R	R	R	R	R	R	S	R	R	R	R	S	S	R	R	**R**	R	R	S	R	R
	S		R	R	R	R	R	R	R	R	R	S	R	R	R	R	S	S	R	R	**R**	R	R	S	R	R
			S						S		R															
			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S		S	S		S	S
			S	S		S	S	S	S	S		S			S							S				
				S		S	S	S						S	S		S		S	S				S	S	

Annex III

SELECTED ENVIRONMENTAL EVENTS (1990-2001)

1990

- Slovak Commission for the Environment created (Act 96/1990).
- Ramsar Convention on Wetlands of International Importance enters into force.

1991

- Principles of environmental policy.
- State Environmental Fund created (Act 128/1991).
- Concept of territorial system of ecological stability.

1992

- Ministry of the Environment of the Slovak Republic (MoE) created in replacement of the Slovak Commission for the Environment (Act 453/1992).
- Concept of environmental monitoring (Government Resolution 449/1992).
- Concept of integrated information system.
- First official bulletin of MoE.

1993

- Strategy, principles and priorities of state environmental policy (Government Resolution 619/1993).
- First annual state of the environment report (since 1997 – English version as well).
- Slovak Environmental Agency established.
- First waste management programme.
- Inscription of the following sites in the World Heritage (WH) list: Vlkolínec, Spišský hrad, Banská Štiavnica.

1994

- Legislation on environmental impact assessment (Act 127/1994).
- Legislation on nature and landscape protection (Act 287/1994).

1995

- Concept of sectoral environmental information system.
- First international environment film festival.
- Inscription of the Slovak and Aggtelek Karst caves into the World Heritage list.

1996

- National Environmental Action Programme (NEAP) (Government Resolution 350/96).
- National eco-labelling programme (Government Resolution 97/1996).
- First issue of "Enviromagazin", a specialised journal on environment.
- First international exhibition on environmental techniques and technologies "Enviro Nitra".
- First public information panels on environmental situation in cities.

1997

- National biodiversity strategy of Slovakia (Government Resolution 231/1997).
- Evaluation of Agenda 21 and sustainable development indicators (Government Resolution 655/1997).
- Concept of environmental education (Government Resolution 846/1997).

1998

- Convention on Biodiversity: 4th Meeting of the Conference of the Parties in Bratislava.
- National report on the status and protection of biodiversity in Slovakia.
- Legislation on access to environmental information (Act 171/1998).
- Start of the project "capacity building for sustainable development in the Slovak Republic" (with UNDP support).

- Framework co-operation agreement signed between MoE and NGOs associated in "Ekoforum".

1999

- National Environmental Action Programme (NEAP II) (Government Resolution 1112/1999).
- Sustainable Development Council established (Government Resolution 78/1999).
- First annual environment event called "Envirojar" (beginning on Earth Day 22, April – ending on World Environment Day 5, June).
- MoE Prize introduced.
- Public relation office and "green-line" established within MoE.
- New legislation on geology (Act 313/1999).

2000

- First draft of the National Sustainable Development Strategy.
- Environment indicators catalogue published.
- Concept of environment protection financing.
- Legislation on free access to information (Act 211/2000).
- The Slovak Republic becomes an OECD Member country (14 December).
- National programme for adoption of Acquis Communautaire.
- Report on the Slovak Republic preparedness for EU membership.

2001

- Revised national programme for adoption of Acquis Communautaire.
- New legislation on waste (Act 223/2001).
- Biodiversity indicators set (Government Resolution 18/2001).
- Legislation on chemical substances and preparations (Act 163/2001).
- National Strategy of Sustainable Development approved by the government on 10 October.

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