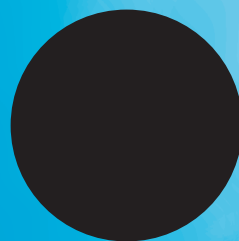




**OECD Environmental  
Performance Reviews**

# **HUNGARY**







# OECD Environmental Performance Reviews

## **HUNGARY**



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## FOREWORD

A healthy economy needs a healthy environment. In line with its mission to promote sustainable economic growth and rising living standards, the OECD emphasises better integration of environmental concerns into economic, social and sectoral policies. In this context, the OECD's Environmental Performance Reviews – conducted since 1992 – provide a systematic analysis of countries' efforts to reach their domestic environmental goals and international commitments, as well as specific recommendations to improve their environmental outcomes.

We have learned much from some 60 environmental reviews of OECD member countries and partner countries such as Chile, China and Russia. In the case of Hungary, the present review builds on more than a decade of OECD-Hungary environmental collaboration, and is part of a wider co-operation with Hungary encompassing numerous other studies, such as the regular Economic Surveys or the recent study on Reforms for Stability and Sustainable Growth.

Since 1998, Hungary has achieved consolidation of environmental progress and alignment with the EU environmental acquis. But pollution, energy and resource intensities still need to be improved and environmentally related health problems persist.

To meet these challenges, the OECD Environmental Performance Review of Hungary provides 46 specific recommendations, including that the country should strengthen its efforts in building environmental infrastructure (e.g. for waste and waste water treatment) and in implementing environmental policies, and further integrate environmental concerns into economic decisions. Hungary also needs to reinforce international co-operation on environmental issues. Addressing these urgent challenges requires decisive actions.

The OECD is grateful to the members of the OECD Working Party on Environmental Performance (which has approved the recommendations), and the experts from the examining countries (Austria, Czech Republic and Italy) for their substantive contributions, as well as the Government of Hungary for its excellent cooperation during the review process.

Angel GURRÍA  
OECD, Secretary-General



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## Signs

The following signs are used in Figures and Tables:

- .. : not available
- : nil or negligible
- . : decimal point
- \* : indicates that not all countries are included.

## Country Aggregates

OECD Europe: All European member countries of the OECD (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey and United Kingdom).

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

Country aggregates may include Secretariat estimates.

## Currency

Monetary unit: forint (HUF)

In 2007 HUF 183.75 = USD 1.

In 2007 HUF 251.32 = EUR 1.

## Cut-off Date

This report is based on information available up to 30 April 2008.

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### Map of Hungary



Source: OECD.





# 1

## CONCLUSIONS AND RECOMMENDATIONS\*

This report examines Hungary's progress since the previous OECD Environmental Performance Review in 2000, and the extent to which the country has met its *domestic objectives and honoured its international commitments*. The report also reviews Hungary's progress in the context of the OECD *Environmental Strategy for the First Decade of the 21st Century*.\*\* Some 46 recommendations are made that should contribute to further environmental progress in Hungary.

Over the review period (since 1998), Hungary's economy continued to grow and the *population* continued to decline and to age. The country underwent further *structural changes* and integration in the European economy; Hungary acceded to the *European Union* in May 2004. *Imports and exports* of goods and services represent 78% of GDP, and more than 85% of GDP is generated in the private sector. The country has received *foreign direct investment* reaching 5.4% in 2006. *Fiscal consolidation* and economic convergence in the EU now dominate the policy agenda.

Further to environmental progress during the 1990s, the review period saw consolidation of this progress and alignment with EU environmental *acquis*. But pollution, energy and resource intensities can still be improved and environmentally related health problems subsist. Overall, the road towards environmental convergence within the EU will be a long one, on a number of issues.

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\* Conclusions and Recommendations reviewed and approved by the Working Party on Environmental Performance at its meeting on 2 June 2008.

\*\* The objectives of the OECD Environmental Strategy are covered in the following sections of these Conclusions and Recommendations: maintaining the integrity of ecosystems (Section 1), decoupling of environmental pressures from economic growth (Sections 2.1 and 2.2) and global environmental interdependence (Section 3).

To meet these *challenges*, Hungary will need to: i) strengthen its environmental efforts in infrastructure building (e.g. for waste and waste water treatment) and in implementation of environmental policies; ii) further integrate environmental concerns into economic decisions; and iii) reinforce international co-operation on environmental issues.

## 1. Environmental Management

### *Strengthening the implementation of environmental policies*

Hungary has developed a comprehensive *environmental planning framework*, included two National Environmental Programmes (for the periods 1997-2002 and 2003-08) and related thematic action programmes, with quantitative objectives and performance indicators. Its programming framework formed the basis for the Environment and Energy Operative Programme which specifies the use of EU Funds and Hungarian matching Funds for the period 2007-13, in the context of the National Development Plan. The review period was characterised by the *consolidation of environmental legislation*, mostly driven by EU environmental “acquis” and EU membership in May 2004. Three of the four transition periods granted to Hungary have already expired, leaving only the one for the treatment of urban waste water, which will last until 2015. Hungary is now also contributing to shape EU environmental policy (e.g. flood management, mining waste, chemicals, ground and bathing waters). The *institutional framework* for environmental management has evolved over the review period, with the gradual merger of authorities in charge of nature conservation, environmental protection and water quality and quantity management. The Energy Centre was established in 2000 to deal with sustainable energy issues. As recommended in the first OECD review, *enforcement activities* have increased: inspectorates have acquired both licensing and enforcement responsibilities over all environmental themes, and the system of non-compliance sanctions has been significantly strengthened. Progress has been made towards the *polluter pays principle* and the *user pays principle*: the use of *economic instruments* has increased with the introduction of an “environmental load charge” applying to air emissions and waste water discharges, and the revision of product charges on packaging wastes. Hungarian firms have greatly expanded their use of *environmental management systems*. *Eco-labelling* and green public procurement are being promoted.

However, Hungarian *environmental performance* is still not fully in line with OECD-Europe standards and EU targets. In particular, some positive trends

of the 1990s have slowed down in recent years (e.g. for energy intensity, some air pollutant emissions, waste generation) or even reversed (e.g. fertilisers and pesticides use). Some health indicators are also of concerns. *Implementation of the second National Environmental Programme* (2003-08) has been lagging behind and Hungary appears unlikely to reach its targets in a number of fields (e.g. water quality, waste recovery). This suggests that efforts or available resources have not been always appropriate to implement the new environmental legislation, despite important EU support. The level of PAC investment expenditure is the same as in the first OECD review (about 1% of GDP), and total PAC expenditure is about 1.6% of GDP. Over the review period, *financial and human resource shortage* has limited monitoring and enforcement capacity of inspectorates. Regional and municipal administrations need to strengthen their environmental capacities and their expertise in economic analysis, also with a view to better absorbing EU funds for environmental projects. The effectiveness of *economic instruments* must be regularly assessed and charges periodically adjusted, to provide a balanced mix of licensing regulations and economic incentives. *Affordability* issues need also to be considered.

#### *Recommendations:*

- evaluate implementation of the second *national environmental programme*; speed up preparation of the third one (including targets, deadlines and means) and implement it;
- secure enough *financing and staff* to the environmental administration and inspectorates to ensure cost-efficient management and enforcement capacity;
- further expand the use of *economic instruments* and regularly assess their effectiveness, assuring a wider application of the polluter pays and user pays principles, taking into account competitiveness and social considerations; extend further cost-recovery to waste management;
- strengthen the use of *economic information and analysis* for environmental projects and policies (e.g. cost-benefit analysis).

## *Air*

Since 1998, Hungary has *considerably reduced air pollutant emissions* and as a consequence has *improved ambient air quality*. Emissions of SO<sub>2</sub> and CO<sub>2</sub>

have been further decoupled from economic growth, falling below the respective targets agreed at international and European levels. Per capita emissions of CO<sub>2</sub> are lower than the OECD-Europe average. Economic restructuring and the closing of several industrial plants have helped reduce emissions of particulate matter (−29%) and CO (−20%). The improvement in ambient air quality has resulted in a decreasing trend in morbidity and mortality associated with respiratory diseases. Concentrations of SO<sub>2</sub>, CO, benzene and lead were kept below the limits throughout the country during the review period. The *national air quality monitoring network was extended*, doubling the number of on-line sampling points, and the vast majority of measuring stations were upgraded to collect data on particulate matter and aromatic hydrocarbons. *Air quality legislation was extensively revised* and is now consistent with international commitments and EU requirements. An “environmental load charge” applying to emissions of the main air pollutants from stationary sources was introduced. Investment in end-of-pipe equipment and improvement in fuel quality have contributed to a significant reduction in emissions from energy generation. Concerning *energy*, Hungary has made significant progress in opening energy markets; and *energy prices* for end-users have been further adjusted to achieve cost recovery. In 2006, the direct subsidy on natural gas for household heating was replaced by a more targeted social compensation scheme. The *energy intensity* of the economy has been reduced, gradually approaching the OECD Europe average. The *share of renewables* in total primary energy supply increased markedly following the introduction of a feed-in tariff in 2001, and the target for electricity generation from renewables was met well ahead of the 2010 deadline. Some large power plants shifted from coal to biomass, thus cutting SO<sub>2</sub> and CO<sub>2</sub> emissions. Concerning *transport*, increases in fuel prices, vehicle taxes and road tolls have helped moderate demand for road transport. Public transport is well developed and still prevails in the modal split for urban travel. Switching to less polluting fuels has been promoted via tax measures. Improvements in fuel quality and vehicle performance have helped to increase the energy efficiency of transport and to reduce related air emissions.

However, some positive trends that characterised the early 1990s slowed during the review period. *Emissions* of NO<sub>x</sub> and VOCs have fluctuated slightly around the same level since 2001, and recent increases will make it more challenging to reach the respective emission ceilings. Similarly, the decline in emissions of heavy metals and persistent organic pollutants appears to have halted in recent years. Emissions of air pollutants and greenhouse gases from household and transport sectors are growing, partially offsetting progress achieved in the industrial and energy sectors, and potentially undermining improvements in *ambient air quality*, especially in urban areas. *Particles and*

*ground-level ozone* are of particular concern: in 2006, daily limits were exceeded at most assessment stations, particularly in the capital city and large urban areas. The NO<sub>x</sub> annual average threshold was also exceeded in some areas and in major cities of the country. The relatively low rates and exemptions for district heating providers may hinder the incentive function of air emission charges. Compliance with licensing regulations appears to remain the main driver for improving the environmental performance of large stationary sources. As in most EU countries, effective competitiveness in *energy markets* is still limited and a significant potential exists for increasing the efficiency of electricity generation. Whilst the feed-in tariff has helped to increase the share of renewables in energy supply, the support scheme might lead to over-subsidisation; cost-benefit analyses would help in assessing overall impacts. Further efforts are needed to increase energy efficiency in the residential and transport sectors, as reflected in the recently

#### *Recommendations:*

- strengthen *measures for reducing air emissions*, especially from the transport and residential sectors, so as to meet national emission ceilings and limit values for ambient air quality;
- maintain the *incentive value of emission charges* (e.g. the environmental load charge) by regularly reviewing their rates; ensure that incentives for energy efficiency provided by relatively high energy prices are not undermined by unjustified exemptions and subsidies;
- ensure *competitiveness in the energy sector*, in the EU context, to improve its environmental and economic performance; take further steps to increase *energy efficiency* in all sectors of the economy;
- reassess the support schemes for *renewables and biofuels*, and their overall impacts (including those on land use); consider introducing more market-oriented measures (e.g. green certificates);
- review *transport prices and taxes* (e.g. the vehicle tax) to better internalise costs and reflect vehicle environmental performance. Create incentives to influence transport decisions by businesses and individuals, to counteract projected traffic increases (e.g. gradually link road fees to distance travelled, reduce fringe benefits and tax rebates for private car use);
- further develop *traffic management in urban areas* (e.g. traffic restrictions in city centres, parking and road pricing) and continue to promote integrated public transport in major cities; give municipalities better control over their revenue sources and traffic management tools.

approved National Energy Efficiency Action Plan. Households still benefit from exemptions on energy taxes, which may discourage efficient use of energy. *Transport demand management* has proven inadequate to influence decisions on car use, partly because of persistent financial constraints faced by municipalities. Commuter subsidies are not sufficient to support public transport and income tax provisions encourage private vehicle use. The growing motor vehicle fleet, as well as the boom in road freight transport which followed EU accession, threatens to offset improvements in vehicle technology and fuel quality. Road prices are not proportional to distance travelled and vehicle taxes do not satisfactorily take account of environmental performance.

### Water

Hungary's *administrative framework* (at both national and regional levels) was reorganised during the review period to merge responsibilities for water quantity and water quality issues. A *national river basin management plan* and the associated programme of measures are being prepared to implement the EU Water Framework Directive. *Water prices* now recover the cost of operation and maintenance for both water supply and waste water services. A *pollution charge* ("environmental load charge") applies to all activities that require a permit (e.g. waste water companies) and is gradually being phased in; the rate takes into account the vulnerability of recipient waters. The charge coexists with pollution fines for discharges in excess of permits; the rate of the fines was significantly increased in recent years, while allowing for quasi exemption if measures are taken to reduce the pollution load. The share of population connected to *waste water treatment* has increased to 60%, though delays occurred in Budapest where a third treatment plant is due to begin operation in 2010. Massive funding of waste water infrastructure, with co-financing from the EU, is planned for the coming years. Hungary is a low and *flood-prone country*, with the largest flood protection system, and the largest fluvial flood plain system in Europe. Important steps have been taken to reduce vulnerability to flood hazards, including through preparing flood prevention and mitigation plans, revising land use planning legislation and local construction regulations, and taking a proactive stance at EU and international levels. The water quality of *large lakes* improved over the review period.

Despite comprehensive programmes to open new drinking water sources, to extend public water supply and to improve purification technology, which has led to considerable progress, 23% of Hungary's *drinking water* do not comply with EU standards for ammonium, arsenic (of geological origin), nitrite, fluoride

and boron (as well as iron and manganese). Bacterial contamination still prevails in *large rivers*, and mercury and zinc still contaminate the Tisza River (due to historical mining operations). Around 60% of the country's surface water bodies have been identified as being at risk of failing to achieve the environmental objectives of the EU Water Framework Directive by 2015. While a third of the country's *aquifers* are subject to pollution from untreated waste water and agriculture, several aquifer protection zones have yet to be established. Despite serious drought events in recent years, the rates of the *water abstraction charge* ("water resource fee") have not significantly increased and continue to vary according to the user. User charges for water and waste water services involve cross subsidies from industry to households. Despite *extreme floods* in recent years, a third of the country's flood defence dikes are not up to the national standard of one metre above the once-in-a-century flood level. Despite a recent change of philosophy towards increasing the role of nature conservation in *flood management*, including the "space for water" concept, Hungary continues to rely primarily on costly engineering approaches and very little on ecosystem approaches. Insurance policy against flooding has yet to develop.

*Recommendations:*

- speed up implementation of the *Drinking Water Quality Improvement Programme*, with the aim of having all public water supply comply with drinking water quality limit values;
- further strengthen the flood prevention and control efforts; further enhance the ecosystem and land use approach to *flood management*; develop a flood insurance policy;
- pursue efforts to connect the population to *waste water treatment* so as to prevent widespread bacterial contamination of large rivers;
- further refine the structure and rates of *economic instruments* (e.g. user charges, abstraction and pollution charges) to give appropriate signals to all users and finance water management, while taking social factors into account;
- carry out a comprehensive analysis of the costs and benefits of implementing the *EU Water Framework Directive*.



### *Nature and biodiversity*

Hungary has made many efforts to protect nature and biodiversity. The Hungarian Nature Conservation Act (adopted in 1996), still provides an adequate *legal framework* for biodiversity conservation throughout the country, including in areas that are not currently protected. The development and implementation of the *network of Natura 2000* sites, in the EU context, will bring the area protected from 9.2% to 21% of the country. In spite of lack of resources, Hungary's nature conservation administration, its NGOs, and a large number of volunteers are working well and hard to strengthen nature and biodiversity protection. One example is the effective and productive collaboration between the Ministry of Agriculture, the Ministry of Environment and Water, and NGOs to prepare the payment system for Natura 2000 sites for the period 2007-13. Hungary has also developed a comprehensive biodiversity monitoring system with an excellent scientific basis.

However, Hungary has not yet adopted its *National Biodiversity Strategy*, although a good draft is available. The *capacity of the nature conservation sector*

#### *Recommendations:*

- adopt at government level and implement the *National Biodiversity Strategy and Action Plan* as soon as possible, as a comprehensive action-oriented framework for ecosystem and species conservation at both national and local levels;
- strengthen the *implementation of the Natura 2000 Ecological Network*, and develop corridors between network sites;
- increase the human and financial *capacity* for nature conservation and biodiversity including in the public administration and civil society; increase the *involvement of stakeholders* in the nature conservation sector;
- continue to improve the *integration of nature conservation objectives in sectoral policies* such as agriculture and forestry, regional development and land use planning, transport and tourism;
- intensify efforts to *raise public awareness* about nature conservation and biodiversity, targeting all age groups, as well as groups such as hunters and farmers;
- assess land use changes resulting from the country's *plans on bio-energy development*; develop, adopt and implement a short-to medium-term strategy to promote the sustainable use of natural resources with appropriate involvement of stakeholders.

has decreased in recent years; for example, the national park directorates, the regional organisation for nature conservation, are unable to prevent the licensing of projects or development programmes that are likely to have negative impacts on biodiversity. Decreasing financial resources and staff are drastically limiting the implementation of nature conservation policies, at the time of implementation of the Natura 2000 network. For instance, during the last two years, the number of national park rangers has decreased by 20%. Urbanisation, transport infrastructure development, intensive wood harvesting for energy use and illegal hunting and logging, all exert negative impacts on biodiversity. Further *integration of nature protection and biodiversity in sectors* like agriculture, forestry, transport, tourism, hunting and land use planning is needed.

## 2. Towards Sustainable Development

While the present agenda is dominated by budget consolidation, and economic convergence in the EU, the Hungarian National Sustainable Development Strategy (NSDS), adopted by the government in June 2007, provides a very long-term (2050) and positive vision with which all members of society can identify. It goes beyond i) the pre-existing National Development Policy Concept (up to 2020) and the National Spatial Development concept (up to 2020), and ii) the New Hungary Development Plan for the 2007-13 period.

### *Integration of environmental concerns into economic decisions*

Hungary made progress over the review period in *decoupling* environmental pressures from economic growth for major conventional pollutants (e.g. SO<sub>x</sub>, NO<sub>x</sub>), CO<sub>2</sub>, water abstraction and municipal waste. There has been progress in *integrating environmental concerns* into energy and transport policy at the strategic level, although the communication between the Ministry of Economy and Transport and the Ministry of Environment and Water has not always been fully satisfactory. As an instrument for integration, SEA has been introduced and successfully implemented in sectoral strategies, although not used in the case of transport policy. *The Polluter Pays Principle and the User Pay Principle* have been implemented further with the elimination of environmental subsidies for the private sector and progress towards cost recovery in the case of water, waste and energy prices. Revenues from environmentally related taxes stayed broadly consistent at 2.5% of GDP, in line with EU average. An increased use of *economic instruments* has to be recognised, with the introduction step by step of

an environmental load charge, the extension of the product charge scheme and the adoption of the energy tax.

However, *road freight transport* is increasing at a higher pace than the GDP rate. *Nitrogen fertiliser use and pesticide use* have also grown as a consequence of the EU income support to farmers. A review of potentially *environmentally harmful subsidies* was undertaken during the review period, but there has been no follow up. In the field of transport, fringe benefits granted to company cars encourage the use of the road. Fuel taxes were reduced from about 70% in 1998 to 50-55% in 2006, and road fuel prices remain below the OECD Europe average. The price of natural gas paid by Hungarian households has increased but remains much below the OECD average. With an increase of EU funding concomitant with a downsizing of public servant staff, Hungary will have still to ensure that *cost-effectiveness* has a central place in decision criteria when establishing priorities among projects to be financed with EU money and that its *capacity of absorption* of EU funds is satisfactory.

#### *Recommendations:*

- further improve the *pollution, energy and resource intensities* of the Hungarian economy; promote sustainable production and consumption patterns;
- strive to eliminate *environmentally harmful subsidies* (e.g. the fringe benefits of company car use);
- develop institutional mechanisms to systematically and continuously review and revise *economic instruments* (e.g. taxes, charges, trading), aiming at green tax reforms and green budgeting, considering competitiveness, distributive and employment issues; make sure that the conditions for granting exemptions are fully justified or fulfilled, to avoid undermining their incentive effects;
- ensure a high *absorption capacity for EU funds*; strengthen technical and economic expertise in the administration to apply EIA and cost-benefit analysis, SEA and environmental integration, when setting up priorities among projects submitted for EU funding, with special attention to non-environment projects;
- continue to improve *inter-institutional co-operation* at national and territorial levels of government, and integration of environmental concerns into sectoral policies;
- develop mechanisms of monitoring and evaluation of progress towards the objectives of the *National Sustainable Development Strategy*, including relevant indicators, and increased public participation.

## Agriculture

The *national nitrogen balance* is low by OECD standards and the national phosphorus balance has decreased, to the extent of becoming negative. Agricultural emissions of greenhouse gases have decreased by nearly half since 1985-87 (base period under the Kyoto Protocol for Hungary). *On-farm energy consumption* was decoupled from agricultural production, showing better performance in the farm sector than in the rest of the economy. Hungary already met its *ammonia emission reduction commitments* (for 2010) under the Gothenburg Protocol. Use of methyl bromide has been prohibited in Hungary in 2005. Water use by agriculture has dramatically decreased. *Afforestation* to combat soil erosion has proved popular among farmers, because of attractive financial incentives; it has involved an increasing share of indigenous tree species. A *code of good agricultural practices* was introduced in the early 2000s, which led to a concept of “strict environmental management” that now applies to 1.4 million hectares of environmentally sensitive areas (out of 5 million hectares of farmland). The code will become compulsory in areas gradually designated as vulnerable to nitrate pollution (to cover nearly half of Hungary). Since the introduction in 2000 of *agri-environmental measures*, expenditure for such payments has increased and now accounts for 13% of total direct payments. The introduction of the *single payment scheme* (following EU accession) is an important step towards reducing production and trade distortions, and thus the degree of flexibility that farmers have in their production choices.

However, a quarter of farmland is affected by moderate to severe *soil erosion* and efforts to improve agricultural soil management have been limited. Little has been done to protect *on-farm biodiversity*: less than a quarter of Environmentally Sensitive Areas overlap with the recently established Natura 2000 network. Organic farming applies only to 2% of the agricultural land area and there is low consumer demand and awareness about organic products. The intensities of use of nitrogen fertilisers and *pesticides* have been quickly increasing in recent years, with the increase of EU support, and are now in line with the OECD Europe average. Many manure storage facilities do not comply yet with requirements of the code of good agricultural practices. Integrated Pest Management accounts for only 0.13% of total agricultural area. *Payments based on input use* have remained. *Top-up payments* (complementary to single payments) have the potential to distort commodity production and thereby to make the farmers decide on production without attention to environmental criteria. The budget devoted to agri-environmental measures under the new National Rural Development Strategy 2007-13 remains insufficient. *Budgetary expenditure on general services* has remained stable since accession, despite

increasing availability of EU funds, thereby missing the opportunity to better help the farming sector build capacity on environmental management.

*Recommendations:*

- design *complementary national direct payments* (“top-up payments”) so as to maintain the degree of flexibility that farmers have in their production choices;
- prepare the shift from single payments (and their top-up payments) to income support *payments based on historical entitlements*, in the context of the CAP reform;
- design *cross compliance* with a view to achieve specific environmental outcomes;
- strengthen *on-farm biodiversity* protection in the context of establishing the Natura 2000 network;
- introduce compulsory *nutrient management plans* at the farm level in “nitrate vulnerable zones”;
- set a national target of reduction in treatment frequency of *pesticides*;
- increase the share of agricultural budgetary expenditure on *general services*, to speed up environmental R&D and innovation in the farming sector.

*Integration of environmental and social decisions*

Hungary adopted its second National *Environmental Health Action Programme* (NEHAP-II 2004-10) during the review period as well as a Children’s Environmental Health Action Plan (CEHAP). The latter followed Europe’s Fourth Ministerial Conference on Environment and Health (Budapest, 2004). Hungary has several positive indicators of environmental health: dioxin levels in human breast milk are among the lowest in Europe and mortality from respiratory diseases is lower than the EU-15 average. A national climate and health strategy, recently adopted, widens the scope of environmental health issues addressed in government policy. Hungary has also taken steps to promote *environmental democracy*, by developing a system to provide environmental information to the public, offering environmental education, and developing closer ties to local authorities, companies, NGOs and the media, with a view to raising environmental awareness. An innovative ombudsman’s position has been established concerning future generations. A 2004 Supreme Court Decision (the

so-called “Uniform Decision”) has opened wider possibilities for non-governmental organisations to appeal decisions on a range of topics including the construction permit procedure. Despite limited resources, *environmental education* has progressed. For example, 272 elementary schools now participate in an eco-school network.

Important problems remain, however, aggravated by the *increase in both poverty and income disparities* that occurred over the review period. The life expectancy remains among the lowest in OECD countries. Rates of mortality from diseases of the circulatory system and malignancies are among the highest in the OECD. Greater attention needs to be given to the *health effects* of air pollution (fine particulate matter) and prevention of health problems related to drinking water quality. Although 93% of the population is supplied with drinking water from central distribution systems, the water does not always meet health standards. Exposure to *asbestos* is still a problem: so far 20% of the asbestos in monitored residential buildings has been removed. Certain trends in environmental democracy have also been unfavourable. Less than 10% of the municipalities have prepared a *Local Agenda 21*. Although steps were taken to

#### *Recommendations:*

- set higher priority on *poverty and income distribution* issues, including child poverty, in environmental management;
- pursue efforts towards meeting NEHAP II objectives and quantitative targets for *public health and the environment*;
- promote *active employment policies* in eco-industries and environmental services, and the role of the not-for-profit sector in environmental employment, especially in environmentally sensitive areas;
- further promote *citizen participation* in environmental decision-making and access to justice concerning environmental issues;
- continue to develop, use and disseminate *environmental indicators*, and promote access to environmental information;
- pursue *environmental education* efforts; further develop the *environmental training* of elected officials, civil servants and teachers, and establish training for justice officials; develop closer and more sustained relations with local authorities, business and NGOs, as well as with the media, with a view to *raising environmental awareness*.

facilitate public participation in environmental decision-making and appeal, the system is still not well understood or effectively used by civil society.

### 3. International Co-operation

During the review period, Hungary managed to comprehensively *revise its environmental legislation* to prepare for *EU accession*. Since its accession to the EU, Hungary has actively participated in the negotiation of new environmental acquis, in the development of EU environmental policies and programmes and in the preparation of EU positions in major environmental negotiations. Hungary has deepened its *bilateral co-operation* (elaborating and signing 30 bilateral agreements), strengthened its co-operation with neighbouring countries and taken an active part in sub-regional, regional and global co-operation promoting sustainable development and environmental protection. Hungarian authorities have participated in a number of transboundary environmental impact assessment procedures under the *Espoo Convention* with Austria, Croatia, Romania and Slovakia, and have promoted international activities aimed at strengthening *environmental security and liability*. Hungary has significantly reduced its *SO<sub>x</sub> emissions* in accordance with its obligations under the Convention on Long-Range Transboundary Air Pollution (CLRTAP) and its protocols, and has decreased its contribution to transboundary SO<sub>x</sub> pollution. Hungary is very likely to meet its targets under the *Kyoto Protocol* and the Montreal Protocol and its amendments. Hungary has taken the first steps towards elaborating and implementing a *donor policy* that conforms to OECD principles.

However, Hungary did not have a comprehensive climate change strategy until recently. There has been insufficient integration of climate change concerns in sectoral policies (e.g. energy, transport). Hungary must be prepared to contribute to the challenging EU GHG emission reduction target by 2020. In early 2008, the Parliament adopted Hungary's National Climate Change Strategy 2008-25, and then the Energy Strategy 2008-20. Both strategies were discussed simultaneously to ensure coherence. *Emissions of VOCs and NO<sub>x</sub>* increased in recent years: further control measures concerning polluting industrial and transport sources will be needed to meet the Gothenburg Protocol targets. Hungary's *capacities to enforce EU law* and to control illegal movement of hazardous wastes, ozone-depleting substances and endangered species appeared insufficient in a number of cases. Ratification of the pollutant release and transfer register (PRTR) protocol is pending. Limited budgetary resources and cuts in human resources may endanger Hungary's implementation of international environmental commitments.

*Recommendations:*

- identify priority measures for mitigation of and adaptation to *climate change* based on an analysis of their cost effectiveness; ensure the co-ordinated implementation of the National Climate Change Strategy with energy, transport, agriculture and water policies;
- improve *energy efficiency*, especially for power plants, buildings and the transport sector;
- further contribute to the development and effective implementation of bilateral and multilateral co-operation, programmes and agreements, in particular focusing on protection of *transboundary watercourses*, prevention of *floods* in the Danube catchment area, and on assistance to prospective EU candidate countries;
- reduce *VOC and N<sub>ox</sub> emissions* to meet the 2010 target set by the EU Directive on National Emissions Ceilings and the Gothenburg Protocol;
- strengthen *controls* for the transboundary movement of hazardous wastes, endangered species and ozone-depleting substances;
- increase *official development assistance*, and its environmental components.





Part I

# **ENVIRONMENTAL MANAGEMENT**



# 2

## AIR MANAGEMENT\*

### Features

- Further reducing air emissions
- Air pollutants and health effects
- Air management and energy policy
- Air management and transport policy

\* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 2000. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy. It takes into account the latest IEA Energy review of Hungary.

## Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Hungary:

- strengthen *measures for reducing air emissions*, especially from the transport and residential sectors, so as to meet national emission ceilings and limit values for ambient air quality;
- maintain the *incentive value of emission charges* (e.g. the environmental load charge) by regularly reviewing their rates; ensure that incentives for energy efficiency provided by relatively high energy prices are not undermined by unjustified exemptions and subsidies;
- ensure *competitiveness in the energy sector*, in the EU context, to improve its environmental and economic performance; take further steps to increase *energy efficiency* in all sectors of the economy;
- reassess the support schemes for *renewables and biofuels*, and their overall impacts (including those on land use); consider introducing more market-oriented measures (e.g. green certificates);
- review *transport prices and taxes* (e.g. the vehicle tax) to better internalise costs and reflect vehicle environmental performance. Create incentives to influence transport decisions by businesses and individuals, to counteract projected traffic increases (e.g. gradually link road fees to distance travelled, reduce fringe benefits and tax rebates for private car use);
- further develop *traffic management in urban areas* (e.g. traffic restrictions in city centres, parking and road pricing) and continue to promote integrated public transport in major cities; give municipalities better control over their revenue sources and traffic management tools.

## Conclusions

Since 1998, Hungary has *considerably reduced air pollutant emissions* and as a consequence has *improved ambient air quality*. Emissions of SO<sub>2</sub> and CO<sub>2</sub> have been further decoupled from economic growth, falling below the respective targets agreed at international and European levels. Per capita emissions of CO<sub>2</sub> are lower than the OECD-Europe average. Economic restructuring and the closing of several industrial plants have helped reduce emissions of particulate matter (–29%) and CO (–20%). The improvement in ambient air quality has resulted in a decreasing trend in morbidity and mortality associated with respiratory diseases. Concentrations of SO<sub>2</sub>, CO, benzene and lead were kept below the limits throughout the country during the review period. The

*national air quality monitoring network was extended*, doubling the number of on-line sampling points, and the vast majority of measuring stations were upgraded to collect data on particulate matter and aromatic hydrocarbons. *Air quality legislation was extensively revised* and is now consistent with international commitments and EU requirements. An “environmental load charge” applying to emissions of the main air pollutants from stationary sources was introduced. Investment in end-of-pipe equipment and improvement in fuel quality have contributed to a significant reduction in emissions from energy generation. Concerning *energy*, Hungary has made significant progress in opening energy markets; and *energy prices* for end-users have been further adjusted to achieve cost recovery. In 2006, the direct subsidy on natural gas for household heating was replaced by a more targeted social compensation scheme. The *energy intensity* of the economy has been reduced, gradually approaching the OECD Europe average. The *share of renewables* in total primary energy supply increased markedly following the introduction of a feed-in tariff in 2001, and the target for electricity generation from renewables was met well ahead of the 2010 deadline. Some large power plants shifted from coal to biomass, thus cutting SO<sub>2</sub> and CO<sub>2</sub> emissions. Concerning *transport*, increases in fuel prices, vehicle taxes and road tolls have helped moderate demand for road transport. Public transport is well developed and still prevails in the modal split for urban travel. Switching to less polluting fuels has been promoted via tax measures. Improvements in fuel quality and vehicle performance have helped to increase the energy efficiency of transport and to reduce related air emissions.

However, some positive trends that characterised the early 1990s slowed during the review period. Emissions of NO<sub>x</sub> and VOCs have fluctuated slightly around the same level since 2001, and recent increases will make it more challenging to reach the respective emission ceilings. Similarly, the decline in emissions of heavy metals and persistent organic pollutants appears to have halted in recent years. Emissions of air pollutants and greenhouse gases from household and transport sectors are growing, partially offsetting progress achieved in the industrial and energy sectors, and potentially undermining improvements in *ambient air quality*, especially in urban areas. *Particles and ground-level ozone* are of particular concern: in 2006, daily limits were exceeded at most assessment stations, particularly in the capital city and large urban areas. The NO<sub>x</sub> annual average threshold was also exceeded in some areas and in major cities of the country. The relatively low rates and exemptions for district heating providers may hinder the incentive function of air emission charges. Compliance with licensing regulations appears to remain the main driver for improving the environmental performance of large stationary sources. As in most EU countries, effective competitiveness in *energy markets* is still limited and a significant potential exists for increasing the efficiency of electricity generation. Whilst the feed-in tariff has helped to increase the share of renewables in energy supply, the support scheme might lead to over-subsidisation; cost-benefit analyses would help in

assessing overall impacts. Further efforts are needed to increase energy efficiency in the residential and transport sectors, as reflected in the recently approved National Energy Efficiency Action Plan. Households still benefit from exemptions on energy taxes, which may discourage efficient use of energy. *Transport demand management* has proven inadequate to influence decisions on car use, partly because of persistent financial constraints faced by municipalities. Commuter subsidies are not sufficient to support public transport and income tax provisions encourage private vehicle use. The growing motor vehicle fleet, as well as the boom in road freight transport which followed EU accession, threatens to offset improvements in vehicle technology and fuel quality. Road prices are not proportional to distance travelled and vehicle taxes do not satisfactorily take account of environmental performance.



## 1. Policy Objectives

*Hungary extensively revised its air quality policy* during the review period. Starting in 2001, several pieces of legislation on air protection were approved, with the aim of fulfilling international commitments and harmonising the country's air management regulation with EU requirements.

The general goals of the renewed air quality legislation framework and the *Second National Environmental Programme for 2003-2008* (NEP-II) are to significantly reduce emissions, including those from transport and energy production and use, and to improve *ambient air quality* in polluted target areas (Budapest and other major cities).

The NEP-II objectives for air quality are detailed in three *thematic action programmes*. The Climate Change Action Programme directly aims both to curb greenhouse gas (GHG) emissions and to improve regional air quality by: reducing air emissions from the energy sector (by improving efficiency in energy production and end use and fostering electricity production from renewables); reducing GHG and polluting emissions from transport; cutting GHG emissions from agriculture and waste and enlarging carbon sink capacities; and preventing atmospheric acidification and stratospheric depletion of the ozone layer. The Environmental Health and Food Safety Action Programme includes a specific objective on the abatement of health risk caused by outdoor and indoor air pollution by reinforcing air quality monitoring systems and the evaluation of health impacts. The Urban Environmental Quality Action Programme aims *inter alia* to reduce urban pollution originating from traffic by defining comprehensive transport plans.

The NEP-II encompasses the 2010 *air emission targets* for sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs) and ammonia stipulated by the Gothenburg Protocol to the Geneva Convention on Long-Range Transboundary Air Pollution (CLRTAP) and the EU National Emission Ceilings Directive (NEC Directive 2001/81/EC). Under the Kyoto Protocol, Hungary has committed to reduce its GHG emissions by 6% below the 1985-87 level by 2008-12 (Chapter 8).

Hungary's *ambient air quality target and limit values* are consistent with the EU Air Quality Framework Directive (Directive 96/62/EC) and related daughter directives. *Additional quantitative targets* set by the NEP-II include: reducing the share of polluted areas in the country from 11% in 2000 to 5-8% by 2008; reducing the share of population affected by air pollution from 40% in 2000 to 20-25% by 2008; and achieving a 20% cut in emissions of persistent organic pollutants by 2008.

The NEP-II air management objectives fully subsume the *recommendations* of the 2000 OECD Environmental Performance Review (EPR), including those related to energy and transport:

- continue to review and upgrade standards relating to air pollution, notably those for ambient air quality, with due regard to harmonisation with relevant EU standards;
- reform regulatory measures for stationary sources, to increase the incentive function of emissions fines, and implement the EU large combustion plant directive; invest in equipment to reduce SO<sub>x</sub> and NO<sub>x</sub> emissions from large coal/lignite-fired power plants, where such investment is shown to be cost-effective;
- extend the national air quality monitoring system and improve data collection and reporting, increasing the number of pollutants measured to include size-fractions of particulate matter (e.g. PM<sub>2.5</sub> and PM<sub>10</sub>), toxic substances and heavy metals;
- continue efforts to improve energy efficiency in the industrial sector;
- modernise district heating networks to reduce distributional losses; pursue efforts to reduce price distortions concerning heat supply and distribution for industrial and residential users;
- prepare and implement measures to improve energy efficiency in the residential sector, including mandatory building codes, metering systems and incentives for insulation improvement;
- encourage use of cleaner fuels and renewable energy sources (e.g. biomass);



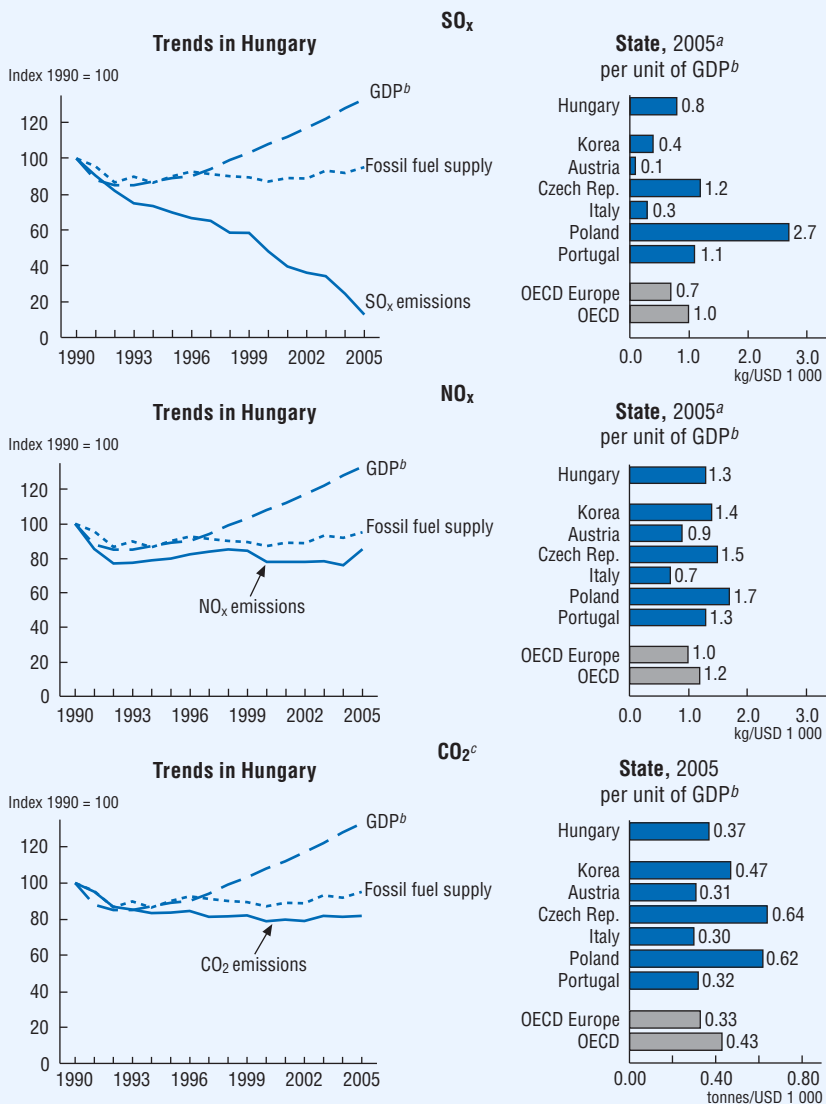
- review the Hungarian Transport Policy, giving special attention to the setting of investment priorities on the basis of economic analysis, covering environmental impact and energy efficiency of transport modes;
- improve enforcement of vehicle inspection programmes and develop incentives for scrapping old motor vehicles;
- review the mix of economic instruments influencing modal choice for passenger transport, and reassess the present system of income tax rebates for commuting by passenger car;
- review public transport fares (e.g. in Budapest), taking into account the pricing of other transport modes and seeking to create financial incentives to use public transport;
- develop a sustainable transport plan for Budapest, incorporating public transport, car-free zones, parking management, two-wheel vehicle lanes, spatial planning and other measures;
- give comprehensive consideration to transport project alternatives throughout the EIA process, including during stages of public consultation and participation;
- carry out noise abatement along major roads and railways, and improve enforcement of emissions limits for motor vehicles;
- develop and monitor indicators of environmental impacts of transport, including air, noise and solid waste emissions as well as impacts on nature and the landscape.

## 2. Air Pollution Trends

### 2.1 *Further reducing air emissions*

Emissions of  $SO_2$  decreased by 78% between 1998 and 2005, reaching 129.3 kilotonnes (kt)/year, well below the 2010 emission ceiling of 500 kt/year stipulated by the Gothenburg Protocol and the EU NEC Directive. The energy sector has made the biggest contribution to the reduction in sulphur emissions. The  $SO_2$ -intensity of the Hungarian economy dramatically dropped over a short period, and it is now in line with the OECD-Europe average (Figure 2.1). In 2005, about 75% of total sulphur emissions came from industrial and non-industrial combustion. Industrial emissions fell by 41%, while emissions from non-industrial combustion rose, correlated to the growth in household heating emissions (+15.6%) (Table 2.1).

Figure 2.1 Air pollutant emissions



a) Or latest available year.

b) GDP at 2000 prices and purchasing power parities.

c) Emissions from energy use only; excludes international marine and aviation bunkers; sectoral approach.

Source: HCSO; OECD-IEA (2007), CO<sub>2</sub> Emissions from Fuel Combustion; OECD (2007), OECD Economic Outlook No. 82; OECD-IEA (2007), Energy Balances of OECD Countries 2004-2005.

Table 2.1 **Atmospheric emissions, by source, 1998-2005**

		SO <sub>2</sub>		NO <sub>x</sub>		NMVOC <sup>a</sup>		CO		PM <sup>b</sup>		CO <sub>2</sub>	
		1 000 t	(%)	1 000 t	(%)	1 000 t	(%)	1 000 t	(%)	t	(%)	1 000 t	(%)
Power Stations	1998	462.7	78.2	49.9	24.7	1.5	0.9	15.4	2.1	19.2	15.1	23 970	39.4
	2005	20.7	16.0	27.9	13.8	3.6	2.0	15.7	2.7	8.3	9.2	16 913	27.4
Industrial Combustion	1998	68.9	11.6	11.4	5.6	12.3	7.3	5.6	0.8	10.5	8.2	11 268	18.5
	2005	40.4	31.2	11.6	5.7	9.7	5.5	5.7	1.0	9.8	10.8	11 796	19.1
Non-industrial Combustion	1998	48.7	8.2	18.3	9.0	21.4	12.6	30.6	4.1	29.2	22.9	13 796	22.7
	2005	56.3	43.5	23.4	11.5	36.8	20.7	36.6	6.2	38.1	42.0	17 548	28.4
Industrial Processes	1998	8.0	1.4	9.0	4.4	22.4	13.2	220.0	29.9	45.0	35.3	3 201	5.3
	2005	10.0	7.7	4.9	2.4	40.3	22.7	98.2	16.7	9.7	10.7	3 326	5.4
Mobile Sources	1998	3.5	0.6	114.0	56.3	63.7	37.6	465.3	63.1	19.6	15.4	8 193	13.5
	2005	1.9	1.5	135.0	66.6	58.6	33.0	419.9	71.5	21.4	23.6	11 777	19.1
Solvents	1998	-	-	-	-	45.9	27.1	-	-	0.0	0.0	95	-
	2005	-	-	-	-	28.4	16.0	-	-	0.0	0.0	65	-
Miscellaneous	1998	-	-	0.0	0.0	2.4	1.4	0.0	0.0	3.9	3.1	267	0.4
	2005	-	-	0.0	0.0	0.0	0.0	10.9	1.9	3.4	3.7	382	0.6
Total	1998	591.8	100.0	202.6	100.0	169.6	100.0	736.9	100.0	127.4	100.0	60 790	100.0
	2005	129.3	100.0	202.8	100.0	177.5	100.0	587.0	100.0	90.7	100.0	61 808	100.0
Change (%)	2005/1998		-78.1		0.1		4.6		-20.3		-28.8		1.7

a) 1999-2005.

b) 1998-2004.

Source: Environmental Statistical Yearbook of Hungary, HCSO; UNFCCC.

Emissions of  $NO_x$  dropped sharply between 1998 and 2000, from 202.6 to 185.5 kt/year, due essentially to the restructuring of the power sector, and they hovered around the same level in the early 2000s. However, in 2005 there was a rise in emissions (203 kt), mostly caused by road transport, which would make it more difficult to reach the 2010 target (198 kt). The  $NO_x$ -emission intensity of the economy is slightly above that of the OECD (Figure 2.1). Transport remains the major source of  $NO_x$ , and non-industrial combustion (mainly household heating) represents a fast-growing source of emissions (Table 2.1).

*Non-methane VOC* emissions rose 4.6% over the review period, from 170 kt in 1999 to 177.5 kt in 2005, taking Hungary further away from its international and EU commitments (137 kt by 2010). Emissions from mobile sources declined by 8%, due to the penetration of catalytic converters in the vehicle fleet, which has outweighed the effect of traffic growth. However, transport remains the major source of VOCs, followed by

industry, whose emissions have almost doubled since 1999, and district heating (+72%). Emissions from solvent use dropped steadily over the review period, as a result of the technological measures introduced by installations to comply with the EU Solvent Directive thresholds (Directive 99/13/EC) (Table 2.1). Further control measures would be required to cut VOC emissions, especially in the industrial and transport sectors.

*Ammonia* emissions increased by 23% between 2002 and 2005 but stayed below the 2010 target of 90 kt.  $\text{NH}_3$  emissions were about 80 kt in 2005, mainly arising from animal breeding and fertilisers use.

Despite Hungary's economic growth, *GHG* gross emissions stayed broadly constant during most of the review period, at around 80 million tonnes of  $\text{CO}_2$ -equivalent, about two-thirds of the base-year (1985-1987) level and well below Hungary's Kyoto target (Figure 2.1). The carbon intensity of the Hungarian economy is slightly above the OECD-Europe average, whereas per capita emissions are about 70% of the OECD-Europe average.  $\text{CO}_2$  emissions amounted to around 62 million tonnes in 2005, accounting for 77% of the GHG total.  $\text{CO}_2$  emissions from energy production continued to decline during the review period, while emissions from transport rose by more than 40% and from households and services by 27%, exceeding the level of emissions generated by power plants (Table 2.1). Methane and nitrous oxide emissions amounted to nearly 7.8 and 9.9 million tonnes, respectively.

Total *particulate matter* (PM) emissions dropped nearly 30% between 1998 and 2004, although emissions of  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  rose sharply between 2002 and 2005, by 21% and 28% respectively. In 2004, PM emissions from the energy and industrial sectors were about one-half and one-fifth of their respective 1998 levels. The energy sector continued to benefit from measures taken in the early 1990s (installation of electrostatic-precipitators). Emissions from households and mobile sources grew by 30% and 9% respectively; fuel combustion for household heating represents the major source of PM emissions (Table 2.1).

Total *carbon monoxide* (CO) emissions decreased, especially in the industrial sector (-55%). Improvements in vehicle performance brought a reduction in CO emissions from mobile sources, although transport remains the largest source of CO-related pollution (Table 2.1). Emissions from the residential and service sectors showed a major increase (+20%).

The downward trend in emissions of *heavy metals* that began in 1990 continued during the early part of the review period, but appears to have either slowed or reversed (copper) in the latter part, with the major exceptions of cadmium and lead. The reduction in lead emissions was mainly due to the gradual phase-out of leaded petrol (completed in 1999).

Emissions of *persistent organic pollutants* (POPs) started to rise slightly in the latter part of the review period; this was especially the case for PAHs, HCB and dioxin, which are mainly linked to combustion of wood, coal and wastes by households. On the other hand, emissions of PCBs decreased. It appears that the emission abatement potential related to the shift from solid to gaseous fuels and the introduction of pollution removal equipment in the metal and mineral processing industry has weakened.

## 2.2 Meeting ambient air quality standards

In line with OECD recommendations, *Hungary extended and upgraded its air quality monitoring system* during the review period, with the contribution of EU funds. In 2002, management of the monitoring system was moved from the Ministry of Health to the Ministry of Environment and Water (MEW). The system consists of 59 automatic stations (11 in Budapest), 200 manual sampling points and six mobile measuring devices (buses). Nearly all automatic stations collect data on SO<sub>2</sub>, NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub>, CO and ozone and almost half monitor some aromatic hydrocarbons (BTEX). Only four stations (one in Budapest) collect data on PM<sub>2.5</sub>.

Economic restructuring and the closing-down of several industrial plants have helped to *improve ambient air quality in formerly heavily polluted areas*, such as Northern Hungary and Central Transdanubia. Since 2000, the share of national territory with poor ambient air quality has fallen from 11% to 6.3%, and the share of population affected by air pollution has dropped from 40% to 35.9%. Hungary has managed to keep concentrations of lead, benzene and carbon monoxide below limit values throughout the country. However, heavily polluted industrial sites still cause significant problems, and *air pollution from transport* affects the population in urban areas, mainly in Budapest, and in cities situated along transport routes (Box 2.1).

Background *concentrations of SO<sub>2</sub>* have been considerably reduced, following the trend of the 1990s and corresponding to the decline in emissions. In 2006, SO<sub>2</sub> limit values were respected throughout the country. Concentrations are usually higher in winter due to the heating of buildings.

Background concentrations of NO<sub>2</sub>, were slightly reduced during the review period. In 2006 peak (hourly) values did not exceed the limit of 200 µg/m<sup>3</sup> beyond the permitted frequency (18 times) anywhere in the country. However, the annual average (40 µg/m<sup>3</sup>) was exceeded in three zones (Budapest, Győr-Mosonmagyaróvár, Sajó Valley), due mainly to heavy traffic.

Suspended *particulate matter* is of major concern. In 2006, the 24-hour limit (50 µg/m<sup>3</sup>) was exceeded in all zones except one (Székesfehérvár-Veszprém), at about one-third

of measuring stations. The annual average limit ( $40 \mu\text{g}/\text{m}^3$ ) was exceeded in four zones, resulting in about half of the population being exposed to excessive levels of  $\text{PM}_{10}$ . High PM concentrations are mainly linked to heavy traffic in urban areas and in cities close to major roads and to residential heating. In some regions local industry represents a major source of pollution (especially in Győr-Mosonmagyaróvár and Komárom).

*Ground-level ozone* is an extensive problem throughout the country. Ozone standard exceedence varied during the review period, in both urban and rural areas. In 2006, all zones were far from the long-term objectives for health. Health protection standards were exceeded at all ozone assessment stations, resulting in the vast majority of the population being exposed to concentrations above the limits. As elsewhere in Europe, ozone concentrations are typically higher in summer and are mainly linked to transport. In some cities and regions (e.g. Dunaújváros), domestic heating is a major source of ozone precursors. Ecosystem impacts have been less significant: the vegetation protection standard was exceeded at one station only. Further efforts are needed to fully comply with the 2010 target values set by the EU Ozone Directive (2002/3/EC).

### Box 2.1 Transport-related pollution in Budapest

The capital city of Budapest is Hungary's largest urban area, with over 1.8 million inhabitants inside the city and 2.5 million in the urban agglomeration.

In 2001 and 2002, tests were conducted to investigate the *population's exposure to air pollution from transport*. Nitrogen dioxide and benzene levels in ambient air were measured at 80 sites throughout the city, including points along heavily trafficked roads.

As expected, the downtown part of the city and the main roads had the highest exposure levels, with concentrations of  $\text{NO}_2$  and benzene reaching 1.5 to 2 times the health limit value and 50% over the acceptable load for urban background areas. According to the tests, about 20% of the Budapest population lives in areas polluted by  $\text{NO}_2$ , and 10% lives in areas polluted by benzene. People over 65 appear to have the heaviest exposure to traffic-related air pollution: 28% of residents over 65 live in areas of the city where  $\text{NO}_2$  concentrations exceed limit values, and 13% of them live where benzene concentrations exceed limit values.

In 2003, a special test was run to determine the *exposure of metro passengers* to particulate matter,  $\text{NO}_2$ , benzene and ozone. Measurements were taken at two metro stations (Nagyvárad Square and Klinikák) located at different depths. In both stations, the concentrations of  $\text{PM}_{10}$ ,  $\text{PM}_{2.5}$  and sub-2.5 micron particles were well above health limit values. On the other hand,  $\text{NO}_2$ , benzene and ozone levels were not significant.

### 2.3 Human exposure to air pollution and health effects

Several studies have demonstrated a *strong correlation between air pollution and respiratory and cardiovascular diseases*. An assessment of the health effects of PM<sub>10</sub> in Budapest and other cities, conducted on data from 2004, suggests that 170 premature deaths per 100 000 inhabitants per year can be attributable to long-term exposure to high PM concentrations (Jakab, 2004). Over the period 1997-2002, excess morbidity associated with chronic respiratory diseases and cancer was registered among males in the eastern part of the country, close to some of the major traditional industrial sites, and in the Western and Southern Transdanubia (Box 2.1).

The improvement in ambient air quality has resulted in a *decreasing trend in morbidity and mortality associated with respiratory diseases*, more evident since 2000. However, further investigation is needed to identify more recent trends and to isolate the health effects of outdoor air quality from the effects of cigarette smoking.

As for the *health impacts of climate change*, the 11 heat waves registered in Hungary in the period 2001-2006 are seen to have caused 377 excess deaths compared to expected rates under normal weather conditions (Box 7.1). A warning system (communication via media and leaflets) was introduced in 2004 to inform citizens and health-care workers about forecasted heat waves and their potential impacts on human health.

## 3. Measures to Prevent and Control Air Pollution

Governmental Decree No. 21/2001 introduced *major changes in air emissions and ambient air quality legislation*, making it consistent with relevant EU directives. The decree establishes 11 air quality management zones and requires implementation of action programmes in zones where air pollution limits are exceeded. The licensing and sanctioning regimes were also modified. Government Decree 21/2001 was complemented by a series of ministerial decrees adopted in 2001-2002. *National emission ceilings* for major air pollutants were introduced in 2003.<sup>1</sup>

*EU standards* for various air pollutants (SO<sub>2</sub>, NO<sub>x</sub>, PM, ground-level ozone, Pb, Cd, As, Ni, CO, benzene and PAHs) were laid down by Decree No. 17/2001 of the Minister of Environment and its implementing regulations, resulting in application of more stringent limit values. Smog alert decrees entered into force in 2003 in major cities (Budapest, Győr, Tatabánya, Miskolc, Pécs, Szeged, Debrecen).

Harmonisation with the EU legislative framework for air protection was completed by 2003, with the transposition of the *EU Large Combustion Plants Directive* (Directive 2001/80/EC) by Decree No. 10/2003 of the Minister of

Environment and Water, which set up related emission limit values. Full implementation of the directive required a transitional period to facilitate operators' investment plans, especially for the installation of fuel desulphurisation equipment in two large power plants (Mátra and Oroszlány).

*Permitting, monitoring and inspection activities* related to air emissions (including when the EU Integrated Pollution Prevention and Control scheme applies) are mainly the responsibility of Regional Environment Nature and Water Inspectorates, but municipalities are also directly involved. Licensing is conditional on compliance with prescribed plant-specific emission limits, the application of best available technologies (also for non-IPPC plants), and ambient air quality in the interested area, on the basis of the air quality implementation plan. As for *compliance*, air management legislation had the second highest number of breaches in 2002-05, with more than 1 300 enforceable violations. Average fines varied between HUF 2.4 million in 2002 and HUF 4.3 million in 2005.

Most of *pollution abatement and control (PAC) investments in air protection* are incurred by businesses. In the first part of the review period, private PAC investments were mainly targeted at large point sources (large combustion plants), including the flue gas desulphurisation equipment at two power plants (Section 4.1) and the Budapest waste incineration plant (totalling HUF 40 billion). In 2004-05, PAC total investments amounted to about HUF 30 billion per year, accounting for 14% to 17% of overall environmental investments. Over half of the expenditures were sustained by transport operators and firms involved in the community, social and personal services sector, with the remaining almost equally split between the manufacturing and energy sectors.

*Public subsidies* to private firms for investment in air quality decreased over time and terminated in 2003. In the period 2000-03, more than 40% of subsidised environmental investment plans related to air emission management, averaging over 55% of total allocated funds.

As for economic instruments, an *air pollution charge* was introduced in 2003 within the framework of the so-called "environmental load charges" (Chapter 5). The charge is levied on SO<sub>2</sub>, NO<sub>x</sub> and non-toxic solid emissions at a unit rate of HUF/kg 50, 120 and 30, respectively, on the basis of the previous year's emission volume. The share of payment was initially set at 40% of the duty amount and has been gradually increased in the years that followed; full payment will be owed from 2008. The duty applies to operators of installations that are subject to a permit. Exemptions are granted to district heating providers and domestic heating appliances; operators who install emission abatement equipment may claim a 50% allowance for a maximum of two years. The relatively low rate of the charge may hinder its effectiveness;



compliance with permitting regulations (e.g. IPPC) appears to remain the major driver for improving environmental performance.

As for GHG emissions, Hungary participates in the *EU emission trading scheme for CO<sub>2</sub>*, which has been operational since 2005. Some 250 installations are involved, covering about 30 Mt of CO<sub>2</sub> emissions. Allocation of quotas and licensing for emission trading are the responsibilities of the MEW and the Chief Inspectorate, respectively. After the first year of operation, Hungary reported a considerable surplus of allowances, and operators acted as sellers on the market. This initial over-allocation was seen to be due to the low quality of the data on which the National Allocation Plan 2005-07 was based. The National Allocation Plan 2008-12 was approved by the European Commission on condition of reducing the number of emission allowances from 30.7 to 26.9 Mt CO<sub>2</sub>, since the cap initially proposed by Hungary exceeded its 2005 verified emissions.

## 4. Integrating Air Management Objectives into Energy and Transport Policies

### 4.1 Air management and energy policy

Hungary's *energy production sector is a major source of air emissions*, especially of SO<sub>2</sub> and CO<sub>2</sub> (Table 2.1). Hungary managed to cut emissions of SO<sub>2</sub> from power plants by 95% between 1998 and 2005, thanks to the reduction in fuel sulphur content, the installation of desulphurisation equipment (mainly at the lignite-fired Mátra power plant in 2002 and the brown coal-fired Oroszlány plant in 2004), and the further decrease in the share of coal in the total primary energy supply, in favour of natural gas and nuclear energy (Box 2.2). In the same period, NO<sub>x</sub>, CO<sub>2</sub> and PM emissions from fuel combustion for the production of energy fell by 44%, 30% and 56.7%, respectively. On the other hand, emissions from household heating increased considerably, suggesting that the effect of switching from coal to natural gas has exhausted its emission reduction potential.

Objectives related to curbing air pollutant and GHG emissions from energy, increasing energy efficiency, and promoting renewables have been integrated into *strategic and planning documents*, including those enabling use of EU Structural and Cohesion Funds (e.g. the Operational Programmes on Environment and Infrastructure 2004-06 and on Environment and Energy 2007-13). Several *institutions* are involved in matters relating to energy and the environment together with the respective ministries (Ministry of Economy and Transport and MEW). Three inter-ministerial committees are in charge of energy savings, renewable energy and Kyoto mechanisms. The Energy Centre established in 2000 acts as the

### Box 2.2 The energy sector at a glance

Hungary made significant progress during the review period in *restructuring and privatising the energy sectors and in opening energy markets*, in line with EU directives. However, the power of incumbents (MVM Hungarian Electricity Company and E.On-Ruhrgas) hinders effective competitiveness in both electricity and gas markets.

Between 1998 and 2005, *total primary energy supply* (TPES) rose 9.3%, to 27.8 Mtoe. Energy production fell by 15% (from 12 Mtoe to 10.3 Mtoe). The structure of the TPES in 2005 shows a *dominance of natural gas* (44%), followed by oil (26%), nuclear (13%), coal (11%) and renewables (4.4%) (Figure 2.2). Biomass and solid wastes account for more than 90% of energy supply from renewable sources. Domestic energy production is mainly nuclear (35%), gas (22.6%) and coal (17%). Hungary is heavily dependent on the import of natural gas.

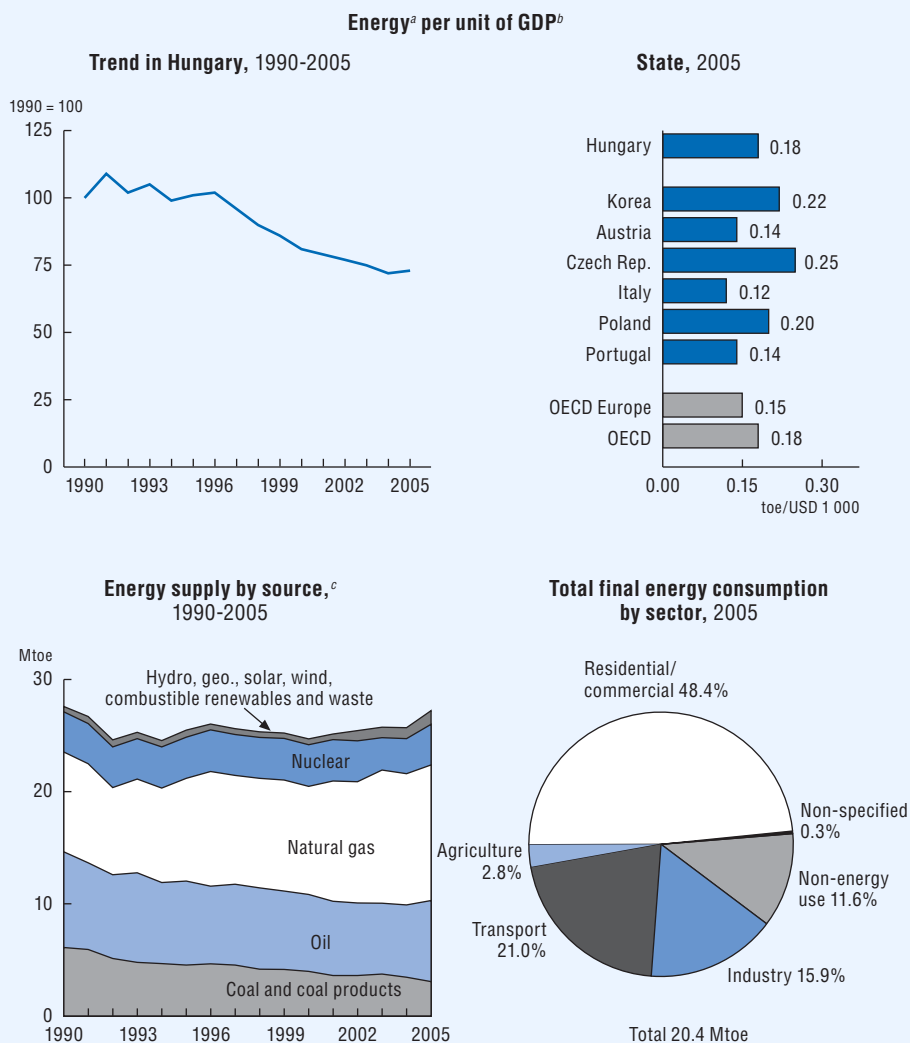
*Total final consumption of energy* (TFC) rose 18% between 1998 and 2005 (from 17.3 Mtoe to 20.4 Mtoe). In 2005, natural gas and oil had a market share of 39.5% and 33.6%, respectively, followed by electricity (13.6%) and heat (6.4%). The transport sector and residential/commercial activities account for nearly 70% of TFC (Figure 2.2). Consumption by transport increased by 36% between 1998 and 2005, and consumption by service activities and households grew by 22%. On the other hand, consumption by industry decreased by 9% over the same period.

*Forecasts to 2020* suggest an increase of both TPES (to 30.6 Mtoe) and TFC (to 21.7 Mtoe). The share of coal is expected to decrease further, reaching 6.9% in TPES and 2.4% in TFC. On a time horizon to 2030, the Hungarian government predicts that the structure of TPES will be modified by a further increase in the share of *natural gas* and renewables.

implementing agency for energy efficiency and renewable energy projects. Nevertheless, some NGOs argue that effective integration of environment and energy policies is still lacking.

The 1993 Hungarian Energy Policy was replaced by *the Energy Policy 2008-20*, with the overarching goals of strengthening competitiveness, increasing the security of energy supply and promoting sustainable development. Air emission targets related to energy were previously established by the 1999 Energy Efficiency and Renewable Energy Programme, which aimed at cutting SO<sub>2</sub> and CO<sub>2</sub> emissions by 50 kt/year and 5 Mt/year, respectively, by 2010. The same programme set a 2010 deadline for: reducing energy intensity by 3.5% per year; saving 75 PJ/year in primary energy consumption; and increasing the amount of energy produced from renewable sources to

Figure 2.2 Energy structure and intensity



a) Total primary energy supply.

b) GDP at 2000 prices and purchasing power parities.

c) Breakdown excludes electricity trade.

Source: OECD-IEA (2007), Energy Balances of OECD Countries 2004-2005; OECD (2007), OECD Economic Outlook No. 82.

1.2 Mtoe/year. Hungary is well on track to reach its energy-saving target and has already met its targets for SO<sub>2</sub> and renewables. However, despite progress in meeting its Kyoto target, this CO<sub>2</sub> goal appears to be more challenging.

### *Energy intensity*

The *energy intensity* of the Hungarian economy continued to decrease in the period 1998-2005, from 0.22 to 0.18 Toe/1 000 USD GDP, gradually approaching the OECD-Europe average (Figure 2.2). On the other hand, TPES per capita, after falling in the 1990s, increased from 2.45 in the year 2000 to 2.75 in 2005. The generation park is relatively old, with almost half of generating capacity more than 25 years old, resulting in comparatively low efficiency (gas and coal-fired power plants). Hence, a significant potential for efficiency improvement exists (IEA-OECD, 2007). Final energy consumption from service activities, transport and households has dramatically increased, due partly to inadequate building and appliance standards and lower gas prices for households (Box 2.2). Full implementation of the EU Building Directive (Directive 2002/91/EC) would require a special effort; Hungary applied for a three-year extension for introducing the energy efficiency certification process and for the assessment of furnaces, boilers and air-conditioning appliances. Nevertheless, progress has recently been made in improving the quality of new buildings with a growing interest shown by the business sector (e.g. the Hungarian Association of Energy Auditors was established) (Gulyás E. et al., 2006).

Several measures were taken during the review period in the form of *financial support (direct subsidies and soft loans) for energy efficiency*: audits and investments by businesses and municipalities, renovation of private and public buildings, upgrading of district heating networks, installation of combined heat and power (CHP) and renewable energy units and tailored educational programmes. These investment programmes resulted in 17.7 PJ/year energy savings by 2006. Hungary's National Energy Efficiency Action Plan 2007-13 (pursuant to Directive 2006/32/EC) indicates that the government expects to achieve the required annual 1% energy savings, mainly maintaining the past energy saving measures.

### *Prices*

*Price distortions among different types of energy* were reduced during the review period but are still problematic. Energy prices paid by the Hungarian industry for natural gas and electricity are higher than the OECD average, but oil prices are lower than the OECD-Europe average. Households pay significantly higher prices than industry for both electricity and natural gas; the household electricity price is 1.4 times the OECD-Europe average, while the natural gas price is far below the

OECD average (Table 5.4). Households have traditionally benefited from direct subsidies for natural gas (averaging 12% of a household gas bill). In late 2006, the subsidy was replaced by a compensation scheme linked to social conditions, leading to a sharp increase in prices and to a partial return to dirtier solid fuels or biomass heating.<sup>2</sup> However, some concerns remain about capabilities for enforcing the compensation scheme, due to the high degree of hidden economy. Moreover, residential consumers are exempted from the energy tax on electricity (HUF 186/MWh) and natural gas (HUF 56/GJ), which was introduced in 2003.

### *Renewables*

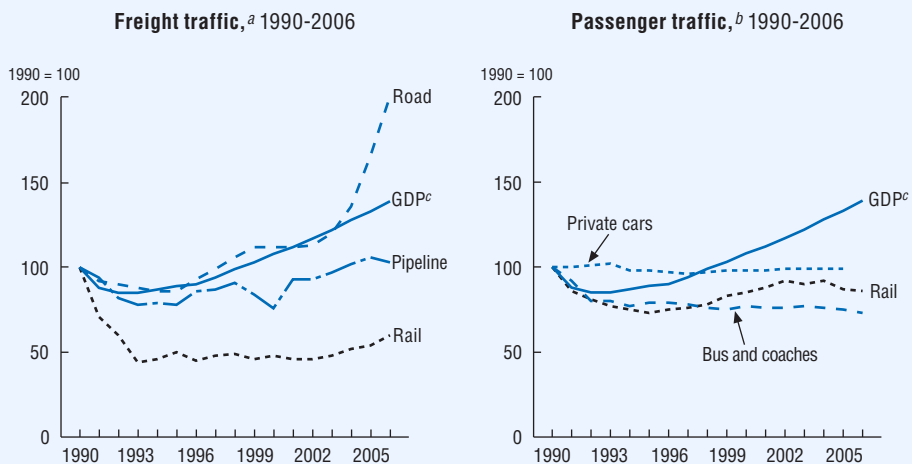
The share of *renewables* (including waste) in TPES more than doubled during the review period, from about 0.5 Mtoe in 1998 to 1.2 Mtoe in 2005, contributing to 4.4% of the energy supply in 2005. The government foresees reaching a 7.2% share by 2013. Nonetheless, further efforts would be needed to meet the more ambitious EU target by 2020. Biomass is the most important renewable source in Hungary, primarily in the form of fuel wood, and it is mainly used in heat production. Emission limits for medium-sized biomass plants (up to 50 MW<sub>th</sub>) are stricter than EU limits, but small boiler emissions (up to 140 kW<sub>th</sub>) have remained unregulated and may cause pollution. The Hungarian potential for biomass production is high, by virtue of the country's endowment of productive farmland and forests.

*Electricity production from renewables* grew seven-fold in the period 1998-2005 (from 267 to 1 942 GWh). Electricity from biomass and wind increased significantly; three large power plants shifted from coal to biomass, thus cutting their CO<sub>2</sub> and SO<sub>x</sub> emissions. In 2005 renewable sources accounted for 4.6% of gross electricity consumption, well above the 2010 indicative target of 3.6% pursuant to EU Directive 2001/77/EC. The support regime introduced in 2001 has probably been the main driver behind this accomplishment: electricity generated from either renewables or small-scale CHP plants benefits from a very favourable feed-in tariff (over twice the average wholesale electricity price) and a must-buy requirement. Although effective, this support scheme might lead to over-subsidisation; cost-benefit analyses would help to evaluate overall impacts (including those on land use and biodiversity).

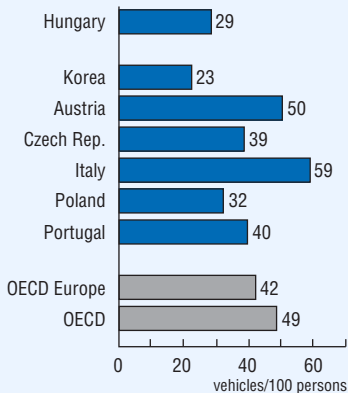
## **4.2 Air management and transport policy**

Hungary is a *transit country* in Central and Eastern Europe, and transport has traditionally played an important economic role. Since the country's accession to the EU, road freight transport has begun to grow much faster than GDP (Figure 2.3). Motorisation of households has also increased and will likely continue to grow,

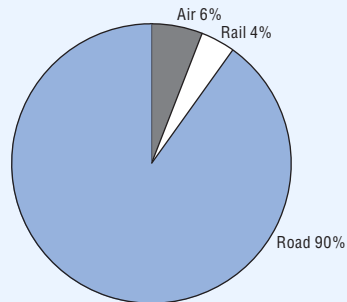
Figure 2.3 Transport sector



Private car ownership, 2005



Total final energy consumption by the transport sector, 2005



a) Index of relative change since 1990 based on values expressed in tonne-kilometres. National and international transport.

b) Index of relative change since 1990 based on values expressed in passenger-kilometres.

c) GDP expressed in 2000 prices and purchasing power parities.

Source: OECD Environment Directorate; OECD-IEA (2007), Energy Balances of OECD Countries 2004-2005.

generating higher car traffic. The country's transport infrastructure is generally insufficient to cope with these trends (Box 2.3).

The *Hungarian Transport Policy 2002-15* encompasses EU transport objectives, and the national legislation relating to the environmental impacts of the transport sector, including air pollution, has been made consistent with EU requirements. The policy aims at developing an environmentally-friendly transport system, giving priority to completing the transport infrastructure network and the Trans-European corridors.

### *Infrastructure*

*Significant investments* have been made on motorways, railways and inter-modal logistic centres, and are planned in the future, also with EU financial support (e.g. the Transport Operational Programme 2007-13). Transport infrastructure projects that might have negative impacts on the environment are subject to *environmental impact assessment* (EIA). EIA has helped to integrate environmental considerations in shaping project alternatives.

### *Traffic demand management*

*Urban and inter-urban passenger public transport* systems are both well developed but problems remain, mainly linked to the aged and insufficient vehicle fleet and inadequate infrastructure in urban areas (Box 2.3). Urban transport infrastructure and services as well as traffic management are the responsibility of municipalities, which often face financial constraints. Municipalities provide cost subsidies to urban public transport operators (mostly municipality-owned) to cover their operational losses; however, they do not control the source of revenues, since fares must be approved by the Ministry of Finance. The central government compensates transport operators for obligatory fare discounts to some population groups (e.g. students and people over 65).

Larger cities (e.g. Budapest, Debrecen, Szeged) have designed *local transport plans*, which include speed limits of 20-30 km/h in residential areas, no-traffic zones and cycling routes. The city of Budapest has put in place a few park-and-ride sites and plans to extend the cycling network, with the objective of 5% cycling in the modal split by 2010. Only Budapest has established an *integrated transport system*, as part of a 1995-2001 World Bank project. Combined tickets permit use of urban and sub-urban services (provided by the Budapest Transport Company, the Volán state-owned inter-city bus company and the Hungarian State Railways). The system is expected to be fully operational by 2010.

*Measures to moderate demand for private car use in urban areas* have not been sufficiently used and have generally been limited to parking fees and awareness-

### Box 2.3 The transport sector: state and trends

The *volume of freight transport per GDP* (in tonne-kilometres/GDP) decreased steadily over the first part of the review period but has increased rapidly since EU accession. In particular, road freight transport has increased at a higher rate than GDP (Figure 2.3). In 2006, the modal share (in tonnes per kilometre) was 64.3% road, 21% rail, 11.5% pipeline and 3% inland waterway. The share of rail in freight transport is much higher than the EU-15 average (14%).

The *volume of inland passenger traffic* (in passenger-kilometres) experienced a moderate increase (+2.7%) between 1998 and 2005. The share of rail travel in the passenger transport modal split increased from 12.2% in 1998 to 13.2% in 2005, whereas the share of car travel remained broadly constant at about 62.5%. Bus accounted for 24.3% passenger trips. Waterway travel represented a negligible share. Air transport has sharply increased since accession to the EU. In 2005 it was almost three times the 1995 volume. Despite an 8% drop between 2000 and 2006, urban public transport still accounts for the majority of urban passenger trips.

In 2005, the number of *road vehicles and passenger cars* per 100 inhabitants was 33 and 29, respectively, well below OECD averages (56 and 49) (Figure 2.3). The number of passenger cars has steadily increased since 1998 (+30% from 1998 to 2005). On the contrary, the bus fleet has been steadily decreasing, despite the growth in passenger traffic by bus. The car fleet is relatively old: about 26% of the cars are more than 16 years old, and more than 40% are between 6 and 15 years old. Most cars are equipped with catalytic converters and 15% use diesel fuel. The truck fleet has grown by 25% since 1998. Renewal of heavy goods vehicles has been faster, spurred by the stringent technical and environmental standards needed to travel abroad. Other road vehicles, mainly motorcycles and buses, are also old.

In 2005, the Hungarian *road network* had a total length of 30 800 kilometres. During the review period, the expressway network was consistently extended, from 500 to 765 km. The density of the country's motorways is about half the EU-15 average (8 km/1 000 km<sup>2</sup>). The public *railway network* covers 7 902 km. The length of electrified railways increased between 1998 and 2005, from 2 594 km to 2 791 km. On the other hand, railways with more tracks have remained unchanged (1 292 km). Railway density is much higher than the OECD-Europe average (about 84 km/1 000 km<sup>2</sup>). The overall quality of the road and rail infrastructures is poor. Both the rail and the motorway networks are concentrated in the Budapest region. The *combined transport* infrastructure includes four transhipment points (in the Budapest region, Győr, Sopron and Szeged), and nine other logistic centres are planned. The density of *permanently navigable inland waterways* is among the highest in Europe (15 km/1 000 km<sup>2</sup>).



raising initiatives (e.g. in 2003, about 50 municipalities held “European Car-Free Days” and “Mobility Weeks”). Despite the relatively low public transport fares compared to other European countries, prices are becoming increasingly expensive for certain population groups, resulting in a decrease in travel demand and rising fare evasion (ECMT, 2004). Commuter subsidies and income tax provisions may make travelling by car more convenient. On the one hand, whilst about 80% of inter-urban commuting expenses are eligible for reimbursement by employers, rebates on expenses for travel within the urban contour are available for employees in the public sector only. On the other hand, the use of individually owned cars for private purposes and commuting is often illegally accounted as business use for tax purposes.<sup>3</sup>

Since 2000 a *motorway usage fee* has been imposed on a travel-time basis. In 2007 tolls were extended to the main routes of national roads for heavy goods vehicles (over 12 tonnes). Express roads and motorway sections that by-pass large settlements are exempted. Transport demand appears to be quite elastic to road pricing, resulting in heavy congestion on toll-free roads. Payment is not proportional to distance travelled and an electronic toll system is under preparation.

### *Vehicles*

Since 2004 a *vehicle registration tax* has been charged on passenger vehicles. The charge is based on size, age and environmental performance and varies between HUF 250 000 and HUF 9 622 000 per vehicle. Together with the higher rate on imported used cars (phased out in 2007), the registration tax has been effective in reducing the importation of old second-hand cars from Western European countries. The annual *vehicle tax* is based on weight for trucks and buses (HUF 1 200/100 kg per year) and on horse power for passenger cars, with partial rebates for cars equipped with a catalytic converter. The tax rate increases relative to car power but decreases relative to vehicle age, ranging from HUF 120/kW for cars that are 16 years and older to 300/kW for new cars up to 3 years old. These taxes have provided an incentive to buy smaller and less polluting cars, but could slow fleet renewal in the future.

Hungary has adopted all *international specifications on vehicles* and the EU label on fuel consumption and CO<sub>2</sub> emissions for new vehicles (EU Directive 1999/94/EC). An *inspection programme* has been implemented, with the introduction of an electronic certification system. The periodicity of inspections is linked to European environmental classification.<sup>4</sup> The share of inspected vehicles violating emission standards decreased only slightly during the review period.

## *Fuels*

*Fuel prices and taxes* have been repeatedly adjusted upward and are in line with those of most OECD countries but still below the OECD-Europe average. Nevertheless, fuel taxes have been decreasing in real terms (Figure 5.2). Excise duties are differentiated by types of fuel: HUF 88/litre on diesel and HUF 106.54/litre on unleaded petrol. The tax share in fuel prices (including standard VAT) is about 40% for diesel and 55% for petrol; diesel-power ships and trains are exempted. Despite a rising trend, lower diesel prices have encouraged the purchase of diesel cars, though petrol vehicles prevail. The overall increase in fuel prices has exacerbated smuggling at the Hungarian-Ukrainian border, implying the potential introduction into the country of massive quantities of poor quality and more polluting fuels.

*Switching to less polluting fuels* has been promoted via tax measures: liquefied petroleum gas (LPG) and compressed natural gas (CNG) benefit from a lower tax rate (HUF 47.9/kg for LPG and HUF 24.5/Nm<sup>3</sup> for CNG), and differentiated excise duties have been applied to low and high sulphur content fuels (HUF 3 600/tonne and HUF 40 000/tonne, respectively). The sulphur content of diesel fuels has been gradually reduced to 0.05%, and leaded petrol was phased out in 1999. The quality of fuels produced in Hungary (by MOL, the Hungarian Oil and Gas Company) is above EU standards (IEA-OECD, 2007). Several measures have been taken or are planned (e.g. in the Environment and Energy Operational Programme 2007-13) to foster *biofuels for transport*, especially bioethanol from cereals. Mixed fuels with a 4.4% minimum share of biofuels are exempted from excise taxes (since 2007 for petrol and from 2008 for diesel), whereas blends with lower biofuel content pay an extra tax. These support schemes also aim at sustaining the rural economy (by converting agricultural production surpluses) and have led to a boost in investments. Hungarian authorities expect to be able to reach the ambitious EU targets for biofuels.

## *Overall assessment*

Despite the rising rate of car ownership, increasing fuel prices, vehicle taxes and road tolls have helped moderate demand for private car use and fuel consumption. Improvements in fuel quality and vehicle performance have contributed to increase the efficiency of transport and to reduce related air emissions, although at a lower rate than in the 1990s. Nevertheless, *energy use by the transport sector* increased some 35% during the review period; consumption of all types of fuel increased, especially diesel oil. Transport accounts for 21% of TFC; 90% of energy consumption by the transport sector is attributable to road transport (Figure 2.3). Emissions of *SO<sub>2</sub>*, *VOCs* and *CO* have decreased by 45%, 12% and 10%, respectively, since 1998. On the other hand, *NO<sub>x</sub> emissions* increased by 18% in 1998-2005 (Table 2.2). *Lead emissions* have reached a negligible level since the phase-out of leaded petrol. Transport

remains the major source of NO<sub>x</sub>, VOCs and CO and contributes to the *continuous growth in CO<sub>2</sub>* emissions. Emissions of *particulate matter* have continued to increase as a consequence of both the ageing vehicle fleet and the gradual shift towards diesel vehicles. Road transport is the prevailing contributor for each pollutant.

Recent trends indicate that the growth in both the traffic volume (especially freight) and the vehicle fleet has begun to outstrip improvements in vehicle technology and fuel quality. Urban sprawl and commercial development in city outskirts generate higher transport demand. Hence, more effort would be needed to counteract expected increases in energy consumption and air emissions.

Table 2.2 **Air emissions from transport, 2002 and 2005**

	Emissions 2002					Emissions 2005		
	Road		Other modes (1 000 tonnes/year)			1 000t/year	Change 1998-2005 (%)	Share in total emissions (%)
	1 000t/year	Share in transport emissions (%)	Rail	Air	Water			
CO <sub>2</sub>	10 420.0	92.9	180.0	72.0	542.0	11 777.0	43.7	19.1
CO	409.6	99.0	0.8	0.1	3.2	419.9	-9.8	71.5
SO <sub>2</sub>	1.1	67.1	0.2	0.0	0.3	1.9	-44.7	1.5
NO <sub>x</sub>	102.1	88.3	4.0	0.3	9.4	135.0	18.4	66.6
VOCs	–	–	–	–	–	58.6	-12.3	33.0
PM <sup>a</sup>	20.4	95.3	0.3	0.0	0.7	21.4	9.2	23.6

a) 1998-2004.

Source: MEW, 2005; Hungarian Central Statistical Office, 2004; UNFCCC.

## Notes

1. Joint Decree No. 7/2003 of the Minister of Environment and Water and the Minister of Economic Affairs and Transport.
2. The compensation scheme is addressed to people with per capita daily income below EUR 6.
3. Although VAT rebates on expenses for car use are rather limited.
4. Every two years for euro 2 and younger vehicles during the first six years of use, and once a year for all others. Periodic inspections consider technical and environmental requirements separately.

## Selected Sources

The government documents, OECD documents and other documents used as sources for this chapter included the following. Also see list of Web sites at the end of this report.

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# 3

## WATER MANAGEMENT\*

### Features

- Drinking water quality
- River basin management
- Relying on economic instruments
- Flood management

\* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 2000. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy.

## Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Hungary:

- speed up implementation of the *Drinking Water Quality Improvement Programme*, with the aim of having all public water supply comply with drinking water quality limit values;
- further strengthen the flood prevention and control efforts; further enhance the ecosystem and land use approach to *flood management*; develop a flood insurance policy;
- pursue efforts to connect the population to *waste water treatment* so as to prevent widespread bacterial contamination of large rivers;
- further refine the structure and rates of *economic instruments* (e.g. user charges, abstraction and pollution charges) to give appropriate signals to all users and finance water management, while taking social factors into account;
- carry out a comprehensive analysis of the costs and benefits of implementing the *EU Water Framework Directive*.

## Conclusions

Hungary's *administrative framework* (at both national and regional levels) was reorganised during the review period to merge responsibilities for water quantity and water quality issues. A *national river basin management plan* and the associated programme of measures are being prepared to implement the EU Water Framework Directive. *Water prices* now recover the cost of operation and maintenance for both water supply and waste water services. A *pollution charge* ("environmental load charge") applies to all activities that require a permit (e.g. waste water companies) and is gradually being phased in; the rate takes into account the vulnerability of recipient waters. The charge coexists with pollution fines for discharges in excess of permits; the rate of the fines was significantly increased in recent years, while allowing for quasi exemption if measures are taken to reduce the pollution load. The share of population connected to *waste water treatment* has increased to 60%, though delays occurred in Budapest where a third treatment plant is due to begin operation in 2010. Massive funding of waste water infrastructure, with co-financing from the EU, is planned for the coming years. Hungary is a low and *flood-prone country*, with the largest flood protection system, and the largest fluvial flood plain system in Europe. Important steps have been taken to reduce vulnerability to flood hazards,

including through preparing flood prevention and mitigation plans, revising land use planning legislation and local construction regulations, and taking a proactive stance at EU and international levels. The water quality of *large lakes* improved over the review period.

Despite comprehensive programmes to open new drinking water sources, to extend public water supply and to improve purification technology, which has led to considerable progress, 23% of Hungary's *drinking water* do not comply with EU standards for ammonium, arsenic (of geological origin), nitrite, fluoride and boron (as well as iron and manganese). Bacterial contamination still prevails in *large rivers*, and mercury and zinc still contaminate the Tisza River (due to historical mining operations). Around 60% of the country's surface water bodies have been identified as being at risk of failing to achieve the environmental objectives of the EU Water Framework Directive by 2015. While a third of the country's *aquifers* are subject to pollution from untreated waste water and agriculture, several aquifer protection zones have yet to be established. Despite serious drought events in recent years, the rates of the *water abstraction charge* ("water resource fee") have not significantly increased and continue to vary according to the user. User charges for water and waste water services involve cross subsidies from industry to households. Despite *extreme floods* in recent years, a third of the country's flood defence dikes are not up to the national standard of one metre above the once-in-a-century flood level. Despite a recent change of philosophy towards increasing the role of nature conservation in *flood management*, including the "space for water" concept, Hungary continues to rely primarily on costly engineering approaches and very little on ecosystem approaches. Insurance policy against flooding has yet to develop.



## 1. Policy Objectives

Hungary's main environmental objectives and targets for water resource management are stated in the *National Environmental Programme 2003-08* (NEP II):

- *drinking water quality*: all public water supply to comply with limit values by 2009 (from 27.4% in 1999-2000) (Box 3.1);
- *waste water treatment*: all municipal waste water to be treated before discharge into sensitive areas (from 68% in 1999-2000); 90% of discharges outside sensitive areas (96% of total municipal waste water) to be treated by 2015 (from 46% in 1999-2000); sound waste water collection for all of the population not connected to public sewerage by 2015 (from 12% in 1999-2000);



### Box 3.1 Drinking water

In 2006, a quarter of the monitoring samples taken nationwide failed to comply with the EU Drinking Water Directive (98/83/EC) standards for chemical contaminants (21% for ammonium, iron and/or manganese; 4.2% for arsenic, boron, fluoride and/or nitrite); 14.4% failed to comply with the directive's standards for microbiological quality (11.8% for coliform bacteria and 2.6% for *Escherichia coli*). This shows little progress since 1997, when the *chemical and bacteriological contamination of drinking water* was unacceptable in 26% and 16% of samples, respectively. It is doubtful that Hungary will achieve its NEP II objective to have "all public water supply comply with limit values by 2009".

Hungary's *Drinking Water Quality Improvement Programme* (DWIP), launched in 2001, is meant to implement the EU Drinking Water Directive.<sup>a</sup> The goal is to eliminate all drinking water quality problems related to health in the entire country's public water supply by 2013 (Chapter 8). Hungary was granted derogations from the EU deadlines ("transition periods") as part of the Accession Treaty (e.g. meeting limits on selected parameters for boron, fluoride and nitrite by the end of 2006 instead of 2003, and for arsenic by the end of 2009). The DWIP recommends measures to directly improve the quality of the public water supply (e.g. developing new water sources, improving water treatment technology). The DWIP covers settlements supplied with drinking water that contains unacceptably high levels of arsenic, boron, fluoride, nitrite and ammonium (i.e. 908 settlements with 2.5 million people spread across the country) but with marked regional differences in population coverage (Table 3.1). It does not cover the 413 settlements with 676 000 people served with water that exceeds the 2001 national limits for iron and manganese, as these pollutants do not pose public health risks (aesthetical problem only).

As of 2006, however, *only 10% of the eligible population* (i.e. 81 settlements with a population of 266 000) was actually covered by the DWIP programme, involving investments of HUF 12 billion (USD 57 million) co-financed by the EU's Cohesion Fund and Structural Funds. As it became clear that the time and money needed to fully implement the DWIP far exceeded what had been estimated at the time the programme was launched, in October 2006 Hungary asked the European Commission to extend by three years the initial deadline of 25 December 2006 (as specified in the Accession Treaty).<sup>b</sup> The Drinking Water Quality Improvement Programme can count on EU funding from the Environment and Energy Operative Programme (EEOP) of EUR 718 million<sup>c</sup> over the period 2007-13 (Chapter 5). It is planned that some 70% of the eligible population (i.e. 500 settlements with a population of 1.8 million) would be covered by then. Regional subsidies (from operative and/or infrastructure development programmes) are available for settlements not covered by the DWIP (e.g. for reducing iron and/or manganese levels or for network reconstruction).

a) A 2001 government decree set requirements for drinking water quality and monitoring.

b) The application involved 129 settlements where boron, fluoride and/or nitrite levels in drinking water were exceeded.

c) This is 15% of the total EEOP budget.

Table 3.1 **Settlements eligible for the Drinking Water Quality Improvement Programme**

Region	Number of settlements	Population	% of the total regional population <sup>b</sup>
Southern Great-Plain	224	1 222 590	91
Northern Great-Plain	219	687 373	45
Southern Transdanubia	203	263 100	27
Northern-Hungary	101	154 647	12
Central Hungary	26	112 309	4
Western Transdanubia	72	61 340	6
Central Transdanubia	28	34 146	3
Total	873 <sup>a</sup>	2 535 505	25

a) Including outskirts, the total is 908.

b) Using total regional population data at the beginning of 2006.

Source: MEW.

- *surface water quality*: not to further deteriorate and to be improved where economically feasible;
- *groundwater quality*: the share of waterworks wells polluted by nitrates (in excess of 50 mg/l) to be reduced to less than 2% (from 3.6% in 1999-2000);
- *groundwater quantity*: the drop in aquifer levels due to water abstraction to be stopped on 90% of the territory (e.g. in 1999-2000 the aquifer level had fallen by three to four metres in the Duna-Tisza interfluvial area), and aquifer levels to be increased on the remaining 10%; recharge obligation to apply to all new users, and to 10% (from 5% in 1999-2000) of existing users of thermal water wells for energy production;
- *flood defence*: 75-80% of dikes to comply with (once-in-a-century or millennial) standards (from 62% in 1999-2000); new detention basins to be created to reduce the average river flow (27.2 l/s/km<sup>2</sup> in 1999-2000).

Hungary's performance can also be evaluated in the light of the *recommendations of the 2000 OECD Environmental Performance Review*:

- examine priorities for financing, building and managing municipal sewerage and sewage treatment services and speed up related efforts to connect a larger share of the population to waste water treatment facilities;

- review and increase water prices, with due regard to cost-effectiveness, financing and social objectives;
- strengthen enforcement of legislation on industrial waste water discharges, particularly through increasing fine rates and introducing an effluent charge;
- revise water legislation in line with requirements of EU directives;
- develop an overall water resource management strategy by river basin, addressing both quantity and quality issues, building upon the recently established Regional Water Councils;
- reduce vulnerability to flood hazards by upgrading flood defence infrastructure;
- strengthen monitoring of groundwater quality;
- pursue efforts targeted at protecting zones around vulnerable aquifers.

## 2. Water Quality

### 2.1 Groundwater

Groundwater accounts for only 16% of total water abstractions, but it provides almost the entire drinking water supply: 40% is bank-filtered water along the major rivers, about 10% is shallow groundwater and the rest is held in deep aquifers (porous and karstic aquifers). The quality of bank-filtered groundwater is mostly related to that of the parent river. Deep aquifers are less subject to anthropogenic pollution, but they do not always meet drinking water quality standards (methane, iron, manganese, ammonia and arsenic are naturally present). *Shallow groundwater is mostly affected by nitrates* originating from agriculture and untreated municipal sewerage. In most parts of the country nitrate concentrations have remained stable, and Hungary has recently designated 48% of its territory as vulnerable zones, pursuant to the EU Nitrates Directive (91/676/EEC). It is doubtful whether Hungary will be able to achieve by 2008 its NEP II objective to “reduce to less than 2% (i.e. by almost half) the share of waterworks wells polluted by nitrates”.

The 513 wells operated by waterworks are used for regular quality monitoring. Responding to the NEP I (1997-2002) objective to “develop the groundwater quality monitoring network (by 2002 for the most endangered areas)” and to the OECD recommendation to strengthen *monitoring of groundwater quality*, 30 monitoring wells were constructed in the shallow groundwater of the Duna-Tisza Inter-fluvial (DTI) area in 1999-2002, and 55 wells<sup>1</sup> in basin areas outside the DTI. A country-wide survey in 2004-06 of the environmental state of shallow groundwaters in agricultural areas and settlements<sup>2</sup> involved construction of 574 new monitoring sites

and prepared for the designation of the Water Framework Directive (WFD) National Monitoring System. Pursuant to the new EU directive on protection of groundwater against pollution and deterioration (2006/118/EC), Hungary will have to set its own groundwater quality standards based on local conditions and define a 2007-08 “baseline level” of groundwater pollution by the end of 2008. Compliance with “good chemical status criteria” (based on EU standards for nitrates and pesticides and Hungary’s own threshold values for other pollutants) must be achieved by 2015. The new directive introduces measures to prevent or limit inputs of pollutants into groundwater.

Little progress has been made with regard to the NEP I objective to “promote the establishment of associations for protecting aquifers which are a source of drinking water” and the OECD recommendation to further protect zones around *vulnerable aquifers*. According to the WFD, the vulnerable aquifers and their protection zones must receive special attention in the national (Danube) river basin management plan, due by the end of 2009. Aquifer protection was allocated EUR 23 million within the Environment and Energy Operational Programme (EEOP) (2007-13), of which 85% is financed by the EU.

## 2.2 Surface waters

Risk of pollution of Hungarian surface waters is still widespread, especially by nutrients and hazardous substances from diffuse sources and organic pollution from point sources (Table 3.2). Secondary rivers are more sensitive to pollution than large rivers that have relatively high dilution capacities. The Danube River generally has good water quality with regard to chemical pollutants, except for phosphorus, while the Tisza River continues to be contaminated by mercury and zinc (Table 3.3). The *main water quality concern for large rivers is bacterial contamination*, which continues to occur almost everywhere along the Danube and Tisza, with up to 3 000 coliforms/ml found at some sampling stations (HCSO, 2006). Little progress has been made with regard to the NEP I objective to “improve surface water quality in the long run, particularly by ensuring at least class III quality for the Danube and Tisza rivers (for micro-pollutants and microbiological parameters)”. Some 60% of the Danube and 90% of the Tisza are in quality class IV (polluted) for microbiological parameters, and some 80% of the Tisza’s length is in quality classes IV and V (extremely polluted) for micro-pollutants (HCSO, 2006). Overall, Hungary has not achieved its NEP II objective for “surface water quality not to further deteriorate and to be improved where economically feasible”.

The *ecological condition of the large lakes* (Balaton, Velence, and Fertő) has improved due to reduced nutrient loading as a result of the drastic drop in the use of

fertilisers (Chapter 6), as well as government measures and environmental investment programmes. The phosphorus load has decreased, which translates into lower concentrations of chlorophyll  $\alpha$  (an indicator of end-of-summer algal blooms). The NEP I objective of ensuring at least class III (average quality) for chlorophyll  $\alpha$  for lakes was achieved for Lake Balaton in 2005. In other lakes, the eutrophication rate has generally been decreasing but still remains a threat.

Table 3.2 **Surface water quality, 2006**

	Number of water bodies monitored <sup>a</sup>	% of water bodies at risk	
		Point source pollution	Diffuse pollution
Organic substances (BOD <sub>5</sub> and COD <sub>Mn</sub> )	74	62	23
Nutrients (total P and total inorganic N)	471	55	68
Hazardous substances <sup>b</sup>	201	13	80

a) Out of a total of 880 water bodies.

b) Priority substances as listed in Annex X of the EU Water Framework Directive.

Source: MEW.

Table 3.3 **Water quality of selected rivers,<sup>a</sup> chemical pollution, 2005**

(%)

Chemical	Danube	Tisza
Ammonium	100	100
Nitrate	100	100
Total phosphorus	54	65
Cadmium	100	100
Mercury	100	33
Zinc	100	56

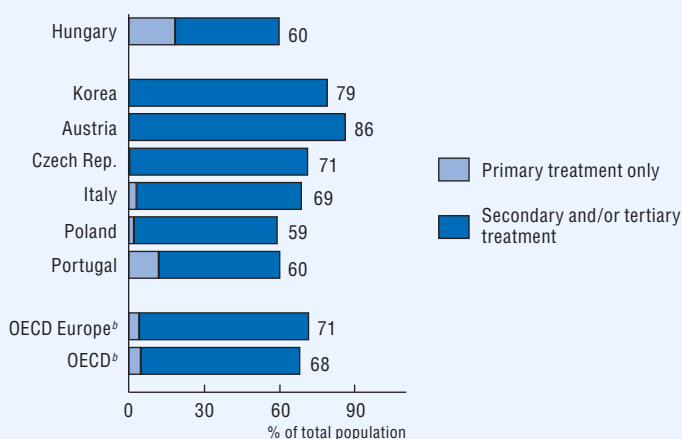
a) Per cent of monitoring stations classified as being of good quality. The quality of surface waters is ranked according to five quality classes: I and II are good quality; III is acceptable quality (can be used to produce potable water); IV and V are polluted.

Source: VITUKI.

### 2.3 Reducing pressures on water quality from households and industry

Responding to the OECD recommendation to speed up efforts to *connect the population to waste water treatment facilities*, the National Implementation Programme of Urban Waste Water Collection and Treatment (NIP) was launched in 2002. The main purpose is to achieve the targets of the EU Urban Waste Water Treatment Directive (91/271/EEC), namely secondary treatment of all discharges from agglomerations above 2 000 population equivalents (p.e.) by 2015, and more advanced treatment for agglomerations above 10 000 p.e. in designated sensitive areas and their catchments. The share of population connected to public sewerage increased significantly over the review period (by 2.5 to 3% annually since 2000), and the share connected to a public waste water treatment plant, though still below the OECD and OECD-Europe averages, increased from 22% in the late 1990s to 60% in 2004 (Figure 3.1). Hungary met its NEP I objective to connect 60% of settlements to public sewerage by 2002. However, out of the 38% of the Hungarian population not connected to public sewerage in 2002, only 12% was connected to private or independent sewerage, representing only minor progress since 1999-2000 and far short of the NEP II 2015 target of 100% coverage. A new regulation under the Act on Public Utilities, now under discussion, would require the population connected to

Figure 3.1 Population connected to public waste water treatment plant, 2005<sup>a</sup>



a) Or latest available year.

b) Secretariat estimates.

Source: OECD Environment Directorate.

public water supply (93% of the Hungarian population) to connect to public sewerage.<sup>3</sup> In Budapest, plans are to increase waste water treatment capacity from 280 000 m<sup>3</sup>/day in 2006 to 688 000 m<sup>3</sup>/day by 2010. EUR 1.46 billion has been allocated to the NIP for the period 2007-13 in the framework of the EEOP (30% of the total EEOP budget).

Another requirement of the EU Waste Water Directive is to control and *improve sewage sludge disposal and re-use*. Hungary made some progress towards meeting the NEP I objective to “improve sewage sludge disposal, particularly through composting”. The share of sewage sludge disposed in agriculture or using other methods than landfill, including composting facilities, increased to 60% in 2002. However, in 2002, 40% of the sewage sludge produced in Hungary was still disposed of in landfills, a high share by OECD standards.

Responding to the OECD recommendation to better address *industrial waste water discharges*, effluent standards (limit values) were strengthened in 2001 for selected industrial branches. In 2004 two government decrees issued by the Minister of Environment and Water strengthened enforcement of the discharge limit values and raised water pollution fines approximately 40 times. Dischargers are eligible for a 97% rebate if they implement approved pollution reduction measures.

### 3. Towards Integrated Water Resource Management

#### 3.1 Legal and planning framework

Responding to the OECD recommendation to revise *water legislation* in line with requirements of EU directives, Hungary transposed the Water Framework Directive by the 2004 deadline.<sup>4</sup> Steps taken so far to implement the WFD include the legal approximation,<sup>5</sup> publishing the river basin management planning time schedule and work programme, and making monitoring systems operational. Several pilot projects have already been initiated throughout the country to support WFD implementation. The basin approach is co-ordinated internationally by the International Commission for the Protection of the Danube River (ICPDR) (Chapter 8). The concept of Integrated Water Resource Management (IWRM)<sup>6</sup> was included in Hungary’s recently released sustainable development strategy (Chapter 5).

However, the European Commission’s *conformity assessment of transposition* revealed missing elements that appear to be major, particularly with regard to environmental objectives (by 2015) and cost recovery objectives (by 2010) (Commission of the European Communities, 2007). Hungary has not carried out a

comprehensive study of the costs and benefits of implementing the WFD. One complication is the difficulty of estimating the extent to which implementation of other water policies (e.g. the Urban Waste Water Treatment Directive and Nitrates Directive) will contribute to achievement of the WFD environmental objectives. Around 60% of surface water bodies in Hungary have been identified (based on data reported to the Commission by Hungary) as being at risk of failing to meet the environmental objectives by 2015, a high share by EU standards.

Responding to the OECD recommendation to develop river basin management, a draft *river basin management plan* is being prepared; it should be presented for public consultation by the end of 2008 and finalised (together with a programme of measures) by the end of 2009, pursuant to WFD requirements. Because the entire territory of Hungary is located in the Danube catchment area, only one river basin district was identified (the Danube) as well as one National River Basin Authority (Ministry of Environment and Water). For practical reasons,<sup>7</sup> the country was split into four sub-basins (Danube, Tisza, Balaton, Drava) and 42 planning units. Co-ordination of water management activities by local governments, farmers and industries is ensured by the twelve Regional Environment and Water Directorates, which were established on a catchment basis, and in close co-operation with the ten Regional Environment, Nature Conservation and Water Inspectorates. Both of these were recently reorganised<sup>8</sup> and, since 2005, have addressed both water quantity and water quality issues (Chapter 5). Water Management Councils have the important duty of making all stakeholders participate in the river basin planning procedure. Development of a system for harmonised planning in the entire country is underway. It will include assessments of risks and pressures, a set of measures and their planning, and guidelines for cost-benefit analysis. River basin management planning has been allocated EUR 10 million over the period 2007-13, as part of the EEOP.

### 3.2 *Relying on economic instruments*

Responding to the OECD recommendation to review *water prices*, Hungary raised water prices dramatically over the review period (Table 3.4), at similar rates as the increases in gas and electricity prices. The water prices now recover the cost of operation, maintenance and accelerated depreciation of both water and waste water services. However, the prices do not provide for future investments, and there are large tariff differences across the country. Despite targeted government support to poor households<sup>9</sup> such rapid and significant price increases have raised affordability issues, which have generated non-payment. As a result, overall household water consumption has remained largely unchanged. Moreover, a cross-subsidy from industry to households (Table 3.5) encourages over-consumption by households.



A further increase in water prices will be required by 2010, pursuant to the EU WFD's provision for *full cost recovery*. To improve the efficiency of water and waste water services (and thereby limit the price increase), both the Drinking Water Quality Improvement Programme (for public water supply) and the NIP (for waste water treatment) foster creation of inter-municipal companies. Establishment of joint services (water/waste water) is foreseen by most EU-funded projects in Hungary. Despite these efforts, the government anticipates that a new support scheme will have to be devised to take social aspects into account (Chapter 7).

An “*environmental load charge*” was introduced in 2004 to supplement the system of fines (waste water fine, sewer fine) for discharges in excess of effluent standards

Table 3.4 **Water and waste water prices for households, 2000-05**  
(HUF/m<sup>3</sup>)

	2000	2003	2004	2005	2000-05 <sup>a</sup> (% change)
Water	138	172	190	209	151
Waste water	110	145	174	195	177

a) Cumulated inflation was 39% over the period.

Source: HCSO.

Table 3.5 **Breakdown of revenues from water and waste water bills, 2006**  
(HUF/m<sup>3</sup>)

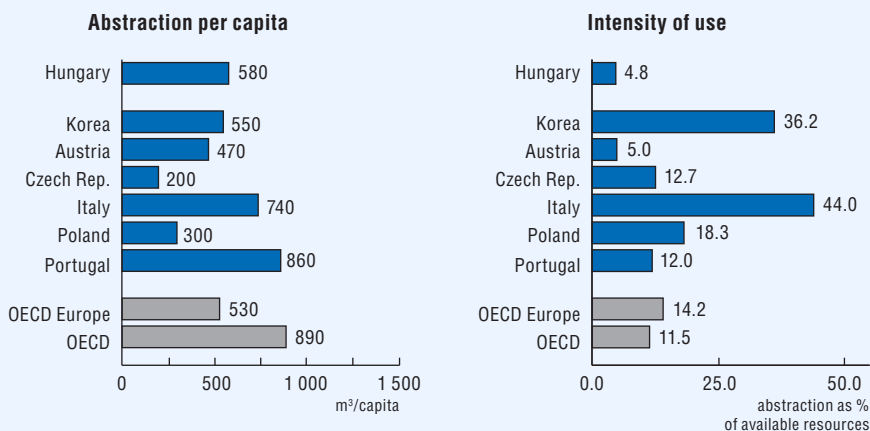
	Households	Industry
Water supply	204	250
Waste water collection and treatment	186	266
Water pollution (environmental load charge)	9	9
VAT (20%)	80	105
Total	479	630

Source: Hungarian Water Utility Association.

(Chapter 5), pursuant to the polluter-pays-principle. The load charge applies to discharges covered by the permit (i.e. discharges within effluent standards) and covers COD, phosphorus, nitrogen and heavy metals (rates vary between HUF 90 000 and HUF 220 000 per kg of pollutant). As is the case for fines, dischargers are eligible for a charge rebate (of 50%) if they implement a pollution reduction programme. The environmental load charge also applies to households (Table 3.5).

The intensity of water use (as a share of available resources) nationwide is low by OECD-Europe standards (Figure 3.2), but Hungary has experienced serious droughts in recent years. Investigations are being carried out on the drought phenomenon and a national drought strategy is being prepared. Meanwhile, despite the NEP I objective to “prevent water shortages and encourage economical water use by households and enterprises” and the NEP II objective to “stop the decrease of aquifer levels due to water abstraction on 90% of the territory”, the rates of the *water abstraction charge* (“water resource fee”) did not increase significantly over the review period. The rate is not set according to water scarcity.

Figure 3.2 **Freshwater use, 2005<sup>a</sup>**



a) Or latest available year.

Source: OECD Environment Directorate.

## 4. Flood Management

### 4.1 Flood defence infrastructure

Situated in the Carpathian Basin, Hungary is a low and flood-prone country; 84% lies less than 200 m above sea level and 52% is flood-prone. As a result, Hungary has the *largest flood protection system in Europe* (ahead of Italy, Ukraine and the Netherlands); it includes more than 4 220 km of flood defence infrastructure. Hungary has also the *largest fluvial flood plain system in Europe* (ahead of the Netherlands, Italy and Ukraine), with 21 000 km<sup>2</sup> of protected flood plains (23% of the territory). *Most (95%) of Hungary's water resources are inflows from neighbouring countries*, from where most floods occurring in Hungary are generated.

Small-scale floods occur every 2 to 3 years, significant floods every 5 to 6 years, and devastating floods every 10 to 12 years. During the period 1998-2001, Hungary experienced an *unprecedented series of extreme floods* along the Tisza River. In 2006 new record water levels (much beyond flood stages)<sup>10</sup> were registered on 123 km along the Danube, on 270 km along the Tisza, and on 70 km along the Hármas-Körös River, and the duration of the flood (which lasted two weeks at Szeged and Mindszent) exceeded previous recorded lengths.

Important steps have been taken to *reduce vulnerability to flood hazards*, as recommended by the 2000 OECD Environmental Performance Review. Hungary has actively participated in the EU Action Programme on Flood Risk Management Planning from its inception (Tóth, 2007). Hungarian experts were involved in the elaboration of the “Best Practice Document on Flood Prevention, Protection and Mitigation”. Flood management is also part of several bilateral agreements on transboundary water management (Chapter 7). In 2000 a government resolution confirmed that the country's flood defence infrastructure should be designed based on the once-in-a-century or millennial flood, the latter for the cities of Budapest, Győr and Szeged and the Algyő oil field. The resolution also stated that buildings in flood-prone areas should have a “freeboard” of at least one metre above the historical high flood level, and of one-and-a-half metres along river stretches that form or cross national borders, in accordance with neighbouring states.

However, *a third of Hungary's dikes do not comply with the national standard* of one meter above the once-in-a-century flood level, and the country has not yet met the NEP II objective of having 75-80% of its dikes in compliance with (once-in-a-century or millennial) standards. Moreover, certain sections of dikes stretching over 500 km urgently require strengthening and/or heightening. In 2006 the government estimated that 40% of Hungary's arable land, 32% of railways, 15% of main roads, 2.3 million

people (23% of the Hungarian population) and about EUR 25 billion (20% of GDP) of property values were at risk from flooding (Szentiványi, 2006).

#### 4.2 *A new approach to flood prevention and control*

*Flood management (contingency) plans* have been prepared since 1997. For each “section” of flood defence infrastructure, the plans include a brief history of flood defence infrastructure development and a general layout (long- and cross-sections) of the infrastructure in place; a summary of experience gained during previous floods; the location of hot spots and of areas requiring special attention; and the detailed information on embankments and their soil foundations, including a review of stability factors. The plans are a key basis for both flood infrastructure development planning and flood emergency response (the section constitutes the basic unit for the organisation of emergency operations). Four copies are kept, respectively, in the centre of defence of the given section, in the territorial engineering department (sub-basin level), in the Regional Environment and Water Directorate, and in the Ministry of Environment and Water. Updates of the plans (and associated data register) are due by 10 December every year.

*Flood risk plans* (so-called confinement plans) are to be prepared for each flood plain basin to anticipate possible breaches of the flood defence system. They consider the morphology of the flood plain basin (flood area), including long- and cross-sections of the valley; details of the built or designated defence lines, including roads and railways; and the flood stage functions of the basin. The plans predict (and map) the potential damages of flooding on flood defence infrastructure. In emergencies, the flow and storage of water in the flood plain can be forecast with a computerized system. The flood risk plans are only available in paper format. Digitisation of the information and further development of Decision Support System tools is envisaged, as proposed by the forthcoming EU directive on the assessment and management of flood risks.

Along the Tisza, a series of four extreme flood events in 1998–2001 revealed that the former prevention strategy to heighten and strengthen dikes needed reconsideration. This prompted the launching (in 2003) of the Revised Vásárhelyi Plan (VTT) in the Tisza Valley, named after Pál Vásárhelyi, a 19th century Hungarian water engineer. The VTT reflects a *new government philosophy*, in that it relies primarily on environmental protection and nature conservation. The new strategy aims at reducing flood hazard by decreasing flood crests. This means: i) reinforcing existing dikes where they do not comply with (once-in-a-century or millennial) standards; ii) improving flood conveyance of rivers (e.g. reducing summer dikes, rehabilitating pastures and mosaic-type forests in place of invasive species with dense

undergrowth); and, most importantly, iii) protecting existing flood plain areas and creating new ones, i.e. providing enough “room for rivers”. Concerning the latter, 75 000 hectares of detention basins have been selected with a total storage capacity of 1.5 billion m<sup>3</sup> (5.5 to 6% of the Tisza River Basin annual runoff). According to preliminary government estimates, this should be enough to decrease peak levels of extreme floods by one metre all along the Hungarian section of the Tisza. The first phase of the VTT, in 2004-07, improved flood conveyance (discharge capacity of the flood bed in various locations) and restored six (out of ten to twelve) detention basins. Although the main objective of the VTT is to increase flood safety along the Tisza River in Hungary, it also aims at nature conservation in the Tisza River Basin.

Although no flood hazard and risk maps are as yet available in Hungary,<sup>11</sup> the *land use planning legislation and local construction regulations* include general provisions on flood risks. Land use planning is regulated by the 1997 Act on the Protection and Development of the Built Environment and a related 1997 Government Decree. Four land use categories are identified: residential, industrial, forest and agriculture, and “other”. For each category, the spatial plans must indicate all potential pressures on the environment and factors that could influence land use (e.g. flood risk). The location of buildings must meet safety requirements, including against the adverse effects of water and moisture. To prevent damage from natural disasters (e.g. flooding), the construction authority (the local government) must prohibit construction upon request of the competent government agency. A 1998 decree of the then Ministers for Environment and Regional Development prohibits construction in case of potential danger to life and property, including inundation or dangerous (ground)water level rising. A 2000 Government Resolution prohibits construction of new flood defence infrastructure in open flood plains<sup>12</sup> and unbuilt flood areas, and prescribes including such areas in land use planning. A 2006 Government Decree regulates the use of flood ways (artificial flood control waterways), flood plains and areas threatened by groundwater flooding, including the issuing of compensation (replacing a previous 1999 Government Decree). The 1997 land use legislation prescribes that on beds and shores of rivers, lakes, channels opened to the public and protection zones around aquifers, construction of public infrastructure for inland navigation, flood control and water sport facilities must have priority over other uses.

### 4.3 Relying on economic instruments

The sequence of severe floods in recent years generated *flood control* expenditure from the central budget (Table 3.6). Flood protection will continue to benefit from EU support in the frame of the EEOP, for which EUR 607 million have been allocated over the period 2007-13 (12% of the total EEOP budget).

The Hungarian government currently has no legal obligation to *compensate flood victims* for related damage and loss. Estimates show that losses from flooding have reached up to 7-9% of GDP (Halcrow Water, 1999). However, as is the case in most OECD countries, it is common practice to provide some degree of compensation. The “Wesselényi Fund for the compensation of damage caused by water” was established in 2003 for that purpose. The fund is guaranteed by the state. On request, the EU Solidarity Fund may cover part of government expenditures, as was the case following the extraordinary 2006 flood events.

Hungarians’ willingness to pay for flood *insurance* is low, as insurance companies in Hungary tend to cover only flood damages resulting from levee breaks on major rivers. The extent and ill-defined nature of exclusions (e.g. localised flooding as a result of leakage through a flood levee) greatly reduce the value of flood insurance and need to be revised if flood insurance is to work effectively.

Table 3.6 **Flood control expenditure, 2000-06**  
(EUR million)

	2000 <sup>a</sup>	2001 <sup>b</sup>	2002 <sup>c</sup>	2006 <sup>d</sup>
Flood emergency operations	53	27	16	80 <sup>e</sup>
Restoration of flood defence	21	20	11	55

a) Middle Tisz.

b) Upper Tisza.

c) Danube.

d) Danube, Middle and Lower Tisza, Hármas-Körös and Maros Rivers.

e) Including EUR 15 million from the EU Solidarity Fund.

Source: MEW.

## Notes

1. Drilled next to soil information monitoring points (well pairs).
2. Under the EU Programme of Community aid to the countries of Central and Eastern Europe (PHARE).
3. Owners of septic tanks that refuse connection to sewerage are currently subject to a soil pollution tax (“soil load charge”), with exemptions for social reasons.
4. For the ten member States joining the European Union on 1 May 2004, the date of accession was the deadline for transposition of the WFD.
5. The obligation to approximate (i.e. align national laws, rules and procedures with EU laws) continues after EU accession.
6. The concept draws upon the Dublin Principles that were officially endorsed by the Earth Summit in 1992.
7. The plan will contain a water resource management strategy for both qualitative and quantitative issues, for all sub-basins.
8. Following the merging of ministerial responsibilities for environment and water between the former Ministry for Environment and the former Ministry of Transport, Communication and Water Management in 2002.
9. Support increased from HUF 3.8 billion in 1999 to HUF 5.5 billion in 2006.
10. A flood stage is the point at which the water level is high enough to affect nearby structures or roads.
11. Floodplain maps published in 1977 indicate the flood extent of the once-in-a-century or millennial floods, but without information on flood depth (thus showing where the water would flow over time, but not how deep it would get) or flood velocity.
12. 97% of the flood plains in Hungary are protected by structural defence, mainly earth embankments.

## Selected Sources

The government documents, OECD documents and other documents used as sources for this chapter included the following. Also see list of Web sites at the end of this report.

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# 4

## NATURE AND BIODIVERSITY\*

### Features

- Significant pressure on species and habitats
- Efforts to increase protected areas
- Integration of nature conservation in sectoral policies (agriculture, forestry, land use planning)
- International co-operation issues

\* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 2000. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy. It takes into account the latest Economic Surveys of Hungary.

## Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Hungary:

- adopt at government level and implement the *National Biodiversity Strategy and Action Plan* as soon as possible, as a comprehensive action-oriented framework for ecosystem and species conservation at both national and local levels;
- strengthen the *implementation of the Natura 2000 Ecological Network*, and develop corridors between network sites;
- increase the human and financial *capacity* for nature conservation and biodiversity including in the public administration and civil society; increase the *involvement of stakeholders* in the nature conservation sector;
- continue to improve the *integration of nature conservation objectives in sectoral policies* such as agriculture and forestry, regional development and land use planning, transport and tourism;
- intensify efforts to *raise public awareness* about nature conservation and biodiversity, targeting all age groups, as well as groups such as hunters and farmers;
- assess land use changes resulting from the country's *plans on bio-energy development*; develop, adopt and implement a short-to medium-term strategy to promote the sustainable use of natural resources with appropriate involvement of stakeholders.

## Conclusions

Hungary has made many efforts to protect nature and biodiversity. The Hungarian Nature Conservation Act (adopted in 1996), still provides an adequate *legal framework* for biodiversity conservation throughout the country, including in areas that are not currently protected. The development and implementation of the *network of Natura 2000* sites, in the EU context, will bring the area protected from 9.2% to 21% of the country. In spite of lack of resources, Hungary's nature conservation administration, its NGOs, and a large number of volunteers are working well and hard to strengthen nature and biodiversity protection. One example is the effective and productive collaboration between the Ministry of Agriculture, the Ministry of Environment and Water, and NGOs to prepare the payment system for Natura 2000 sites for the period 2007-13. Hungary has also developed a comprehensive biodiversity monitoring system with an excellent scientific basis.

However, Hungary has not yet adopted its *National Biodiversity Strategy*, although a good draft is available. The *capacity of the nature conservation sector* has decreased in recent years; for example, the national park directorates, the regional organisation for nature conservation, are unable to prevent the licensing of projects or development programmes that are likely to have negative impacts on biodiversity. Decreasing financial resources and staff are drastically limiting the implementation of nature conservation policies, at the time of implementation of the Natura 2000 network. For instance, during the last two years, the number of national park rangers has decreased by 20%. Urbanisation, transport infrastructure development, intensive wood harvesting for energy use and illegal hunting and logging, all exert negative impacts on biodiversity. Further *integration of nature protection and biodiversity in sectors* like agriculture, forestry, transport, tourism, hunting and land use planning is needed.



## 1. Policy Objectives

The main objectives of Hungary's policy for nature protection are contained in the *National Environmental Programme 2003-08 (NEP II)*:

- *protected areas of national importance*: 11% of the territory (1.024 million hectares) to be protected (from 9.2% or 0.85 million hectares in 1999-2000);
- *protected areas with nature conservation management plans*: 1.1 million hectares (from 0.35 million hectares in 1999-2000);
- *protected areas with legally-binding nature conservation management plans*: 0.85 million hectares (from 0 hectare in 1999-2000);
- *protection of other natural and semi-natural areas*: maintain the 1999-2000 level of 14% of the territory;
- *number of endangered plant and animal species*: decrease by 10% (from 115 species in 1999-2000);
- *forests with indigenous tree species*: 10.5% of the territory (from 9.5% in 1999-2000);
- *forests in protected areas*: 25% of the forest area (from 21% in 1999-2000);
- *forests in strictly protected areas*: 6.5% of the forest area (from 5% in 1999-2000);
- *forest reserves*: 1% of the forest area (from 0.55% in 1999-2000);
- *Natura 2000 sites*: 15% of the territory (from 0% in 1999-2000);

- *registered karstic caves*: maintain the 1999-2000 level of 3 600 caves;
- *threatened karstic caves*: below 20% (from 30% in 1999-2000).

Hungary's performance during the review period can also be evaluated against the *recommendations of the 2000 OECD Environmental Performance Review*:

- put in place the National Biodiversity Strategy;
- establish a national ecological network;
- continue efforts to increase the share of the national territory designated as protected areas;
- improve the integration of nature conservation objectives in sectoral policies, primarily agriculture, regional development, transport and tourism;
- make wider use of Environmental Impact Assessments particularly in relation to tourism, afforestation, water infrastructure and land consolidation programmes;
- expand educational efforts concerning nature conservation by addressing professional and social groups, particularly farmers and hunters.

In NEP-II, biodiversity and nature protection are addressed by the 2nd *National Nature Conservation Master Plan*. The Master Plan is to be complemented by the (as yet unapproved) *National Biodiversity Strategy and Action Plan*. Adoption of a national biodiversity strategy and action plan, as was recommended by the first OECD environmental performance review, would give Hungary a comprehensive framework for ecosystem and species conservation at national and local levels.

## 2. Land Use and State of Biodiversity

Most of Hungary lies in the Pannonian bio-geographical region. Its terrestrial habitats and landscapes can be ascribed to four main groups: plains habitats, hilly and mountain habitats, sub-mountain habitats and aquatic ecosystems. *Arable land, grassland and forests* cover nearly 80% of the land area and are important for nature conservation and biodiversity (Table 4.1). The agricultural area has continued to decrease in recent years (by 47 000 ha or 0.8% in 2000-07, essentially a decrease in grasslands) while forest land has increased (by 53 000 ha or 3% in 2000-07), reflecting support for afforestation as part of the agricultural and rural development policies (Chapter 5).

The *proportion of threatened species* of mammals is very high by OECD standards (Table 4.2). The share of freshwater fish species requiring protection is also very high, calling for an ecosystem approach to water and flood management

(Chapter 3). In contrast, Hungary compares very favourably with other OECD countries for the proportion of threatened species of birds, reptiles, amphibians and vascular plants.

Table 4.1 **Trends in land use, 2000-07**  
(‘000 hectares)

	2000	2005	2006	2007	% change 2000-07
Agricultural area	5 854	5 861	5 817	5 807	-0.8
Arable land	4 500	4 513	4 510	4 506	0.1
Grassland	1 051	1 057	1 014	1 017	-3.3
Orchards	95	102	103	102	6.8
Kitchen gardens	102	96	96	96	-5.4
Vineyards	106	93	94	86	-18.8
Forest area	1 770	1 775	1 777	1 823	3.0
Reeds	60	62	61	57	-4.8
Fish ponds	32	34	34	34	7.5
Uncultivated area	1 587	1 571	1 614	1 582	-0.3
Total land area	9 303	9 303	9 303	9 303	

Source: MEW.

Table 4.2 **State of flora and fauna, mid-2000s**

	Known species		Threatened <sup>a</sup>	
	Total	Indigenous	Number	(%)
Mammals	90	79	34	37.8
Birds	393	384	57	14.5
Reptiles	15	15	5	33.3
Amphibians	18	18	5	27.8
Freshwater fishes	81	52	35	43.2
Vascular plants	2 510	2 433	179	7.1

a) IUCN categories “critically endangered”, “endangered” and “vulnerable” in % of total known species. For freshwater fishes, refers to protected and strictly protected species.

Source: OECD Environmental Data 2008.

Hungary has a *long-standing conservation policy* that applies to an increasing number of species. The number of legally protected species continued to increase over the review period, to comply with EU requirements. Hungary has a high share of species of Community interest, pursuant to approximation with the EU Habitats Directive (Table 4.3). Conservation plans for 22 animal and 20 plant species were adopted by the Ministry of Environment and Water (MEW) between 2004 and 2006, including for the wolf and the lynx. One example of Hungary's actions to protect biodiversity is the Moson project in Kisalföld (Northwest Hungary). Although the main goal is to protect the great bustard, other species like the grey partridge<sup>1</sup> and the brown hare are also benefiting from the project (Box 4.1).

Table 4.3 Trends in numbers of protected species, 1997-2005

	1997	2001	2005
Plants	515	1 193	1 271
Protected species	463	632	632
Strictly protected species	52	63	63
Species of Community interest <sup>a</sup>	..	498	576
Animals	855	1 533	1 560
Protected species	771	828	828
Strictly protected species	84	137	137
Species of Community interest <sup>a</sup>	..	568	595
Mushrooms and lichens	..	..	40
Total	1 370	2 726	2 871
Protected species	1 234	1 460	1 500
Strictly protected species	136	200	200
Species of Community interest <sup>a</sup>	..	1 066	1 171

a) Listed in Annex II of the EU Habitats Directive (92/43/EEC).

Source: MEW.

### 3. Protected Areas

In 2000 the OECD recommended that Hungary further designate protected areas. Since 2000 the *protected area has slightly (4%) increased*; in 2007 protected areas of national importance covered close to 9% of the country's land area (Table 4.4).<sup>2</sup> This percentage is relatively low (Figure 4.1) and is short of meeting the NEP II target of 11% by 2008. Nearly half of the protected areas are covered by forests, a quarter by grasslands and a quarter by agricultural land (Table 4.5).

#### Box 4.1 Moson: Protecting the great bustard with positive effects on other species

The great bustard is strictly protected under the Law for the Conservation of Nature and in the Red Data Book. Although winter feeding and the control of corvids in some areas have had a beneficial effect, all efforts should now focus on habitat management in agricultural areas. Recent habitat protection programmes have been implemented in Dévaványa Landscape Protection Area, Hortobágy National Park, Kiskunság National Park and in the Moson Project near Mosonszolnok, covering about 11 000 hectares altogether. These programmes include habitat management and predator control.

The Moson project to save the great bustard population of the Kisalföld (in Northwest Hungary) was launched on a former agricultural production site. The project covers 850 hectares. The goal is to increase the population of about 50 great bustards, as well as grey partridges, by cultivating the land with ecologically sustainable methods. The project was initiated by the Game Management Institute of the University of West Hungary with support from the Fertő-Hanság National Park Directorate and WWF Austria. Although the project area is not protected by legislation, it is managed as a *game and nature conservation area*. Traditional plant production systems with regular fallowing are dominant. Eighty percent of the project area is left fallow each year, while plants that great bustards like to feed on are grown in 20 metre-wide belts on the remaining 20%. The belts are shifted annually, creating a varying plant composition and cover. The use of chemicals is restricted and there is no cultivation after April until harvesting.

A 1993 agreement to harmonise *hunting* times in Hungary and in areas situated on the adjacent Austrian territory helps guarantee tranquillity during lekking and breeding, and provides equal opportunities to hunters on both sides of the border. *Brown hare* management is an important part of the project, as the population has increased due to habitat development, and sustainable hunting of brown hares provides a significant part of the project income. Reduction of predators such as corvids and the red fox is also important, especially since the immunisation programme against rabies has increased the red fox population in the project area. The great bustard population in the project area grew from 49 individuals in 1992 to 115 in 2005, and the grey partridge population increased to several times its former size.

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Source: Faragó (2002), Faragó (2004), Faragó and Giczi (1997).

This situation is due to change dramatically with the *establishment of the Natura 2000 ecological network*. In May 2004, with its accession to the European Union, Hungary was required to transpose the 1979 Birds Directive and 1992 Habitats



Directive into national legislation and prepare for the establishment of Natura 2000 on its territory. After making the necessary amendments in national legislation, Hungary submitted to the European Commission (EC), in October 2004, a list of

Table 4.4 **Trends in protected areas, 2000-07**

	2000			2007			% change 2000-07	
	Sites	Surface area (ha)	(%) <sup>a</sup>	Sites	Surface area (ha)	(%) <sup>a</sup>	Sites	Area
National parks	9	440 840	4.7	10	485 806	5.2	11.1	10.2
Landscape protection areas	37	341 700	3.7	36	324 034	3.5	-2.7	-5.2
Nature reserves	145	26 400	0.3	152	29 191	0.3	4.8	10.6
Natural monuments	1	-	-	1	-	-	0	0
Local protected areas	1 067	36 000	0.4	1 296	39 464	0.4	21.5	9.6
Total	1 259	844 940	9.1	1 495	878 495	9.4	18.7	4.0

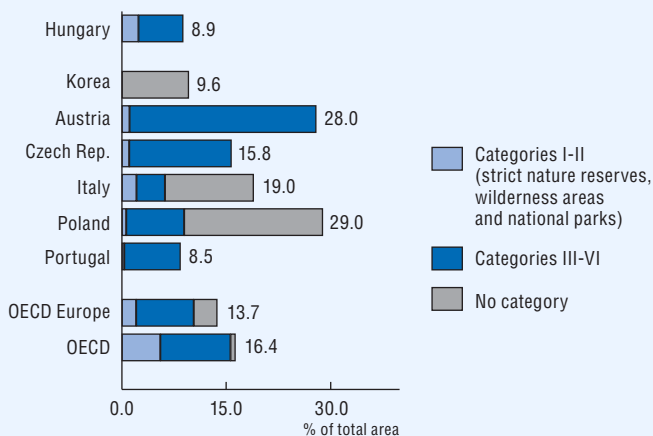
a) Per cent of the Hungarian territory.  
Source: MEW.

Table 4.5 **Land use in protected areas, 2007**

(%)

	National parks	Protected landscapes	Nature reserves	Total
Forest	42	54	44	47
Meadows and grasslands	28	23	27	26
Arable land	11	14	6	12
Land set aside from agriculture	13	7	14	11
Reeds	3	1	4	2
Fish ponds	1	1	4	1
Vineyards	1	0	1	1
Gardens	< 1	< 1	< 1	< 1
Total	100	100	100	100

Source: MEW.

Figure 4.1 Protected areas,<sup>a</sup> 2004

a) Terrestrial and marine areas. IUCN management categories I-VI and protected areas without IUCN category assignment. National classifications may differ.

Source: IUCN/UNEP-WCMC (2005), World Database on Protected Areas.

proposed Sites of Community Importance (SCIs) under the Habitats Directive and Special Protection Areas (SPAs) under the Birds Directive. In November 2007, after a three-year EC assessment of the relative importance of proposed sites and of their overall importance in the context of the EU as a whole (so-called “moderation process”), all of Hungary’s proposed SCIs (1 397 000 ha) were added to the EU’s SCI list. Together with the SPAs, Hungary’s Natura 2000 network covers 1 968 000 ha or 21% of the Hungarian territory.<sup>3</sup> This is a major step forward for both Hungary and the EU, as it considerably expands the EU network and adds a new bio-geographic region (the Pannonian region shared with the Czech Republic and Slovakia).

Efforts are being made to *improve the management of protected areas*. The 1996 Act on Nature Protection requires the national park directorates to elaborate management plans for protected areas of national importance (national parks, landscape protection areas, nature reserves, natural monuments). The content and structure of the plans are regulated by law. Since 2000, management plans have been adopted (by decree) for 39 (out of 210) protected areas of national importance. Hungary is on track with the NEP II target of 0.85 million hectares of protected areas with legally-binding nature conservation management plans by 2008, as the plans yet to be adopted relate to nature reserves that account for a small share of the total protected area.

A key problem for the years to come is the *reduction in both the size and the authority of Hungary's conservation sector*. Since 2005, 167 positions have been eliminated in the national park directorates, and Hungary now has fewer than 200 rangers covering its entire territory. This led to the elimination of the Directorate of the Órség National Park in 2007,<sup>4</sup> which left a single directorate responsible for managing both the Órség and the Fertő-Hanság National Parks.<sup>5</sup> In addition, as of January 2005, following the establishment of a new authority for environment, nature and water management, the national park directorates have lost their independent authority over licensing of economic activities in areas under their jurisdiction. This responsibility has been transferred to the regional inspectorates responsible for nature conservation, environmental management and water management, but these are understaffed and lack the necessary knowledge and expertise in nature conservation (Chapter 5).

Launched in 2005, the initiative of co-operation between the Public Work Council of the Ministry of Social Affairs and Labour and the MEW to create seasonal work for unemployed people in national park directorates should be emphasised (Box 4.2). NGOs frequently participate in surveys (mostly birds) and public

#### Box 4.2 Public work programme at the national park directorates

To provide *seasonal work to unemployed people* at the national park directorates, a programme was carried out in 2005 and 2006 by the Public Work Council of the Ministry of Social Affairs and Labour with the co-operation of the MEW. The main jobs, lasting one to six months, included: nature management of grasslands and forests, eradication of invasive and allergen plants, cleaning of illegal waste disposal sites in protected areas, maintenance of ecotourism buildings, and maintenance of nature conservation demonstration paths.

The two ministries consider the programme to have been *very successful*, providing both nature conservation and social benefits, as long-unemployed rural residents were able to find meaningful seasonal work. In addition, the national park directorates were able to better fulfil their nature management tasks, and to strengthen their relationships with local governments.

Financial contributions to the programme included grants from the Public Work Council (HUF 293 million and HUF 100 million in 2005 and 2006) and co-financing of the national park directorates (HUF 31 million in both 2005 and 2006). The number of people employed was 556 in 2005 and 180 in 2006.

*Source:* MEW.

education; they have been provided with additional funding following establishment of the National Civil Fund in 2005 (Chapter 7). A significant decrease in the number of employees dealing with nature protection took place during the review period, notably in the national park directorates, and contributed to the increasing occurrence of illegal hunting and clear-cutting of forests in protected areas (Chapter 5).

## 4. Integration of Biodiversity into Agriculture, Forestry and Land Use Planning

### 4.1 Agriculture

Since arable land occupies almost half of Hungary's surface area, measures to integrate biodiversity concerns in agricultural practices are of major importance. In 2002, areas with significant natural value (*Environmentally Sensitive Areas, or ESAs*) were addressed as "zone targets" in the National Agri-Environmental Programme (NAEP) (Chapter 6). The programme's aim is to promote farming methods adapted to local conditions, landscape management, and conservation and improvement of the environmental and natural values of the area. Farmers have been positive about ESAs as participation in NAEP has made them eligible for agri-environmental payments:<sup>6</sup> in 2004-05 applications were submitted for a total area (about 120 000 ha) that was three times larger than in 2002 when the programme began. In some of these sites the population of the great bustard has doubled. There is 50% overlap of ESAs with the recently established Natura 2000 network (Chapter 6).

*Payments for Natura 2000* were launched in 2007, based on the new European Agricultural Fund for Rural Development (EAFRD). These payments compensate the farmers who manage Natura 2000 sites for their extra costs and foregone income. Natura 2000 payments were implemented in grassland areas in 2007. These payments are the result of the collaboration between the Ministry of Agriculture and Rural Development, the MEW and NGOs during the negotiations on how to allocate EU funding for the period 2007-13. No firm decision has been reached yet on granting payments to forest and wetland owners.

The Hungarian administration disposes of another incentive for protecting scarce bird species (particularly the great bustard and the corncrake) in agricultural lands. Farmers who report the presence of breeding corncrakes or great bustards in their fields receive *financial compensation*.

In 2000 the OECD recommended that Hungary expand *efforts to educate* farmers about nature conservation. Since 2000, the MEW has taken part in the training of inspectors of the Ministry of Agriculture and Rural Development. Special nature

conservation lectures are held by the Environment Ministry for members of the farm advisory system. Farmers learn about nature conservation during the compulsory agri-environmental training programmes.

## 4.2 Forestry

About 20% of the Hungarian territory is covered by forests, more than half of which have remained in public ownership. Only two state-owned forest companies, which cover 5% of the total forest area, are eco-certified. Some 57% of the forest area is dominated by indigenous tree species and 43% by either introduced (black locust, coniferous) or cloned (hybrid poplar) species. Oaks are the dominant tree species in 22% of the forest area but the black locust, an invasive alien species, occupies 23%. There are only one hundred forest inspectors for the 1.8 million hectares of Hungary's forest area, which has led to cases of illegal tree cutting, notably in response to the increased demand for wood for energy production.

Afforestation has long been an important government goal. Since 1930, the country's forest cover has increased by almost 70%. The "afforestation concept" of 1996 aims to increase the forest cover to 27% in the next 35-50 years, involving 15 000 hectares of afforestation a year (Chapter 6). However, only *half of the afforestation target has been achieved* since the concept was released, partly due to uncertainties of land ownership resulting from the privatisation process and partly due to lack of funding.

In 2003 the NEP II recommended that Hungary expand the area of forests with *indigenous tree species*. Since 2003 efforts have been made to increase the share of indigenous tree species in the plantations (Table 4.6). Under the National Rural Development Plan (2004-06), the proportion of the (privately-owned) territory afforested with black locust decreased significantly while the share of indigenous tree species increased. However, being a fast growing species, the black locust will play an important role in the production of energy from wood.<sup>7</sup>

### *Biomass as an energy source*

The *use of wood fuel* as a renewable energy source (RES) has developed rapidly over the last decade (at an average annual rate of 116% between 1997 and 2004): wood fuel now accounts for about 70% of renewable electricity supply.<sup>8</sup> To a large degree, this can be attributed to co-firing projects (switching from coal fired units to gas and biomass fired units). The preferential feed-in tariff introduced in 2003 for electricity produced from RES<sup>9</sup> has created further incentives to use wood fuel (Chapter 5). The future of solid biomass in Hungary appears promising (about 1 000 MWe technical potential). The National Agricultural Energy Alliance

Table 4.6 **Afforested land<sup>a</sup>**  
(%)

Financing source		Oak and beech	Black locust	Other hard broadleaved tree species	Poplar and willow	Other soft broadleaved tree species	Pine	Total
National budget	2002	20	33	5	31	9	2	100
	2003	12	37	8	29	12	2	100
	2004	32	31	3	22	12	0	100
EU funds	2004	35	39	4	13	8	1	100
	2005	36	28	8	12	15	1	100

a) Oak, beech and the main part of the hard and soft broadleaved tree species are indigenous species.

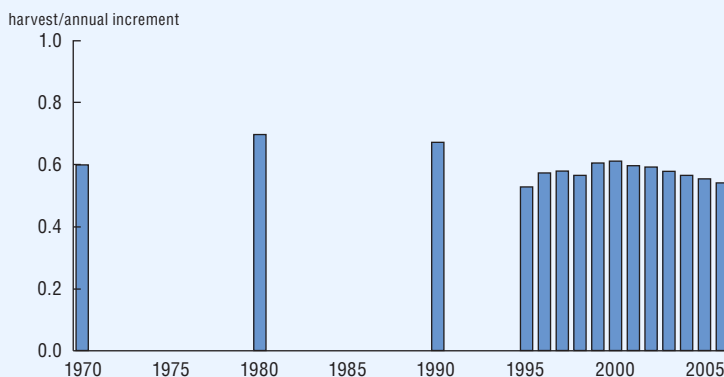
Source: State Forest Service.

(NAESZ), an umbrella organisation of Hungarian biomass energy producers, has already planned for EUR 2 billion investments to construct ten new biomass power plants. Hungary currently has three biomass plants (in Kazincbarcika, Ajka and Pécs) and two mixed-fuel plants (in Tiszapalkonya and Mátra) (Bodo, 2006). None involve cogeneration.

However, pending development of fast growing plantation forests, wood extraction for energetic purposes is exerting a *high pressure on forest ecosystems* in Hungary (Bodo, 2006), even though the overall intensity of forest use has declined since 2000 (Figure 4.2). Clear cutting is even carried out in protected areas, including the national parks. Wood is also imported from neighbouring countries, without much control of (eco-certified) origin. Prices for firewood have increased 40% and poor people have fallen back on illegal wood for domestic use.

Up to 300 000 ha, a surface corresponding to Hungary's fallow area, are estimated to be suited to short rotation tree plantations (Marton, 2006). Care must be taken so that such "*biomass plantations*" do not have negative impacts on biodiversity in the coming years.<sup>10</sup> In particular, the plantations should not encroach on preserved natural ecosystems, such as permanent grasslands and wetlands. It should not be overlooked that fallow areas are vital for many animal and plant species (Pain et al., 1997). Wood biomass planting was excluded from the 1996 Act on Forests and Forest Protection, because of specific management methods. New regulations need to be introduced.

Figure 4.2 Intensity of use of forest resources, 1970-2006



Source: HCSO.

### Hunting

Except for game species associated with farmland, which saw their populations decline (Chapter 5), game populations remained almost constant during the review period or increased (e.g. roe deer) (HCSO, 2006). However, their *very high density in forest areas* exerts a negative impact on the natural regeneration of forests. For example, a stock of 324 400 roe deer was estimated in 2003. This means 18 roe deer per km<sup>2</sup> of forest on average. Locally higher densities might exist. It is unclear whether sustainable hunting plans have been prepared, as required by the 1996 Act on Protection of Game, Game Management and Hunting.

*Illegal hunting* of protected bird species by foreign hunters is an issue. In 2006, 10 000 birds were confiscated on the Hungarian border. With less than 200 rangers for all the Hungarian territory, it is very difficult to control illegal hunting. Moreover, Hungary entered the Schengen travel area on 21 December 2007, which led to no more systematic border inspection of traffic with Western Europe where most illegal trade of protected birds occurs.

*Illegal use of poison baits* in an attempt to control the booming fox population<sup>11</sup> also affects protected birds of prey. Fifty individuals of strictly protected eagles were poisoned in the last two years. The pesticides used as poison are soon to be banned.

### 4.3 Land use planning

Current legislation<sup>12</sup> provides for strict protection of protected species and designated nature conservation land in land use planning. Building permits or any other development permits can be issued for protected areas in very limited numbers and always subject to prior approval by nature conservation authorities. Protected land cannot normally be de-classified for economic purposes.<sup>13</sup> The 2003 Act on the National Spatial Plan contains a wide range of *restrictions to preserve the forthcoming Natura 2000 national ecological network*. This includes national passageways standards for wildlife crossing public roads, which were updated at the beginning of 2007. Around EUR 83 million have been allocated in the Environment and Energy Operational Programme 2007-13 (EEOP) to habitat restoration and protection and to lessen the adverse effects of linear transport structures and electricity lines on the Natura 2000 network.

The *shoreline and the floodplain of natural or near-natural watercourses* are protected by the Nature Conservation Act. Only water management facilities are permitted in floodplains. It is also prohibited to locate new buildings or any other constructions within 50 metres of the shoreline of natural or near-natural watercourses and wetlands, within 100 metres of the shoreline of lakes and ponds and in the floodplain of watercourses. River bank ecosystems do not receive *ex lege* protection by law.<sup>14</sup> The harvest of riparian forests is not forbidden but is nevertheless restricted in protected areas, and reforestation must be carried out with indigenous tree species under the Nature Conservation Act.

## 5. International Issues

With respect to the *Ramsar Convention*, Hungary and the Slovak Republic have recently designated two sites (already listed as Wetlands of International Importance) as transboundary sites to facilitate harmonisation of their management. Of the 2 638 hectares involved, the Hungarian part (Ipoly-vögy or Ipoly Valley) accounts for more than 80%.

To carry out Hungary's obligations under the *Convention on Biological Diversity*, the Hungarian Academy of Sciences drafted a biodiversity conservation strategy that has yet to be approved. The national biodiversity monitoring system was initiated by the nature conservation authority of the then Ministry of the Environment and Regional Policy.



## 6. Expenditure and Economic Instruments

Hungary's *public expenditure* on nature conservation grew from HUF 3 400 million (EUR 14 million) in 1998 to HUF 5 700 million (EUR 22 million) in 2006, in line with inflation. EU accession has resulted in an increase in funding of activities related to the protection of nature and biodiversity, particularly agri-environmental programmes, Natura 2000 (since 2007), as well as, to a lesser extent, eco-tourism and transboundary co-operation.

Entrance fees are charged for some of the caves as well as for visiting some of the areas with special facilities (such as observation towers and transportation services). The national park directorates carry out some tourism activities to supplement their budget. Far more effort should be made to implement *economic instruments* (e.g. fees for some of the services provided by the national park directorates) that would increase incentives for and budget of nature protection and biodiversity management.

### Notes

1. This species has declined up to 95% since 1960 in Hungary.
2. 10.4% if including the registered, ex lege protected bogs, mires and sodic lakes.
3. Going beyond the NEP II target of 15% of the territory.
4. The Órség is Hungary's youngest national park; it was created in 2002 on 44 000 hectares.
5. The Órség national park directorate was re-established in April 2008.
6. Since 2003 most NAEP beneficiaries have switched to the National Rural Development Plan's agri-environmental schemes.
7. Black locust also has a great potential for bee keepers.
8. Pursuant to the EU renewables directive (2001/77/EC) Hungary was given an indicative target of 3.6% renewables in electricity consumption by 2010 (up from 0.5% in 2000). This target was met in 2005.
9. The feed-in tariff was set at the same rate for all renewable energy sources.
10. Biomass plantations are prohibited in Natura 2000 sites.
11. The fox population exploded following introduction of an immunisation programme against rabies.
12. 1996 Act on Nature Conservation and 1996 Act on Regional Development and Physical Planning.
13. However, airports are being built in protected areas.
14. However, most of such areas are protected as reserves, national parks or Natura 2000 sites.

## Selected Sources

The government documents, OECD documents and other documents used as sources for this chapter included the following. Also see list of Web sites at the end of this report.

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Part II

**SUSTAINABLE DEVELOPMENT**

## 1. Key National Development Policy Objectives

Although Hungary's current agenda is dominated by EU convergence and fiscal consolidation, key development policy documents released in the mid-2000s address challenges according to *different time horizons*. These planning documents have medium- or long-term perspectives which correspond, respectively, to 3-5 year, 10-15 year, and 25-50 year horizons (Box 5.1). The Lisbon Action Programme and the New Hungary Development Plan (NHDP) focus on the medium term, until 2013.<sup>1</sup> The National Development Policy Concept (NDPC) and the National Spatial Development Concept (NSDC) provide, respectively, development objectives and a vision of Hungary's regional development and spatial planning in the long term, until 2020. Hungary's National Sustainable Development Strategy (NSDS) is the development document with the longest time horizon, until 2050; it provides a development reform framework for "a shift to a growth path that will insure the sustainable development of the Hungarian society".

The *medium- and long-term key policy documents put particular emphasis on social and economic objectives*, while environmental issues are given more prominence in the very long term, through the NSDS. There are of course environmental objectives in medium- and long-term development programmes, including in other programmes focused specifically on environmental policy (e.g. the National Environmental Programme 2003-08), but the medium- and long-term priorities, overall, are clearly of a more economic nature.

### 1.1 Medium-term objectives

The two key objectives of the NHDP 2007-13 are to i) foster employment, and ii) create the conditions for long-term growth (e.g. improving competitiveness, widening the economic basis and improving the business environment). Six areas have been identified to fulfil these objectives over the NHDP period: economic development; transport; social renewal and social infrastructure development; environment and energy; regional development; and state reform and electronic public administration. Thirteen sector-based Operative Programmes (OPs) have been launched to achieve NHDP objectives in these six areas.

These include the *Environment and Energy Operative Programme* (EEOP). The EEOP budget (EUR 4.9 billion) represents a fifth of the EU Cohesion Funds for Hungary (EUR 22.4 billion).<sup>2</sup> More than half (53%) of the EEOP is aimed at promoting healthy and clean settlements (waste water treatment, waste management

and improvement of drinking water quality) and another 28% at wise management of waters (including flood protection). The balance is allocated to energy efficiency and renewable energy (8%), other natural assets (3%), project preparation and technical assistance (6%), and the promotion of sustainable production and consumption patterns (2%).

The *integration of energy and environment concerns in the other* OPs primarily relate to: technology (OP on economic development), with energy criteria and targets; transport infrastructure and public transportation (OP on transport), with reduction targets for transport-related pollution; environmental education and training (OP on social renewal); and urban rehabilitation and eco-tourism (OP on regional development).

## 1.2 Long-term objectives

The eight key objectives of the NDPC are, by 2020, to: i) increase competitiveness (e.g. increase R&D expenditure, facilitate development of SMEs); ii) increase the rate of employment; iii) increase competitive skills (e.g. improve public education, promote life-long learning); iv) improve the health status of the population (e.g. improve the health care system); v) strengthen social cohesion (e.g. reduce growing social inequality); vi) improve physical accessibility (e.g. develop transport infrastructure); vii) move towards an information society (e.g. increase the rate of ICT penetration); and viii) protect and use sustainably natural resources and environmental assets.

This last NDPC strategic objective regroups many environmental objectives (e.g. quality of water supply and ecological state of water resources, landscape, environmentally friendly farming, sewerage treatment). This “*environment cluster*” is presented as an integral part of social welfare improvement and a key component of competitiveness. It aims at encouraging a shift from quantity and product-oriented economic activities to quality and service-oriented activities as well as “good household practice” and environmental democracy. It promotes application of the polluter-pays principle as well as material and energy saving. But the NDPC environmental objectives do not seem to be connected to the global and long-term concerns related to climate change and biodiversity loss.

## 2. The National Sustainable Development Strategy

The NSDS offers a very long-term vision (up to 2050). It identifies *16 key social, environmental and economic issues* that could threaten Hungary’s sustainable development. Social concerns relate to diminishing and ageing population, high unemployment, declining standard of public education, gaps in the health care

system, and growing disparities in income, health, education and access to public services. Environmental concerns include declining environmental carrying capacity, climate change, land-use trends, fragmentation of biotopes and pressures on water reserves. Economic concerns include a weak SME sector, energy security, material and energy-intensive consumption patterns, pricing of natural resources not reflecting scarcity, fiscal consolidation, and slow and inefficient administrative procedures.

The strategy proposes *11 key sustainable development policy priorities* to address these 16 trends threatening sustainability. The priorities relate to social (demography, health, social cohesion and employment), environmental (nature, climate and water) and economic factors (competitiveness, production and consumption patterns,<sup>3</sup> energy policy, mobility and spatial planning, use of economic instruments). “Decent employment”<sup>4</sup> is not yet recognised as a full sustainable development objective of the Hungarian NSDS, although it is a key aspect of sustainable development production patterns.

The NSDS was *adopted in June 2007*, 15 years after the international commitment to adopt such strategies at the United Nations Earth Summit in Rio.<sup>5</sup> Over this 15-year period Hungary’s development was guided by programmes, development plans and projects “lacking synergy, which restricted their effectiveness in terms of principles and approaches of sustainable development”.<sup>6</sup> The previous OECD Environmental Performance Report, published in 2000, had recommended starting discussion of a sustainable development strategy, building on the National Environmental Programme and with participation by local stakeholders. However, inter-ministerial consultations on the draft NSDS were only initiated in spring 2007. Public consultation has been opened for only a short period of time, which has led to discontent among civil society, particularly NGOs and the academic community.

The NSDS priorities not only set directions and tasks for state bodies and local governments; their implementation also requires close co-operation with economic and civil partners. However, the NSDS only refers to the creation of “fora for dialogue between the administration, decision-makers and scientists”. The *Commission on Sustainable Development*, established in 1993, which was mostly operating as a permanent inter-ministerial body, stopped its activities in 2003. If this institutional vacuum remains, it will be a severe handicap for implementation of the NSDS. Parliamentarians could also be involved in following up progress in implementation of the NSDS. In addition, a *National Council for Sustainable Development* with a high level of multi-stakeholder participation was established early 2008 to provide advice and respond to the expectations of civil society. Sustainable development indicators should be developed to help monitor the strategy, based on existing environmental indicators (Chapter 7).

## Notes

1. A government commissioner for development policy is responsible for ensuring coherence of the Lisbon Action Plan and the NHDP.
2. In euros at 2004 prices.
3. Changing unsustainable consumption and production patterns is one of the three overarching objectives of sustainable development adopted at the Johannesburg World Summit on Sustainable Development (WSSD) in 2002 (Plan of implementation, Article 2).
4. “Decent work” or “decent employment” is the converging focus of four strategic objectives: employment, rights at work, social protection, and social dialogue. Decent employment is a key factor of a balanced approach to sustainable development. See, for instance, *Decent Work for Sustainable Development*, ILC 96-2007/Report I (A).
5. The agreement to prepare an overarching sustainable development strategy was repeated twice by the international community: at the UN General Assembly in 1997 (Rio+5), with a time limit of 2002, and at the Johannesburg WSSD in 2002 (Rio+10), with a time limit of 2005.
6. National information provided by the Hungarian Commission on Sustainable Development to the WSSD.





# 5

## ENVIRONMENT-ECONOMY INTERFACE\*

### Features

- Economic trends and environmental pressures
- Energy efficiency
- Energy subsidies
- EU support for Hungary's environmental policy
- National environmental planning
- Harmonisation with EU legislation
- Implementation and enforcement of regulations
- Environmental and product charges

\* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 2000. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy. It takes into account the latest Economic Surveys of Hungary and the latest IEA Energy review of Hungary.

## Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Hungary:

- further improve the *pollution, energy and resource intensities* of the Hungarian economy; promote sustainable production and consumption patterns;
- strive to eliminate *environmentally harmful subsidies* (e.g. the fringe benefits of company car use);
- develop institutional mechanisms to systematically and continuously review and revise *economic instruments* (e.g. taxes, charges, trading), aiming at green tax reforms and green budgeting, considering competitiveness, distributive and employment issues; make sure that the conditions for granting exemptions are fully justified or fulfilled, to avoid undermining their incentive effects;
- ensure a high *absorption capacity for EU funds*; strengthen technical and economic expertise in the administration to apply EIA and cost-benefit analysis, SEA and environmental integration, when setting up priorities among projects submitted for EU funding, with special attention to non-environment projects;
- continue to improve *inter-institutional co-operation* at national and territorial levels of government, and integration of environmental concerns into sectoral policies;
- develop mechanisms of monitoring and evaluation of progress towards the objectives of the *National Sustainable Development Strategy*, including relevant indicators, and increased public participation;
- evaluate implementation of the second *national environmental programme*; speed up preparation of the third one (including targets, deadlines and means) and implement it;
- secure enough *financing and staff* to the environmental administration and inspectorates to ensure cost-efficient management and enforcement capacity;
- further expand the use of *economic instruments* and regularly assess their effectiveness, assuring a wider application of the polluter pays and user pays principles, taking into account competitiveness and social considerations; extend further cost-recovery to waste management;
- strengthen the use of *economic information and analysis* for environmental projects and policies (e.g. cost-benefit analysis).

## Conclusions

### *Integration of environmental concerns into economic decisions*

Hungary made progress over the review period in *decoupling* environmental pressures from economic growth for major conventional pollutants (e.g. SO<sub>x</sub>, NO<sub>x</sub>),

CO<sub>2</sub>, water abstraction and municipal waste. There has been progress in *integrating environmental concerns* into energy and transport policy at the strategic level, although the communication between the Ministry of Economy and Transport and the Ministry of Environment and Water has not always been fully satisfactory. As an instrument for integration, SEA has been introduced and successfully implemented in sectoral strategies, although not used in the case of transport policy. *The Polluter Pays Principle and the User Pay Principle* have been implemented further with the elimination of environmental subsidies for the private sector and progress towards cost recovery in the case of water, waste and energy prices. Revenues from environmentally related taxes stayed broadly consistent at 2.5% of GDP, in line with EU average. An increased use of *economic instruments* has to be recognised, with the introduction step by step of an environmental load charge, the extension of the product charge scheme and the adoption of the energy tax.

However, *road freight transport* is increasing at a higher pace than the GDP rate. *Nitrogen fertiliser use and pesticide use* have also grown as a consequence of the EU income support to farmers. A review of potentially *environmentally harmful subsidies* was undertaken during the review period, but there has been no follow up. In the field of transport, fringe benefits granted to company cars encourage the use of the road. Fuel taxes were reduced from about 70% in 1998 to 50-55% in 2006, and road fuel prices remain below the OECD Europe average. The price of natural gas paid by Hungarian households has increased but remains much below the OECD average. With an increase of EU funding concomitant with a downsizing of public servant staff, Hungary will have still to ensure that *cost-effectiveness* has a central place in decision criteria when establishing priorities among projects to be financed with EU money and that its *capacity of absorption* of EU funds is satisfactory.

### *Strengthening the implementation of environmental policies*

Hungary has developed a comprehensive *environmental planning framework*, included two National Environmental Programmes (for the periods 1997-2002 and 2003-08) and related thematic action programmes, with quantitative objectives and performance indicators. Its programming framework formed the basis for the Environment and Energy Operative Programme which specifies the use of EU Funds and Hungarian matching Funds for the period 2007-13, in the context of the National Development Plan. The review period was characterised by the *consolidation of environmental legislation*, mostly driven by EU environmental “acquis” and EU membership in May 2004. Three of the four transition periods granted to Hungary have already expired, leaving only the one for the treatment of urban waste water, which will last until 2015. Hungary is now also contributing to shape EU

environmental policy (e.g. flood management, mining waste, chemicals, ground and bathing waters). The *institutional framework* for environmental management has evolved over the review period, with the gradual merger of authorities in charge of nature conservation, environmental protection and water quality and quantity management. The Energy Centre was established in 2000 to deal with sustainable energy issues. As recommended in the first OECD review, *enforcement activities* have increased: inspectorates have acquired both licensing and enforcement responsibilities over all environmental themes, and the system of non-compliance sanctions has been significantly strengthened. Progress has been made towards the *polluter pays principle* and the *user pays principle*: the use of *economic instruments* has increased with the introduction of an “environmental load charge” applying to air emissions and waste water discharges, and the revision of product charges on packaging wastes. Hungarian firms have greatly expanded their use of *environmental management systems*. *Eco-labelling* and green public procurement are being promoted.

However, Hungarian *environmental performance* is still not fully in line with OECD-Europe standards and EU targets. In particular, some positive trends of the 1990s have slowed down in recent years (e.g. for energy intensity, some air pollutant emissions, waste generation) or even reversed (e.g. fertilisers and pesticides use). Some health indicators are also of concerns. *Implementation of the second National Environmental Programme* (2003-08) has been lagging behind and Hungary appears unlikely to reach its targets in a number of fields (e.g. water quality, waste recovery). This suggests that efforts or available resources have not been always appropriate to implement the new environmental legislation, despite important EU support. The level of PAC investment expenditure is the same as in the first OECD review (about 1% of GDP), and total PAC expenditure is about 1.6% of GDP. Over the review period, *financial and human resource shortage* has limited monitoring and enforcement capacity of inspectorates. Regional and municipal administrations need to strengthen their environmental capacities and their expertise in economic analysis, also with a view to better absorbing EU funds for environmental projects. The effectiveness of *economic instruments* must be regularly assessed and charges periodically adjusted, to provide a balanced mix of licensing regulations and economic incentives. *Affordability* issues need also to be considered.



## 1. Sustainable Development in Practice

In the context of Hungary's efforts to reflect and shape its economic, social and environmental future in the medium, long and very long term (Box 5.1), much has been done concerning sustainable development in practice.

### Box 5.1 Main national development documents: strategies, plans and programmes

Term	Name	Dates <sup>a</sup>		Content
Medium	Revised National Lisbon Action Programme for Growth and Employment	H	2008	Framework document and action programme shaping macroeconomic, microeconomic and employment policy, with some objectives and measures extending beyond 2008 and connecting to the EU Lisbon Strategy.
		D	Oct. 2006	
	New Hungary Development Plan (NHDP)	H	2007-13	Planning document, defining the strategy for use of EU funds and domestic resources. +13 operational programmes (OPs) setting sector-based interventions (e.g. Environment and Energy EEOP) and internal distribution of resources (e.g. EU Cohesion Policy).
		D	Oct. 2006	
Long	National Development Policy Concept (NDPC)	H	2020	Comprehensive concept including policy tasks and objectives until 2020, and which harmonises branch policy objectives. NDPC provides a long-term development framework.
	Towards a Successful Hungary: Objectives and Priorities of the NDPC	D	June 2005	
		D	Sept. 2005	
	National Spatial Development Concept (NSDC)	H	2020	Concept coupled to NDPC, translating NDPC at regional level, setting out spatial policy objectives and priorities of the country, consistent with branch policies and national/regional policies.
		D	Dec. 2005	
Very long	National Sustainable Development Strategy (NSDS)	H	2050	Framework document outlining long-term goals in social, economic and environmental areas, and corresponding means and instruments. Connected to EU SDS and UN long-term objectives (2050) for a sustainable future.
		D	June 2007	

a) H = horizon or period; D = date of production.

### 1.1 Decoupling environmental pressures from economic growth

Overall, Hungary's growth record was reasonably good during the period 1998-2006 (Figure 5.1). The economy grew by 41% while the population decreased by 2% (Table 5.1). Industrial production increased by 80% and road freight traffic by 90% while passenger car traffic volumes decreased by 3%. Agricultural production started to increase again after a considerable fall between 1990 and 1993, but decreased overall by 5% between 1998 and 2005. Total primary energy supply and total final consumption of energy increased respectively by 9 and 18% (Table 5.1).

Table 5.1 Economic trends and environmental pressures

	1990-06	1998-06
Selected economic trends		
GDP <sup>a</sup>	39	41
Population	-3	-2
GDP <sup>a</sup> /capita	43	43
Agricultural production	-23	-5
Industrial production <sup>b</sup>	111	86
Road freight traffic <sup>c</sup>	101	90
Passenger car traffic volume <sup>d</sup>	-9 <sup>f</sup>	-3 <sup>f</sup>
Selected environmental pressures		
Pollution intensities		
CO <sub>2</sub> emissions from energy use <sup>e</sup>	-18 <sup>g</sup>	0 <sup>g</sup>
SO <sub>x</sub> emissions	-87 <sup>g</sup>	-78 <sup>g</sup>
NO <sub>x</sub> emissions	-15 <sup>g</sup>	0 <sup>g</sup>
Energy intensities		
Total primary energy supply	-3 <sup>g</sup>	9 <sup>g</sup>
Total final consumption of energy	-3 <sup>g</sup>	18 <sup>g</sup>
Resource intensities		
Water abstractions	-8 <sup>f</sup>	1 <sup>f</sup>
Nitrogenous fertiliser use	-5 <sup>f</sup>	21 <sup>f</sup>
Municipal waste <sup>h</sup>	-14	-5
Pesticide use	-60 <sup>f</sup>	60 <sup>f</sup>

a) At 2000 prices and PPPs.

b) Mining and quarrying, manufacturing, and production of electricity, gas and water.

c) Based on values expressed in tonne-kilometres. National and international transport.

d) Based on values expressed in vehicle-kilometres.

e) Sectoral approach; excluding marine and aviation bunkers.

f) To 2004.

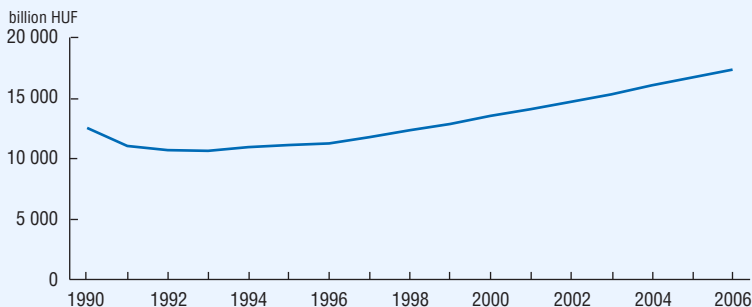
g) To 2005.

h) The underlying data series includes methodological changes.

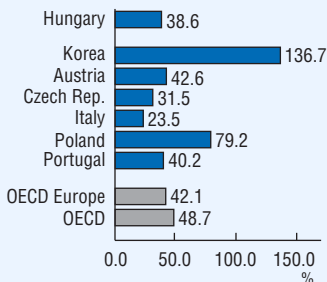
Source: OECD Environment Directorate; IEA-OECD.

Figure 5.1 Economic structure and trends

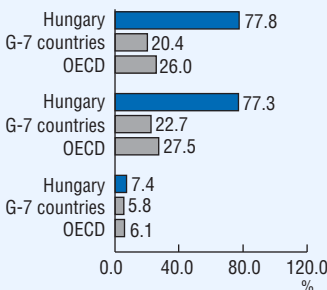
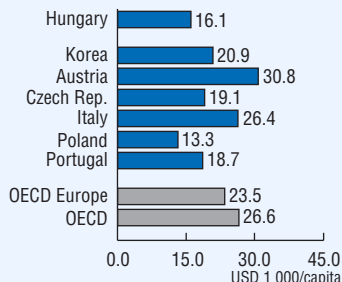
GDP<sup>a</sup> in Hungary, 1990-2006



GDP<sup>b</sup> growth, 1990-2006



GDP<sup>b</sup> per capita, 2006



a) GDP at 2000 prices.  
 b) GDP at 2000 prices and purchasing power parities.  
 c) % of civilian labour force.  
 Source: OECD (2007), OECD Economic Outlook No. 82.



### *Pollution intensities*

Reduction of *air emissions from major point sources* has been the most successful aspect of Hungary's decoupling efforts. SO<sub>2</sub> emissions have decreased by 78%, while NO<sub>x</sub> and CO<sub>2</sub> emissions have remained stable.

However, Hungary's NO<sub>x</sub> and CO<sub>2</sub> emissions per unit of GDP are higher than the OECD-Europe average (Figure 2.1). SO<sub>2</sub> emissions per unit of GDP are slightly higher than the OECD-Europe average, but lower than those of Poland, the Czech Republic and the Slovak Republic.

### *Energy intensity and energy efficiencies*

Energy intensity in Hungary has *improved* considerably since 1990 (it was 0.25 tonnes of oil equivalent (toe) per thousand US dollars in 1990), though at a *slower rate* (from 0.20 toe to 0.18 toe in 2000-05). Hungary's energy intensity is higher than the OECD-Europe average, but lower than that of Poland, the Czech Republic and the Slovak Republic. Official estimates predict a further improvement in energy intensity (to 0.15 toe by 2010) owing to continued structural changes in industry (though at a slower pace) and equipment replacement.<sup>1</sup>

### *Resource intensities*

*Water withdrawals* remained stable during the review period and the intensity of water use (i.e. withdrawal as a percentage of gross annual availability) remained far below OECD-Europe and OECD averages (4.8% versus 14.2% and 11.5%, respectively). The largest reduction in the use of water took place in the industrial and agricultural sectors. The decrease in industrial water use, which is responsible for nearly three-quarters of all water withdrawn, was driven by the spread of water-efficient technologies and techniques. Water recycling improved in most industrial sectors.<sup>2</sup> Agriculture accounts for only 11% of total water withdrawal.

Whereas the use of *nitrogen fertilisers and pesticides* declined during the 1990s, it increased in the period 1998-2004 (21% and 60%). The consumption of nitrogenous fertilisers has reached 5.8 tonnes/km<sup>2</sup> of agricultural land, compared to the OECD-Europe average of 5.5 tonnes/km<sup>2</sup>. The consumption of pesticides is slightly lower than the OECD-Europe average (0.17 versus 0.18 tonne/km<sup>2</sup> of agricultural land). The beginning of this trend coincides with Hungary's accession to the European Union, with farmers benefiting from an income support which enables them to buy more fertilisers and pesticides.<sup>3</sup>

The generation of *municipal waste* decreased by 5% between 1998 and 2006 whereas GDP grew by 41%. In 2006, municipal waste generation (460 kg per capita)

was below the OECD average (550 kg per capita). However, it is expected to grow, as packaging materials are increasingly used and private final consumption is increasing. The National Waste Management Plan projects a 14% rise in the total quantity of municipal solid waste by 2008 compared to 2000 levels.

### *Assessment*

Hungary has made progress in decoupling environmental pressures from economic growth for SO<sub>x</sub> (strong decoupling), NO<sub>x</sub>, CO<sub>2</sub> and water abstraction (moderate but significant decoupling). Energy intensity has been improved although at a more modest pace than during the 1990s. The trend towards a strong increase in the use of nitrogen fertilisers and pesticides is of concern. Contrary to what is happening in most OECD countries, municipal waste generation was strongly decoupled from economic growth. However, there are signals that this favourable situation will change. Hungary should continue its efforts to further reduce its pollution, energy and resource intensities.

## **1.2 Market integration**

### *Environmentally harmful subsidies*

There is a trend towards the phasing out of *direct subsidies* in the Hungarian economy. As of 1 January 2006, only one deep mine was receiving support for operating purposes. The grant was HUF 10 billion in 2006 and is to decrease to HUF 7 billion by 2010. The total subsidy should not exceed HUF 41 billion over the period 2006-10.

A study by an NGO estimated that *environmentally harmful subsidies* account for more than 10% of the Hungarian GDP (Kiss, 2004).<sup>4</sup> Income tax credits for commuting by passenger car and corporate tax credits for company-owned vehicles, both of which favour passenger car use, were targeted for elimination. But there was no follow up by the government.

### *Transition towards implementation of the polluter-pays and user-pays principles*

However, Hungary is progressively implementing the polluter-pays and user-pays principles. The *price of water and waste water services* increased respectively by 50% and 70% during the period 1999-2004, and the government set up a support scheme to help the poor (Chapter 6). Water and waste water fees nearly cover the costs of operation, maintenance and accelerated depreciation (98% for water, 88% for waste water). These fees are expected to increase further with a view to complying

with the EU full cost recovery requirement by 2010 (Chapter 3). *Transfers from the central budget to municipalities* help them finance investments in waste water infrastructure and solid waste management. Such transfers covered 25% to 50% of the costs of sewage and sewerage treatment facilities, and 40% of the cost of regional municipal disposal sites over the review period.

In line with the polluter-pays principle, *subsidies for environmental investments* in the private sector decreased steadily, from HUF 30.1 billion in 2000 to HUF 2.2 billion in 2004, and were phased out in 2005 following termination of the Earmarked Scheme for Environment and Water (successor to the Central Environment Protection Fund).

Progress has also been made in recovering the costs of solid waste management. While in 1999 the actual costs of waste services were some 40% higher than the charges, in 2002 the *user charges on municipal waste collection and disposal* practically covered the operating cost of the facilities and sometimes, in case of modern landfills, the investment cost. In 2003 the user charges were further increased pursuant to a government regulation calling for coverage of costs of the services provided, including the costs associated with site management after closing the landfill. Subsidies continue to be granted to municipalities to help them address affordability issues for the poor.

#### *Environmentally related taxes*

Revenues from environmentally-related taxes represented 2.5% of GDP in 2005, a share that remained relatively unchanged over the review period (Table 5.2). In 2003-05 most (84%) revenues were generated from taxes on energy (mainly fuel taxes), some (9%) from transport-related taxes, and the remaining (7%) from pollution and resource taxes, a slightly higher share than the EU-15 average (less than 5%). The share of transport in environmentally-related taxes increased over the review period (it was 5% in 1998-2000), while that of energy, pollution and resource decreased slightly (from 86% and 8% in 1998-2000, respectively). A *green tax reform* is being envisaged, but it has not yet been put on the governmental agenda. A green tax commission should be established to this effect.

An *energy tax* on sales and imports of *electricity and natural gas* was introduced in 2003 and became effective 1 January 2004. In 2006, the tax was HUF 186/MWh for electricity and HUF 56/GJ for natural gas. Residential consumers were exempted from this energy tax, for social reasons. The direct *gas subsidy* to households (some EUR 500 million per year) was criticised for drawing on the government budget and also artificially increasing gas demand. In October 2006, the subsidy was abolished and replaced by a direct income support scheme for poor households. This is commendable and goes towards addressing IEA recommendations (IEA, 2007). As a

Table 5.2 **Revenues from environmentally related taxes, 1998-2005**  
(at current prices, million HUF)

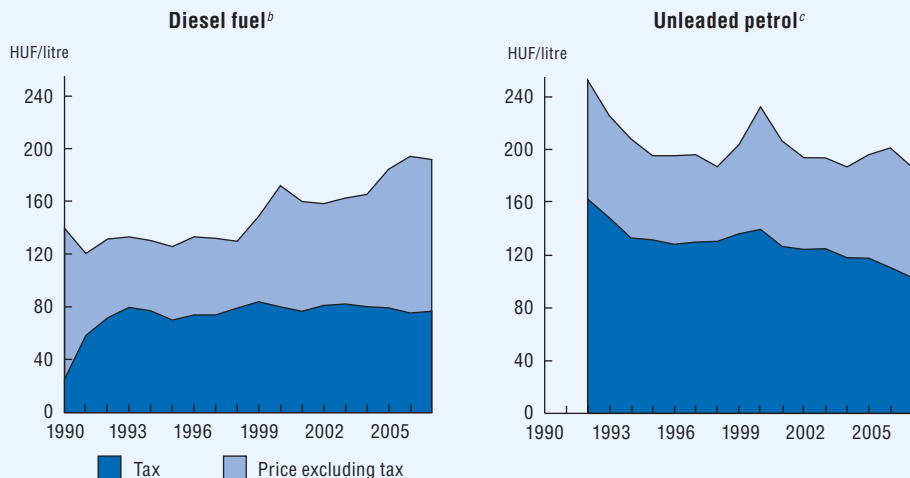
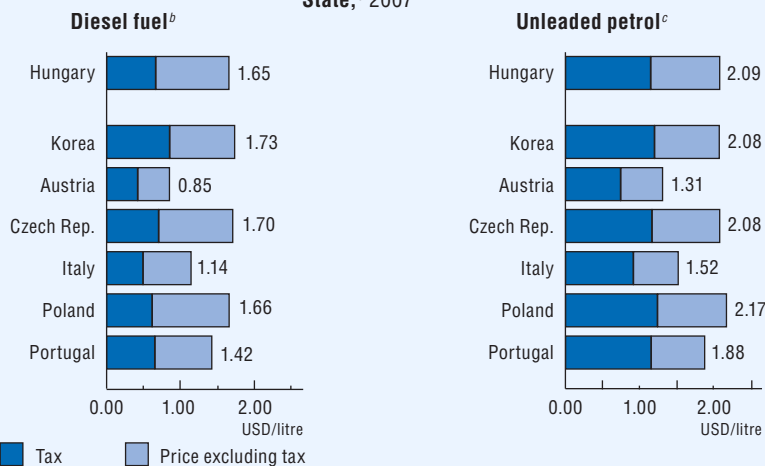
	1998	1999	2000	2001	2002	2003	2004	2005
Product fees	18 723	20 675	24 407	26 404	20 054	25 459	20 009	19 616
Fuel	8 735	8 274	9 570	9 904	–	–	–	–
Tyres	1 445	1 918	2 425	3 110	4 340	5 918	1 607	–45
Refrigerators	520	815	1 267	1 372	2 190	4 173	3 773	1 888
Batteries	729	797	916	1 076	1 288	1 137	354	203
Packaging material	2 750	3 503	4 631	5 191	6 081	5 572	5 663	8 520
Lubrication oil	4 543	5 368	5 598	5 753	6 156	7 049	5 691	6 041
Diluters and solvents	–	–	–	–	–	1 300	2 134	–
Paper materials for advertising	–	–	–	–	–	310	789	1 669
Electronic devices	–	–	–	–	–	–	–	1 340
Other revenues	217 705	338 158	348 511	352 625	397 344	425 732	472 304	529 121
Vehicle tax	8 842	22 269	23 422	25 671	26 853	33 864	45 941	50 030
Revenue tax on fuel	204 000	310 700	319 000	320 215	362 500	383 800	399 100	450 900
Petrol	102 200	165 700	156 000	..	189 000	199 400	200 900	226 700
Gas oil	97 300	140 700	157 000	..	171 600	182 400	196 300	221 200
Other oil products	4 500	4 300	6 000	..	1 900	2 000	1 900	3 000
Water resource fee	4 863	5 189	6 089	6 740	7 991	8 068	9 859	12 304
Energy tax	–	–	–	–	–	–	10 922	12 732
Environmental load charge	–	–	–	–	–	–	6 482	3 155
Total	236 428	358 833	372 918	379 030	417 398	451 190	492 313	548 737
Share of total revenues in GDP (%)	2.3	3.1	2.8	2.5	2.4	2.4	2.4	2.5

Source: Ministry of Finance.

result, gas prices for households rose 70% on average, leading some households to return to coal for heating. It turns out that the budgetary cost of both policies is quite similar. The Hungarian government should now make sure that the conditions for granting exemptions to these energy taxes are fully justified or fulfilled so as not to undermine the incentive effects of such taxes.

Concerning *fuel taxation*, tax rates<sup>5</sup> decreased in real terms by about 3% for diesel and 21% for gasoline in 1998-2007 (Figure 5.2). Differentiation of tax rates increased over the review period and the taxation of diesel fuels is now somewhat lower than that of unleaded gasoline: in 2007, at about 40% for diesel fuel for non-commercial use and at around 55% for unleaded (95 RON) gasoline. Taxes on

Figure 5.2 Road fuel prices and taxes

Trends in Hungary,<sup>a</sup> 1990-2007State,<sup>d</sup> 2007

a) At constant 2000 prices.

b) Automotive diesel for commercial use; Korea: non-commercial use.

c) Unleaded premium (RON 95); Korea: unleaded regular.

d) In USD at current prices and purchasing power parities.

Source: IEA-OECD (2008), database of end-use prices.

road fuels are similar to those of neighbouring countries. Some 3% of revenues of the excise taxes on fuels and other energy products for transport are earmarked for environmental purposes (while 28.7% are earmarked for construction and maintenance of motorways). Rail and agricultural users are exempt from such taxes. Concerning *vehicle taxation*, motor vehicles are subject to an annual circulation tax which is differentiated according to vehicle age and power/weight, with older vehicles paying less (Table 5.3). Some 40% of the revenues are earmarked for maintenance and development of the public road network. Local and intercity public transport services are exempt from the tax. There is no governmental bonus system for the purchase of energy-efficient (petrol and diesel) vehicles.

Table 5.3 **Environmentally related taxes, 2007**

Tax	Rate	Exemptions
Excise taxes		
Transport fuels	88.01 HUF/litre (diesel) 106.54 HUF/litre (unleaded gasoline); 111.80 HUF/litre (leaded gasoline and paraffin) 24.50 HUF/litre (gas hydrocarbon); 47.90 HUF/litre (liquid hydrocarbon)	Diesel-powered ships and trains, diesel used in electricity generation and in agriculture Military aircraft and international air navigation
Heating fuels	85.00 HUF/litre (residual fuel oil)	
Motor vehicle taxes		
Annual circulation tax	300 HUF/kilowatt (0- to 3-year-old cars) 260 HUF/kilowatt (4- to 7-year-old cars) 200 HUF/kilowatt (8- to 11-year-old cars) 160 HUF/kilowatt (12- to 15-year-old cars) 120 HUF/kilowatt (16-year-old and older cars) 1 200 HUF/100kg/year (lorry, bus)	

Source: Ministry of Finance; IEA-OECD.

### *Integration of environmental concerns in the energy sector*

Hungary's energy policy is aimed at balancing the "three Es", namely Energy security, Economic growth and Environmental protection. Progress has been made in integrating environmental concerns in energy policy *at the strategic level* although there has occasionally been a lack of communication between the Ministry of Economy and Transport and the Ministry of Environment and Water (MEW). Among

the *key measures* of Hungary's environmental policy in the energy sector are support programmes, including grants and soft loans; preferential feed-in tariffs for renewables and combined heat and power; taxation of gas and electricity through the energy tax; an environmental levy on refined mineral oil products; and emission allowances under the EU Emission Trading Scheme.

Hungary has made progress in *energy efficiency*, but has much more to do to capture the related multiple benefits (traditional air pollution, greenhouse gas emissions, reduced energy imports, economic benefits). In 1999, Hungary launched a *long-term Energy Efficiency and Renewable Energy Programme and Action Plan*.<sup>6</sup> The plan defines the following targets for 2010:

- reduce energy intensity by 3.5% a year, assuming a GDP growth and an energy consumption growth of 5% and 1.5% per year, respectively; in practice energy intensity was reduced by 2.3% a year between 1999 and 2004, from 0.21 to 0.18 toe, with a GDP growth and an energy consumption growth of 4.4% and 1.6% per year, respectively;
- savings of 75 Peta Joules/year (or 1.8 Million tonnes of oil equivalent/year) of primary energy sources; in practice a 2.4 Mtoe increase was experienced between 1999 and 2005;
- reduce SO<sub>2</sub> emissions by 50 000 tonnes a year (reduction was 77 000 tonnes a year between 1999 and 2005) and CO<sub>2</sub> emissions by 5 million tonnes a year (emissions have increased since 1999 (Chapter 8));
- increase renewable energy production from 28 PJ/year to 50 PJ/year (1.2 Mtoe/year); in practice 1.2 Mtoe was produced in 2005.

While Hungary has improved its energy intensity since the political changes of 1990, which were followed by industrial restructuring, there is still a significant potential to improve energy efficiency in the transformation, transport and residential sectors. The *primary use of energy in the transformation sector* is in electricity generation and heat production. Hungarian gas-fired and coal-fired power plants are not very efficient by EU standards.<sup>7</sup> Combined Heat and Power (CHP), which is primarily used for district heating systems in Hungary, is much more efficient (73% combined efficiency on average). In both cases, however, there is scope for modernisation of combustion equipment. CHP benefits from a very high feed-in tariff provided it can demonstrate an annual 65% combined efficiency (75% for gas engines), which is a very lax requirement. The government should consider strengthening (and enforcing) the minimum requirement for eligibility to the preferential feed-in tariff, and reducing the feed-in tariff rate to a level that avoids over-subsidisation (thereby removing the incentive for heat dumping).

As regards the *transport sector*, Hungary still has a high share of public passenger transport. In 2005, 37% of passenger kilometres were delivered by public transport (13% by rail and 24% by buses) and 62% by private cars, indicating that despite an ageing infrastructure, the mass transport system is continuing to fulfil an important role in the economy. The *energy efficiency of transport* has increased significantly following the switch to modern vehicles since 1990, but efficiency gains have been less important since 2000. In 2000-05, energy consumption by passenger transport fell on an annual basis, but energy consumption by freight transport started rising by around 1% a year. The government expects this trend to continue in the future. The government should consider raising incentives for the use of highly energy-efficient vehicles (by further internalising externalities in road fuel prices) and adopting a strategy for inter-modal freight transport<sup>8</sup> (where the different modes should be used where they are the most efficient). It should also consider continued investment in the mass transport sector to maintain and even increase its attractiveness and to prevent shifts towards individual transport.

In the *residential sector*, subsidies for natural gas consumption and the poor *energy performance* of many residential buildings have led to an average energy demand for space heating that is 70% above that of the EU-15 average, and 275% above the level of best practices for modern buildings. Almost half of the Hungarian buildings were built before 1945 and most of these have not been refurbished since. In addition, about 22% of all residences are pre-fabricated flats with low energy performance. New building regulations issued in 2006 address the energy performance of new and existing buildings, which will require major refurbishment of the latter. Hungary was granted EU support of about HUF 40 billion over 2007-13 to help invest in energy efficiency technology, which will greatly help the government improve residential energy performance. However, two major challenges lie ahead. The first is meeting co-financing requirements in the context of budgetary restrictions. The second challenge is ensuring appropriate expertise to control use of the funds.

Reliance on *renewable energy sources* in Hungary's energy supply *increased significantly over the review period*, from 0.48 Mtoe in 1998 to 1.22 Mtoe in 2005. Most of the increase followed enactment in 2001 of the Electricity Act, which provides for generous feed-in tariffs for renewables and combined heat and power. Renewables contributed 4.4% of total primary energy supply (TPES) in 2005. This is on the way towards the targets of 7-7.2% by 2013 and 14-16% by 2020, as laid down in the energy policy document recently released by the Ministry of Economy and Transport. Renewables are primarily used for heat production, mainly in the form of fuel wood. As regards their contribution to electricity generation Hungary has set an indicative target of 3.6% by 2010 (from 0.5% in 2000).<sup>9</sup> This target was reached



in 2005, due to introduction of a *generous feed-in tariff* of HUF 23.8 (USD 0.113) per Kwh, more than twice the average wholesale price of electricity in Hungary, and priority access to the grid. Preferential feed-in tariffs are limited in time and production volume/capacity so as to prevent operators from benefitting after their investment has been fully recovered. To counter the risk of over-subsidisation, the government should consider the introduction of more market-based approaches in promoting renewable energy. Green certificates, which are priced according to the difference between the market price and production costs, could, in principle, solve the problem of over-subsidisation.

Concerning *energy prices*, electricity and natural gas prices in the industrial sector are higher than the OECD-Europe average (Table 5.4). With the full market liberalisation that took effect on 1 July 2007, prices are expected to decrease following increased competition. The price of *natural gas* paid by Hungarian households is well below the OECD price average (at purchasing power parities), by

Table 5.4 Energy prices in selected OECD countries, 2007

	Electricity		Oil			Natural gas	
	Industry (USD <sup>a</sup> /kWh)	Households (USD <sup>a</sup> /kWh)	Industry <sup>a</sup> (USD <sup>a</sup> /tonne)		Households <sup>b</sup> (USD <sup>a</sup> /1 000 l)	Industry (USD <sup>a</sup> /10 <sup>7</sup> kcal)	Households (USD <sup>a</sup> /10 <sup>7</sup> kcal)
			High-sulphur oil	Low-sulphur oil			
Hungary	0.134	0.261	..	440.2	n.a.	584.1	851.7
Korea	0.069	0.129	551.9	574.2	1 269.1	551.1	902.5
Austria	0.134	0.183	..	474.9	779.6	..	801.9
Czech Republic	0.115	0.207	285.5	338.2	1 211.0	391.7	827.9
Italy	0.237	0.221	..	473.5	1 310.6	454.2 <sup>e</sup>	859.7 <sup>e</sup>
Poland	0.083	0.216	354.1	428.1	1 281.1	375.1	983.1
Portugal	0.129	0.222	..	587.7	1 032.7	428.7	1 119.3
OECD Europe	0.106 <sup>e</sup>	0.169 <sup>e</sup>	..	487.3	755.2	..	..
OECD	0.088 <sup>e</sup>	0.133 <sup>e</sup>	..	..	745.5	335.9 <sup>e</sup>	619.8 <sup>e</sup>
HUN price/ OECD (%)	119 <sup>e</sup>	175 <sup>e</sup>	..	..	..	134 <sup>e</sup>	78 <sup>e</sup>

.. = not applicable.

a) High-sulphur oil or low-sulphur oil.

b) Light fuel oil.

c) At current exchange rates.

d) At current PPPs.

e) 2006.

Source: IEA-OECD, Energy prices and taxes, 1st quarter 2008.

nearly a quarter. As already mentioned, household gas consumption was subsidised, with the subsidy covering some 12% of the average household bill (e.g. HUF 11 000 per household per year). The reform adopted in 2006 abolished the subsidy and established a compensation support system for the poor. There is no subsidy to *electricity consumers*, network operators or generators of electricity, and prices in the residential sector are much higher than the OECD-Europe average (at purchasing power parities). *Low-sulphur oil prices* for industry are lower than the OECD-Europe average. *Road fuel prices* are above the OECD-Europe average. Tax concessions are granted to bio fuels to promote their wider use.

### 1.3 Pollution abatement and control expenditure and financing

In the last few years Hungary has devoted around 1% of its GDP to *pollution abatement and control (PAC) investment expenditure* from both the public and the private sectors, while a further 0.6% of GDP has been devoted to PAC operating expenditure. In 2006 PAC investment expenditure amounted to 0.85% of GDP (Table 5.5), bringing *total PAC expenditure to 1.7% of GDP*. Overall, 54% of PAC investment expenditure is on water protection, 17% is on waste management and 14% is on air management. Investment expenditure relates mainly to end-of-pipe technology (71%).

The public sector was the main source of financing of the *first National Environmental Programme (NEP-I)*. The original target of 1.7% of GDP for PAC investment was not met, and PAC investment remained around 1.1% during the whole period. On the other hand, the amount spent on other environmental matters, nature conservation and water management research and development increased from approximately HUF 6 billion/year to HUF 13 billion in 2002. Total expenditure in relation to the implementation of the objectives of *NEP-II* was HUF 588.7 billion (HUF 204.3 in 2003, HUF 149.1 in 2004, and HUF 235.3 billion in 2005). As the level of financing was lagging behind schedule, NEP-II benefited from resources from the Cohesion Fund and from Structural Funds (as part of the National Development Plan and the National Regional Development Plan). Within the context of the EU Structural Funds, an Operative Programme for Environment and Infrastructure was developed for 2004-06 with an allocation of HUF 111.2 billion (HUF 42.5 billion for environmental protection, HUF 64.2 billion for transport infrastructure, HUF 4.4 billion for technical assistance).

The *structure of financing* has changed radically since 2004. The size of *EU support* and domestic co-financing increased more than twofold, and in parallel, support from the state budget decreased. For the next EU programming period (2007-13) a new and considerable operative programme has been prepared: the Environment and Energy Operative Programme (EEOP) with an allocation of

Table 5.5 **Pollution abatement and control expenditure by sector, 2006**

(HUF billion current)

	Water protection <sup>c</sup>	Waste management	Air protection	Other <sup>d</sup>	Total
Total PAC expenditure	173.6	128.9	35.9	59.0	397.3
Share in total (%)	43.7	32.4	9.0	14.9	100.0
Share in GDP (%) <sup>a</sup>	0.73	0.54	0.15	0.25	1.67
of which:					
Public sector	74.8	15.7	6.3	25.4	122.1
Share in GDP (%) <sup>a</sup>	0.31	0.07	0.03	0.11	0.51
of which:					
Investment	73.4	13.6	6.1	21.0	114.2
Current expenditure	1.4	2.0	0.2	4.4	8.0
Business sector <sup>b</sup>	98.8	113.2	29.6	33.6	275.1
Share in GDP (%) <sup>a</sup>	0.42	0.48	0.12	0.14	1.16
of which:					
Investment	34.8	21.3	22.2	9.7	88.1
Current expenditure	63.9	91.8	7.4	23.9	187.1
of which:					
Agriculture, hunting, fishing, forestry	2.3	3.8	1.9	1.2	9.1
Mining and quarrying	0.0	0.1	0.2	0.1	0.3
Manufacturing industry	24.2	7.4	16.2	8.7	56.4
Electricity, gas and water	50.1	3.2	4.9	3.6	61.8
Other <sup>b</sup>	22.2	98.8	6.5	20.1	147.5

a) 1% GDP = HUF 237.6 billion in 2006.

b) Includes specialised producers of environmental services.

c) Includes waste water treatment.

d) Includes noise and protection of landscape and nature.

Source: OECD; HCSO.

EUR 4.9 billion for the period. This EEOP programme represents about 17% of the total of EU funds allocated to Hungary for the period 2007-13, which themselves represent an annual allocation of roughly 4.8% of the GDP of Hungary.<sup>10</sup> The largest sums have been allocated to waste water treatment (30%), the improvement of drinking water quality (15%) and waste management (9%).

It is therefore important for Hungary to ensure a high *absorption capacity for EU Funds*. Co-financing is likely to be a problem with small municipalities that could find it difficult to raise the needed matching funds. There are also concerns that applicants may lack the expertise to submit projects that pass the required criteria.

With an increase in EU funding concomitant with a downsizing of government staff, Hungary will need to ensure that the administration has sufficient *technical and economic expertise* to apply environmental impact assessment and cost-benefit analysis when setting priorities among projects submitted for EU funding, and that cost-effectiveness has a central place in decision criteria.

## 2. Implementation of Environmental Policies

### 2.1 Environmental policy objectives

Two *National Environmental Programmes* were developed during the review period with time-bound horizons and quantitative objectives: NEP-I covering 1997-2002 and NEP-II covering 2003-2008. These programmes<sup>11</sup> have been assessed, reviewed and adjusted periodically to changing economic conditions (Box 5.2).

*Broad environmental planning goals* are set by NEP-II: protection of ecosystems; assuring a balanced social-environmental interface, mainly in terms of a healthy environment for the population; integration of environmental aspects into economic development policy and decoupling of environmental pressures from economic growth; strengthening the scientific knowledge of environmental processes and impacts and improving environmental awareness and institutional cooperation.

NEP-II builds upon the experience of NEP-I and the EU 6th Environmental Action Programme to 2010. While NEP-I had a sectoral approach, NEP-II acknowledges the *multi-dimensionality of environmental problems* and calls for co-operation among different administrative bodies at both central and local levels, and for stronger partnership among public authorities, social and economic actors, including NGOs and academic institutions.

Implementation of NEP-II relies upon *nine Thematic Action Programmes* (TAPs): i) environmental awareness; ii) climate change; iii) environmental health and food safety; iv) urban environmental quality; v) biodiversity conservation and landscape protection; vi) rural environmental quality and land use; vii) protection and sustainable use of water; viii) waste management; and xi) environmental security. Each TAP outlines actions and defines qualitative objectives, quantitative targets and performance indicators (Table 5.6). For the monitoring of the overall NEP-II, macro-indicators have to be elaborated. The TAPs encompass objectives and actions of *related ongoing sectoral programmes* (e.g. National Environmental Health Programme, National Waste Management Plan, Drinking Water Quality Improvement Programme). The linkages between NEP-II and Hungary's first National Sustainable Development Strategy have not been made explicit.

### Box 5.2 National environmental planning and programming process

Medium-term environmental planning is regulated by Act LIII/1995, which lays down general rules for environmental protection. *National environmental programmes* (NEPs) cover a six-year period and are endorsed by the Parliament. Regions, counties and municipalities must define their respective environmental protection plans, in accordance with the national plan. In the first planning period (1997-2002), the vast majority of regions and counties approved their plans. However, less than 10% of municipalities did, and special funding was provided in 2001 to support local governments in their planning process.

The NEPs are implemented on the basis of *annual action plans* approved by the government and are assessed every two years. The *biannual assessment report* is submitted to the Parliament. As for the second planning period (2003-2008), a high level *inter-sectoral committee* has been set up to co-ordinate implementation of the programme. Representatives of both ministries and regional councils participate in the committee, which reports to the National Environmental Council. The committee works through subcommittees, one for each *thematic action programme* (TAP), which involve representatives from municipalities and from social, environmental and economic sectors. Each subcommittee is responsible for preparing an annual progress report and a TAP implementation plan, allocating human and financial resources accordingly. The inter-sectoral committee reviews overall objectives and priorities and drafts the annual implementation plan and budget on the basis of the subcommittees' work, prior to final government approval.

The *overall expected spending under NEP-II* is HUF 4 200 billion (at 2002 prices), half of which is covered by the central budget. The share of central budget resources in financing the programmes is expected to decrease from about 57% in the early years of implementation to 47% in 2008. Municipalities' budget and EU funds account for about 13% each. In the first three years of implementation, Hungary faced financial constraints and NEP-II expenditure totalled HUF 588.7 billion, including a substantial EU contribution.

NEP-II envisages enhancement of the polluter-pays principle, gradual adjustment of utility fees towards full cost recovery, and reform of the subsidy system to provide for greater involvement of the financial sector (e.g. through interest relief).

The *2000 OECD Environmental Performance Review* recommended that Hungary:

- strengthen enforcement of environmental laws and regulations at national, regional and local levels by developing the capacity of inspectorates, and by improving the effectiveness of the system of non-compliance fines;

**Table 5.6 Selected objectives, targets and intermediate achievements of the NEP-II, 2003-08**

Objective	Indicator	Base year 1999/2000	Target 2008	Achievement 2005 <sup>a</sup>
Decrease of air pollution	Share of the country area suffering from air pollution	11%	5-8%	6.3%
	Share of the country population affected by air pollution	40%	20-25%	35.9%
	SO <sub>2</sub> emissions	594.7 kt	500 kt (2010)	129.3 kt <sup>b</sup>
	NO <sub>x</sub> emissions	210.5 kt	198 kt (2010)	202.7 kt <sup>b</sup>
	VOC emissions	170.4 kt	137 kt (2010)	177.5 kt <sup>b</sup>
	Ammonia emissions	71 kt	90 kt (2010)	80.1 kt <sup>c</sup>
Decrease of global air polluting impacts	Net GHG emissions	82 Mt	6% below the 1985-1987 level (2008-12)	80.2 Mt (gross) <sup>b</sup> 75.7 Mt (net) <sup>d</sup>
Protection of quantity and quality of groundwaters	Share of waterworks wells polluted by nitrates	3.6%	2%	No improvement
Flood management	Share of dikes in line with standards	62%	75-80%	No improvement
Soil conservation	Area under water erosion	2.3 million ha	10% decrease	No improvement
Conservation and extension of protected natural areas	Total area and share of natural area under protection	857 327 ha 9.2%	1 024 000 ha 11%	875 000 ha 9.4%
	Conservation of forests	Share of forested land	19.2%	20%
	Share of native tree species forested land	9.5%	10.5%	10.8%
Establishment of Hungary Natura 2000 network	Share of the country area included in Natura 2000 sites	0%	15%	20.6%
Sustainable use of natural resources	Share of renewable energy sources in TPES	3.6%	5%	5.3%
Increasing food safety	Organic farming land	85 000 ha	300 000 ha	129 000
Dissemination of environment-friendly life style	Share of municipal waste selectively collected	3%	35-40%	13% (2004)
	Share of waste reuse, recovery and recycling	30%	50%	11.8% (2004)

Table 5.6 **Selected objectives, targets and intermediate achievements of the NEP-II, 2003-08** (*cont.*)

Objective	Indicator	Base year 1999/2000	Target 2008	Achievement 2005 <sup>a</sup>
Improving urban environment	Green areas per capita in urban areas	38.7 m <sup>2</sup> per capita	45 m <sup>2</sup> per capita	17.8 m <sup>2</sup> per capita
	Share of population supplied with unsatisfactory drinking water	27.4%	0% (2009)	25.3%
	Share of treated municipal waste water (in non-sensitive areas)	46%	90% (2015)	66.5% (2004)

a) Unless otherwise indicated.

b) OECD Environmental Data Compendium.

c) NECE Convention on Long-Range Transboundary Air Pollution – officially reported emission data.

d) UN Framework Convention on Climate Change – officially reported emission data.

Source: MEW.

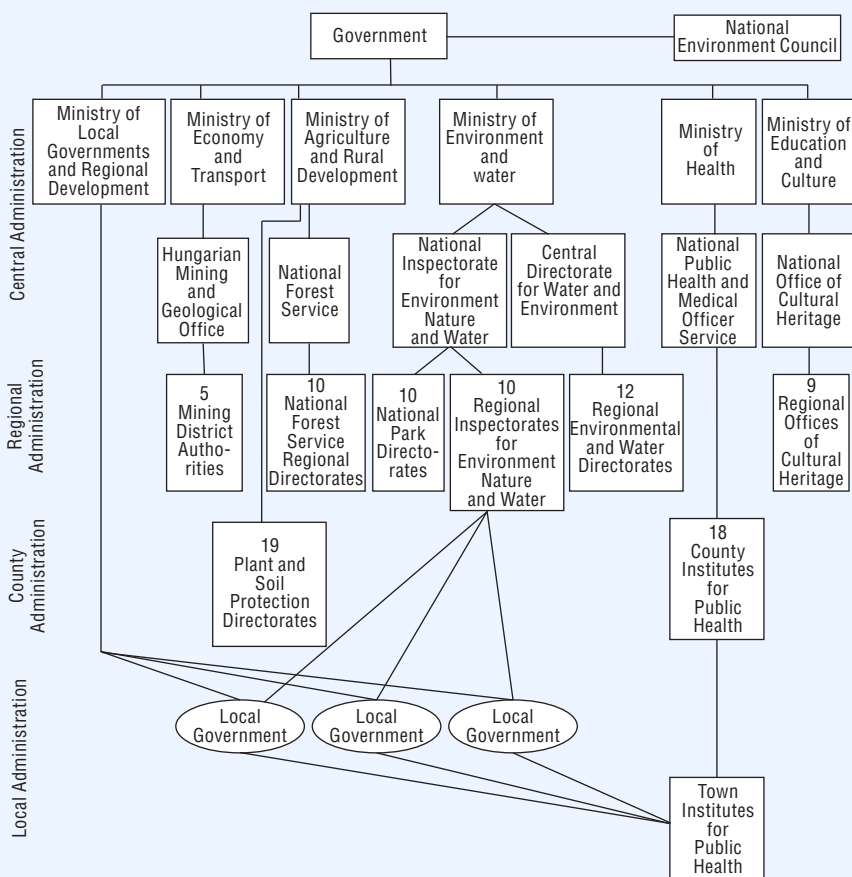
- implement the National Environmental Programme, with a view to achieving its quantitative targets according to deadlines, and monitor and evaluate implementation progress;
- strengthen the capacity of the Ministry for Environment, especially for strategic planning, economic analysis, and for developing the laws and regulations necessary to transpose EU legislation;
- strengthen the capacity of regional authorities to improve environmental infrastructure on the basis of the polluter-pays and user-pays principles;
- further develop the financing strategy for implementing environmental policies, especially in the areas of waste water treatment and waste management, through greater implementation of the polluter-pays and user-pays principles;
- introduce emission charges for water, air and soil pollutants;
- promote wider use of eco-labelling and energy efficiency labelling.

## 2.2 Institutional and legal framework

### Institutions

Since the economic transition, environmental management has been based on a *four-tiered system*, with competencies shared between administrations at central, regional, county and municipal levels (Figure 5.3).

Figure 5.3 Administrative structure for environmental protection



Source: MEW.



Between 2002 and 2005, the system of environmental authorities underwent a simplification process with the *gradual merger of the water and environmental administrations*. At the central level, the renewed MEW also acquired responsibilities for ambient air quality protection and monitoring from the Ministry of Health. Its Development Directorate was established for managing EU and international funds.

*The MEW retains responsibilities for environmental strategic planning, legislation and co-ordination of national and international activities*, whereas pure management activities have been gradually reallocated. The MEW continues to share environmental protection responsibilities with other ministries, especially on mineral resources and mining (Ministry of Economy), agricultural land and forestry (Ministry of Agriculture and Rural Development) and environment-related health issues (Ministry of Health), though to a lesser extent than in the past. These ministries co-ordinate decentralised bodies at regional and/or county levels.

Asset management has been separated from permitting and related enforcement functions. The Central Directorate for Water and Environment replaced the former three separate national authorities for nature conservation, environment protection and water (quality and quantity) management and was transferred the responsibilities of the suppressed Environment Management Institute.<sup>12</sup> In addition, twelve *environmental and water directorates* and ten *national park directorates* operate at the regional level. Municipalities manage local environmental services such as drinking water supply and sewerage system, and urban waste collection and treatment, although they face recurrent financial and human resource difficulties.

Permitting, inspection and enforcement powers over all environmental themes have been regrouped in the National Inspectorate for Environment, Nature and Water (the so-called “*Chief Inspectorate*”) and ten *regional inspectorates*. The allocation of permitting and enforcement powers to a single authority may facilitate information flow and implementation of environmental regulation. Regional inspectorates are located in county capitals<sup>13</sup> and their territorial jurisdiction is based on water catchment areas. The inspectorates’ workload has increased due to both the merger of competences and the development of the regulatory framework. The Chief Inspectorate is an active member of the EU Network for the Implementation and Enforcement of Environmental Law (IMPEL).

There is no mechanism to promote *inter-institutional co-ordination*, especially at local and regional levels, other than the committees established for implementation of NEP-II (Box 5.2) and sector-specific inter-ministerial committees (e.g. for energy policy). The National Commission on Sustainable Development was discontinued in 2003. Participation of both the scientific community and business and

environmental NGOs is assured through the National Environmental Council, a government advisory body established in 1996.

The overall number of *staff in environmental administrative bodies* grew steadily between 1999 and 2003, reaching 8 216. However, since then the administration has suffered severe staff cuts: the staff numbered 6 745 in 2006 (nearly 18% lower than in 2003). This staff decrease is linked to rationalisation measures (i.e. the removal of duplication of tasks among different bodies), as well as to Hungary's ambitious budget consolidation programme to bring down a large budget deficit.<sup>14</sup> In 2005, the *MEW's budget* was reduced by 30%, thereby weakening management capacity.

### *Legislative context*

The right to a healthy environment is recognised in the *Hungarian Constitution*; protection of the urban and natural environment is seen mainly as a way to secure a high level of physical and mental health for the population. The entire review period was characterised by the *consolidation of environmental legislation, although not always supported by economic analysis*. The main piece of legislation remains Act LIII/1995 (as amended), which lays down general rules for environmental protection, containing fundamental principles and the basic institutional framework related to the environment. Major legislative changes have occurred concerning ambient air quality, climate change, water quality, waste management and nature conservation (Table 5.7).

Most of Hungary's environmental legislation is now *driven by EU directives*. Hungary joined the European Union in May 2004, after a pre-accession period marked by intense efforts to successfully transpose the EU environmental "acquis": some 300 new or amended pieces of legislation were adopted. Hungary required a few transition periods for the implementation of EU legislation on: *waste management* (Regulations No. 259/93 and 2557/2001 on shipments of waste; Directive 94/62/EC on packaging and packaging waste; Directive 94/67/EC on the incineration of hazardous waste), *air pollution from large combustion plants* (Directive 2001/80/EC), *drinking water* (Directive 98/83/EC) and *urban waste water treatment* (Directives 91/271/EEC and 98/15/EC). The deadlines were fully met for waste and large combustion plants. EU co-funded investment programmes (Drinking Water Quality Improvement Programme and National Implementation Programme of Urban Waste Water Collection and Treatment) have been implemented, although with some delays, to meet the deadlines in 2008, 2010 and 2015 for the water sector (Chapter 3).

Since accession, Hungary has experienced some delays in transposing EU legislation. Nonetheless, as of 2005, the *national legislation was consistent with EU*

Table 5.7 Selected environment-related legislation

2000	Act XXV of 2000 on Chemical Safety
2000	Act XLIII of 2000 on Waste Management
2000	Government Decree No. 33/2000. (III. 17.) on certain tasks relating to activities affecting the quality of groundwater
2001	Government Decree No. 20/2001. (II. 14.) on environmental impact assessment
2001	Government Decree No. 21/2001. (II. 14.) on certain rules relating to the protection of ambient air
2001	Government Decree No. 98/2001. (V. 15.) on the conditions of the handling of hazardous waste
2001	Government Decree No. 193/2001. (X. 19.) on the detailed rules of uniform environmental permitting procedure (repealed in 2005)
2001	Government Decree No. 203/2001. (X. 26.) on certain rules relating to the protection of the quality of surface water (repealed in 2004)
2001	Government Decree No. 213/2001. (XI. 14.) on the conditions of the handling of municipal waste
2001	Decree No. 4/2001. (II. 23.) of the Minister of Environment on the detailed conditions of the treatment of waste oil
2001	Decree No. 9/2001. (IV. 9.) of the Minister of Environment on the detailed rules of the treatment of spent batteries and accumulators
2001	Joint Decree No. 14/2001. (V. 9.) of the Minister of Environment, Minister of Health and the Minister of Agriculture and Rural Development on ambient air quality limit values and emission limit values of stationary sources of air pollution
2001	Decree No. 17/2001. (VIII. 3.) of the Minister of Environment on the rules relating to control, supervision and evaluation of ambient air quality and stationary sources of air pollution
2001	Decree No. 23/2001. (XI. 13.) of the Minister of Environment on the technological emission limit values of combustion installations with a rated thermal input between 140 kWth and 50 MWth
2001	Decree No. 22/2001. (X. 10.) of the Minister of Environment on the rules and conditions of landfills of waste, as well as the closure and after-care of landfills
2002	Government Decree No. 94/2002. (V. 5.) on packaging and the detailed rules of the treatment of packaging waste
2002	Government Decree No. 271/2002. (XII. 20.) on the implementation of the Convention on the International Trade in Endangered Species of Wild Fauna and Flora, adopted in Washington on 3 March 1973
2002	Decree No. 3/2002. (II. 22.) of the Minister of Environment on the technical parameters, operating conditions and technological limit values of waste incineration
2002	Decree No. 4/2002. (VII. 9.) of the Minister of Environment and Water on the waste from the titanium-dioxide industry
2003	Act LXXXIX of 2003 on Environmental Load Charge
2003	Government Decree No. 94/2003. (VII. 12.) on ozone depleting substances
2003	Joint Decree No. 7/2003. (V. 16.) of the Minister of Environment and Water and of the Minister of Economic Affairs and Transport on the national emission ceilings for certain air pollutants
2003	Decree No. 10/2003. (VII. 11.) of the Minister of Environment and Water on the operating conditions and air pollution limit values of combustion installations with a rated thermal input of 50 MWth or more
2003	Decree No. 23/2003. (XII. 29.) of the Minister of Environment and Water on the treatment of biological waste and on the technical parameters of composting
2004	Act CXL of 2004 on the General Rules of Administrative Procedures and Services
2004	Government Decree No. 219/2004. (VII. 21.) on the protection of groundwater
2004	Government Decree No. 220/2004. (VII. 21.) on the protection of the quality of surface water
2004	Government Decree No. 221/2004. (VII. 21.) on certain rules of river basin management

Table 5.7 Selected environment-related legislation (*cont.*)

2004	Government Decree No. 264/2004. (IX. 23.) on the take back of the waste of electrical and electronic equipment
2004	Government Decree No. 267/2004. (IX. 23.) on end-of-life vehicles
2004	Government Decree No. 272/2004. (IX. 29.) on the permitting, monitoring and reporting of greenhouse gas emissions from certain installations
2004	Government Decree No. 275/2004. (X. 8.) on nature conservation areas of European Community importance
2004	Government Decree No. 276/2004. (X. 8.) on nature conservation state subsidies and certain rules on monetary compensation
2004	Decree No. 15/2005. (X. 8.) of the Minister of Environment and Water on the detailed rules of the treatment of waste of electrical and electronic equipment
2004	Decree No. 16/2005. (X. 8.) of the Minister of Environment and Water on the restriction of the use of certain hazardous substances in electrical and electronic equipment
2004	Decree No. 25/2004. (XII. 20.) of the Minister of Environment and Water on strategic noise maps and on the detailed rules of the preparation of action plans
2004	Decree No. 28/2004. (XII. 25.) of the Minister of Environment and Water on limit values of discharges of water polluting substances and their rules of application
2005	Act XV of 2005 on the trade in emission allowances of greenhouse gases
2005	Government Decree No. 2/2005. (I. 11.) on the environmental assessment of certain plans and programmes
2005	Government Decree No. 109/2005. (VI. 23.) on the take back of spent batteries and accumulators
2005	Government Decree No. 143/2005. (VII. 27.) on certain implementing rules of Act XV of 2005 on the trade in emission allowances of greenhouse gases
2005	Government Decree No. 311/2005. (XII. 25.) on the rules governing public access to environmental information
2005	Government Decree No. 314/2005. (XII. 25.) on the uniform environmental permitting procedure
2005	Decree No. 24/2005. (IX. 13.) of the Minister of Environment and Water on the rules of verification of greenhouse gas emissions
2006	Government Decree No. 27/2006. (II. 7.) on the protection of waters against pollution by nitrates from agricultural sources
2006	Government Decree No. 348/2006. (XII. 23.) on the detailed rules of protection, keeping, utilisation and presentation of protected animal species
2006	Decree No. 20/2006. (IV. 5.) of the Minister of Environment and Water on the landfill of waste, and on certain rules and conditions relating to landfills
2006	Decree No. 40/2006. (X. 6.) of the Minister of Environment and Water on environmental quality standards for polluting substances of surface waters and their application
2006	Decree No. 45/2006. (XII. 8.) of the Minister of Environment and Water on the land registry identification of nature conservation sites of European Community importance

Source: MEW.

*directives* and Hungary had only two infringement procedures for bad application of Community law (in the air and waste sectors) (CEC, 2006a). Actual implementation of recent environmental legislation still requires improvement in environmental management capacity, especially at local level, and heavy investment programmes in a number of fields.

## 2.3 Regulation and enforcement

### *Environmental permitting and impact assessment*

Regional inspectorates act as the main *permitting authorities* for most environmental matters (e.g. environmental impact assessment, air emissions, effluent discharges, waste treatment), with the direct involvement of municipalities. The “Chief Inspectorate” is the licensing authority in selected cases of national relevance (e.g. waste export or import, emission trading), and acts as the second level appeal body for decisions taken by regional inspectorates. The MEW keeps some permitting powers in selected cases (e.g. allocation of quotas to new entrants into the emission trading scheme), co-operates with the Chief Inspectorate for issuing specific licenses (e.g. release of genetically modified organisms) and acts as the second level appeal body for decisions taken by the Chief Inspectorate.

Hungary has traditionally had an *integrated permitting procedure* based on environmental impact assessment (EIA). The overall permitting procedure was modified in 2001 with the introduction of the EU integrated pollution prevention and control (IPPC) scheme, and in 2005 with the merger of EIA and IPPC licensing in a co-ordinated procedure: in case of IPPC activities, the IPPC licence is based on the conclusions of the EIA. The EIA decision is binding for both the operator and other authorities (e.g. the building licensing authorities). The EIA procedure remains a two-step process, implying a preliminary assessment and possibly a detailed EIA,<sup>15</sup> but now allows for *wider consultation of environmental authorities as well as a public hearing* in the preliminary phase. In particular, the national park directorate concerned and the county institute of national public health are involved. Moreover, provisions have been included to assure involvement of neighbouring countries in case of trans-boundary environmental impacts. Over the last decade, EIA has helped in integrating environmental concerns at the project level; each year an average of 300 projects were granted an EIA permit, while around 20 project applications were refused or withdrawn (Table 5.8).

The *activities subject to IPPC and EIA are broader* than requirements of the corresponding EU directives (e.g. they include mining activities), and for some activities limit values are stricter (e.g. thermal power plants, waste water treatment plants). In many cases, licensing is conditional on the application of the best available technologies. As of 2006, the number of IPPC installations in Hungary was 1 048, 590 IPPC permits had been released, and nine national best available technique (BAT) guidance documents had been issued, as well as 11 BAT reference document summaries.

*Industrial risk management* is not integrated into the general permitting system and is the responsibility of the National Directorate for Disaster Management within the

Ministry of the Interior, in co-operation with the Hungarian Trade Licensing Office. These authorities are in charge of implementing the EU Seveso II Directive, according to national legislation revised in 2006. As of 2005, Hungary had 47 upper tier establishments,<sup>16</sup> all of which had a safety report and an internal (on-site) emergency plan as required by the directive (CEC, 2006b). External (off-site) emergency plans were available for 90% of the upper tier establishments (EU average: 68%), and all these plans had been tested at least once (EU average: 40%). Operators of installations and mayors share the responsibility of informing the local community, and the safety report is made public. Permitting of new installations requires a public hearing.

Provision of *financial guarantees for environmental damage* for landfills or mining activities, and liability insurance for a number of hazardous activities, are being considered to implement the EU Directive on Environmental Liability (2004/35/EC).

*Strategic environmental assessment* (SEA) of plans and programmes was introduced in 2005, following transposition of the corresponding EU Directive. National legislation requires an SEA for certain plans and programmes including: national and regional development plans and programmes, regional and municipal land use plans, waste management plans (at all government levels), agricultural plans, the national strategy for water management and related programmes, watershed management plans, and road network development plans.

Table 5.8 **Environmental impact assessments, 1998-2006**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	1998-2006
EIA procedures started	497	502	527	587	532	589	574	578	489	4 875
Env. permits issued	250	277	303	341	321	294	329	298	269	2 682
Applications refused	12	12	15	13	11	15	19	18	20	135
Applications withdrawn	5	2	5	7	6	8	7	9	3	52
Procedures cancelled	0	3	0	0	0	0	0	0	0	3

Source: MEW.

### *Monitoring and enforcement*

Regional inspectorates are the main *monitoring and enforcement authorities*. They are responsible for monitoring of ambient air (Chapter 2), groundwater and

surface water quality (Chapter 3). They operate their own laboratories for sampling and analysis. IPPC operators must carry out self-monitoring and report to the regional inspectorates. Hungary has implemented the European Pollutant and Emission Register and is progressing in the implementation of the more comprehensive European *Pollutant Release and Transfer Register*.

*Inspections* are carried out on regular and ad hoc bases. The schedule of regular inspections is set out in the annual work programme of each inspectorate and is approved by the Chief Inspectorate. Some sectoral laws define the frequency of inspections (e.g. surface water and air emissions), and at least one annual on-site inspection for IPPC installations is mandatory. Ad hoc inspections are carried out in case of complaints, pollution levels above limit values (recorded by automatic monitoring stations), environmental remediation works and accidents. However, regional inspectorates spend much of their working time on technical support to other authorities and private operators, leaving little time for inspections (e.g. 10% in some regional inspectorates). In 2006, a training project on environmental inspections was conducted in co-operation with the Netherlands. In case of *non compliance with environmental regulations*, a fine is levied and/or the activity can be restricted, suspended or closed. In case of environmental damage, the operator is required to restore the damaged environment. Inspection costs are partially covered by inspection fees paid by non-compliant operators.

Co-operation of environmental inspectorates with police and customs authorities has been improved, and specific bilateral agreements among these authorities concluded. Since 2005, joint inspections have been conducted by the so-called "*Green Commando*" (ad hoc teams of experts from environmental inspectorates, civil protection authority, police, transport authority, fire brigade, health offices and customs). These joint inspections have mainly addressed production, transport and disposal of hazardous materials.

Since 2005, the National Directorate for Disaster Management and the Hungarian Trade Licensing Office have *inspected Seveso II installations* every 12 or 24 months, depending on the quantity of dangerous substances held. A specific guidance handbook was prepared within an EU-funded twinning project in 2003. As of 2005, five installations were found to be out of compliance, four of which were forced to limit their activities until compliance was restored.

The system of sanctions has been significantly strengthened at both administrative and criminal levels. During the review period, new environmental fines were introduced (on waste management, groundwater, sewerage, waste water, nitrate pollution) and others were revised (on air pollution, ozone). Fines are determined on the basis of severity, recurrence and duration of non-compliance; in particular,

repeated violations lead to higher fines. Inspectorates have some flexibility in defining the amount of a fine. Fine collection has been re-allocated to tax authorities, which have stronger enforcement powers. Out of the revenues from fines, 30% are re-distributed to the municipalities where the non-compliant activities are located. Revenues from environmental fines increased by over 80% in real terms in 2002-05, reflecting both adjustments in fine rates and increased numbers of inspections (Table 5.9). The number of imposed fines actually increased more than 40%. However, some 25% of enforceable fines remain unpaid (especially those related to air, waste, waste water and noise). The waste water sector records the highest number of non-compliance cases, followed by air, but nearly 70% of revenues relate to violation of air legislation.

As for criminal sanctions, environmental crimes have been prosecuted since the late 1970s in Hungary and underwent a comprehensive revision in 2004-05. Environmental crimes are punishable with detention (up to eight years depending on the offense) and include: general crimes related to environmental damage; damage to protected natural habitat, flora and fauna; illegal disposal of hazardous and non-hazardous waste; illegal hunting and hurting of animals; abuse of nuclear materials; and violation of legislation on nuclear installations.

In 2005 the number of *environmental inspectorate staff*, as well as rangers, customs and police personnel, was cut by 50%, thereby weakening enforcement

Table 5.9 Revenues collected from fines,<sup>a</sup> 2002-05

	Revenues (000' HUF)				Share (%)	
	2002	2003	2004	2005	Total revenues	Total No. fines
Waste	86.8	39.3	50.2	88.1	7.0	13.0
Air	449.8	358.8	952.9	841.9	68.5	31.8
Waste water	129.7	188.4	124.2	306.3	19.7	41.0
Sewerage	23.1	31.5	37.5	38.6	3.4	4.6
Groundwater	0	4.5	10.4	1.9	0.4	0.5
Noise	12.4	6.7	7.0	4.3	0.8	3.3
Administrative fine <sup>b</sup>	0.6	0	2.5	2.7	0.2	5.8
Total	702.5	629.3	1 185.0	1 284.1	100.0	100.0

a) At constant 2002 prices.

b) Omission of administrative duties (e.g. reporting).

Source: MEW, OECD.



capacity. A high rate of non-compliance and non-payment of environmental charges is estimated among small and medium-sized enterprises. Frequent occurrences of illegal environment-related activities have been reported in recent years (e.g. smuggling of poor quality fuels, illegal hunting, illegal transport of hazardous waste).

## 2.4 Economic instruments

Since the last OECD review, *Hungary has increased its use of economic instruments* and made progress in implementing the polluter-pays principle. Hungarian businesses participate in the EU emissions trading scheme for carbon dioxide (Chapters 2 and 8).

Charges for use and abstraction of water (Chapter 3), for waste collection and disposal, for mining and changes in use of agricultural land, and product charges were supplemented in 2004 by a new *environmental load charge on air, water and soil pollution*. In the first year of implementation, about HUF 6.5 billion was collected (Table 5.2). The amount due has been gradually increased, reaching 100% of the charge in 2008 for air and water and in 2009 for soil. Polluters undertaking waste recovery operations are entitled to a reduction of air and water duties in proportion to the volume of recovered waste. This is a commendable step forward since Hungary previously had no pollution charge. Nonetheless, the relatively low rates of the charge, and the exemptions and rebates offered, may hinder its effectiveness.

Concerning *air pollution*, the environmental load charge is levied on SO<sub>2</sub>, NO<sub>2</sub> and non-toxic particulate emissions at a unit rate of HUF/kg 50, 120 and 30 of emitted substance, respectively. The charge is paid by the operators of installations subject to a permit. A 50% reduced charge is granted if the operator undertakes to install abatement equipment. The charge does not apply to households, district heating providers and transport.

Concerning *water pollution*, the environmental load charge applies to discharges of chemical oxygen demand (COD), phosphorus, nitrogen and heavy metals. The fee varies (HUF/kg 90-220 000 of discharged pollutant), and is lowest for COD and highest for mercury. It takes into account the vulnerability of the receiving water bodies and the sludge disposal treatment used. The charge does not apply if waste water recycling is in place, and the discharger can receive a 50% reduction if pollution reduction measures are implemented. The duty does not replace the excess discharges fines and also applies to households.

Concerning *soil pollution*, the charge is levied on disposal of waste water by means other than the local public sewerage system. The unit rate is HUF/m<sup>3</sup> 120 and

is applied to the volume of water supply,<sup>17</sup> taking into account the quality of groundwater bodies. The charge aims at encouraging households to use available public infrastructures. This scheme might have contributed to the increase of the population connected to public sewerage.

The average annual *waste charge* for Hungarian households was over HUF 12 080 in 2005. Municipal waste treatment charges increased dramatically during the review period (22% in real value from 2003 to 2005), generating affordability problems. Nonetheless, they cover almost exclusively operational costs and not investment needs (CEC, 2006c).

*Products charges* (Table 5.10) such as packaging materials, tyres, refrigerators and refrigerants and batteries were introduced in Hungary by the 1995 Act on

Table 5.10 **Product charges<sup>a</sup>**

	1999	2006
Lubricants	69.90 HUF/kg (lubricating oil)	97 HUF/kg (lubricating oil)
Fuels	2.3-2.5 HUF/litre (gasoline and diesel)	n.a.
Packaging materials	2-10 HUF/kg	6-44 HUF/kg 3-25 HUF/each (plastic bags) 10-60 HUF/each (drink packaging)
Tyres	35 HUF/kg (new tyres); 140 HUF/kg (imported used tyres)	110 HUF/kg
Refrigerators and coolants	Refrigerators: 812.5-3 775 HUF/unit Coolants: 147 HUF/kg (HCFC/HCFC mix); 590 HUF/kg (imported, regenerated or regenerable HCFC/HCFC mix); 1 748 HUF/kg (imported, regenerated CFC/CFC mix)	Refrigerators: 2 443-11 344 HUF/unit Coolants: 907 HUF/kg
Batteries	45-63 HUF/kg	112-156 HUF/kg
Paper materials for advertising	n.a.	26 HUF/kg
Electronic devices	n.a.	83-100 HUF/kg
Deposit refund system for packaging	20-30 HUF/glass bottle 28-65 HUF/plastic bottle	26-60 HUF/item

n.a. = not applicable.

a) At current prices.

Source: MEW, OECD.

Environmental Product Charges. Positive waste management results have been registered from the use of product charges and from the distribution of part of related revenues to the collection of used batteries, old refrigerators, paper packaging materials and used tyres. In 2004, the product charge regime underwent a major reform with the extension of the scheme to electric appliances and electronic equipment and with changes in the payment conditions. Concerning beverage containers and plastic bags, the charge is no longer based on the weight of the product but on the number of items placed on the market, with a view to reducing waste volume. Tax exemptions can be claimed if a certain percentage of the product placed on the market is reusable (e.g. 67% for beer packaging; 20% for wine packaging; 7% for mineral water bottles; 11% for soft drink packaging) and if a certain percentage of the waste from that product is collected (e.g. 60% in the case of so-called commercial packaging). Preliminary results of the 2004 reform of the product charge system show that recycling of packaging waste increased to reach 57% in 2005, as a consequence of the co-operation with industry. However, the scope of Hungary's product charge system has been criticised by NGOs who have found it inadequate and too limited compared to other countries. They argue that other waste materials should also be made subject to these charges (e.g. building scraps or demolition materials) (Kiss, 2004).

In 2004, the *voluntary deposit-refund system* was revised. The scheme is implemented by manufacturers and distributors, with average deposit charges between HUF 26 and HUF 60. As this voluntary scheme has failed to deliver a significant change in behaviour, plans are to make deposit charges obligatory for some items.

## 2.5 Voluntary instruments

The entering of industry into *voluntary agreements has been regulated only since late 2005*.<sup>18</sup> To date no such agreements have been concluded in the area of environmental management other than the so-called "pooling agreement" of companies subject to the EU's greenhouse gas emission trading scheme, including affiliates of the Hungarian Oil and Gas (MOL) Group. However, such agreements are mainly designed to rationalise management and taxation.

A *national eco-labelling scheme* was introduced in 1997 and the regulation was revised in 2004 with the introduction of 10 new eligible product groups. The system is managed by the Hungarian Eco-labelling Organisation (HELO), a public interest company under full control of the Ministry of Environment and Water. The application process is open, continuous and voluntary for all foreign and domestic manufacturers, service providers and distributors. As of 2007, environmental requirements were specified for 51 product groups, and 31 companies were awarded the label. On the other hand, participation in the EU Eco-label is negligible (with two companies).

The possibility of including *environmental requirements in public procurement procedures* was introduced in 2003. In 2006, Budapest was the first local authority to approve a green public procurement regulation, on the basis of a handbook issued by the Centre for Environmental Studies (an independent non-profit organisation) (Chapter 7).

Hungarian companies show a considerable commitment to *environmental auditing and management*. Some 20 consulting companies offer environmental auditing services. Environmental management is promoted by KOVET, the Hungarian association of businesses for environmentally-aware management. During the review period, the number of ISO 14001 certified companies increased from 60 in 1999 to 1 140 in 2006. This implies 112 ISO-registered firms per thousand inhabitants and 6.5 companies per billion USD of GDP, well above the OECD-Europe averages (102 and 3.9, respectively). However, only eight organisations are registered for the more stringent EU Eco-Management and Audit Scheme (EMAS). The Chief Inspectorate is the responsible authority for EMAS. EMAS- and ISO- certified organisations benefit from some advantages in accessing public financial support (e.g. priority or higher score).

## Notes

1. Since 2000, total final consumption of energy has grown regularly as energy demands for road transport and household heating have more than offset the decreasing demand by industry. The increase in household demand can be explained by the growing size of the average flat and the decrease in the number of occupants of flats, combined with an increased use of household appliances.
2. Processing industries increased water recycling by 25%, while the machinery and equipment manufacturing industry reduced water demand by 80%.
3. The decreasing use of fertilisers during the 1990s coincides with the radical decline in animal husbandry and the concomitant decrease of livestock manure, while the use of pesticides largely corresponds to the growth path of agricultural production.
4. This figure is very high because the study authors included in their estimate an evaluation of the cost of the non-internalisation of the environmental damage.
5. In 1998 taxation of diesel fuels and unleaded gasoline was between 60% and 70% of end-use prices.
6. Energy efficiency and renewable energy are key elements of the National Development Plan 2004-06 (NDP-I).
7. According to the Energy Efficiency Information Centre (established in 2000 under the aegis of UNDP and GEF), the average efficiency of a gas-fired power plant in Hungary is 38% *versus* 45%, 47% and 53% in Germany, Austria and France, respectively.
8. Road freight traffic (in tonne-kilometres) increased significantly over the review period. Rail freight traffic also increased, but to a much lesser extent.
9. Pursuant to the EU directive on the promotion of electricity produced from renewable energy sources in the internal electricity market (2001/77/EC).
10. Hungary's allocation from the 2007-13 Financial Framework of the European Union is equivalent to about 2½ times the average yearly amount available during 2004-06. The total available amount over the programming period will be EUR 30 billion, which includes around EUR 5 billion of statutory co-financing. Altogether, this implies an annual allocation of about 4.8% of GDP per year, and the net financial inflow to the economy could be equivalent to about 4% of GDP.
11. Although they are called programmes, the NEPs are planning instruments and not investment programming documents.
12. The Environment Management Institute was a scientific agency supporting the former Ministry of Environment. It was suppressed in 2004 and its staff was transferred to the MEW.
13. Budapest, Szeged, Pécs, Győr, Miskolc, Nyíregyháza, Székesfehérvár, Szolnok, Szombathely, Debrecen. Two additional inspectorate offices are located in Baja and Gyula.
14. The budget deficit in 2006 was at 10% of GDP.
15. The legislation specifies the activities that require a detailed EIA procedure. In these cases, during the preliminary phase, the responsible inspectorate decides on the scope of the detailed

EIA report. In the other cases, the inspectorate can require a detailed EIA on the basis of potential environmental impacts identified in the preliminary assessment.

16. The Seveso Directive classifies establishments or sites according to the quantity of dangerous substances held. Upper tier establishments, which hold quantities of substances above the upper threshold specified in the directive, must comply with the corresponding requirements.
17. Water supply is used to approximate waste water not disposed through public sewerage.
18. 2004 Act on the General Rules of Administrative Procedures and Services, effective as of 1 November 2005.

## Selected Sources

The government documents, OECD documents and other documents used as sources for this chapter included the following. Also see list of Web sites at the end of this report.

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# 6

## ENVIRONMENT AND AGRICULTURE\*

### Features

- Environmental performance of agriculture
- Energy, greenhouse gases and agriculture
- Policy developments following EU accession

\* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 2000. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy. It takes into account the latest Economic Surveys of Hungary.



## Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Hungary:

- design *complementary national direct payments* (“top-up payments”) so as to maintain the degree of flexibility that farmers have in their production choices;
- prepare the shift from single payments (and their top-up payments) to income support *payments based on historical entitlements*, in the context of the CAP reform;
- design *cross compliance* with a view to achieve specific environmental outcomes;
- strengthen *on-farm biodiversity* protection in the context of establishing the Natura 2000 network;
- introduce compulsory *nutrient management plans* at the farm level in “nitrate vulnerable zones”;
- set a national target of reduction in treatment frequency of *pesticides*;
- increase the share of agricultural budgetary expenditure on *general services*, to speed up environmental R&D and innovation in the farming sector.

## Conclusions

The *national nitrogen balance* is low by OECD standards and the national phosphorus balance has decreased, to the extent of becoming negative. Agricultural emissions of greenhouse gases have decreased by nearly half since 1985-87 (base period under the Kyoto Protocol for Hungary). *On-farm energy consumption* was decoupled from agricultural production, showing better performance in the farm sector than in the rest of the economy. Hungary already met its *ammonia emission reduction commitments* (for 2010) under the Gothenburg Protocol. Use of methyl bromide has been prohibited in Hungary in 2005. Water use by agriculture has dramatically decreased. *Afforestation* to combat soil erosion has proved popular among farmers, because of attractive financial incentives; it has involved an increasing share of indigenous tree species. A *code of good agricultural practices* was introduced in the early 2000s, which led to a concept of “strict environmental management” that now applies to 1.4 million hectares of environmentally sensitive areas (out of 5 million hectares of farmland). The code will become compulsory in areas gradually designated as vulnerable to nitrate pollution (to cover nearly half of Hungary). Since the introduction in 2000 of *agri-environmental measures*, expenditure for such payments has increased and now accounts for 13% of total direct payments. The introduction of the *single payment scheme* (following EU accession) is

an important step towards reducing production and trade distortions, and thus the degree of flexibility that farmers have in their production choices.

However, a quarter of farmland is affected by moderate to severe *soil erosion* and efforts to improve agricultural soil management have been limited. Little has been done to protect *on-farm biodiversity*: less than a quarter of Environmentally Sensitive Areas overlap with the recently established Natura 2000 network. Organic farming applies only to 2% of the agricultural land area and there is low consumer demand and awareness about organic products. The intensities of use of nitrogen fertilisers and *pesticides* have been quickly increasing in recent years, with the increase of EU support, and are now in line with the OECD Europe average. Many manure storage facilities do not comply yet with requirements of the code of good agricultural practices. Integrated Pest Management accounts for only 0.13% of total agricultural area. *Payments based on input use* have remained. *Top-up payments* (complementary to single payments) have the potential to distort commodity production and thereby to make the farmers decide on production without attention to environmental criteria. The budget devoted to agri-environmental measures under the new National Rural Development Strategy 2007-13 remains insufficient. *Budgetary expenditure on general services* has remained stable since accession, despite increasing availability of EU funds, thereby missing the opportunity to better help the farming sector build capacity on environmental management.



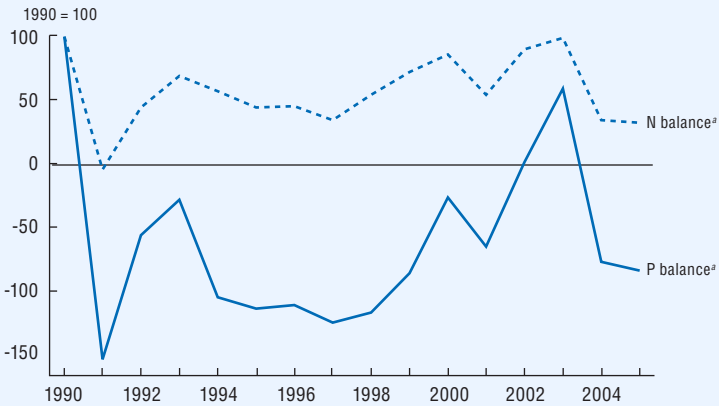
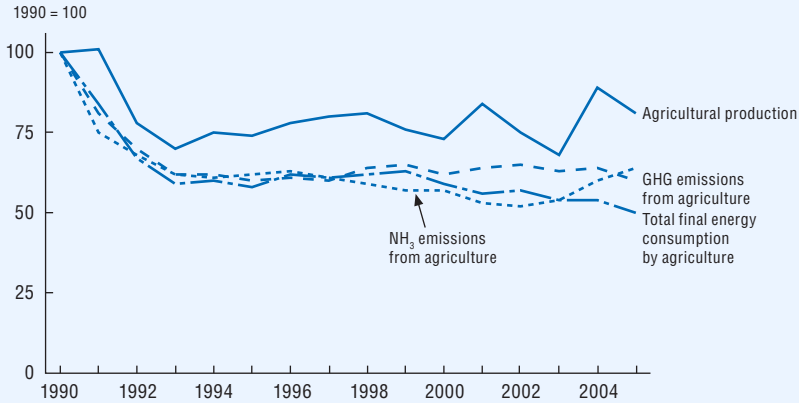
## 1. Environmental Performance<sup>1</sup>

Overall, the environmental performance of Hungarian agriculture has improved significantly following the collapse of farm support, the transition to a market economy, and a sharp decrease in the use of farm inputs. *The situation is more nuanced*, however, when looking at trends since 1998 (Figure 6.1). It is too early to evaluate progress following accession to the European Union, and further assessment by the Hungarian authorities is needed.<sup>2</sup>

### 1.1 Nitrogen

The soil surface *nitrogen balance*, as estimated by the OECD, had decreased significantly since the late 1980s and early 1990s.<sup>3</sup> It has since moderately increased, but has been less than 20 kg per hectare of agricultural land in recent years (Figure 6.1), a low figure by OECD standards and when compared with the Czech

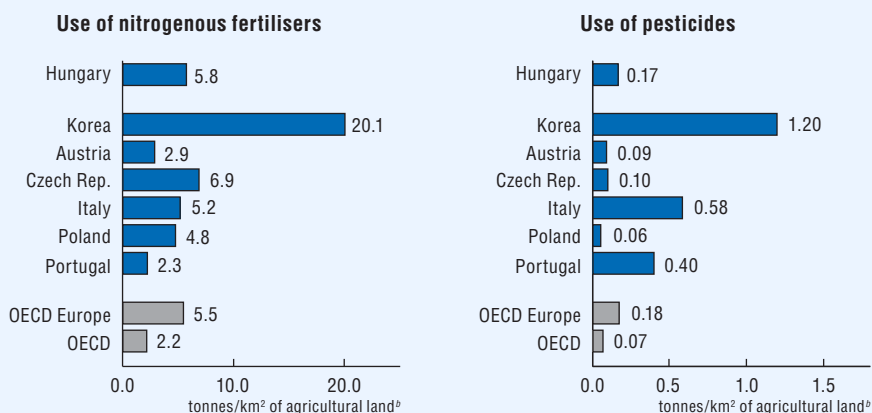
Figure 6.1 Trends in agriculture



a) The gross nitrogen (phosphorus) balance calculates the difference between the nitrogen (phosphorus) inputs entering a farming system (i.e. mainly livestock manure and fertilisers) and the nitrogen (phosphorus) outputs leaving the system (i.e. the uptake of nutrients for crop and pasture production).

Source: OECD-IEA (2007), Energy Balances of OECD Countries 2004-2005; UNFCCC; UN-ECE EMEP; FAO (2006), FAOSTAT data.

Republic, Poland and Slovakia.<sup>4</sup> The trends can be explained by the intensity of use of chemical fertilisers, which is now close to the OECD-Europe average (Figure 6.2). Livestock manure production has also decreased continuously over the last 20 years,

Figure 6.2 Agricultural inputs, 2004<sup>a</sup>

a) Or latest available year.

b) Arable and permanent crop land and permanent grassland.

Source: IFA (2007); OECD Environment Directorate.

but to a lesser extent than fertiliser use. Hungarian livestock density is now below the OECD-Europe average (Figure 6.3). Chemical fertilisers currently account for half of the nitrogen inputs and livestock manure for a quarter, with atmospheric deposition (from air pollution) and biological nitrogen fixation (by leguminous crops) making up most of the remainder.

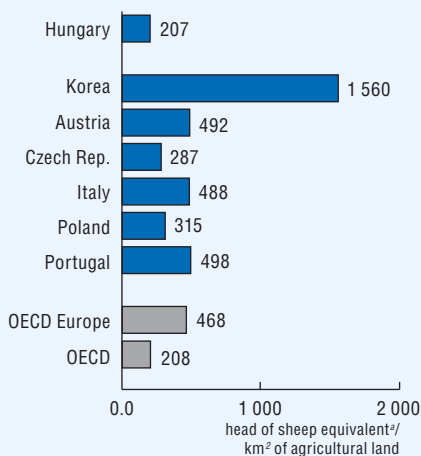
## 1.2 Phosphorus

Similarly, Hungary's soil surface *phosphorus balance* has dramatically decreased, to the extent that it has become negative (Figure 6.1).<sup>5</sup> This could lead (in the long-term) to deterioration of soil quality. The low intensity of use of phosphorus fertilisers (1.2 kg/ha of agricultural land compared to an OECD-Europe average of 1.8 kg/ha) may partly reflect the lack of farmer security over land ownership.<sup>6</sup>

## 1.3 Plant protection products

Consumption of pesticides (active ingredients) has decreased dramatically since 1990 and the transition to a market economy. All categories of plant protection products have been affected (fungicides, herbicides and insecticides). However, the

Figure 6.3 Livestock density, 2005



a) 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 cow = 6 sheep.

Source: FAO (2006), FAOSTAT data.

*declining trend in pesticide use has reversed in recent years* and Hungary's intensity of pesticide use is now close to the OECD-Europe average (Figure 6.2). Efforts to reduce the use of plant protection products should therefore continue, with targets that reflect pesticide toxicity (rather than just volume of sales). Re-approval of plant protection products should be carried out according to EU standards.

*Integrated crop management schemes* were introduced in Hungary in 2002 as part of the National Agri-Environmental Programme, based on the international principles and practices of integrated pest management (IPM) and of the International Organisation for Biological Control of Noxious Animals and Plants (IOBC). Efforts are needed to speed uptake of IPM, which still accounts for only 0.13% of total agricultural area in Hungary (OECD, 2008). *Organic farming* has increased from 8 000 hectares in 1995 (around 100 farms) to 104 000 hectares in 2002 (nearly 1 000 farms), i.e. close to 2% of the agricultural land area, above the OECD average of 1.5 % but below the EU-15 average of 3.5% (OECD, 2008). Organic animal husbandry has remained modest (83 farms in 2002) compared with organic beekeeping (nearly 200 farms in 2002). Most (90%) of Hungarian organic products are exported (mainly to the European Union and Switzerland) in unprocessed form. Hungary was the first country in the

Central and Eastern European region to introduce a labelling scheme for organic products. The scheme complies with EU requirements.

## 1.4 Water

It is not possible to accurately quantify trends in the nitrate, phosphate and pesticide pollution of surface waters and groundwater from agricultural sources, until the national monitoring system is completed (Chapter 3). However, based on preliminary surveys of *nitrate pollution*,<sup>7</sup> Hungary has delineated 47 % of its territory as Nitrate Vulnerable Zones (NVZs), pursuant to the EU Nitrates Directive (91/676/EEC). NVZs account for 4.3 million hectares, 2.8 million hectares of which is agricultural area (45% of the agricultural area in use). Hungary implements the Nitrates Directive through four Nitrate Action Plans; the first one began in 2002. The Nitrate Decree, which came into effect in 2001, sets rules of good farming practice in manure management.

Agriculture accounts for only 11% of total water abstractions (or 600 million m<sup>3</sup>). *Water use by agriculture* dramatically decreased in the first half of the 1990s (-54% in 1990-96) and has since continued to decrease but at a lower rate (-16% in 2000-04). Irrigation accounts for only 25-30% of agricultural water use, fish ponds accounting for most of the rest.

## 1.5 Soil

*Soil erosion* remains a major problem for Hungarian agriculture. Some 25% of agricultural land (2.3 million hectares) is classified as having moderate to severe water erosion risk (over 20 tonnes/ha/year of soil loss), a share that has hardly changed since 1990 (OECD, 2008). The share of agricultural land subject to moderate to severe wind erosion risk is 15%. Despite these concerns,<sup>8</sup> little effort has been made to improve agricultural soil management in Hungary. There is limited uptake of soil conservation practices, which cover only 0.1% of total agricultural area (OECD, 2008). Improving ground cover (e.g. maintenance of a winter plant cover) is not part of the good agricultural and environmental condition (GAEC) standards. It is expected that new afforestation measures will protect 13 million tonnes of fertile soils against water erosion (soil loss is currently 100 million tonnes per year) and reduce wind erosion on some 400 000 hectares in the Great Plains.

## 1.6 Biodiversity

Around 9% of the Hungarian territory is under nature protection (Chapter 4). About half of the protected areas of national importance are agricultural land,

representing over 400 thousand hectares. This includes meadows and grasslands (26%), arable land (12%), land set aside from agriculture (11%) and vineyards (1%) (Table 4.5). Unfortunately, less than 25% of Hungary's Environmentally Sensitive Areas (ESAs),<sup>9</sup> i.e. some 120 thousand hectares, have been included in the agricultural areas under nature protection (Ministry of Agriculture and Rural Development, 2006). *Nature protection on agricultural land* has thus been driven more by the lack of agricultural productivity than by the land's value for biodiversity. This situation is not going to improve. The degree of overlap of ESAs with the recently established Natura 2000 network<sup>10</sup> is around 50%.

Protection of the corncrake and the great bustard, both of which are included in Annex I of the EU Birds Directive, depends on the use of specific farming practices (e.g. mowing no more than twice a year). A drastic reduction of their populations in Hungary occurred in the mid-1970s and early 1980s, when the number of pairs dropped below 1 500 and 1 000, respectively. According to counts performed in recent years, the great bustard population is slowly recovering and is now around 1 200 specimens (Box 4.1). More generally, Hungary's *farmland bird populations* increased 10% between 2000 and 2003 (OECD, 2008).

By contrast, two key game species associated with Hungarian farmland, the grey partridge and brown hare, have seen their populations dramatically decline since the mid-1970s, partly indicating agricultural intensification (and the loss of traditionally managed pastures). There is a need to clarify the specific needs of farmland game populations and to tailor agri-environmental measures accordingly (Báldi and Faragó, 2007).

One of the key aims of *agri-environmental schemes* is to increase biodiversity on farmland. However, these schemes are often applied to small patches of land (e.g. field boundaries) and are thus more likely to increase biodiversity if larger resource patches are provided. One way of achieving this may be to run these schemes more like traditional protected area schemes, with farms or groups of farms using extensive farming methods (Whittingham, 2007).

## 1.7 Afforestation

A national long-term "*afforestation concept*", released in 1996, estimated at 778 000 hectares the quantity of agricultural land suitable for afforestation in the long term (35-50 years). Afforestation of that area would raise Hungary's forest cover to the "optimal rate" of 27%. In the period 2001-10, the government set an afforestation target of 15 000 hectares a year, approximately 80% of which was to be carried out on agricultural land, in line with objectives of the National Rural Development Plan

### Box 6.1 Air, energy, greenhouse gases and agriculture

After a rapid decrease in the years following transition to a market economy, *on-farm energy consumption continued to decrease over the review period*, though at a lower rate. Since 1998, on-farm energy consumption has been strongly decoupled from agricultural production (Figure 6.1), notwithstanding sustained reliance on farm machinery. The decrease in on-farm energy consumption (21% between 1998 and 2005) contrasted with the increase in Hungary's total final consumption of energy (11%), reflecting better performance in this sector than in the rest of the economy. Agriculture accounts for 2.8% of total final energy consumption (or 0.6 Mtoe).

However, *rebates on road fuel taxes* are granted to Hungarian farmers, involving budgetary transfers of around HUF 20 billion a year since EU accession in 2004. Such rebates have (to some extent) masked real-term increases in crude oil prices, thereby acting as disincentives to further improve energy efficiency in the sector.

The agriculture sector accounts for 98% of total *emissions of ammonia* (NH<sub>3</sub>), most of which comes from livestock production. Hungary reduced its NH<sub>3</sub> emissions from 121 000 tonnes in 1990 to 78 000 tonnes in 2005, meeting its commitments (for 2010) under the Gothenburg Protocol (Table 8.3). Most of this reduction is attributable to a continuous decline in livestock density. NH<sub>3</sub> emissions increased by 9% over the review period, the same rate as agricultural production. Critical loads can be exceeded in areas even when the emission reduction goals of the Gothenburg Protocol are reached. Care should thus be taken to comply with the critical loads specified in the protocol.

Agriculture's share of *emissions of greenhouse gases* in Hungary is currently around 13% (compared with the OECD average of 8%). Agricultural GHG emissions decreased by 51.6% between 1985-87 (the Hungarian base period under the Kyoto Protocol) and 2005 (Table 8.2), mainly due to a drastic reduction in emissions from agricultural soils (essentially nitrous oxide) and, to a lesser extent, a continuous decrease in emissions from enteric fermentation (methane) and manure management (nitrous oxide and methane). This decrease of 9.62 million tonnes of CO<sub>2</sub> equivalent (compared with 1985-87) more than fulfils Hungary's overall commitment (up to 2010) under the Kyoto Protocol (-7.22 million tonnes with land use, land use change and forestry or LULUCF). GHG emissions decreased by 5.8% over the review period (1998-2005), while agricultural production increased by 9%. Agricultural soils (nitrogen balance) remain the leading source of GHG emissions (64%), followed by livestock enteric fermentation and manure storage management (17-18% each).

With regard to *ozone-depleting substances*, after a gradual phasing out since 1991 (the base year of the Montreal Protocol) methyl bromide use has been prohibited in Hungary since 2005, pursuant to the EU regulation on substances that deplete the ozone layer (2037/2000/EC). Hungary never applied for critical use exemptions, but the use of methyl bromide for quarantine and pre-shipment (QPS) is still allowed.



(NRDP). A similar target had been set for the period 1991-2000, planning for 150 000 hectares of creation of new forests. Only 44% of the target was achieved by the end of 2000 (i.e. 66 000 hectares), due to delays in the settlement of land ownership issues as well as lack of financial resources. Between 2000 and 2007, Hungary's forest area increased by 53 000 hectares (Table 4.1), again (50%) below target.

There has however been a marked shift in the *choice of tree species planted*.<sup>11</sup> While in 1991-2000 most private owners preferred establishing forests with fast-growing species, since then the share of indigenous tree species in afforestation has significantly increased (Chapter 4). However, as for protected areas, afforestation on farmland has not been primarily driven by concerns about nature or ecosystem conservation, but has been most significant in areas with poor-quality agricultural land (Ministry of Agriculture and Rural Development, 2006).

## 2. Agricultural and Rural Development Policy

### 2.1 Key plans and programmes

#### *Prior to EU accession*

Between 1999 and 2004, Hungary was eligible for *three EU financial instruments* to help prepare for accession, along with nine other countries that joined the European Union on 1 May 2004. These were: the Instrument for Structural Policies for Pre-Accession (ISPA), the forerunner of the Cohesion Fund (focusing on transport and the environment); the Special Accession Programme for Agriculture and Rural Development (SAPARD), aiming at adjustment of the agricultural sector and rural areas; and the “Pologne, Hongrie Assistance à la reconstruction économique” (PHARE) programme, focusing on economic and social cohesion, including cross-border co-operation. The European Union was also providing assistance through loans from the European Investment Bank, technical assistance and improved administrative co-operation (twinning).

Launched in 2000 and covering the period 2000-06, SAPARD implements the Council Regulation (EC) No. 1268/1999 on Community support for pre-accession measures for agriculture and rural development in the applicant countries of Central and Eastern Europe in the pre-accession period. Environmental protection is one of SAPARD's three stated key objectives, along with increasing the competitiveness of the agricultural sector and enhancing rural development. However, only EUR 15 million was allocated to environmental protection over seven years, of which 75% was co-financed by the EU and 25% from the national budget (Ministry of

Agriculture and Rural Development, 2000). This is only 2.15% of the total budget of SAPARD and 4.27% of the EU support to SAPARD. Agri-environmental measures under SAPARD relate to organic farming (27% of the budget), pilot farms (27%), extensive grasslands (22%), orchards and vineyards (19%) and wetlands (5%). Payments are granted for practices that go beyond good agricultural practice, with a view to compensating for income foregone and extra cost incurred, while adding a 20% incentive, pursuant to Council Regulation (EC) No. 1257/1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF). Support is in the form of acreage payments, with rates varying from EUR 28/ha (extensive grasslands) to EUR 166/ha (orchards and vineyards), with organic farming being eligible for EUR 75/ha and wetlands for EUR 82/ha. Thirty pilot/demonstration farms were established in 15 ESAs across the country, entitling them to apply for a maximum of EUR 31 300 per farm. The SAPARD ceased to exist with EU accession (i.e. as of May 2004).<sup>12</sup>

The *National Agri-Environmental Programme* (NAEP) was approved in 1999 as a sub-programme of the NEP I (1997-2002), and started being implemented only in 2002. It was designed to introduce agri-environmental measures in ESAs, accounting for 500 000 hectares spread across the country. The NAEP promotes environmentally friendly practices through area-based support (agri-environment management, integrated farming, organic farming, grassland management, wetlands protection). It also supports creation of agri-environmental model farms.

Some EUR 9 million was allocated to the launching of NAEP in 2002. In 2003, the support requested by applicants was EUR 23 million, of which NAEP could only contribute EUR 4 million. In 2003 NAEP beneficiaries contracted in 2002 were given the choice of applying for the NRDP agri-environmental schemes by the end of 2003, or staying in NAEP until the end of the five-year contracting period. Most (over 90%) of eligible farmers opted to switch to the new co-financed NRDP scheme.

#### *Since EU accession*

Hungary as a whole is eligible under Objective 1 of the *EU Structural Funds*, which aims at “supporting development in the less prosperous regions”. The entire territory is also eligible for support from the *EU Cohesion Fund* (EUR 1.13 billion for 2002-04). The first EU programming period following accession was very short (three years), covering the years 2004 to 2006.<sup>13</sup> The second EU programming period is longer (seven years), covering the years 2007 to 2013.

Hungary has no stand-alone *sustainable agriculture strategy*. Agricultural policy objectives are set in the National Development Plan and are implemented through specific programmes (Table 6.1). The *National Development Plan 2004-06*

Table 6.1 **Agricultural and rural development programmes**, allocated funding, 2004-06  
(EUR million)

	2004		2005		2006	
	Total	EU (%) <sup>a</sup>	Total	EU (%) <sup>a</sup>	Total	EU (%) <sup>a</sup>
Total	620	8	1 650	19	1 622	23
Sectoral development	361		530		475	
SAPS <sup>b,c</sup>	40		597		357	
NRDP <sup>d</sup>	7	83	200	87	250	79
Market measures <sup>c</sup>	0		27		227	
ARDOP <sup>e</sup>	0		75	71	196	74
SAPARD <sup>f</sup>	59	76	120	77	35	83
National Horse Programme	109		62		30	
State aids	20		17		17	
Current expenditure and income support	0		7		17	
Compensation for the loss of animals	8		5		7	
Soil conservation	4		4		4	
Forestry activities	6		2		3	
Forest management	0		0		2	
Fisheries management	3		2		2	
National Beekeeping Programme	0		1	0	2	0
Livestock breeding	1		1		1	
Game management	0		0		0.04	
Farmers' associations	1		0		0	

a) Share of the total budget that is co-financed by EU.

b) Single Area Payment Scheme.

c) Financed directly by Treasury.

d) National Rural Development Plan.

e) Agricultural and Rural Development Operational Programme.

f) Special Accession Programme for Agriculture and Rural Development.

Source: MARD.

(NDP) sets three key objectives for Hungary's agricultural and rural development policy, namely:

- to improve the competitiveness of agricultural production and food processing;
- environmentally friendly development of agriculture, rationalisation of land use; and
- to promote the realignment (i.e. decrease disadvantages) of rural areas.

The *Agricultural and Rural Development Operational Programme* (ARDOP) primarily serves the achievement of the first and third objectives, while the second objective is included in the NRDP containing the accompanying measures financed by the EAGGF Guarantee Section. The NDP provides for EUR 1.2 billion<sup>14</sup> to be spent on a “more competitive agricultural sector”, accounting for 31% of NDP’s total budget over the three-year period (Republic of Hungary, 2003). Two-thirds of this amount (around EUR 800 million) should originate from private funding, a quarter (EUR 308 million) from EU funding and the rest (EUR 102 million) from the central budget. Thus 75% of public funding comes from the EU (essentially EAGGF). The following measures of the ARDOP will be entirely financed from the national budget: improving basic services for the rural economy and population; diversification of rural economic activities; renovation and development of villages and protection and conservation of the rural heritage.

The NRDP 2004-06 responds to the three key objectives of the NDP, with emphasis on the second. The NRDP provides for EUR 754 million<sup>15</sup> to be spent over the three-year period, of which 80% comes from the EU (Ministry of Agriculture and Rural Development, 2006). The aid consists of compensation for income forgone and costs incurred. Most (60%) of NRDP relates to agri-environmental payments (Table 6.2). The plan is applicable to the entire territory of Hungary, with identical terms and conditions except in ESAs and Less Favoured Areas.

Under NRDP, *agri-environmental payments* (AEP) are contract-based incentives for the application of environment-friendly methods for a period of at least 5 years and normally not longer than 10 years (20 years in the case of land set-aside). AEP are provided to encourage farming methods “adapted to the local environment/agricultural conditions” (entry level scheme); integrated pest management; organic farming; and low-input farming to protect biodiversity in ESAs. Support is also provided to protect the environment, maintain the countryside and preserve the tourist potential of “*Less Favoured Areas*” (880 000 hectares or 14% of the agricultural area in use), that is, land of poor productivity whose potential cannot be increased except at excessive cost and which is mainly suitable for extensive livestock farming. The NRDP helps *meet standards* related to manure storage in areas vulnerable to nitrates, animal welfare and animal hygiene. Here eligibility of payments is on a first-come, first-served basis. *Afforestation of agricultural land* aims at increasing forest cover (and the associated environmental services) and preserving the natural and landscape heritage (e.g. by establishing close-to-nature forests and developing rural tourism) while improving timber/wood energy supply (through sustainable forest management). The NRDP financed 9 000 ha in 2004, 10 000 ha in 2005 and 11 000 ha in 2006. Support is granted for the plantation and its maintenance over a period of 5 years; it also includes a premium for loss of income over a period of 10 years (coniferous) up to 20 years (broadleaved trees).

Table 6.2 **The National Rural Development Plan**, planned expenditure, 2004-06  
(EUR million)

	Total	EU contribution	
		(EUR million)	(%) <sup>a</sup>
Total budget	754	602	80
Safeguarding and improving the environment			
Agri-environmental payments	451	361	80
Meeting standards (e.g. nitrates, animal welfare)	25	20	80
Converting production to better match ecological and market conditions			
Afforestation	80	64	80
Improving economic viability of producers			
Semi-subsistence farms	3.5	2.8	80
Producer groups	28	23	80
Complements to direct payments <sup>b</sup>	94	75	80
Maintaining agriculture in all rural areas			
Payments to Less Favoured Areas	15	12	80
Other			
Technical assistance	38	30	80
Remaining pre-accession funds <sup>c</sup>	20	15	75

a) Share of the total budget that is co-financed by EU.

b) Top-up payments.

c) Council Regulation (EC) No. 1268/1999 on Community support for pre-accession measures for agriculture.

Source: MARD.

An annual lump sum of 1 000 EUR per farm (over five years) is deemed to help *semi-subsistence farms* (with arable land between 5 and 10 hectares, or with one to five cows) move towards market orientation of their production. There are 43 000 semi-subsistence farms in Hungary, accounting for 20% of individual farm enterprises. The NRDP seeks coverage of 13 000 such farms. The NRDP also supports establishment of *producer groups or associations* with a view to creating scale economies and thereby improving the efficiency and competitiveness of individual farmers. The NRDP provides for *complements to direct payments* granted under the Single Area Payment Scheme (SAPS).

Pursuant to Council Regulation 1698/2005/EC on support for rural development by the (newly created) European Agricultural Fund for Rural Development (EAFRD), Hungary has released a *National Rural Development Strategy* (NRDSP) for 2007-13, to create a framework for “developing agriculture and confirming the values and

economy of the rural areas". The six NRDP schemes (agri-environment, Less Favoured Areas, meeting standards, afforestation, semi-subsistence farms, producer groups) have been included in the new Strategy, which was dotted with a budget of EUR 5.2 billion over the seven-year period, i.e. around EUR 700 to 800 million a year (to be compared with the EUR 400 million a year of ARDOP plus NRDP in 2004-06). The NRDSP puts emphasis on improving competitiveness and promoting structural adjustment (45-55% of the budget), innovation and market orientation (30-37%), environmental protection (10-14%), rural development (5-6%) and developing local communities (3-4%) (Nagy, 2006). Planned budgetary expenditure on agri-environmental measures for the period 2007-13 was thus decreased compared to previous years (EUR 70 to 100 million a year under NRDSP compared to around EUR 150 million a year in 2005 and 2006).

## 2.2 Policy measures

Since EU accession in 2004, EU support has significantly increased<sup>16</sup> and now accounts for more than 30% of total budgetary expenditure on agriculture (Table 6.3). The main emphasis of the 2003 Common Agricultural Policy (CAP) reform is the introduction of a single payment, which does not require recipients to produce. In Hungary this translated into adoption, immediately after accession, of the *Single Area Payment Scheme* (SAPS) under which each eligible hectare receives the same payment rate, called Single Payment Scheme (SPS) payment.<sup>17</sup> SPS payment rates were set in 2004 at 25% of the EU level and are being progressively increased to reach 100% in 2013. Complementary national direct payments ("top-up payments") are paid from national funds in the form of area payments to crops and headage payments to beef and sheep, as well as payments per tonne of milk. Single payments account for around half of total payments to producers (54% in 2005, 47% in 2006), but the share of top-up payments is increasing significantly (16% in 2005, 36% in 2006). The SAPS will apply until 2010 when payments will be based on historical entitlements (at the farm or regional level), as is already the case in 15 countries.

Since EU accession, *policy emphasis has shifted from payments based on input use to payments requiring production* (including single payments and their top-up payments), though without reducing support to the former. Even though payments requiring production include SPS payments with a uniform payment rate regardless of the commodity produced, top-up payments have the potential to distort commodity production and thereby to make farmers decide based on production rather than environmental criteria (e.g. soil quality, water availability, flood-prone area, ecosystem conservation). Moreover, reliance on top-up payments to support acreage and headage payments reduces the funds available for other payments that may have less potential to distort commodity production.

Table 6.3 Actual budgetary transfers to Hungarian farmers,<sup>a</sup> 2004-06

(EUR million)

	2004		2005		2006	
	Total	EU (%) <sup>b</sup>	Total	EU (%) <sup>b</sup>	Total	EU (%) <sup>b</sup>
Payments to producers <sup>c</sup>	412	5	653	32	948	31
Payments based on input use	396	5	383	22	399	32
of which:						
Breeding improvement	10		16		40	
Soil improvement (liming)	3		1		2	
Insurance subsidies	10		0		0	
Fuel tax rebates	75		82		78	
Purchase of variable inputs	76		95		67	
Assistance to agricultural employment	17		0		3	
Investments in agricultural holdings	27	75	104	75	136	75
Setting-up of young farmers	2		1	12	4	67
Other capital grants	83		32		6	
Meeting standards (e.g. nitrates, animal welfare)	0		1	80	4	80
Vineyard restructuring	32		23		19	
Irrigation	4		3	8	0	
Drainage	0		0.3	9	0	
Natural disaster prevention and control	1		0		7	
Pest and disease control	51		16		7	12
Technical assistance	2	8	8	61	27	77
Payments requiring production	15		258	46	503	26
of which:						
Headage payments	0		3		61	
Acreage payments	1		101		279	
Disaster payments	8		5		0	
Agri-environmental payments	6		143	80	161	80
Payments to Less Favoured Areas	0		6	80	2	80
Payments based on non-commodity criteria	0		12	80	46	67
of which:						
Afforestation	0		12	80	26	80
Permanent abandonment of areas under vines	0		0		20	50
General Services	232	17	417	17	274	33
Research	19		26		14	
Agricultural schools	18		21	1	16	5
Inspection services	92		251		103	
Investments in infrastructure	34	36	3		37	65
Development of rural areas	16	73	48	77	30	74
Marketing and promotion	47	31	53	61	63	67
Miscellaneous	7		17		11	
Total	644	9	1 070	26	1 222	31

a) Excluding market price support through border protection as part of EU Common Agricultural Policy.

b) Share of the total budget that is co-financed by EU (through ARDOP and NRDOP).

c) Including Single Payment Scheme (SPS) payments and their "top-up payments" from national funds.

Source: OECD PSE database.

*More specifically*, the amount of payments based on input use has remained relatively unchanged but their share of total payments to producers has significantly decreased (from 96% in 2004 to 42% in 2006). Payments based on input use consist mainly of subsidies to variable input use (including fuel tax rebates) and to fixed capital formation. The amount of payments requiring production has dramatically increased, both in absolute terms and relative to total payments (rising from 4% in 2004 to 53% in 2006). They consist mainly of acreage payments and, to a lesser extent, agri-environmental payments. Conversion of farmland to forest land (afforestation) is receiving increasing attention, though it remains marginal in budget (3% of total payments in 2006) and limited in scope (areas are selected because of poor agricultural productivity, with the principal aim of controlling soil erosion). In 2006, most budgetary transfers to Hungarian farmers related to acreage payments (23%), agri-environmental payments (13%) and investments in agricultural holdings (11%) (Table 6.3).

Payments based on non-commodity criteria (not requiring production) have remained marginal. The situation should change from 2010 with the expected shift from single payments (and their top-up payments) to *payments based on historical entitlements* (in the context of the CAP reform). Payments based on historical entitlements are independent of production and, as such, they are clearly less distorting (in terms of commodity production) than acreage and headage payments. As income support payments, they are paid annually, based on the sums received during a reference period and the number of hectares which conferred entitlement to those payments. Farmers are free to decide what they want to produce.

From 2009 all direct payments in Hungary will be subject to farmers meeting statutory management requirements set-up in accordance with 19 EU directives and regulations relating to environmental protection, animal and plant health, and animal welfare (*cross compliance*). Hungarian farmers are so far only committed to maintain their land in good agricultural and environmental condition (GAEC), according to national standards. However, cross compliance cannot be expected to achieve as much, in terms of its two policy objectives (farm income support and environmental outcomes), as could be achieved by two policies targeted at each of the objectives separately (OECD, 2007b). First, gradual reductions in direct payment support over time, as part of policy reform,<sup>18</sup> with constant or increasing compliance costs will lead to a point where farmers begin to exit the cross compliance system. Second, the environmental objective is not necessarily being served at no cost to the income support objective unless the environmental conditions are very modest. Third, compliance costs (determined by site-specific agri-ecological considerations) reduce the net income benefit of income support in an uneven way, thereby raising equity issues.



Further to payments to individual producers, policy support is provided to *general services provided to agriculture as a sector*. In 2006 most support went to inspection (40%); marketing and promotion (23%), including through the grouping of producers; infrastructure development (13%); and development of rural areas (11%), including helping semi-subsistence farms and the EU LEADER programme. Some support was also provided to research and training. All in all, budgetary expenditure on general services has not increased substantially since accession, despite the increasing availability of EU funds, thereby missing the opportunity to better help the farming sector build capacity in environmental management, regardless of impacts on farm production.

Overall, Hungary was able to *spend less than 60% of the EU funds for agriculture for which it was eligible* during the period 2004-06, i.e. EUR 522 million out of EUR 910 million (EUR 602 million from NRDP plus EUR 308 million from ARDOP).<sup>19</sup> This mainly reflects fiscal austerity and difficulties in co-financing from the national budget.

## Notes

1. The performance with regard to air, energy and climate is presented in Box 6.1.
2. Prior to accession, Hungarian academics feared that intensification of agricultural production resulting from increased EU support would lead to increased pressures on the Hungarian environment.
3. Fertiliser subsidies were removed in 1990.
4. In 2002-04 the OECD average was 77 kg/ha of agricultural land; the average was 70 kg/ha for the Czech Republic, 48 kg/ha for Poland and 46 kg/ha for Slovakia (OECD, 2008).
5. Hungary is the only OECD country with a negative phosphorus balance.
6. Phosphorus fertilisers have no immediate effect on yields, as have nitrogenous fertilisers.
7. The nitrate pollution of groundwater is primarily associated with poor manure storage by large-scale livestock farms.
8. Soil erosion decreases agricultural productivity and harms aquatic environments.
9. Also called “High Nature Value Areas” or “Nature Sensitive Areas”.
10. Hungary’s Natura 2000 network, which was recently added to the EU’s Natura 2000 list, represents 1 968 000 ha or 21% of the Hungarian territory (Chapter 4).
11. The National Afforestation Programme, launched in 1997, recommends the planting of “indigenous close-to-nature forests”.
12. However, SAPARD funds were still used in 2005 and 2006 to finance projects established before that date.
13. The EU’s Single Programming Document (SPD) contains the strategy and priorities for action under Objective 1 of the Structural Funds for the period.
14. In euros at 1999 prices.
15. Converted using exchange rates.
16. As part of EU’s Common Agricultural Policy, Hungary has fully implemented border protection since 2004 while the EU direct aid is being phased in gradually (OECD, 2007a).
17. The SPS is sometimes referred to as the Single Farm Payment.
18. As part of the 2003 CAP reform, all direct payments (EU-wide), coupled or not, are to be reduced by 3 % in 2005, 4 % in 2006 and 5 % from 2007 onwards, except direct payments under EUR 5 000 per farm.
19. Excluding EUR 4 million under the Financial Instrument for Fisheries Guidance (FIFG).

## Selected Sources

The government documents, OECD documents and other documents used as sources for this chapter included the following. Also see list of Web sites at the end of this report.

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# 7

## ENVIRONMENTAL-SOCIAL INTERFACE\*

### Features

- Environmental health: state, objectives, actions
- Environmental democracy
- Environmental awareness and education
- Ombudsman for future generations

\* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 2000. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy.

### Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Hungary:

- set higher priority on *poverty and income distribution* issues, including child poverty, in environmental management;
- pursue efforts towards meeting NEHAP II objectives and quantitative targets for *public health and the environment*;
- promote *active employment policies* in eco-industries and environmental services, and the role of the not-for-profit sector in environmental employment, especially in environmentally sensitive areas;
- further promote *citizen participation* in environmental decision-making and access to justice concerning environmental issues;
- continue to develop, use and disseminate *environmental indicators*, and promote access to environmental information;
- pursue *environmental education* efforts; further develop the *environmental training* of elected officials, civil servants and teachers, and establish training for justice officials; develop closer and more sustained relations with local authorities, business and NGOs, as well as with the media, with a view to *raising environmental awareness*.

### Conclusions

Hungary adopted its second National *Environmental Health Action Programme* (NEHAP-II 2004-10) during the review period as well as a Children's Environmental Health Action Plan (CEHAP). The latter followed Europe's Fourth Ministerial Conference on Environment and Health (Budapest, 2004). Hungary has several positive indicators of environmental health: dioxin levels in human breast milk are among the lowest in Europe and mortality from respiratory diseases is lower than the EU-15 average. A national climate and health strategy, recently adopted, widens the scope of environmental health issues addressed in government policy. Hungary has also taken steps to promote *environmental democracy*, by developing a system to provide environmental information to the public, offering environmental education, and developing closer ties to local authorities, companies, NGOs and the media, with a view to raising environmental awareness. An innovative ombudsman's position has been established concerning future generations. A 2004 Supreme Court Decision (the so-called "Uniform Decision") has opened wider possibilities for non-governmental organisations to appeal decisions on a range of topics including the construction

permit procedure. Despite limited resources, *environmental education* has progressed. For example, 272 elementary schools now participate in an eco-school network.

Important problems remain, however, aggravated by the *increase in both poverty and income disparities* that occurred over the review period. The life expectancy remains among the lowest in OECD countries. Rates of mortality from diseases of the circulatory system and malignancies are among the highest in the OECD. Greater attention needs to be given to the *health effects* of air pollution (fine particulate matter) and prevention of health problems related to drinking water quality. Although 93% of the population is supplied with drinking water from central distribution systems, the water does not always meet health standards. Exposure to *asbestos* is still a problem: so far 20% of the asbestos in monitored residential buildings has been removed. Certain trends in environmental democracy have also been unfavourable. Less than 10% of the municipalities have prepared a *Local Agenda 21*. Although steps were taken to facilitate public participation in environmental decision-making and appeal, the system is still not well understood or effectively used by civil society.



## 1. Environmental Health

Hungary gives high priority to environmental health and has set out objectives in its successive National Environmental Programmes (NEPs) and *National Environmental Health Action Programmes (NEHAPs)*. Hungary also has a Children's Environmental Health Action Plan (CEHAP), adopted following Europe's Fourth Ministerial Conference on Environment and Health in 2004. Scientific, technical and administrative support is provided in part by Hungary's National Institute for Environmental Health (NIEH), created in 1998 as a government service and made independent in January 2007.

*NEP-I*, covering 1997-2002, set 120 targets, primarily for reducing emissions of "traditional" air and water pollutants, but did not define the country's environmental health problems or set priorities. Because the objectives are long term, it is difficult to monitor progress and evaluate achievement, but the experience of EU member states suggests the objectives could eventually be achieved. Hungary's progress has been facilitated by EU pre-accession funds for environmental protection (e.g. PHARE, ISPA, SAPARD, LIFE), which increased during the NEP-I years. Since EU accession, Hungary has had access to other EU resources such as the Cohesion and Structural Funds.

*NEP-II*, covering 2003-08, sets several quantitative targets related to health which are supplemented by *NEHAP-II*, covering 2004-10 (*NEHAP-II* was published as a chapter in Hungary's principal public health policy document, National Programme – Decade of Health 2003-2010) (Table 7.1). *NEHAP-II* sets out four main policy directions: i) integrate the environmental and health information systems; ii) investigate and reduce the incidence of disease linked to environmental exposures; iii) reduce exposure to pollution; and iv) raise general awareness about environmental health by providing information, education and training (Table 7.2).

The *state of health* of the Hungarian population shows contrasted performance. Life expectancy at birth is six years below the EU average (Figure 7.1). Mortality rates due to malignant diseases of the lung and trachea and diseases of the circulatory system, Hungary's two leading causes of death, are the highest in Europe. Heat waves associated with climate change have had significant health impacts (Box 7.1). By contrast, the rate of mortality due to respiratory diseases is lower than the EU-15 average, and dioxin levels in human milk are among the lowest in Europe. Mortality due to respiratory diseases potentially linked to air pollution (bronchitis, emphysema and asthma) declined slightly between 1996 and 2000, and then rose. Allergic rhinitis has increased tenfold in the past 12 years, although the trend slowed in the early 2000s and then levelled off in 2003-06.

### Box 7.1 Health impacts of climate change

The growing incidence of heat waves caused by global warming is presenting a new challenge in Hungary. The results of a 31-year time series *analysis of mortality and meteorological data* (Paldy et al., 2006) suggest that a 5°C increase in the mean daily temperature significantly increases the risk of daily mortality, with:

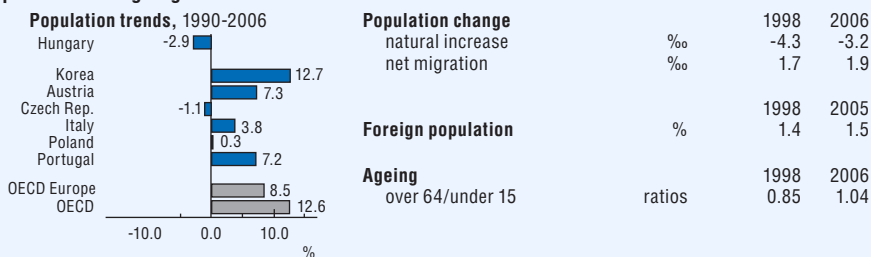
- a 10% increase in all causes of mortality;
- a 12% increase in mortality due to diseases of circulation; and
- a 15% increase in emergency ambulance calls due to general complaints and heart problems.

Hungary experienced many *heat waves* between 2001 and 2006, during which there were more than 377 premature deaths compared to mortality rates on cooler days.

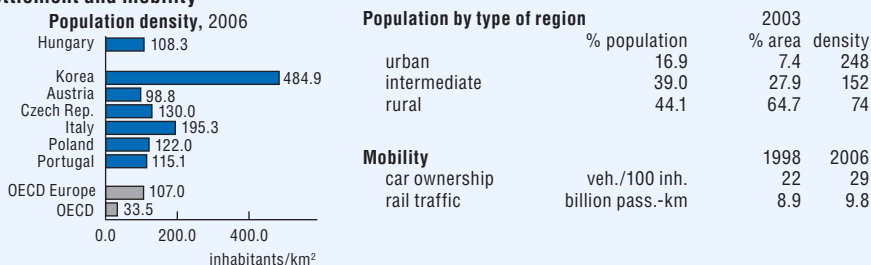
Hungary initiated a “heat and health” public outreach effort in 2004, distributing leaflets and providing information through the media about the *health effects of heat*. Information is also provided to the health care system to help them prepare. In 2007 a national climate and health study was carried out within the context of the preparation of the National Climate Change Strategy.

Figure 7.1 Social indicators

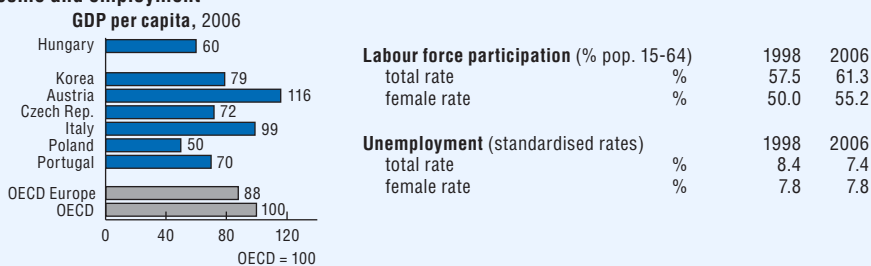
**Population and ageing**



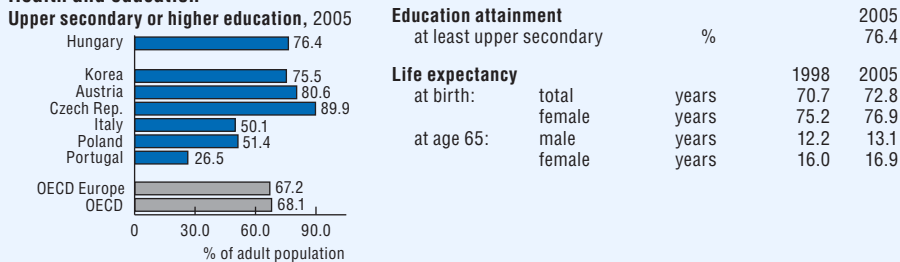
**Settlement and mobility**



**Income and employment**



**Health and education**



Source: OECD, Environment Directorate.



Table 7.1 Health-related objectives of the NEP II

Objective	Indicator	Reference status (1999/2000)	Target (2008, or indicated when different)
Reducing chemical risk	Reduced application of toxic, bio-accumulating and water polluting chemical substances and pesticides	100%	Reducing current application by 20%
	Reduced emissions of persistent organic pollutants (POPs)	100%	Reducing current application by 20%
Preserving good health	Reduced incidence of hay fever/pollenosis and asthmatic illnesses (number of new patients per year/total number of patients with the above illnesses)	10%	5%
	Reduced frequency of occurrence of goitre related to iodine supply	Changing county by county 4-10%	Max. 5%
	Reduced number of illnesses with Methemo-globin	10 cases	Should not occur
Increasing food safety	Size of qualified area cultivated by organic farming	85 000 ha	300 000 ha
Dissemination of environmentally friendly life style and consumption habits	Proportion of municipal waste collected separately compared to the total volume of collected waste	3%	35-40%
	Proportion of waste reuse, recovery and recycling compared to the total volume of collected waste	30%	50%
Improving urban environmental quality	Number of certification conditions for environmentally friendly products (product groups)	34	50
	Size of public green areas per city/town inhabitant	38.7 m <sup>2</sup> /person	45 m <sup>2</sup> /person
	Number of individuals affected by noise load exceeding 75dB(A) during daytime	20 000 people	No one should be affected by load exceeding 65dB(A)

Table 7.1 **Health-related objectives of the NEP II** (*cont.*)

Objective	Indicator	Reference status (1999/2000)	Target (2008, or indicated when different)
	Number of individuals affected by noise	1.7 million people	(0 person) 1.4 million people
	Proportion of inhabitants supplied with water that is not in compliance with the drinking water quality limit values	27.4%	0% (2009)
	Proportion of municipal waste water treated at the appropriate rate		
	– on sensitive areas (4.1% of the total waste water generated by settlements having a collection system)	68%	100%
	– on non-sensitive areas (95.6% of the total waste water generated by settlements having a collection system)	46%	90% (2015)
	Collection of waste water at settlements or parts of settlements not having a collection system	12%	100% (2015)

Source: MEW.

Table 7.2 National Environmental Health Action Programme – NEHAP II (2004-10)

Goal	Tasks and actions	Related programme
Integrate environmental and health information system		
Encourage better sharing of data and information on the environment and health	Develop the environmental health information system Develop the environmental health Geography Information System (GIS) Establish a connection to the international environmental health information and reporting systems Monitor the POP compounds (e.g. dioxin), metals and endocrine disruptors in human biological samples	EU EHAP <sup>a</sup> WHO/Euro project NEPP-II <sup>b</sup> EU EHAP, PHP <sup>c</sup>
Investigate and reduce diseases caused by exposure to pollution		
Environmental health research	Carry out bio-monitoring of environmental genotoxic exposure (environmental tobacco smoke, contamination containing PAHs), by DNA adduct examination	PHP <sup>c</sup>
Reduce environmentally-related burden of disease; Prevent and reduce respiratory diseases in children, with special emphasis on asthma	Survey respiratory diseases in young children (aged 0 to 14) in areas of industrial air pollution	HUN CEHAP <sup>d</sup>
Decrease the burden of neurological diseases caused by malformation	Reduce the inequities by molecular genetic screening	HUN CEHAP <sup>d</sup>
Decrease exposure		
Reduce exposure to outdoor and indoor air pollution	Evaluate the human effects of air polluting chemicals and dust contamination Analyse, evaluate and reduce the harmful effects of buildings on the human organism, including examination of the impacts of indoor air quality and heating methods, as well as introduction of the health and environmental qualification of building materials Determine the indoor air quality and environmental air-contamination status of different public institutions (health, educational, sport, cultural) and other establishments with large numbers of people	EU EHAP, <sup>a</sup> HUN CEHAP <sup>d</sup>
Protect against and decrease occurrence of water-borne diseases and adverse health impacts	Establish and run the national drinking water safety programme and surveillance system	HUN CEHAP <sup>d</sup>

Table 7.2 **National Environmental Health Action Programme – NEHAP II (2004-10)** (*cont.*)

Goal	Tasks and actions	Related programme
Decrease soil contamination and increase the safety of waste management	Establish healthy and safe playgrounds	PHP <sup>c</sup>
Reduce the risks of exposure to chemicals	Determine the role of different types of environmental exposure on pregnancy outcome	PHP <sup>c</sup>
Raise public awareness and provide risk information, education and training		
Raise awareness, provide risk and other information	Shape the approaches	NEPP-II, <sup>b</sup> HUN CEHAP <sup>d</sup>
Prevent children's accidents and injuries		
Provide environmental health education, training and continuing education		EU EHAP <sup>a</sup>

a) EU EHAP, European Environment and Health Action Plan for 2004-2010.

b) NEPP-II, National Environment Protection Programme (NEPP-II) for 2004-2008.

c) PHP, The environmental health sub-programme of the public health programmes.

d) HUN CEHAP, Hungarian National Children, Health, Environment Action Plan.

Source: MEW.

### *Ambient air pollution*

Ambient air quality generally improved during the review period. The population weighted average of PM<sub>10</sub> concentration in Hungary was 32.6 µg/m<sup>3</sup> in 2004. A 2004 government study, which looked at the *long- and short-term impacts of exposure to PM<sub>10</sub>* throughout Hungary, concluded that the long-term effects contributed to 170 deaths out of 100 000. Another study<sup>1</sup> concluded that reducing PM<sub>10</sub> levels from the current yearly mean of 29.9 µg/m<sup>3</sup> to 20 µg/m<sup>3</sup> (the limit value set in EU Directive 1999/30/EC) would prevent six post-neonatal deaths and one respiratory death per year in Budapest.

*Ragweed pollen* potentially affects Hungarians who suffer from respiratory diseases or allergies, most of whom are sensitised to ragweed.<sup>2</sup> The country's ragweed cover decreased between 2004 and 2005 and airborne pollen levels generally dropped between 2000 and 2005; but the ragweed cover and airborne pollen levels both increased again in 2006. That year, the suggested limit value of 30 pollen grains/m<sup>3</sup> was exceeded on more than 40 days in several areas, and the number of days with pollen counts above 100 pollen grains/m<sup>3</sup> was high (the maximum was 27 days in Zalaegerszeg, in Western Hungary). Law XXXV, adopted in 2000 and modified in 2005, aims to reduce ragweed pollen levels by requiring landowners to prevent the blossoming of ragweed until the 30th of June, and prescribing fines if they fail to do so. Country-wide ragweed eradication campaigns are also in place.

### *Drinking water quality*

*Little progress was made in improving drinking water quality* over the review period. More than 900 settlements with 2.5 million people (spread across the country) are still supplied with drinking water of unsatisfactory quality from a health perspective (Chapter 3).

*Arsenic of natural origin* is present in the waters in a significant part of the country although an assessment done under CEHAP showed that fewer than 5% of Hungarian children live in the predominantly small settlements where piped drinking water contains arsenic above the national limit value of 10 µg/l.<sup>3</sup> In the first phase of the National Drinking Water Quality Improvement Programme, covering the period 2002-05, the limit value was to be achieved at six settlements supplied with drinking water with an arsenic content above 50 µg/l, and at 64 settlements whose water had an arsenic content between 30 and 35 µg/l. Implementation has been delayed (Chapter 3). In the second phase, covering 2006-09, another 345 settlements, where the arsenic content of the drinking water is between 10 and 30 µg/l, are to be included in the programme.

*Iodine deficiency* is more widespread, with large variations of iodine supply across the country. Approximately 80% of the population lives in areas where the drinking water has low iodine levels, and surveys carried out in 1994-99 found that goitre frequency among school children was about 20%. Use of iodized salt is voluntary, except in the areas surrounding the nuclear power station (Paks), where the supply of iodized salt is compulsory. Effective measures and repeated monitoring will be necessary to comply with World Health Organisation goals (in “Health for All for 2000”) to reduce the rate of goitre to no more than 5% country-wide.

Another problem is *bacterial contamination*.<sup>4</sup> Although 92.8% of the population is supplied with drinking water from central distribution systems, bacteria levels sometimes exceed the legal limits. In the last several years, however, cases of microbiological contamination have steadily dropped. The number of outbreaks of water-borne disease infections is low, affecting up to 200 persons. Food-borne infections have been more common, except during 2006 which saw an outbreak in Miskolc with 3 673 reported cases of which 161 were admitted to hospital with gastroenteritis (Campylobacterium species were isolated).<sup>5</sup> The number of bathing water samples with microbiological contamination above the limits generally declined, and in 2005 the rate was as low as 4.5%. The ratio of non-compliance reflects the pollution of bathing waters visited by a high number of people during the bathing season.

## 2. Environmental Democracy

Hungary signed the *Aarhus Convention* on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters in 1998, and ratified it in 2001.

### *Access to information*

Hungarian law has supported the public’s right of access to environmental information, public or private, since 1992.<sup>6</sup> Anyone can request access without having to state a reason. The 1995 Environment Act defines environmental information as “public information”. An important aspect of Hungary’s procedure for handling information requests (and possible refusals and resulting court reviews) is that it is overseen by an *independent data protection ombudsman*. Over the years, the ombudsman’s recommendations have contributed to the steady improvement of access to information in Hungary, including environmental information. In addition, in 2005 a government decree (No. 311/2005) further enhanced access to environmental information, pursuant to EU Directive 2003/4/EC. Importantly, the public has access to information on *risks associated with industrial activities*

involving hazardous substances (for facilities classified as upper-tier hazardous), including access to external emergency plans (protection measures for residents).<sup>7</sup>

Hungary has a wide range of *environmental data collection* and processing schemes, and a project is underway to combine them into one integrated system. A government decree defining the terms of use of such a system is under preparation. The development of environmental statistics, which began in 1986, has been accelerating since the mid-1990s when Hungary began publishing the Environmental Statistical Yearbook of Hungary, covering a growing number of substances (Hungarian Central Statistical Office, 2006).

Hungary has also developed and used *environmental indicators*, especially since joining the OECD. It now publishes several reports with environmental indicators; these include: i) Environmental Indicators of Hungary by the Ministry of Environment and Water (MEW), a comprehensive report following the OECD pressure-state-response model, published for the first time in 2000; ii) Main Environmental Indicators of Hungary, an annual booklet containing sectoral, socio-economic and regional indicators and international data; iii) Key Environmental Indicators of Hungary; iv) Environmental Pressure Indicators of Hungary; v) Environmental Headline Indicators of Hungary; and vi) Sectoral Environmental Indicators of Hungary.

A number of initiatives have been taken to *bring environmental information closer to citizens*. First, environmental information and statistics have also been posted on the *Internet*, including data and information related to particular programmes (e.g. PRTR, EMAS, waste management, ecolabelling, the air quality monitoring network, and the Lake Balaton and Tisza Basin information systems). Secondly, a *network of Green-Point Offices* covers the entire country (Box 7.2). Thirdly, a computerised and Internet accessible information system permits any citizen to identify environmental information associated with sites located close to a specific location (e.g. home or employment location).

### *Participation in decision-making*

The main channel for public participation in decision-making is through the *Environmental Impact Assessment (EIA)* procedure, which follows Government Decree No. 314/2005. Commencement of the EIA procedure must be announced in public notices and newspaper advertisements by the clerk of the municipalities concerned; 30 days must be allowed for public review and comment; and a public hearing, also announced in notices and newspapers, must be held by the environmental authority (e.g. the regional environmental, nature conservation and water inspectorate). Public comments must be taken into consideration in the

### Box 7.2 National Network of Green-Point Offices

In 2004, 42 “Green-Point” Offices operated under the auspices of the MEW and its subsidiary bodies, to provide both *environmental information* and *environmental administrative services* to the public. From 1 March 2005, these offices were integrated into a single non-profit organisation called the National Network of Green-Point Offices.

This network covers the *entire country*, providing information on environmental and nature protection and water management in a uniform format and content. The information is made available to all citizens through a user-friendly access method.

The responsibilities of the National Network of Green-Point Offices include: to receive and solve *public complaints* and reports without delay and, if official action is required, to forward the problem to the relevant authorities; to establish and implement conditions of *simplified administration*; to provide *information* about environmental data and to collect and manage the data and make them available; to ensure *access to relevant laws*; to organise *public events* related to “green days” that are in the public interest and are suitable for disseminating information; and to participate actively at these events.

environmental authority’s decision, and minutes of hearings must be taken and distributed. Decisions ending the different phases of the procedure must be publicised and made available for inspection by the authorities and municipalities concerned.

A second Government Decree issued in 2005 (No. 2/2005) provides for public participation in the environmental assessment of plans and programmes in line with the EU *Strategic Environmental Assessment (SEA)* Directive. The decree requires that the public be given early information on plans and programmes subject to strategic environmental assessment and the opportunity to comment in writing; and it requires authorities to take public comments into account and to publicise final plans and programmes.

Hungary has recently created (by unanimous vote of its Parliament) a position of Ombudsman for future generations with a capacity to intervene in judicial procedures (Box 7.3). The Ombudsman was elected in spring 2008.

#### *Environmental justice*

Hungarian law provides for *public access to justice* in the case of refusal of environmental information as well as environmental decision-making. Act CXL of



### Box 7.3 The Ombudsman for future generations

The *ombudsmen's role* is to guarantee fair and equitable treatment of citizens under the law, acting on behalf of those whose rights are violated. In Hungary, three such ombudsmen were created in the early 1990s: the general Ombudsman (acting as a commissioner for human rights), the Ombudsman for the protection of the national and ethnic minority rights, and the Ombudsman for data protection and freedom of information.

Given that *future generations cannot vote* or take part in today's elections and decision-making processes, although they are directly affected by the consequences of today's activity, the Hungarian Parliament unanimously decided in November 2007 to establish a new ombudsman whose aim shall be to *protect the rights of future generations*. This green ombudsman will have to implement fairness amongst generations, preventing people not yet born from harmful economic, social and environmental impacts of current policies. The green ombudsman will be entitled to suspend environmental permits and operating licenses, as well as to intervene in ongoing judicial procedures.

Similar initiatives in other OECD countries (e.g. Canada, Finland, France, Germany, Poland, Switzerland, United Kingdom) have shown that ombudsmen cannot fully accomplish their missions without legislative and executive powers. The Hungarian green ombudsman is a step forward, as it entails *extended jurisdiction*.

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Source: Javor (2006), Balla (2007).

2004 on the General Rules of Administrative Procedures and Services allows any person who can demonstrate connection to and harm from decisions affecting the environment (*locus standi*) to appeal to the second instance administrative authority. If no such second instance authority exists (which applies to a limited number of cases) the law provides for recourse to direct judicial review. Any person who has appealed the first instance administrative decision has a right to a maximum three-stage judicial review. The scope of review is limited to the legality of the administrative decision.

Given the inherent conflict between large-scale infrastructure projects and environmental protection, Hungary's courts have dealt with public participation issues extensively. An important milestone in the development of the national jurisprudence was the so-called *Uniformity Decision No. 1/2004 of the Hungarian Supreme Court*, which provides that environmental NGOs may appeal the decisions made (e.g. permits granted) by any authority which has sought expert advice from the

environmental authorities (such consultation is required by law). Such uniformity decisions are issued in the form of normative texts (rather than precedent cases) and are binding on all courts in the Hungarian judicial system.

The Hungarian Constitution states that citizens have the *right to a healthy environment* but does not specify what this means. The Constitutional Court has interpreted the right on several occasions but in doing so has not addressed the right to certain public services, such as the provision of drinking water. To date, low-income households who fail to pay their water bills have not been disconnected from public water supply, but neither have populations affected by pollution been granted financial compensation. Perhaps the latter will change in the future, as Hungary is now developing an environmental liability regime following the EU liability directive.

Hungarian law does not expressly provide for the *right to water and sanitation*. However, Hungarian regulations specify that national water management must be implemented in such a way that social needs are met (Law LVII/1995). Additionally, the law stipulates that the government must draw up a “national environmental plan” with separate programmes to improve drinking water quality and to expand sewerage networks and sewage treatment. These programmes are specified in government decrees and contain specific timelines, whose implementation is supervised by the MEW through a system of indicators.

An important aspect of the right to water and sanitation in Hungary is the *contractual relationship between households and the water company*. The exact content of the contracts, including the rights and responsibilities of both sides, is specified by the 38/1995 Government Decree and the Law on Consumer Protection. The arrangement obliges consumers (including households) to pay their water bills in accordance with their consumption. Compliance with the contracts is monitored by the Inspectorate of Consumer Protection, which has conducted several general enquiries on the service providers’ practices based on consumer complaints. The State Auditor examines the operation of the service companies and owner municipalities from a financial perspective, considering how they set fees, what the fees include, the financial structure of the companies’ investments, and so forth.

### *Environmental NGOs*

The *number of environmental NGOs* in Hungary has approximately doubled since the early 1990s, rising to more than 1 200. Between 1991 and 2000, an average of 84 groups was created annually. Some 40% of Hungary’s NGOs operate as a private or public foundation, and the remaining 60% operate as non-profit entities.

While two-thirds of the former are located in Budapest, more than 80% of the latter were located in towns and villages.

Environmental NGOs receive *preferential treatment under the Hungarian EIA regime*, which gives them the right: to register with the environmental authorities for automatic inclusion in environmental licensing procedures; to challenge the environmental authorities' decisions at all phases of licensing; and to appeal in court in all environmental licensing procedures.<sup>8</sup> Similar rights are also granted NGOs under the "uniform environmental permitting" (IPPC) procedure even when it is not preceded by an EIA.

The MEW has for several years funded programmes for environmental and nature conservation organisations, and in 2002 it invited applications for assistance in implementing the Aarhus Convention. This "civil appropriation" for non-profit green organisations increased steadily over the years, from HUF 25 million in 1995 to HUF 175 million in 1997 and HUF 600 million in 2004. In 2005, due to changes to the Central Budget's chapter numbers, only HUF 300 million was earmarked for NGOs, but further funds were provided as a result of the establishment of the National Civil Fund, which had been created in 2003 specifically to provide *governmental support to registered NGOs*. In 2004, HUF 6 108 million was available, and individual NGOs were able to apply for up to HUF 18 million. A similar amount was available in 2005.

Another important source of funding for environmental NGOs is *tax redistribution*. Taxpayers have the possibility of diverting 1% of their personal income tax to a particular NGO. NGOs have appealed widely to citizens for such support and have succeeded in gathering substantial sums of money.

### 3. Environmental Education and Awareness

In 1999 the Ministry for Environment (now MEW) and the Ministry of Education together established the Environmental Education and Communication Programme Office (EECPO). The office worked until its termination in 2005 to fulfil its mission to increase citizens' "knowledge, awareness and responsibility for their environment with a view to promoting proactive interest in environmental sustainability". EECPO also worked to accelerate the flow of information between institutions and organisations who are working in the field. It led to creation of the (still existing) *Environmental Educational and Communication Database*, which contains the data, publications and programmes of organisations that carry out environmental education activities.

### *Forest School Programme*

A national six-year programme to support *field environmental education*, initiated by the Ministry of Education, the MEW, the Ministry for Children, Youth and Sports, and the Hungarian Prime Minister's Office, included a "Forest School Programme 2003-06", but the programme was suspended in 2005 due to lack of funds. The long-term objective is to ensure that every child has an opportunity to attend forest school at least once during their primary school years.

## 4. Environment and Employment

The issue of environmental and employment policy forms part of Hungary's National Sustainable Development Strategy. A recent survey conducted by the Hungarian Central Statistical Office shows a *growing number of employees in the environmental industry*: between 2002 and 2005, the total number grew by approximately 16% (Table 7.3).

*Green public procurement* is at an early stage of development in Hungary. To promote it, an inter-ministerial working group has been set up to establish an action

**Table 7.3 Number of employees in environmental protection**

	2002	2003	2004	2005
Agriculture, hunting and forestry	64	50	53	48
Manufacturing	2 247	2 052	2 480	2 263
Electricity, gas and water supply	4 379	4 557	4 657	4 525
Construction	670	689	520	571
Wholesale and retail trade <sup>a</sup>	576	594	598	646
Transport, storage and communication	98	135	104	81
Real estate, renting and business activities	605	609	634	657
Public administration, defence; social security	149	251	556	407
Education	17	8	128	342
Other community, social and personal services	7 526	6 721	8 105	8 494
Other	28	97	222	916
<b>Total</b>	<b>16 359</b>	<b>15 763</b>	<b>18 056</b>	<b>18 950</b>

a) Includes repair of motor vehicles, motorcycles and personal and household goods.

Source: Hungarian Central Statistical Office.

plan in line with the EC recommendations. The plan will determine targets and deadlines for five product groups and services: IT and office equipment, stationary, cleaning services, construction and vehicles. In July 2006 the General Assembly of Budapest approved a “green public procurement regulation”, the first local authority green procurement regulation in Hungary. It is based on the Green Procurement Manual for Local Authorities 2002 by the Centre for Environmental Studies, an environmental NGO. The Procurement Department of Budapest Municipality expects at least 40% of the calls for tender – the share recommended by the EU – to include environmental criteria. To achieve this, environmental aspects must as a rule be incorporated in all procurement deals, except for cases when the urgency of the project or the excessive (more than 20% higher) price of environmentally friendly alternatives make it impossible. In all other cases, a waiver must be obtained from the Environmental Department.

## Notes

1. The study was carried out in the context of the EU APHEIS (Air Pollution and Health: A European Information System) Programme.
2. Ragweed pollution is an emerging problem in several European countries. Information from monitoring stations indicates that the ragweed pollen load has been expanding in both *Southern and Northern* Europe.
3. Specified in Government Decree No. 21/2001 (X.25.)
4. The most important pathogens in Hungary include: *E. coli*, *Salmonella*, *Shigella*, *Campylobacter*; viruses such as *Norovirus*, *Enteroviruses*, *Rotavirus* and *Adenovirus*; protozoons such as *Giardiasis* and *Cryptosporidiosis*.
5. The number of food-borne outbreaks by year is: in 2001, 674; in 2002, 674; in 2003, 164; in 2004, 183. The affected population: in 2001, 4 628; in 2002, 2 959; in 2003, 2 838; in 2004, 2 281.
6. Act LXIII of 1992 on the Protection of Personal Data and the Disclosure of Information of Public Interest.
7. Act LXXIV of 1999 on the Management and Organisation of Disaster Protection and the Prevention of Major Accidents Involving Dangerous Substances.
8. In this case the authority sends notices to NGOs about the main documents and steps of the proceedings.

## Selected Sources

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Part III  
**INTERNATIONAL COMMITMENTS**





# 8

## INTERNATIONAL CO-OPERATION\*

### Features

- Accession to the EU
- GHG emissions reduction
- Transboundary watercourses
- Trade and environment
- Official development assistance

\* The present chapter reviews progress in the last ten years, and particularly since the previous OECD Environmental Performance Review of 2000. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy. It takes into account the latest Economic Surveys of Hungary.

## Recommendations

The following recommendations are part of the overall conclusions and recommendations of the environmental performance review of Hungary:

- identify priority measures for mitigation of and adaptation to *climate change* based on an analysis of their cost effectiveness; ensure the co-ordinated implementation of the National Climate Change Strategy with energy, transport, agriculture and water policies;
- improve *energy efficiency*, especially for power plants, buildings and the transport sector;
- further contribute to the development and effective implementation of bilateral and multilateral co-operation, programmes and agreements, in particular focusing on protection of *transboundary watercourses*, prevention of *floods* in the Danube catchment area, and on assistance to prospective EU candidate countries;
- reduce *VOC and NO<sub>x</sub> emissions* to meet the 2010 target set by the EU Directive on National Emissions Ceilings and the Gothenburg Protocol;
- strengthen *controls* for the transboundary movement of hazardous wastes, endangered species and ozone-depleting substances;
- increase *official development assistance*, and its environmental components.

## Conclusions

During the review period, Hungary managed to comprehensively *revise its environmental legislation* to prepare for *EU accession*. Since its accession to the EU, Hungary has actively participated in the negotiation of new environmental acquis, in the development of EU environmental policies and programmes and in the preparation of EU positions in major environmental negotiations. Hungary has deepened its *bilateral co-operation* (elaborating and signing 30 bilateral agreements), strengthened its co-operation with neighbouring countries and taken an active part in sub-regional, regional and global co-operation promoting sustainable development and environmental protection. Hungarian authorities have participated in a number of transboundary environmental impact assessment procedures under the *Espoo Convention* with Austria, Croatia, Romania and Slovakia, and have promoted international activities aimed at strengthening *environmental security and liability*. Hungary has significantly reduced its *SO<sub>x</sub> emissions* in accordance with its obligations under the Convention on Long-Range Transboundary Air Pollution (CLRTAP) and its protocols, and has decreased its contribution to transboundary SO<sub>x</sub>

pollution. Hungary is very likely to meet its targets under the *Kyoto Protocol* and the *Montreal Protocol* and its amendments. Hungary has taken the first steps towards elaborating and implementing a *donor policy* that conforms to OECD principles.

However, Hungary did not have a comprehensive climate change strategy until recently. There has been insufficient integration of climate change concerns in sectoral policies (e.g. energy, transport). Hungary must be prepared to contribute to the challenging EU GHG emission reduction target by 2020. In early 2008, the Parliament adopted Hungary's National Climate Change Strategy 2008-25, and then the Energy Strategy 2008-20. Both strategies were discussed simultaneously to ensure coherence. *Emissions of VOCs and NO<sub>x</sub>* increased in recent years: further control measures concerning polluting industrial and transport sources will be needed to meet the Gothenburg Protocol targets. Hungary's *capacities to enforce* EU law and to control illegal movement of hazardous wastes, ozone-depleting substances and endangered species appeared insufficient in a number of cases. Ratification of the pollutant release and transfer register (PRTR) protocol is pending. Limited budgetary resources and cuts in human resources may endanger Hungary's implementation of international environmental commitments.



## 1. Main Objectives

Hungary's involvement in international environmental co-operation during the review period was driven by two main objectives: *accession to the European Union* and achieving the highest degree of *environmental security*. As a downstream and transit country sharing borders with seven other countries (four EU and three non-EU), Hungary is at great risk of transboundary environmental pollution. This has been an incentive for very active *bilateral and regional co-operation*.

### 1.1 Accession to the EU

In 1999, the opening of negotiations on the "environment" chapter marked the beginning of a two-year period of intense negotiations on the terms and conditions of Hungary's accession to the EU. The environment chapter was provisionally closed in June 2001, and the accession negotiations were effectively concluded in December 2002. Hungary joined the EU on 1 May 2004.

Hungary subsequently undertook a major effort to comprehensively *revise its environmental law*. This process was mainly driven by the country's accession to the

EU, but it was strongly influenced by other international commitments as well. During 2002-06, more than 300 pieces of environmental legislation were adopted (e.g. 32 acts and some 120 government decrees). By 2004, Hungary had achieved almost full harmonisation with the environmental acquis. Hungary required transition periods in four areas: air pollution from large combustion plants (transition period until 2004), incineration of hazardous waste (2005), recovery and recycling of packaging waste (2005), and treatment of urban waste water (2015). Hungary's biggest challenges in implementing EC legislation are waste management, wastewater treatment and drinking water quality.

Actual implementation of the new legislation was supported by large *financial investments* from the public and private sectors. Hungary has received significant support from EU funds (e.g. Phare, ISPA, LIFE) (Box 8.1). Additional EU Funds to be provided for the period 2007-13 (HUF 700 billion) will be primarily used for meeting these challenges, as well as for improving water management and flood protection. An additional HUF 87 billion will be available for renewable energy and energy efficiency projects. However, due to limited budgets, Hungary's environmental inspectorates are currently unable to fully enforce EC legislation.

## 2. Climate Change

### 2.1 Commitments and trends

Hungary ratified the 1992 United Nations Framework Convention on Climate Change (UNFCCC) in 1994 and acceded to the Kyoto Protocol in 2002. It has been very active in UNFCCC negotiations (COP Presidency in 2003-04). Under the Kyoto Protocol, Hungary agreed to *reduce greenhouse gas (GHG) emissions* from its territory by 6% compared to the average of its 1985-87 levels by 2008-12. As an EU member since 2004, Hungary is not a party to the EU burden-sharing agreement of 1998. Under the EC Renewables Directive (2001/77/EC), Hungary was set an indicative target of 3.6% for the contribution of renewables to electricity generation by 2010, compared to 0.5% in 2000. Based on Directive 2003/87/EC, which establishes a scheme for GHG emission allowance trading within the EC, Hungary has prepared its first and second national allocation plan (NAP) for the periods 2005-07 and 2008-12.

The *Kyoto target* is very *likely to be met*. Hungary had reduced total GHG emissions by almost 33% between its base year average and 2005 (Table 8.1). The most important reduction took place between 1987 and 1992 due to the collapse of the energy-intensive heavy industries and restructuring of the Hungarian economy. Since 1998, gross GHG emissions have increased by 1.6%.  $CO_2$  accounts for 77% of the emissions in absolute weight, followed by  $N_2O$ , which contributed 12% in 2005.

### Box 8.1 Environmental projects implemented from EU funding

Between 2000 and 2006 the EU supported the development of Hungary's environmental protection infrastructure, with twelve regional *waste management* projects funded by the Instrument for Structural Policies for Pre-Accession (ISPA) and one Cohesion Fund (CF) project, the municipal solid waste management system of Szabolcs-Szatmár-Bereg County. These projects cover nearly 4.2 million people and more than 1 400 settlements. The investment in these ISPA and CF waste management projects is more than EUR 325 million. In addition, the Environment and Infrastructure Operative Programme (KIOP) supported fifteen projects concerning animal waste management and nine projects concerning health-related construction-demolition waste management, for a total of HUF 7.95 billion (about EUR 30 million).

In the same period the EU supported the development of Hungary's *sewage water management* with seven ISPA and three CF projects (including the Budapest central wastewater treatment plant). These projects cover nearly two million people and more than 100 settlements. The total cost is nearly EUR 800 million. The KIOP supported five sewage water management projects, for a total of HUF 15.6 billion (about EUR 60 million).

Concerning drinking water, CF funds amounting to EUR 25.5 million will support the first phase of a project to improve drinking water quality in the North Great Plains Region. The project covers 108 000 people and 41 settlements. In addition, six projects to improve drinking water, totaling HUF 3.3 billion (about EUR 13 million), were approved for support by the KIOP.

The *air pollution monitoring* network has received a KIOP subsidy of more than HUF 300 million (about EUR 1 million), to obtain the devices necessary for its development in 2005. As regards *measuring noise level*, two central projects costing a total of HUF 800 million (about EUR 3 million) will be implemented using KIOP sources. One will create a noise map for Budapest and zone of gravity settlements noise map; the other will make noise grids of four environmental protection inspectorates and will continuously measure noise level.

Concerning *flood protection security*, the programme for strengthening the main protection lines continued during the review period, and within the framework of expanding the Vásárhelyi-plan (VTT), the establishment of the Tisza Valley inundation system and preparation of the Mainstream Tisza Basin began. HUF 9.9 billion (about EUR 40 million) in KIOP subsidies was granted within the VTT to support implementation of the Cigánd-Tiszakarádi nature management facilities for flood storage.

Within KIOP's "*Strengthening Nature Conservation*" central programme, the development of Natura 2000 areas will be implemented in the Tisza Reservoir, for HUF 3.3 billion (about EUR 13 million). The beneficiary of the programme is the directorate of three national parks (i.e. the Hortobágy, Kiskunság and Körös-Maros National Parks). The achievement of nature conservation objectives is supported by the purchase of Natura 2000 areas (nearly 5 000 hectares), the reconstruction of habitats, and establishment of outdoor educational facilities for children.

### Box 8.1 Environmental projects implemented from EU funding (*cont.*)

Within KIOP's action on "*Developing Environmentally Friendly Energy Utilisation*", 45 applications were supported (21 related to renewable energy and 24 to energy efficiency), generating a total savings of 2.06 PJ/year.

*Source:* Environment and Energy Operational Programme 2007-2013.

Table 8.1 **GHG emissions**  
(Gg CO<sub>2</sub> equivalent)

	Base years <sup>a</sup>	1998	2005	Base years to 2005 (% change)	1998-2005 (% change)
CO <sub>2</sub> (with LULUCF)	82 819	55 529	57 302	-30.8	3.2
CO <sub>2</sub> (without LULUCF)	85 969	60 790	61 808	-28.1	1.7
CH <sub>4</sub>	10 169	8 285	7 804	-23.3	-5.8
N <sub>2</sub> O	19 227	9 514	9 709	-49.5	2.0
HFC	—	125	518	—	313.8
PFC	268	193	209	-22.0	8.7
SF <sub>6</sub>	81	68	201	148.1	193.6
Total (inc. net CO <sub>2</sub> from LULUCF)	112 564	73 715	75 743	-32.7	2.8
Total (excl. net CO <sub>2</sub> from LULUCF)	115 715	78 976	80 248	-30.6	1.6

a) The base period is the average of the years 1985-87.

*Source:* Inventory submission to UNFCCC, 2007.

Hungary's per capita CO<sub>2</sub> emissions were approximately 5.7 tonnes in 2005, which was below the OECD-Europe average (7.7 tonnes). In the same year CO<sub>2</sub> emissions intensity (0.37 tonnes of CO<sub>2</sub>/USD 1 000) was slightly above the OECD-Europe average (0.33 tonne of CO<sub>2</sub>/USD 1 000).

*Energy-related activities* were responsible for 81% of Hungary's net GHG emissions in 2005 (Table 8.2). Agriculture and industrial processes accounted for

11% and 8% respectively, while waste treatment and use of solvents and other products accounted for about 5%. The biggest decrease between the base years and 2005 occurred in the use of solvents and other products (–61.4%), agriculture (–51.6%) and industrial processes (–42%).

Table 8.2 **GHG emissions by sector**  
(Gg CO<sub>2</sub> equivalent)

Greenhouse gases activities	Base years <sup>a</sup>	1998	2005	Base years to 2005 (% change)	1998-2005 (% change)
Energy	84 006	60 811	61 455	–26.8	1.1
Industrial processes	10 725	5 154	6 209	–42.1	20.5
Solvent and other product use	384	266	148	–61.4	–44.3
Agriculture	17 496	8 984	8 464	–51.6	–5.8
Land use, land-use change and forestry	–3 117	–5 235	–4 476	43.6	–14.5
Waste	3 070	3 735	3 942	28.4	5.5
Total (including LULUCF)	112 564	73 715	75 743	–32.7	2.8

a) The base period is the average of the years 1985-87.

Source: Inventory submission to UNFCCC, 2007.

## 2.2 Policy integration

The Ministry of Environment and Water (MEW) has responsibility for *co-ordinating Hungary's implementation* of the Kyoto Protocol. An *inter-ministerial committee* was set up in 2003 to ensure a co-ordinated approach to the Kyoto commitments and the related EU regulations. The committee co-ordinates tasks related to the flexible mechanisms, supervises the approval of Joint Implementation project proposals, and is instrumental in creating the country's positions in the trading of GHG emission rights and allowances. Basic strategic elements of Hungary's climate policy have been incorporated into the *second National Environmental Programme for 2003-08 (NEP-II)*. NEP-II includes an action programme on climate change with the objectives of: reducing atmospheric emissions from energy management activities; developing and disseminating technologies related to the use of renewable energy sources; reducing atmospheric emissions from transport, and



GHG emissions from agriculture and management; strengthening CO<sub>2</sub> sink capacities; fighting stratospheric ozone depletion; and preventing atmospheric acidification. Hungary has transposed most of the relevant EU legislation and the Parliament adopted a national *climate change strategy* by consensus in March 2008.

Hungary's 1993 *Energy Policy* and 1999 *Energy Efficiency and Renewable Energy Programme and Action Plan* promote environmental protection and energy efficiency. The programme sets quantitative targets with a 2010 deadline for preserving primary energy resources, reducing SO<sub>2</sub> and CO<sub>2</sub> emissions, and increasing renewable energy production (Chapters 2 and 5). *Energy taxes and levies* were introduced on energy products in 2004. Electricity *prices* for non-household users have been liberalised since 2003 and natural gas prices since 2004. In 2001, the Electricity Act introduced legally guaranteed feed-in tariffs for renewable energy. Prices in the public utility market are regulated by the Hungarian Energy Office and were liberalised from 1 July 2007. The new *National Development Plan II* (2007-13) includes an operational programme whose objective is to facilitate environmentally-friendly energy management by increasing the use of renewable energy and improving energy efficiency. It provides a direct subsidy of 25-75% for renewable energy projects and 30-70% for energy efficiency programmes. *The new energy policy document* envisages a significant change in the energy mix: the total share of renewables in the total primary energy supply (TPES) is projected to be 7-7.2% by 2013 and 14-16% by 2020. A number of incentives and support schemes have been introduced including: participation in the EU emission-trading scheme, approval of Joint Implementation projects for renewable energy production, technological modernisation, funding of renewable energy projects through the Environment and Energy Operational Programme, and internalisation of environmental damage costs.

However, despite all the measures taken, there is still room for improvement. Serious distortions in the wholesale electricity market are caused by long-term power purchase agreements. The greatest potential for increasing energy efficiency is in the household and public sectors. A strategic environmental assessment of the new energy policy document has not been done. Current policies focus mainly on mitigation, whereas climate change is related to water issues such as flooding in Hungary. Hence, cost-effective adaptation measures should be implemented.

During 1996-97, a national long-term *afforestation concept* and programme was adopted. It identified 778 000 hectares as a realistic estimate of the amount of agricultural land suitable for afforestation; this would have increased Hungary's forest coverage rate to an "optimum" of 27%. However, because of resource limitations, changes in land ownership, and lack of information for the new land owners, the targets were not met and were subsequently reduced. A less ambitious

afforestation schedule was then proposed, based on the financing targets of the National Rural Development Plan; this plan calls for afforestation of 10 000 ha in 2005, 11 000 ha in 2006, and 15 000 ha per year during 2007-13. Annual cuts are expected to stagnate at around 8 million m<sup>3</sup> of harvested wood.

### 2.3 Implementation of flexibility mechanisms

In compliance with EC legislation (2003/87/EC; 2004/156/EC), the Hungarian Parliament approved the GHG trading system in 2005 (*Act XV of 2005*). Detailed rules for allocating emission rights and trading were set forth in the respective government decree and *national allocation plans*. The initial intent of NAP I (2005-07) was to reduce CO<sub>2</sub> emissions by 4.2% by 2005 compared to 2003. Trading sectors were allocated 30.2 Mt CO<sub>2</sub> for 2005, and the average annual allocation for 2005-07 was 29.9 Mt CO<sub>2</sub> with reserves of 0.8 Mt CO<sub>2</sub>. However, an over-allocation of 17% became obvious based on data for 2005. The EU emissions trading scheme, involving some 250 installations, has been fully operational since 2005, covering Hungary's entire fossil power sector. Although the impact of the trading scheme on GHG emissions has not been possible to measure or forecast, it has clearly increased the awareness of large companies and will likely be a driver in reducing CO<sub>2</sub> emissions in the future, especially from 2008 onwards. In April 2007 the European Commission accepted Hungary's NAP II for the 2008-12 trading period on condition that certain changes be made. The EC approved an annual allocation of 26.9 million tonnes of CO<sub>2</sub> allowances, 12.4% less than Hungary had proposed. Hungary has expressed concern with the Commission over its demand for cuts in NAP II.

Hungary is a host country for *Joint Implementation* projects. As Hungary meets the eligibility requirements, the so-called "track one" procedure is pursued. MEW and the Ministry of Economy share primary responsibility for *Joint Implementation policies and procedures*. The procedure for approval after an application is submitted takes about one month if all requirements are met. To date, most projects have been for fuel conversion to biomass, N<sub>2</sub>O reduction in adipic acid plants and wind farms.

### 2.4 Future challenges

Trends show that Hungary should be able to fulfil its commitment to reduce GHG emissions by 6% by 2008-12 (Table 8.1) (MEW, 2005). However, Hungary must be prepared to contribute to the EU target, approved by the European Council, of reducing GHG emissions by 20% by 2020 compared to emissions in 1990. Hungary's projections of future emissions were approved by MEW in 2005 and were included in Hungary's national communication to UNFCCC.

### 3. Transboundary Issues

#### 3.1 Transboundary air pollution

Hungary ratified the 1979 Geneva Convention on Long-range Transboundary Air Pollution (CLRTAP) in 1980 and is party to all protocols to CLRTAP, including the 1999 Gothenburg Protocol which was ratified in 2006.  $SO_x$  emissions have been significantly reduced – by 54% between 1980 and 1993 and by 70% between 1980 and 2000 – due to the installation of flue gas desulphurisation equipment in two large lignite and brown-coal fired electric power plants and to a shift in fuel mix from fuel oil to natural gas in large and medium-sized combustion plants. Hungary met the target set by the Helsinki Protocol and is well on path to meet the Oslo targets.  $NO_x$  emission decreased 29% between 1987 and 1994 and 15% between 1990 and 2004. Hungary has met its commitment under the Sofia Protocol and will probably meet its Gothenburg target as well.  $SO_x$ ,  $NO_x$  and  $CO_2$  emissions per GDP are slightly higher than the OECD-Europe averages. The objectives of the Aarhus Protocols on persistent organic pollutants and heavy metals to reduce emissions below their 1990 levels were achieved (Table 8.3).

Hungary exports and imports significant quantities of  $SO_x$  and  $NO_x$ . Hungary is responsible for, as well as being the recipient of, significant quantities of transboundary air pollution. In 2004 Hungary “exported” 82% of its  $SO_x$  emissions (mainly to Slovakia, Russian Federation, Mediterranean Sea, Ukraine and Poland) and 90% of its  $NO_x$  emissions (mainly to Mediterranean Sea, Russian Federation, Ukraine, Poland and Romania).  $SO_x$  deposition in Hungary from transboundary sources reached 74% in the same year (mainly from Bosnia-Herzegovina, Serbia and Montenegro, Romania, Poland and Bulgaria). Transboundary contributions to  $NO_x$  deposition reached 86% (mainly from Italy, Poland, Germany, Czech Republic and Serbia and Montenegro).

The EU Directive on National Emissions Ceilings sets caps for  $SO_2$ ,  $NO_x$ , VOC and  $NH_3$  emissions in 2010. With respect to  $NO_x$ , Hungary’s latest trends are not positive.  $NO_x$  emissions decreased between 1998 and 2004 by almost 11% but their levels did not change between 2000 and 2004 and data for 2005 shows an increase above the 2010 cap. Reducing emissions of volatile organic compounds (VOCs) to the target value will require further control measures on polluting industrial and transport companies, a reduction of VOC emissions from the car fleet, and enforcement of legal requirements by the responsible authorities. The target for ammonia emissions has been met (Chapter 6).

Table 8.3 Performance compared to international targets for air emissions

	Protocol		Commitments		Performance		
			Target period	Target (% reduction)	Observed period	Change (%)	
LRTAP Convention							
Sulphur dioxide (SO <sub>2</sub> )	Helsinki	(1985)	1980-1993	-30	1980-1993	-54 <sup>a</sup>	
	Oslo	(1994)	1980-2000	-45	1980-2000	-70	
Nitrogen oxides (NO <sub>x</sub> )	Gothenburg	(1999)	1980-2005	-50	1980-2005	-92	
			1980-2010	-60			
			1990-2010	-46	1990-2005	-87	
			1987-1994	n.a.	1987-1994	-29 <sup>a</sup>	
	Sofia	(1988)	1987-1994	n.a.	1987-1994	-29 <sup>a</sup>	
Non-methane volatile organic compounds (NMVOCs)	Gothenburg	(1999)	1990-2010	-33	1990-2005	-13	
	Geneva	(1991)	1988-1999	n.a.	1988-1999	-17 <sup>b</sup>	
Ammonia (NH <sub>3</sub> )	Gothenburg	(1999)	1990-2010	-27	1990-2005	-35	
Heavy metals	Aarhus	(1998)					
			Cadmium (Cd)	1990 cap	n.a.	1990-2005	-72
			Lead (Pb)	1990 cap	n.a.	1990-2005	-94
			Mercury (Hg)	1990 cap	n.a.	1990-2005	-34
Persistent organic pollutants (POPs)	Aarhus	(1998)					
			Polycyclic aromatic hydrocarbons (PAHs)	1990 cap	n.a.	1990-2004	-47
			Dioxins/furans	1990 cap	n.a.	1990-2004	-52
			Hexachlorobenzene (HCB)	1990 cap	n.a.	1990-2004	-99
EU Directive on National Emissions Ceilings (NEC)							
	Sulphur dioxide (SO <sub>2</sub> )		2000-2010	2.8 <sup>c</sup>	2000-2005	-73	
	Nitrogen oxides (NO <sub>x</sub> )		2000-2010	6.6 <sup>c</sup>	2000-2005	9	
	Non-methane volatile organic compounds (NMVOCs)		2000-2010	-25.5 <sup>c</sup>	2000-2005	3	
	Ammonia (NH <sub>3</sub> )		2000-2010	21.0 <sup>c</sup>	2000-2005	13 <sup>a</sup>	

n.a.: not applicable.

a) OECD (2000).

b) Faragó T. (2006).

c) Based on EMEP emission data for 2000 and NEC Directive targets.

Source: EMEP; MEW; OECD.

### 3.2 Transboundary watercourses

About 95% of Hungary's surface waters originate abroad, explaining why the country places a high importance on *bilateral and multilateral co-operation* on

protection of international watercourses.<sup>1</sup> Hungary's borders are crossed by 24 incoming rivers, which bring in 114 km<sup>3</sup> of water per year. With 23% of the country comprising floodplains and 25% of the population living in reclaimed floodplains, *flooding* is a key issue. Major rivers are important for transportation. Hungary contains 1 600 km of *navigable waterways*. The Danube and Tisza are key international routes while lower parts of the Dráva are used for internal transport. *Lake Balaton* in west Hungary is the largest lake in the Danube Basin (605 km<sup>2</sup> surface area containing 2 million m<sup>3</sup> of water) and a well-known tourist area.

Since 1994, Hungary has been party to the UN-ECE *Convention on the Protection and Use of Transboundary Watercourses and International lakes*. Hungary follows objectives and provisions of the convention in the course of numerous bilateral and multilateral co-operation programmes on transboundary watercourses. Hungary was an initiator of the *Water and Health Protocol* to the UNECE Water Convention and chaired the elaboration process of the document. After signing in 1999, Hungary became the lead country of the Water and Health Working Group co-ordinating the water and health related activities. Hungary hosted a series of meetings and workshops.

The *Danube basin approach* is co-ordinated by the International Commission for the Protection of the Danube River (ICPDR).<sup>2</sup> Hungary meets its commitments stemming from ICPDR membership, especially those regarding compliance with the EU Water Framework Directive (WFD).<sup>3</sup> Following the disastrous Danube floods of 2002, the Danube countries agreed to strengthen their flood prevention and reduction efforts. In December 2004, the Danube countries adopted the *Action Programme for Sustainable Flood Protection* for managing the risk of floods to protect human life and property. Key elements of the Action Programme include: developing of a new international flood warning system, mapping high flood risk areas, giving rivers more space (with new water retention zones), and ending the construction of new buildings in natural floodplain areas. In 2005, during the Hungarian Presidency of ICPDR, the 2nd International Danube Day and the 1st Danube Basin Stakeholder Forum were organised in Budapest. Hungary strengthened the Tisza Basin and the Danube-Black Sea co-operation. Three presidential missions in Ukraine, Bosnia-Herzegovina and Moldova took place. Hungary encouraged the organisation of the international conference on the protection and sustainable development of the Danube Delta, held in Odessa in February 2006. Hungary also participates actively in the UN Development Programme/Global Environment Facility (UNDP/GEF) Danube Programmes.<sup>4</sup>

Ministers of the five countries situated in the *Tisza catchment area* signed the *Budapest Declaration* in 2001 and established therewith the Tisza Basin Flood Protection Forum.<sup>5</sup> In December 2004 the *Memorandum of Understanding on the Tisza*

*Basin Co-operation* was signed by the ministers of ICPDR countries. Its aim is the elaboration of an integrated river basin water management plan and a flood protection programme. A permanent Tisza Group was established to co-ordinate the co-operation, and its first meeting was organised by Hungary, in February 2006 in Budapest.

### 3.3 *Bilateral and regional co-operation*

In general, Hungary has been *very proactive* in bilateral environmental co-operation: e.g. it has a total of 47 bilateral agreements, of which 25 are inter-ministerial agreements and four are memoranda of understanding regarding implementation of the Kyoto Protocol. During the review period, 30 of these agreements were elaborated and signed. Bilateral agreements regarding the environment, nature conservation or sustainable use of transboundary water courses were concluded or renewed with Croatia, Romania, Slovakia and Ukraine. Their implementation is governed by annual meetings of joint commissions. Hungary participated in many international environmental impact assessment procedures under the Espoo Convention with Austria, Croatia, Romania and Slovakia. An important platform of sub-regional co-operation is provided by the annual meetings of the ministers of the so-called Visegrád (V4) countries (Czech Republic, Hungary, Poland, and Slovakia). Several sensitive environmental issues are dealt with in Hungary's bilateral relations with neighbouring countries.<sup>6</sup>

During the last decade, environmental co-operation with *Romania* has developed considerably. The two countries have concluded an *Agreement of environmental co-operation* (1997, 2000) as well as an *Agreement of co-operation for protection and sustainable use of transboundary waters* (2003, 2004). The implementation of the Agreement on environmental co-operation is managed by a Joint Commission<sup>7</sup> under which four expert groups operate. The expert group on environmental protection compiles a common inventory on the potential polluting sources of the border area and jointly reports on the environmental status of the Hungarian-Romanian border region. The expert group on nature conservation deals with exchange of experiences in Natura 2000 issues, elaboration of partnership agreements and co-operation among authorities and institutions. There is an ad hoc expert group on activities having potential environmental impacts with special regard to the Rosia Montana Goldmine Project, and finally an expert group on international programmes and projects. Hungarian-Romanian Joint Governmental Meetings were held with a special focus on environmental issues in 2005 in Bucharest, in 2006 in Budapest and in 2007 in Sibin (Romania). They gave birth to joint projects and to Memorandums of Understanding in 2005 on *co-operation in flood protection* and in 2007 on *common activities in the border area*. The new agreement on water management fully complies with the

### Box 8.2 The Baia Mare accident and related Hungarian initiatives

On 30 January 2000, a breach in the tailings dam of the Aurul S.A. Baia Mare Company released some 100 000 m<sup>3</sup> of cyanide-rich tailings waste into the river system near Baia Mare in northwest Romania. This spill released an estimated 50 to 100 tonnes of cyanide, as well as heavy metals (particularly copper) into the Someş, the Tisza and finally the Danube River, before reaching the Black Sea. The failed Aurul tailings dam is part of an operation of treatment of tailings from earlier mining activity to recover precious metals, especially gold and silver. The company, a stock company, jointly owned by Esmeralda, Exploration Limited, Australia, and the Romanian Compañia Nationala a Metalelor Pretiosasi si Neferoase, started processing an existing 30-year-old tailings dam (the Meda Dam) located near Baia Mare, in May 1999.

The accident had a *severe impact* on the socio-economic conditions of the local population, biodiversity and the rivers' ecosystems (massive fish kill). The accident caused no human fatalities but the interruption of drinking water supply in 24 locations affected 2.5 million people.

Factors that contributed to this accident included:

- deficiencies in the system design (tailings retention dam and cyanide treatment processes) at the Aurul Mine, especially as concerns fail-safe features in case of unusual operating conditions;
- deficiencies in the operation of the plant (e.g. precautions against overflows and spills) and in emergency response plans; and
- weak and inappropriate permitting of the facility, and inadequate monitoring and inspection.

The company blocked the flow of polluted water from the mine. However, attempts to neutralise the cyanide in the river were unsuccessful, and added more noxious chemicals to the water. Attempts at public information by various parties were guarded, cautious and often insubstantial. Although the physical damage was only temporary, there were widespread fears that the cyanide would cause lasting ecological and economic damage. The early warning system of the *International Commission for the Protection of the Danube River* (ICPDR) proved its usefulness. It alerted downstream riparian authorities of the polluted water coming their way. Towns downstream were able to block the pumps drawing river water and make other arrangements for drinking water. Pollution levels were measured regularly at key points along the river.

An Environmental Task Force led by the UN Environment Programme (UNEP) was set to investigate the damage and the cause of the accident. The Baia Mare spill marked a *turning point* for a number of related issues such as: waste disposal technology, mine and mining waste management, accident prevention and mitigation of environmental emergencies, the adequacy of regulations to ensure public safety, and communication with the public. The Baia Mare experience resulted in major changes in mine safety and response to accidents generally. It was reflected in EU legislation and in the work of UNEP, the UN Economic Commission for Europe (UN-ECE) and other international organisations.

### Box 8.2 The Baia Mare accident and related Hungarian initiatives (cont.)

Hungary has played an important role, especially on regional and sub-regional levels, in developing international instruments aimed at prevention, control or monitoring of trans-boundary environmental impacts. Hungary was active in negotiations of the *Protocol on Civil Liability to the UN-ECE Water Convention and Industrial Accident Convention*, and was the first country to ratify the protocol (2004). To promote further ratifications, Hungary hosted a workshop on trans-boundary accidental water pollution, liability and compensation in May 2007. Hungary has been an active supporter of the Environment and Security Initiative of the UNEP Regional Office for Europe.

requirements of water management targets of transboundary catchment areas, the EU Water Framework Directive and international conventions. Its implementation is managed by the Hungarian-Romanian Water Commission, sub-commissions of which deal with water quality, floods and inland waters issues, water management and hydrometeorology, and the elaboration of the renewed regulations (Box 8.2).

An Agreement between Hungary and *Bulgaria* on co-operation in the field of environmental protection has been concluded (2001, 2002). Both countries recently expressed their willingness to strengthen their bilateral co-operation on the environment, including with exchange of experience between experts from the two countries. However, implementation of this agreement has not yet begun.

In the context of preparation of Croatia for EU accession, an agreement between Hungary and *Croatia* on co-operation in the field of environmental protection has been concluded (2006, 2007). The purpose is to prevent harmful environmental impacts, promote sustainable use of natural resources and improve the state of the environment in the Mura-Drava-Danube border area.

## 4. Trade and Environment

Hungary has been *actively involved* in the relevant international negotiations, including those of the World Trade Organisation (WTO), and has very *strict criminal penalties* for environmental crime. The scope and content of criminal offences underwent a comprehensive revision in 2004-05. For illegal transport of hazardous waste or illegal trafficking of wildlife, a maximum penalty of five years of imprisonment could be



imposed. To enhance the efficiency of criminal investigation, special teams dedicated to environmental crimes have been established in the criminal prosecution service and in the police. Their work is supplemented by the so-called “green commando”, an ad hoc co-operation among environmental authorities, the customs guard and the police. However, the *enforcement capacities* are still not sufficient.

#### 4.1 Ozone-depleting substances

Hungary has ratified the Montreal Protocol and all its amendments. Having received GEF support, Hungary has made good progress in phasing out ozone-depleting substances (ODS). As of 1996 Hungary used only regenerated chlorofluorocarbons (CFCs), and their consumption ceased completely in 2000. Since 1996 there has also been no use of *carbon tetrachloride* or *methylchloroform*. Hungary still uses hydrochlorofluorocarbons (HCFCs), but the consumption rapidly declined between 1998 and 2004, falling almost 90%, from 1 350 tonnes to 147 tonnes annually. The consumption of *methyl bromide* dropped in the same period by 88%, from 53 to 6.5 tonnes per year. Methyl bromide was used for soil fumigation in 2004, but this was the last year that this use was permitted. Since 2005 it has been phased out, although from time to time quarantine and pre-shipment uses are permitted. Hungary now focuses on the controlled substances encapsulated in different products (e.g. foams, refrigerators, fire extinguishers). As an EU member state, Hungary is obliged to meet more ambitious targets than those set by the Montreal Protocol and its amendments. Customs officers undergo training in enforcement of ODS trade regulations. No cases of illegal traffic or trade were detected in the last ten years, but data on the numbers of checks are not available.

#### 4.2 Hazardous waste

Hungary is a party to the Basel Convention, and the country’s Act on Waste Management 2000 reflects OECD requirements. The *National Waste Management Plan 2003-08* seeks to minimise the generation of waste, including hazardous waste. The plan’s quantitative targets include: to reduce by 20% the quantity of hazardous waste for final disposal and to increase by at least 30% by 2008 the recovery and reuse of hazardous waste. The total amount of hazardous waste generated declined by almost 22% between 2003 and 2005 from 1.18 million tonnes to 0.92 million tonnes.<sup>8</sup> However, the *export of hazardous waste* more than *doubled* in the same period from 31 458 tonnes to 76 044 tonnes. In 2005, the main exported hazardous wastes were lead and lead compounds, acidic solutions or acid in solid form. They were exported to Austria, the Czech Republic, Germany, Italy and Slovenia. In the same year, 17 300 tonnes of hazardous waste were imported, mainly from Germany. One case of

illegal import of hazardous waste into Hungary was discovered during the review period. Data on checks on waste shipments were not available.

### 4.3 Endangered species

Hungary ratified the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) in 2001 and adopted its implementing decree in 2002. The illegal trade of articles has been largely influenced by Hungary's accession to the EU. Although there was no significant change in the total volume of illegal wildlife trade between 2000 and 2006, the pattern of trade has only slightly changed. Smuggling of *live tortoises* (mainly from Turkey, Macedonia, Serbia and Romania) continues. The intended destinations of these shipments are mainly the EU member states. Several hundred or sometimes more than a thousand animals in a single shipment are being seized each year. Illegal killing for food purposes and trade of *songbirds* protected by domestic legislation continue year after year. This trade is well organised and the destination of these shipments is southern Europe, where the specimens are sold for exclusive restaurants. Illegal imports in *caviar* have been discovered on several occasions recently, a relatively new field in CITES enforcement. Hungary is considered to be an important transit route for smuggled caviar to other EU member states. The number of illegal imports of *traditional Asian medicinal products* has strongly increased in recent years. The products are usually smuggled in postal consignments from China.

## 5. Official Development Assistance and the Environment

### 5.1 Hungary as donor

Before the political transformation, Hungary provided considerable aid to developing countries, mainly for education and training, *close to the UN goal of 0.7% of GNI*. A new phase in the Hungarian international development policy started with the government decision 2319/1999 calling for formulation of the concept of official development assistance (ODA).

Although Hungary is not a member of the OECD Development Assistance Committee (DAC), the country implements an international development co-operation policy that conforms to OECD and EU principles and practices, and has agreed to fulfil the commitments and meet the targets set in the UN Millennium Declaration and the Millennium Development Goals. Hungary's strategic partners are Serbia, Montenegro, Bosnia-Herzegovina and Viet Nam. Other partner countries include Macedonia, Moldova, Mongolia, Kyrgyzstan, Ukraine and the Palestinian Authority. Special

Table 8.4 Overview of GEF projects for Hungary

Project Name	Focal area	Agency	Project type	GEF Grant (million USD)	Project stage
National Biodiversity Strategy and Action Plan and First National Report to the CBD	Biodiversity	UNEP	Enabling activity	0.166	CEO approved
Clearing House Mechanism Enabling Activity	Biodiversity	UNEP	Enabling activity	0.007	CEO approved
Conservation and Restoration of the Globally Significant Biodiversity of the Tisza River Floodplain through Integrated Floodplain Management	Biodiversity	UNDP	Medium-size project	0.969	CEO approved
Energy Efficiency Co-Financing Program	Climate change	IBRD	Full-size project	5.000	Project completion
Renewable Energy and Regional Development Project – Szekesfehervar Biomass-Gas CHP Project	Climate change	IBRD	Full-size project	6.050	Cancelled
Szombathely CHP/Biomass Project	Climate change	IBRD	Full-size project	2.500	Cancelled
Public Sector Energy Efficiency Programme	Climate change	UNDP	Full-size project	4.200	CEO endorsed
Energy Efficiency Co-Financing Program 2 (HEECP2)	Climate change	IBRD	Medium-size project	0.700	CEO approved
Rehabilitation and Expansion of Small Hydro-Plants on the River Raba in Hungary	Climate change	IBRD	Medium-size project	0.405	CEO approved
Lake Balaton Integrated Vulnerability Assessment, Early Warning and Adaptation Strategies	Climate change	UNDP	Medium-size project	0.985	CEO approved
Reduction of Nutrient Discharges – under WB-GEF Strategic Partnership for Nutrient Reduction in the Danube River and Black Sea	International waters	IBRD	Full-size project	12.850	CEO endorsed
National Capacity Self-Assessment (NCSA) for Global Environmental Management	Multi-focal areas	UNEP	Enabling activity	0.200	CEO approved
Technical Support and Investment Project for the Phase-out of Ozone-Depleting Substances	Ozone depletion	IBRD	Full-size project	6.900	Project completion
Enabling Activities to Facilitate Early Action on the Implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs)	Persistent organic pollutants	UNIDO	Enabling activity	0.489	CEO approved
			Total	41.422	14 projects

Source: [www.gefonline.org/projectList.cfm](http://www.gefonline.org/projectList.cfm).

attention is devoted to the following “least developed” countries: Ethiopia, Yemen, Cambodia and Laos. The fourth group of partners consists of Afghanistan and Iraq.

Hungarian environment-related development assistance primarily concentrates on areas where the country has a comparative advantage, such as: contributing to water management and water resources development; planning and providing technical advice (reservoirs and barrages, water purification plants, planning of dikes, inland drainage, exploration and assessment of water stocks, etc.); and providing technical advice on environmental protection.

Hungary considers a ratio of 60% multilateral aid and 40% bilateral aid to be currently right. Whereas in 2003 the ODA/GNI rate was 0.03%, it reached 0.11% in 2006. The share of ODA devoted to environmental projects is not available.

## 5.2 Hungary as recipient

Hungary’s performance in environmental issues has been supported by 12 projects financed by the Global Environment Facility (Table 8.4). In addition, a further 20 regional or global GEF projects include Hungary as a partner. These multilateral projects are mainly focused on the Danube River Basin Environmental Management.

During the review period, *foreign direct investment* (FDI) flows to Hungary nearly doubled, to USD 6.7 billion, while outflows increased nearly five times, to USD 1.3 billion in 2005 (Table 8.5). The attractiveness of the country as a destination for FDI is enhanced by a 16% corporate tax rate and tax exemptions for foreign strategic investors, but high real wages relative to other countries in the region pose a challenge to future competitiveness.

Table 8.5 Direct investment flows

(USD million)

	Inflows			Outflows			Net inflows (cumulative for 1998 to 2005)
	1998	2002	2005	1998	2002	2005	
Hungary	3 337	2 994	6 700	278	278	1 346	23 931
Austria	4 534	357	8 905	2 745	5 812	9 382	-2 282
Czech Republic	3 716	8 483	10 988	127	206	856	44 514

Source: OECD Factbook 2007.

## Notes

1. Hungary has bilateral agreements with all its seven neighbouring countries, based on requirements of the EU Water Framework Directive.
2. Hungarian experts play a leading role in a number of working groups of the ICPDR; the Flood Protection Working Group has been headed by Hungary since its establishment.
3. All Danubian countries have formally declared their willingness to implement the WFD.
4. The last of which, the so-called Danube Regional Project, ended in spring 2007.
5. Hungary was president of the Forum between 2001 and 2003.
6. For example, the building of the Gabčíkovo-Nagymaros Dams in Slovakia and the Rosia Montana Gold Mining Project prepared in Romania.
7. It is co-chaired by the ministers and has been convened every year, alternating between the two countries, since 2003.
8. The amount of other waste generated increased 35%, from 2.8 million tonnes to 3.8 million tonnes.

## Selected Sources

The government documents, OECD documents and other documents used as sources for this chapter included the following. Also see list of websites at the end of this report.

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## **REFERENCES**

- I.A Selected environmental data
- I.B Selected economic data
- I.C Selected social data
- II.A Selected multilateral agreements (worldwide)
- II.B Selected multilateral agreements (regional)
- III. Abbreviations
- IV. Physical context
- V. Selected environmental websites



**I.A: SELECTED ENVIRONMENTAL DATA (1)**

		CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN
<b>LAND</b>													
Total area (1000 km <sup>2</sup> )		9971	1958	9629	378	100	7713	270	84	31	79	43	338
Major protected areas (% of total area)	2	8.7	9.2	25.1	17.0	9.6	18.5	32.4	28.0	3.4	15.8	11.1	9.1
Nitrogenous fertiliser use (t/km <sup>2</sup> of agricultural land)		2.5	1.2	2.7	9.0	20.1	0.2	2.6	2.9	10.7	6.9	7.8	5.9
Pesticide use (t/km <sup>2</sup> of agricultural land)		0.06	0.04	0.08	1.24	1.20	-	0.02	0.09	0.69	0.10	0.11	0.06
Livestock densities (head of sheep eq./km <sup>2</sup> of agr. land)		192	256	191	1011	1560	62	685	492	1790	287	912	290
<b>FOREST</b>													
Forest area (% of land area)		45.3	33.9	32.6	68.9	63.8	21.4	34.7	41.6	22.4	34.1	12.7	75.5
Use of forest resources (harvest/growth)		0.4	0.2	0.6	0.4	0.1	0.6	..	0.7	0.9	0.7	0.7	0.7
Tropical wood imports (USD/cap.)	3	1.6	0.2	2.1	10.7	6.1	4.0	3.4	0.4	24.2	0.3	3.8	1.4
<b>THREATENED SPECIES</b>													
Mammals (% of species known)		20.3	31.8	16.8	23.3	11.4	23.8	18.0	22.0	30.5	20.0	22.0	10.8
Birds (% of species known)		9.8	16.2	11.7	13.1	6.3	13.0	21.0	27.7	28.1	50.0	16.3	13.3
Fish (% of species known)		29.6	27.6	31.7	36.0	8.9	1.0	10.0	50.6	23.8	41.5	15.8	11.8
<b>WATER</b>													
Water withdrawal (% of gross annual availability)		1.5	15.9	19.2	20.4	36.2	4.8	1.7	5.0	32.5	12.7	4.1	2.1
Public waste water treatment (% of population served)		72	35	71	67	79	..	80	86	46	71	88	81
Fish catches (% of world catches)		1.2	1.4	5.3	4.7	1.7	0.2	0.6	-	-	-	1.1	0.1
<b>AIR</b>													
Emissions of sulphur oxides (kg/cap.)		64.0	25.9	44.8	5.9	8.5	123.6	20.4	3.2	13.8	21.4	4.0	13.0
(kg/1000 USD GDP)	4	2.1	2.9	1.2	0.2	0.4	4.2	0.9	0.1	0.5	1.2	0.1	0.4
% change (1990-2005)		-34	-3	-37	-24	-50	58	54	-64	-60	-88	-88	-73
Emissions of nitrogen oxides (kg/cap.)		73.6	14.0	57.3	15.0	27.1	78.0	39.6	27.3	25.6	27.2	34.3	33.5
(kg/1000 USD GDP)	4	2.4	1.6	1.5	0.6	1.4	2.7	1.7	0.9	0.9	1.5	1.1	1.1
% change (1990-2005)		-1	14	-26	-6	50	25	58	7	-26	-63	-32	-40
Emissions of carbon dioxide (t./cap.)	5	17.0	3.7	19.6	9.5	9.3	18.5	8.5	9.4	10.7	11.6	8.8	10.6
(t./1000 USD GDP)	4	0.55	0.40	0.53	0.35	0.47	0.63	0.37	0.31	0.38	0.64	0.29	0.36
% change (1990-2005)		28	33	20	15	98	45	63	34	3	-23	-6	1
<b>WASTE GENERATED</b>													
Industrial waste (kg/1000 USD GDP)	4, 6	..	..	..	40	40	20	10	..	50	30	10	110
Municipal waste (kg/cap.)	7	420	340	750	400	380	690	400	560	460	290	740	470
Nuclear waste (t./Mtoe of TPES)	8	6.2	0.1	1.0	1.5	3.2	-	-	-	2.2	1.7	-	1.9

.. not available. - nil or negligible.

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) IUCN management categories I-VI and protected areas without IUCN category assignment; national classifications may differ.

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

4) GDP at 2000 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	SLO	ESP	SWE	CHE	TUR	UKD*	OECD*
549	357	132	<b>93</b>	103	70	301	3	42	324	313	92	49	506	450	41	779	245	35042
13.3	31.5	5.2	<b>8.9</b>	9.5	1.2	19.0	17.1	18.9	6.4	29.0	8.5	25.2	9.5	9.5	28.7	4.3	30.1	16.4
7.6	10.4	2.9	<b>5.8</b>	0.7	7.9	5.2	-	13.8	10.1	4.8	2.3	3.7	3.5	5.2	3.6	3.6	6.3	2.2
0.27	0.17	0.12	<b>0.17</b>	-	0.05	0.58	0.33	0.41	0.08	0.06	0.40	0.16	0.14	0.05	0.10	0.06	<i>0.21</i>	<i>0.07</i>
514	689	245	<b>207</b>	65	1139	488	4351	2142	845	315	498	226	339	409	794	290	674	208
31.6	30.2	22.8	<b>19.5</b>	1.3	9.4	23.3	34.5	9.5	39.2	30.0	36.9	41.6	33.3	73.5	30.8	27.0	11.6	34.4
0.6	0.5	0.6	<b>0.5</b>	-	0.7	0.5	0.5	0.6	0.5	0.6	0.8	0.5	0.5	0.7	0.8	0.5	0.6	<u>0.6</u>
6.8	1.8	2.7	<b>0.1</b>	2.8	11.2	7.2	-	15.6	3.6	0.3	17.6	0.1	6.2	2.2	0.6	0.5	2.7	4.0
19.0	37.9	37.8	<b>37.8</b>	-	1.8	40.7	51.6	18.6	13.7	13.5	26.2	21.7	13.3	18.3	32.9	14.3	<i>15.8</i>	..
19.2	27.3	1.9	<b>14.5</b>	44.0	5.4	18.4	23.1	21.6	16.1	7.8	38.1	14.0	26.9	17.5	36.4	3.7	<i>16.2</i>	..
36.1	68.2	26.2	<b>43.2</b>	-	23.1	35.1	27.9	22.1	9.4	21.0	62.9	24.1	51.4	10.9	38.9	11.1	<i>11.1</i>	..
17.5	18.9	12.1	<b>4.8</b>	0.1	2.3	44.0	3.3	10.0	0.9	18.3	12.0	1.3	33.3	1.5	4.7	19.1	22.4	11.5
79	93	56	<b>60</b>	50	70	69	95	99	76	59	60	52	55	85	97	42	<i>98</i>	<u>68</u>
0.7	0.3	0.1	-	1.9	0.3	0.3	-	0.6	2.7	0.2	0.2	-	0.9	0.3	-	0.5	0.7	26.2
7.6	6.8	49.1	<b>12.8</b>	27.5	17.0	7.1	6.3	3.8	5.2	33.2	20.7	16.5	28.9	4.4	2.3	26.9	11.8	25.7
0.3	0.3	2.2	<b>0.8</b>	0.8	0.5	0.3	0.1	0.1	0.1	2.7	1.1	1.2	1.3	0.1	0.1	3.4	0.4	1.0
-65	-90	16	<b>-87</b>	12	-62	-77	-80	-67	-54	-61	-31	-84	-42	-63	-59	28	-81	-45
19.8	17.5	29.9	<b>20.1</b>	94.0	28.0	19.0	30.3	21.1	42.6	21.3	24.6	18.1	35.1	22.7	11.5	15.0	27.1	32.1
0.7	0.7	1.3	<b>1.3</b>	2.8	0.8	0.7	0.5	0.7	1.1	1.7	1.3	1.3	1.5	0.8	0.4	1.9	1.0	1.2
-34	-50	19	<b>-15</b>	1	-5	-43	-39	-38	-7	-49	4	-55	22	-35	-47	66	-45	-22
6.4	9.9	8.6	<b>5.7</b>	7.5	10.6	7.7	24.9	11.2	8.0	7.8	6.0	7.1	7.9	5.6	6.0	3.0	8.8	11.0
0.23	0.38	0.39	<b>0.37</b>	0.22	0.31	0.30	0.42	0.38	0.20	0.62	0.32	0.52	0.34	0.19	0.19	0.39	0.31	0.43
9	-16	36	<b>-18</b>	16	42	14	8	16	29	-15	59	-33	65	-4	9	70	-5	16
50	20	..	<b>30</b>	10	40	20	30	40	20	120	50	130	30	110	-	30	30	50
540	600	440	<b>470</b>	520	740	540	710	620	760	250	470	270	650	480	650	430	580	560
4.2	1.2	-	<b>1.7</b>	-	-	-	-	0.1	-	-	-	3.0	1.2	4.1	1.9	-	1.0	1.5

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

5) CO<sub>2</sub> from energy use only; sectoral approach; international marine and aviation bunkers are excluded.

6) Waste from manufacturing industries.

7) CAN, 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.

**I.B: SELECTED ECONOMIC DATA (1)**

	CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
<b>GROSS DOMESTIC PRODUCT</b>											
GDP, 2006 (billion USD at 2000 prices and PPPs)	1017	1028	11319	3537	1008	611	96	255	304	195	170
% change (1990-2006)	55.4	60.9	59.1	23.3	136.7	68.4	62.4	42.6	37.6	31.5	43.0
per capita, 2006 (1000 USD/cap.)	31.2	9.8	37.8	27.7	20.9	29.7	23.3	30.8	29.0	19.1	31.3
Exports, 2006 (% of GDP)	36.3	31.9	11.1	16.1	43.2	20.9	29.3	56.3	87.5	76.3	52.0
<b>INDUSTRY</b> 2											
Value added in industry (% of GDP)	32	27	23	31	43	26	25	32	27	40	27
Industrial production: % change (1990-2005)	46.7	51.3	55.9	3.2	210.9	30.5	29.5	70.1	21.0	11.8	38.3
<b>AGRICULTURE</b>											
Value added in agriculture (% of GDP)	3	3	4	2	1	4	4	7	2	1	4
Agricultural production: % change (1990-2005)	25.6	41.5	27.6	-12.3	19.3	25.4	47.9	9.9	13.0	..	0.7
Livestock population, 2005 (million head of sheep eq.)	118	275	787	53	30	283	99	17	25	12	24
<b>ENERGY</b>											
Total supply, 2005 (Mtoe)	272	177	2340	530	214	122	17	34	57	45	20
% change (1990-2005)	29.9	42.0	21.4	19.3	128.9	39.3	22.9	37.1	15.2	-7.7	9.6
Energy intensity, 2005 (toe/1000 USD GDP)	0.27	0.18	0.21	0.15	0.22	0.20	0.18	0.14	0.19	0.25	0.12
% change (1990-2005)	-14.1	-7.5	-21.5	-1.2	1.5	-15.3	-22.9	-0.8	-13.8	-25.3	-20.7
Structure of energy supply, 2005 (%)	4										
Solid fuels	10.2	4.9	23.8	21.1	23.1	44.5	11.9	11.9	9.1	43.6	19.1
Oil	35.5	58.8	40.8	47.4	45.0	31.1	40.4	42.5	40.7	21.6	42.1
Gas	29.4	25.0	21.8	13.3	12.8	18.9	18.9	24.2	25.2	16.6	22.6
Nuclear	8.8	1.6	9.0	15.0	17.9	-	-	-	22.1	14.0	-
Hydro, etc.	16.1	9.7	4.7	3.2	1.2	5.5	28.9	21.4	2.9	4.2	16.3
<b>ROAD TRANSPORT</b> 5											
Road traffic volumes per capita, 2004 (1000 veh.-km/cap.)	9.8	0.7	16.2	6.5	3.2	9.8	12.3	9.3	9.0	4.6	7.8
Road vehicle stock, 2005 (10 000 vehicles)	1883	2205	24119	7404	1540	1348	271	502	559	439	245
% change (1990-2005)	13.8	129.3	27.8	31.1	353.5	37.9	47.0	36.0	31.2	69.4	29.5
per capita (veh./100 inh.)	58	21	81	58	32	66	66	61	54	43	45

.. not available. - nil or negligible.

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	SLO	ESP	SWE	CHE	TUR	UKD	OECD
161	1743	2225	257	<b>162</b>	11	151	1556	28	494	188	505	198	79	1036	282	245	603	1760	31225
44.5	34.9	30.1	62.5	<b>38.6</b>	64.7	174.6	23.5	108.2	49.4	65.0	79.2	40.2	46.5	60.7	42.1	22.2	86.3	47.7	48.7
30.5	28.5	27.0	23.1	<b>16.1</b>	34.6	35.6	26.4	61.7	30.2	40.4	13.3	18.7	14.7	23.5	31.1	32.7	8.2	29.2	26.6
44.5	26.9	45.1	18.6	<b>77.8</b>	32.2	79.8	27.9	166.4	73.2	46.6	40.3	31.1	85.7	26.0	51.3	52.5	28.2	28.4	26.0
32	25	30	23	<b>31</b>	27	42	29	20	26	38	30	29	32	30	28	27	31	26	29
75.6	18.2	16.9	19.5	<b>92.2</b>	..	312.8	10.5	57.6	20.8	35.5	113.0	15.1	19.5	27.0	55.3	27.6	78.3	8.6	<u>34.6</u>
4	3	1	7	<b>4</b>	9	3	3	1	3	2	3	4	5	3	2	1	12	1	3
-3.9	0.9	-4.7	10.1	<b>-10.5</b>	5.4	2.6	10.7	13	-9.2	-9.4	-15.8	1.1	..	7.4	-10.2	-4.3	18.2	-8.0	..
8	156	117	21	<b>12</b>	1	50	64	6	42	9	58	19	6	100	13	12	111	113	2639
35	276	345	31	<b>28</b>	4	15	185	5	82	32	93	27	19	145	52	27	85	234	5548
19.8	21.1	-3.2	39.7	<b>-2.8</b>	66.9	47.5	25.2	33.7	22.6	49.3	-6.9	53.1	-11.7	59.4	9.7	8.6	60.9	10.3	22.6
0.23	0.16	0.16	0.13	<b>0.18</b>	0.36	0.11	0.12	0.18	0.17	0.18	0.20	0.14	0.26	0.15	0.19	0.11	0.15	0.14	0.18
-13.0	-8.2	-23.3	-10.4	<b>-27.1</b>	5.7	-43.2	3.3	-31.9	-15.5	-6.9	-44.8	10.6	-34.7	3.0	-19.3	-8.2	-8.4	-23.2	-15.1
14.8	5.1	23.7	29.2	<b>11.3</b>	2.7	17.8	9.1	1.8	10.2	2.3	58.1	12.6	22.2	14.1	5.0	0.6	26.3	16.2	20.4
32.0	32.5	35.8	57.7	<b>26.5</b>	24.5	56.7	45.2	70.3	41.0	42.8	23.6	59.8	18.1	49.1	28.3	48.1	35.0	36.3	40.6
10.8	14.6	23.4	7.7	<b>44.4</b>	-	23.0	39.0	26.2	44.0	15.6	13.0	14.1	30.8	20.5	1.6	10.5	26.7	36.4	21.8
18.1	41.9	12.3	-	<b>13.3</b>	-	-	-	-	1.3	-	-	-	24.4	10.3	35.9	23.0	-	9.1	11.0
24.3	5.9	4.8	5.4	<b>4.5</b>	72.7	2.6	6.7	1.7	3.6	39.3	5.3	13.5	4.5	6.0	29.2	17.9	11.9	2.0	6.2
9.7	8.6	7.1	8.7	<b>2.3</b>	10.2	9.5	8.9	8.9	8.0	7.8	3.9	7.4	2.7	4.8	8.2	8.0	0.8	8.2	8.4
282	3617	4803	552	<b>333</b>	21	198	3894	34	806	252	1472	552	150	2516	463	419	843	3217	64939
26.2	27.1	28.8	118.7	<b>49.4</b>	59.8	108.5	30.2	68.0	40.7	29.9	126.8	151.3	44.4	74.2	17.9	28.9	257.1	35.0	38.7
54	59	58	50	<b>33</b>	72	48	66	74	49	55	39	52	28	58	51	56	12	54	56

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

4) Breakdown excludes electricity trade.

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

**I.C: SELECTED SOCIAL DATA (1)**

	CAN	MEX	USA	JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK
<b>POPULATION</b>											
Total population, 2006 (100 000 inh.)	326	1049	2994	1278	483	206	41	83	105	103	54
% change (1990-2006)	17.8	24.9	19.9	3.5	12.7	20.7	23.1	7.3	5.5	-1.1	5.7
Population density, 2006 (inh./km <sup>2</sup> )	3.3	53.6	31.1	338.2	484.9	2.7	15.3	98.8	344.3	130.0	126.1
Ageing index, 2006 (over 64/under 15)	76.4	17.4	61.3	152.6	51.0	68.6	58.6	106.0	100.5	97.0	81.8
<b>HEALTH</b>											
Women life expectancy at birth, 2005 (years)	82.6	77.9	80.4	85.5	81.9	83.3	81.7	82.2	81.6	79.1	80.2
Infant mortality, 2005 (deaths /1 000 live births)	5.3	18.8	6.8	2.8	5.3	5.0	5.1	4.2	3.7	3.4	4.4
Expenditure, 2005 (% of GDP)	9.8	6.4	15.3	8.0	6.0	9.5	9.0	10.2	10.3	7.2	9.1
<b>INCOME AND POVERTY</b>											
GDP per capita, 2006 (1000 USD/cap.)	31.2	9.8	37.8	27.7	20.9	29.7	23.3	30.8	29.0	19.1	31.3
Poverty (% pop. < 50% median income)	10.3	20.3	17.0	15.3	..	11.2	10.4	9.3	7.8	4.4	4.3
Inequality (Gini levels)	2	30.1	48.0	35.7	31.4	..	30.5	33.7	26.0	26.0	24.0
Minimum to median wages, 2000	3	42.5	21.1	36.4	32.7	25.2	57.7	46.3	x	49.2	32.3
<b>EMPLOYMENT</b>											
Unemployment rate, 2006 (% of civilian labour force)	4	6.3	3.2	4.6	4.1	3.5	4.8	3.8	4.7	8.2	7.1
Labour force participation rate, 2006 (% 15-64 years)	79.4	64.4	75.2	79.5	69.1	77.2	80.3	79.1	67.8	71.1	81.7
Employment in agriculture, 2006 (%)	5	2.6	14.1	1.5	4.3	7.7	3.5	7.1	5.5	2.0	3.8
<b>EDUCATION</b>											
Education, 2005 (% 25-64 years)	6	85.2	21.3	87.8	84.0	75.5	65.0	78.7	80.6	66.1	89.9
Expenditure, 2004 (% of GDP)	7	6.1	6.4	7.4	4.8	7.2	5.9	6.9	5.4	6.1	4.9
<b>OFFICIAL DEVELOPMENT ASSISTANCE</b>											
ODA, 2006 (% of GNI)	0.29	..	0.18	0.25	..	0.30	0.27	0.47	0.50	..	0.80
ODA, 2006 (USD/cap.)	113	..	79	88	..	103	62	181	188	..	411

.. 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	SLO	ESP	SWE	CHE	TUR	UKD	OECD
53	612	824	111	<b>101</b>	3	42	589	5	163	47	381	106	54	441	91	75	731	603	11753
5.6	8.0	3.8	10.2	<b>-2.9</b>	19.2	20.9	3.8	19.8	9.3	10.1	0.3	7.2	1.7	13.4	6.1	11.5	30.2	5.4	12.6
15.6	111.5	230.7	84.3	<b>108.3</b>	2.9	60.3	195.3	177.9	393.6	14.4	122.0	115.1	109.9	87.1	20.2	181.3	93.8	246.3	33.5
94.7	89.5	144.5	129.6	<b>103.6</b>	53.9	54.4	138.3	77.3	79.0	75.5	83.4	111.5	72.3	115.0	101.2	101.4	21.3	90.2	73.5
82.3	83.8	81.8	81.7	<b>76.9</b>	83.1	81.8	83.2	82.3	81.6	82.5	79.4	81.4	77.9	83.9	82.8	83.9	74.0	81.1	..
3.0	3.6	3.9	3.8	<b>6.2</b>	2.3	4.0	4.7	2.6	4.9	3.1	6.4	3.5	7.2	4.1	2.4	4.2	22.6	5.1	..
7.5	11.1	10.7	10.1	<b>8.1</b>	9.3	7.5	9.0	7.4	9.2	8.7	6.2	10.2	7.1	8.3	9.1	11.3	7.6	8.3	..
30.5	28.5	27.0	23.1	<b>16.1</b>	34.6	35.6	26.4	61.7	30.2	40.4	13.3	18.7	14.7	23.5	31.1	32.7	8.2	29.2	26.6
6.4	7.0	9.8	13.5	<b>8.2</b>	..	15.4	12.9	5.5	6.0	6.3	9.8	13.7	..	11.5	5.3	6.7	15.9	11.4	10.2
25.0	28.0	28.0	33.0	<b>27.0</b>	35.0	32.0	33.0	26.0	27.0	25.0	31.0	38.0	33.0	31.0	23.0	26.7	45.0	34.0	30.7
x	60.8	x	51.3	<b>37.2</b>	x	55.8	x	48.9	47.1	x	35.5	38.2	..	31.8	x	x	..	41.7	..
7.7	9.2	9.8	8.9	<b>7.4</b>	2.9	4.4	6.8	4.7	3.9	3.5	13.8	7.7	13.3	8.5	7.0	4.1	9.7	5.3	6.1
75.2	68.8	77.7	65.4	<b>60.7</b>	85.7	73.5	63.2	67.5	79.1	79.7	62.9	78.1	68.7	72.4	78.7	87.6	52.5	76.4	71.8
4.7	3.4	2.3	12.0	<b>4.9</b>	6.3	5.7	4.3	1.3	3.0	3.3	15.8	11.8	4.4	4.8	2.0	3.7	27.3	1.3	5.5
78.8	66.3	83.1	57.1	<b>76.4</b>	62.9	64.5	50.1	65.9	71.8	77.2	51.4	26.5	85.7	48.8	83.6	83.0	27.2	66.7	68.1
6.1	6.1	5.2	3.4	<b>5.6</b>	8.0	4.6	4.9	3.6	5.1	6.6	6.0	5.4	4.8	4.7	6.7	6.5	4.1	5.9	5.7
0.40	0.47	0.36	0.17	..	..	0.54	0.20	0.89	0.81	0.89	..	0.21	..	0.32	1.02	0.39	..	0.51	0.31
158	173	127	38	..	..	241	62	632	334	633	..	37	..	87	436	220	..	207	63

4) Standardised unemployment rates; MEX, ISL, TUR: commonly used definitions.

5) Civil employment in agriculture, forestry and fishing.

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

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

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

## II.A: SELECTED MULTILATERAL AGREEMENTS (WORLDWIDE)

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

		CAN	MEX	USA
1946	Washington	Conv. - Regulation of whaling	Y D	R R
1956	Washington	Protocol	Y D	R R
1949	Geneva	Conv. - Road traffic	Y R	R
1957	Brussels	Conv. - Limitation of the liability of owners of sea-going ships	Y S	
1979	Brussels	Protocol	Y	
1958	Geneva	Conv. - Fishing and conservation of the living resources of the high seas	Y S	R R
1959	Washington	Treaty - Antarctic	Y R	R
1991	Madrid	Protocol to the Antarctic treaty (environmental protection)	Y R	R
1960	Geneva	Conv. - Protection of workers against ionising radiations (ILO 115)	Y	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	Y	
1963	Moscow	Treaty - Banning nuclear weapon tests in the atmosphere, in outer space and under water	Y 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
1973	London	Protocol (pollution by substances other than oil)	Y	R R
1969	Brussels	Conv. - Civil liability for oil pollution damage (CLC)	Y D	D S
1976	London	Protocol	Y R	R
1992	London	Protocol	Y R	R
1970	Bern	Conv. - Transport of goods by rail (CIM)	Y	
1971	Brussels	Conv. - International fund for compensation for oil pollution damage (FUND)	D	D S
1976	London	Protocol	Y R	R
1992	London	Protocol (replaces the 1971 Convention)	Y R	R
2000	London	Amendment to protocol (limits of compensation)	Y R	R
2003	London	Protocol (supplementary fund)	Y	
1971	Brussels	Conv. - Civil liability in maritime carriage of nuclear material	Y	
1971	London, Moscow, Washington	Conv. - Prohib. emplacement of nuclear and mass destruct. weapons on sea-bed, ocean floor and subsoil	Y R	R R
1971	Ramsar	Conv. - Wetlands of international importance especially as waterfowl habitat	Y R	R R
1982	Paris	Protocol	Y R	R R
1987	Regina	Regina amendment	Y R	R
1971	Geneva	Conv. - Protection against hazards of poisoning arising from benzene (ILO 136)	Y	
1972	London, Mexico, Moscow,	Conv. - Prevention of marine pollution by dumping of wastes and other matter (LC)	Y R	R R
1996	London	Protocol to the Conv. - Prevention of marine poll. by dumping of wastes and other matter	Y R	R S
1972	Geneva	Conv. - Protection of new varieties of plants (revised)	Y R	R R

**OECD EPR / SECOND CYCLE**

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

JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SVK	ESP	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	S	R	R
D		D		D		D	D	D	D			R		S			D	D	R	R		R	D	R		D	
		R		R		S		S						R			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		R	R	R	R	R		R
R	R	R	R	S	R	R	R	S	R	R	R	R	S		R	R	R	R		S	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
	S			S				S				S		S		R			R		R						
				R				R				R						R	R	S						S	
				S	R	R	R	S	R	R	R	R		R		R	R	R	S	R	S	R	S	R	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	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	S	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	
D	D	D	D		D		D	D	D	D		D	D	D	D	D	D	D	D		D	D	D		D		D
R	R	R		R		R	R	R	R	R	R	R	D	R	R	R	R	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	R	R	R		R
D	D	D	D		D		D	D	D	D		D	D	D		D	D	D	D		D	D	D		D		D
R		R		R		R	R	R	R	R	R	R	D	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	R	R	R		R
D	D	D	D		D		D	D	D	D		D	D	D		D	D	D	D		D	D	D		D		D
R		R		R		R	R	R	R	R	R	R	D	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	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	R	R	R	R	R	R	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



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

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

		CAN	MEX	USA
1978	Geneva Amendments	Y	R	R R
1991	Geneva Amendments	Y		R
1972	Geneva Conv. - Safe container (CSC)	Y	R	R R
1972	London, Moscow, Washington Conv. - International liability for damage caused by space objects	Y	R	R R
1972	Paris Conv. - Protection of the world cultural and natural heritage	Y	R	R R
1973	Washington Conv. - International trade in endangered species of wild fauna and flora (CITES)	Y	R	R R
1974	Geneva Conv. - Prev. and control of occup. hazards caused by carcinog. subst. and agents (ILO 139)	Y		
1976	London Conv. - Limitation of liability for maritime claims (LLMC)	Y		R
1996	London Amendment to convention	Y		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
1978	London Annex III	Y	R	R
1978	London Annex IV	Y		
1978	London Annex V	Y	R	R
1997	London Annex VI	Y		S
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	Y		
1996	The Hague Agreem. - Conservation of African-Eurasian migratory waterbirds	Y		
2001	Canberra Agreem. - Conservation of albatrosses and petrels (ACAP)	Y		
1982	Montego Bay Conv. - Law of the sea	Y	R	R
1994	New York Agreem. - relating to the implementation of part XI of the convention	Y	R	R S
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	Y	R	R
1983	Geneva Agreem. - Tropical timber	Y	R	R
1994	New York Revised agreem. - Tropical timber	Y	R	R R
2006	Geneva Revised agreem. - Tropical timber		S	R
1985	Vienna Conv. - Protection of the ozone layer	Y	R	R R
1987	Montreal Protocol (substances that deplete the ozone layer)	Y	R	R R
1990	London Amendment to protocol	Y	R	R R
1992	Copenhagen Amendment to protocol	Y	R	R R
1997	Montreal Amendment to protocol	Y	R	R R
1999	Beijing Amendment to protocol	Y	R	R R
1986	Vienna Conv. - Early notification of a nuclear accident	Y	R	R R
1986	Vienna Conv. - Assistance in the case of a nuclear accident or radiological emergency	Y	R	R R

OECD EPR / SECOND CYCLE

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

JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SVK	ESP	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	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	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	D	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	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
					R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
					R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	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	R	R	R	R
R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	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	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
R	R	R	R	R	R	R	R	R	R	R	R	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

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

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

		CAN	MEX	USA
1989 Basel	Conv. - Control of transboundary movements of hazardous wastes and their disposal	Y	R	R S
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
2000 London	Protocol - Pollution incidents by hazardous and noxious substances (OPRC-HNS)	Y		
1992 Rio de Janeiro	Conv. - Biological diversity	Y	R	R S
2000 Montreal	Prot. - Biosafety (Cartagena)	Y	S	R
1992 New York	Conv. - Framework convention on climate change	Y	R	R R
1997 Kyoto	Protocol	Y	R	R S
1993 Paris	Conv. - Prohibition of the development, production, stockpiling and use of chemical weapons and their destruction	Y	R	R 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	Y	R	R R
1994 Vienna	Conv. - Nuclear safety	Y	R	R R
1994 Paris	Conv. - Combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa	Y	R	R R
1996 London	Conv. - Liability and compensation for damage in connection with the carriage of hazardous and noxious substances by sea (HNS)			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	R
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)	Y	R	R S
2001 London	Conv. - Civil liability for bunker oil pollution damage			
2001 London	Conv. - Control of harmful anti-fouling systems on ships			R S
2001 Stockholm	Conv. - Persistent organic pollutants	Y	R	R S

Source: IUCN; OECD.

OECD EPR / SECOND CYCLE

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

JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRC	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SVK	ESP	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	
						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	
							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	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	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	
						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	R	
												R					S	R	R		R				R			
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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	R	R	R	S	R	R	R	R	R	R	S	R	R

## II.B: SELECTED MULTILATERAL AGREEMENTS (REGIONAL)

		CAN MEX USA		
1950 Paris	Conv. - Protection of birds	Y		
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		
1960 Paris	Conv. - Third party liability in the field of nuclear energy	Y		
1963 Brussels	Supplementary convention	Y		
1964 Paris	Additional protocol to the convention	Y		
1964 Paris	Additional protocol to the supplementary convention	Y		
1982 Brussels	Protocol amending the convention	Y		
1982 Brussels	Protocol amending the supplementary convention	Y		
1988 Vienna	Joint protocol relating to the application of the Vienna Convention and the Paris Convention	Y		
1968 Strasbourg	Agreem. - Restriction of the use of certain detergents in washing and cleaning products	Y		
1983 Strasbourg	Protocol	Y		
1968 Paris	Conv. - Protection of animals during international transport	Y		
1979 Strasbourg	Protocol	Y		
1969 London	Conv. - Protection of the archaeological heritage	Y		
1979 Bern	Conv. - Conservation of European wildlife and natural habitats	Y		
1979 Geneva	Conv. - Long-range transboundary air pollution (CLRTAP)	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)	Y	R	R
1998 Aarhus	Protocol (persistent organic pollutants)	Y	R	R
1999 Gothenburg	Protocol (abate acidification, eutrophication and ground-level ozone)	Y	S	R
1980 Madrid	Conv. - Transfrontier co-operation between territorial communities or authorities	Y		
1995 Strasbourg	Additional protocol	Y		
1998 Strasbourg	Second protocol	Y		
1980 Bern	Conv. - International carriage of dangerous goods by train (COTIF)	Y		
1989 Geneva	Conv. - Civil liab. for damage caused during carriage of dang. goods by road, rail, and inland navig. (CRTD)			
1991 Espoo	Conv. - Environmental impact assessment in a transboundary context	Y	R	S
2001 Sofia	Amendment			
2003 Kiev	Prot. - Strategic environmental assessment			
1992 Helsinki	Conv. - Transboundary effects of industrial accidents	Y	S	S
2003 Kiev	Prot. - Civil liability and compensation for damage caused by the transboundary effects of industrial accidents on transboundary waters			
1992 Helsinki	Conv. - Protection and use of transboundary water courses and international lakes	Y		
1999 London	Prot. - Water and health	Y		
2003 Kiev	Prot. - Civil liability and compensation for damage caused by the transboundary effects of industrial accidents on transboundary waters			

OECD EPR / SECOND CYCLE

JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRCH	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SVK	ESP	SWE	CHE	TUR	UK	DEU
	S	R						S		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
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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	S	R	S	S	S	S	R	R	R	R	S	S	R	S	R	S	R	R	R	R
R	R	R	R	R	R	R	R	S	R	R	S	R	R	R	R	R	R	R	S	S	R	S	R	R	R	R	R
S	R	R	R	R	R	R	R	S	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			R	R	R	R	R	R	R	R	R	R	R	R	R
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S	S		S	S		S	R								S		S	S	S			S		S		S	

**II.B: SELECTED MULTILATERAL AGREEMENTS (REGIONAL) (cont.)**

		CAN MEX USA
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
1994 Lisbon	Protocol (energy efficiency and related environmental aspects)	Y
1994 Sofia	Conv. - Co-operation for the protection and sust. use of the Danube river	Y
1998 Aarhus	Conv. - Access to env. information and public participation in env. decision-making	Y
2003 Kiev	Prot. - Pollutant Release and Transfer Registers (PRTR)	
1998 Strasbourg	Conv. - Protection of the environment through criminal law	
2000 Florence	Conv. - European landscape convention	Y
2000 Geneva	Agreem. - International carriage of dangerous goods by inland waterways (AND)	
2003 Kiev	Conv. - Framework Convention on the Protection and Sustainable Development of the Carpathians	Y

Source: IUCN; OECD.

OECD EPR / SECOND CYCLE

JPN	KOR	AUS	NZL	AUT	BEL	CZE	DNK	FIN	FRA	DEU	GRCH	HUN	ISL	IRL	ITA	LUX	NLD	NOR	POL	PRT	SVK	ESP	SWE	CHE	TUR	UK	DEU	
				S	R	R	R	R	R	R	R	R	R	R	S	S	R	R	R	R	R	S	R	R	R	R		
				R							R			R					R		R							
						S				S		S	S	S							S							
R	S	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	R	R
R	S	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	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	S	R
				S	S	S	S	S	S	R	S	S	S	S	S	R	R	S	S	S		S	S	R		S	R	
				S	S	S	S	S	S	S	S	S	S	S	S	S						S						
				R	R	R	R	R	S	R		R	R	R	R	R	R	R	R	R	R	R	R	R	S	S	R	R
				R	S			S	S	R		R		S	R	R					S							
				R							R										R		R				R	



## Reference III

### ABBREVIATIONS

AEP	Agri-environmental payment
ARDOP	Agricultural and Rural Development Operational Programme
CAP	Common Agricultural Policy (EU)
CEHAP	Children's Environmental Health Action Plan
CHP	combined heat and power
CITES	Convention on International Trade in Endangered Species
CLRTAP	Convention on Long-Range Transboundary Air Pollution
CNG	Compressed natural gas
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
COD	Chemical oxygen demand
DWIP	Drinking Water Quality Improvement Programme
EAFRD	European Agricultural Fund for Rural Development
EAGGF	European Agricultural Guidance and Guarantee Fund
EEOP	Environment and Energy Operational Programme
EIA	Environmental Impact Assessment
ESA	Environmentally Sensitive Area
EU	European Union
FDI	Foreign direct investment
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse Gas
ha	hectare
HCSO	Hungarian Central Statistic Office (KSH)
IPM	Integrated pest management
IPPC	Integrated Pollution Prevention and Control
ISPA	Instrument for Structural Policies for Pre-Accession (to the EU)
IWRM	Integrated Water Resource Management
LIFE	EU financial instrument supporting environmental and nature conservation projects
LPG	Liquefied petroleum gas
MEW	Ministry of Environment and Water

Mtoe	Million tonnes of oil equivalent
NAEP	National Agri-Environmental Programme
NAP	National allocation plan (for GHG emissions trading)
NDP	National Development Plan
NDPC	National Development Policy Concept
NEAP	National Environmental Action Programme
NEC	National Emissions Ceiling (EU Directive)
NEHAP	National Environmental Health Action Programme
NEP	National Environmental Programme
NGO	Non-governmental organisation
NHDP	New Hungary Development Plan
NIEH	National Institute for Environmental Health
NIP	National Implementation Programme (urban waste water collection and treatment)
NO <sub>x</sub>	Nitrogen oxides
NPDs	National Park Directorates
NRDP	National Rural Development Plan
NRDSP	National Rural Development Strategy
NSDC	National Spatial Development Concept
ODA	Official development assistance
PHARE	Polish and Hungarian Assistance for Economic Reconstruction
PAC	Pollution abatement and control
PAH	Polycyclic aromatic hydrocarbons
Phare	Poland and Hungary Assistance for Restructuring of the Economy (European Commission)
PM	Particulate matter
POP	Persistent organic pollutant
PPP	Polluter Pays Principle
PPPs	Purchasing power parities
PRTR	Pollutant Release and Transfer Register
SAPARD	Special Accession Programme for Agriculture and Rural Development
SCI	Site of Community Importance (EU Habitats Directive)
SEA	Strategic environmental assessment
SMEs	Small and medium-sized enterprises
SO <sub>2</sub>	Sulphur dioxide
SPA	Special Protection Area (EU Birds Directive)
TAP	Thematic Action Programme (under NEP II)
toe	tonnes of oil equivalent
TFC	Total final energy consumption

TPES	Total primary energy supply
VAT	Value-added tax
VOCs	Volatile organic compounds
VTT	Vásárhelyi Plan (for flood prevention)
WFD	Water Framework Directive

## Reference IV

### PHYSICAL CONTEXT

Located in Central Europe, *the Republic of Hungary* shares borders with Austria, Croatia Romania, Serbia, Slovakia, Slovenia and Ukraine. This landlocked country of 93 030 km<sup>2</sup> lies between the Carpathian Mountains and the Alps. Its widest extensions are 268 kilometres north-south and 526 kilometres east-west. Hungary can be broadly divided into *four geographical regions*: the Great Plain (nearly half its territory) and the Northern Mountains, both east of the Danube; and Transdanubia (a third of its territory) and the Small Plain, both west of the Danube.

Hungary is a *lowland country*: 84% of its territory lies less than 200 metres above sea level. A chain of mountains of medium height runs across it. The Transdanubian Mountains west of the Danube are 400 to 700 metres high, while the Northern Mountains to the east rise from 500 to 1 000 metres. The country's highest point is Mount Kékes (1 015 metres). Transdanubia is a hilly region. The *climate* is temperate continental, with cold winter and warm summer. Annual average rainfall is 500 to 550 mm on the plains, and 600 to 800 mm at higher altitudes.

Scarcely 5% of Hungary's surface waters have their origins in the country itself. The two most important *rivers*, the Danube (with a 417 kilometre stretch within Hungary) and the Tisza (598 kilometres), cross the country from north to south. The Danube, flowing through Budapest, links Hungary to the Black Sea; it joins the North Sea via the Rhine-Main-Danube canal. There are 1 200 natural and artificial *lakes* in Hungary. Lake Balaton is the largest freshwater lake in Central Europe and an important international tourist attraction. Hungary has long been known for its abundance of thermal waters.

*Arable and permanent cropland* covers nearly 52% of the total land area, permanent grassland 13% and forest and other wooded land 19%. The main crops are wheat and maize; pig meat is the main livestock product. About 320 000 hectares are irrigable. Over the last three decades there has been a 10% decrease in the amount of agricultural land (including grassland) and a 20% increase in forested area.

Hungary is not well endowed with *natural resources*. Its fertile soil is the most important asset. Around half its primary energy requirements must be imported, mainly oil and gas from Russia. There are brown coal and open-cast lignite mines in the Northern and Transdanubian ranges. Natural gas is exploited in the southern part of the Great Plain.

## Reference V

### SELECTED ENVIRONMENTAL WEBSITES

<b>Website</b>	<b>Host institution</b>
<i>Government</i>	
<a href="http://www.keh.hu/keh">www.keh.hu/keh</a>	Office of the President of the Republic of Hungary
<a href="http://www.meh.hu/english">www.meh.hu/english</a>	Prime Minister's Office
<a href="http://www.kulugyminiszterium.hu">www.kulugyminiszterium.hu</a>	Ministry of Foreign Affairs
<a href="http://www.fvm.gov.hu">www.fvm.gov.hu</a>	Ministry of Agriculture and Rural Development
<a href="http://www.kvvm.hu">www.kvvm.hu</a>	Ministry of Environment and Water
<a href="http://www.bm.hu">www.bm.hu</a>	Ministry of Local Government and Regional Development
<a href="http://www.mkogy.hu/parl_en.htm">www.mkogy.hu/parl_en.htm</a>	Hungarian National Assembly
<a href="http://portal.ksh.hu">http://portal.ksh.hu</a>	Hungarian Central Statistics Office
<a href="http://www.met.hu">www.met.hu</a>	Hungarian Meteorological Service
<a href="http://www.oktt.hu">www.oktt.hu</a>	National Environmental Council
<a href="http://www.orszagoszoldhatosag.gov.hu">www.orszagoszoldhatosag.gov.hu</a>	National Inspectorate for Environment, Nature and Water
<a href="http://www.antsz.hu">www.antsz.hu</a>	National Public Health and Medical Officer Service

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