# ENVIRONMENTAL PERFORMANCE REVIEWS (1st Cycle)

# CONCLUSIONS AND RECOMMENDATIONS
# 32 COUNTRIES (1993-2000)

## OECD WORKING PARTY ON ENVIRONMENTAL PERFORMANCE

# FOREWORD

The report presents in a single document the CONCLUSIONS AND RECOMMENDATIONS of the 32 OECD country Environmental Performance Reviews carried out so far by the OECD Working Party on Environmental Performance. They focus on:

- the effectiveness of environmental policies in the fields of pollution control and nature conservation;
- the integration of environmental concerns into all other policies;
- the effectiveness of co-operation with the international community.

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

- to help individual governments assess progress by establishing baseline conditions, trends, policy commitments, institutional arrangements and routine capabilities for carrying out national evaluations;
- to promote environmental improvements and a continuous policy dialogue among Member countries, through a peer review process and by the transfer of information on policies, approaches and experiences of reviewed countries; and
- to stimulate greater accountability from Member countries' governments towards public opinion within developed countries and beyond.

Programme efforts are directed at promoting sustainable development, with emphasis on developments in domestic and international environmental policy, as well as on the integration of economic and environmental decision making.

Environmental performance is assessed with regard to the degree of achievement of domestic objectives and international commitments. Assessment of environmental performance is also placed within the context of historical environmental records, the present state of the environment, the physical endowment of the country in natural resources, its economic conditions and demographic trends.

The conclusions and recommendations of each country review were approved by the OECD Working Party on Environmental Performance.

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* This document presents the Conclusions and Recommendations concerning the country environmental performance reviews conducted by the OECD Working Party on Environmental Performance, up to 2000.

** In co-operation with UN/ECE.

# AUSTRALIA

## CONCLUSIONS AND RECOMMENDATIONS*

Australia is an ecologically unique continent, characterised by mega-biodiversity. It is also a fully developed, highly urbanised, federal country with growing links to many developing countries in the region. It has an economy based more on natural resources than many other OECD countries: agriculture and mining account for over 61 per cent of export earnings derived from trade in commodities, mainly in the Asia-Pacific region.

In the past ten years, Australia's economy has grown faster than the OECD average. Pressures on the environment and natural resources from agriculture, manufacturing, the energy sector, transport and mining continue to grow, constituting a major challenge for Australia. Environmental progress thus depends not only on environmental policies themselves but also on the integration of environmental concerns in sectoral policies, as well as on action taken by local, State/Territory and Commonwealth Governments and by enterprises, households and community groups.

Early environmental policy responses were directed at limiting the local impact of natural resource exploitation and large development projects. As environmental issues have grown in importance on Australia's policy agenda, the debate has centred on the Commonwealth Government's constitutional power to protect the environment and on the need for intergovernmental co-operation within Australia on environmental matters, with sharing of responsibilities and the development of a more consultative approach to conflict resolution. After the adoption of the National Strategy for Ecologically Sustainable Development in the early 1990s, efforts are now directed at breathing life into Australia's sustainable development policy agenda and meeting the challenge of integrating the practice of sustainable development into economic and sectoral decisions. Sectoral strategies consistent with ecologically sustainable development have recently been completed for agriculture, forestry, waste, biodiversity and water. State and local governments have the main responsibility in addressing issues such as water, air and waste management, land use, transport planning and natural resource management.

This OECD report sets out the baseline for assessing future environmental progress, and examines Australia's environmental performance in three areas:

- implementation of environmental policies;
- integration of environmental concerns and economic decisions;
- international co-operation on environmental protection.

It also assesses the extent to which Australia's domestic objectives and international commitments are being met, based on the criteria of environmental effectiveness and economic efficiency. A number of recommendations are put forward that could contribute to further environmental progress in Australia.

### 1. Implementing Environmental Policies

#### *Strengthening the effectiveness of environmental policies*

The current approach to environmental management in Australia is often described as a partnership approach. It uses a mix of regulatory, economic and voluntary instruments, with voluntary measures and agreements between governments, industry and community groups playing a central part. Corporate environmental management drives environmental progress in the mining industry, for instance. Voluntary programmes, such as the Greenhouse Challenge initiative, open the road to greater private sector involvement more generally. The approach to environmental licensing is case by case, and there are wide differences among States in enforcement and in the availability of information on compliance. Substantial efforts are being made to develop regimes that allow regulators to avoid devoting too many resources to inspections and directive action. The water reform agenda emphasises true-cost water pricing; in addition, innovative and effective economic instruments are being used in other areas, such as performance bonds to cover mine site rehabilitation costs. The Great Barrier Reef Marine Park Authority, the Murray-Darling Basin Commission and the Board of Management of Uluru-KataTjuta are examples of sound place-based and partnership-based environmental management.

* Conclusions and Recommendations revised and approved by the Group on Environmental Performance at its November 1997 meeting.

There is significant potential for improving the effectiveness and efficiency of environmental management, by: i) setting environmental standards within the country, such as those currently being defined as National Environment Protection Measures; ii) expanding the use of economic instruments, such as product charges, deposit refund systems and emission trading regimes; and iii) integrating these instruments into the general partnership approach. The user pays principle should be applied more extensively to cover all expenditure on environmental protection, notably for waste management and waste water treatment.

Despite progress in reporting on the state of the environment, environmental monitoring and environmental data in Australia are often inadequate in terms of coverage and consistency. This weakens the capacity to track environmental progress, formulate cost-effective policies and measure environmental performance. Better environmental data, indicators, monitoring and reporting are necessary so the public and decision makers can better understand the situation and address the most pressing problems.

Efforts are being made at various levels of government to improve public access to environmental information. In the preparatory stages of environmental regulation, and in environmental assessment procedures, public insight and influence are provided for. Nevertheless, the potential remains to increase public access to environmental information, e.g. on environmental licensing and approval processes and on the contents and implementation of voluntary agreements. Consideration should be given to translating some of the Rio principles concerning public information and participation into national minimum standards on access to courts and to environmental information.

There is also scope to expand reporting by companies on their environmental performance and the impact of their activities. Progress in developing the National Pollutant Inventory is important in this respect. The introduction of mandatory reporting should be taken ahead. Several OECD countries have already established such reporting on continuous and accidental emissions (e.g. through Pollutant Release and Transfer Registers).

Australia's total pollution abatement and control expenditure amounts to about 1 per cent of GDP, mostly related to water and waste management. Spending by enterprises represents 32 per cent of the total. Most public expenditure is funded by State/Territory and local governments and by households through various charges; the Commonwealth Government accounts for less than 1 per cent of total recorded environmental expenditure. Local authorities have expressed concern about their capacity to finance needed environmental investments and operating expenditure in the current climate of reduced public budgets.

It is recommended that consideration be given to the following proposals:

- continue the development and implementation of place-based, partnership-based, outcome-oriented environmental management, using a more cost-effective mix of instruments;
- set environmental standards within the country and implement and enforce them throughout Australia;
- develop the use of economic and fiscal instruments to promote more cost-effective pollution prevention and sustainable use of natural resources;
- upgrade collection and assessment of environmental data with a view to better evaluating performance in relation to environmental policies;
- continue and strengthen efforts to apply public information and participation principles, including access to environmental information, timely responses and access to courts;
- expand public reporting from companies on their environmental performance, both as part of voluntary commitments and through corporate environmental management reports; accelerate the development of the National Pollutant Inventory.

***Ecosystems and biodiversity***

Australia contains a large and unique part of the earth's fauna and flora and is one of the few countries in the world with mega-biodiversity. Its ecosystems and biodiversity are under a range of pressures from economic activities, intense in some areas, particularly exploitation of natural resources from fishing and agriculture (e.g. grazing, land clearing, irrigation) and to a lesser extent forestry. A large number of introduced species also present major and serious threats to Australian biodiversity. In addition, some coastal areas are subject to strong pressures from urbanisation and tourism, and conflicts between mining activities and protection of sensitive areas are recurrent.

Australia's recognition of the importance of international co-operation for ecosystem and biodiversity management is evidenced by its early ratification of major conventions and the active, often leading role it has played in developing national responses and new international regimes for marine issues. Examples include the Great Barrier Reef Marine Park and protection of marine species near Antarctica. In response to its international responsibilities as well as to pressure from economic activities on its biodiversity, Australia has established a solid legal, institutional and scientific basis for managing biological diversity. It has made significant progress in protecting areas of global significance, such as its 11 World Heritage Areas, and in increasing terrestrial protected areas from about 5 to almost 8 per cent of its land area. The new Natural Heritage Trust, devoted to sustainability of land, water, coastal and marine resources, has the potential to foster greater integration of environmental and natural resource management programmes. The 1996 National Strategy for the Conservation of Australia's Biological Diversity is supported by sectoral strategies. Forward-thinking policies have been adopted for forest protection, and a target has been set of retaining at least 15 per cent of the natural pre-European area of each forest habitat type, 60 per cent of existing old-growth forests and at least 90 per cent of existing high-quality wilderness forests, through the development of Regional Forest Agreements in different parts of the country. New legislation introduced throughout Australia has resulted in improved fishery management. Many voluntary, community-based programmes with significant grass-roots participation have been established and are helping raise the level of awareness of environmental trends and challenges.

The extent and intensity of pressures leading to habitat loss and modification, for both terrestrial and aquatic ecosystems, continue to present an extremely serious threat to Australian biodiversity, with a very high number of threatened and endangered species. The status of some marine species, including mammals, reptiles and fish, is of particular concern. The current coverage and management of protected areas may not be adequate to deal with the pressures involved. In the system of reserves, some areas of poor biodiversity are better protected than areas with high biodiversity. Outside of protected areas, while there has been progress in conservation of natural resources (land, soil and water), progress in conservation of biodiversity (habitats and species) has been extremely limited. There is continued concern within Australia about timber operations in old-growth forests. Much remains to be done to translate Australia's broader strategic approach and commitment to sustainability into actual management of natural resources that integrates ecosystem and biodiversity protection concerns in decision making and actual practice. It is unclear whether the progress currently being made is of sufficient strength, scope and speed to relieve pressures and redress their impact on biodiversity and ecosystems.

It is therefore recommended that consideration be given to the following proposals:

- continue and intensify efforts to halt and reverse negative trends threatening biodiversity by strongly increasing the pace of ongoing programmes and developing new, creative mechanisms for the conservation of biodiversity in and outside protected areas, combining efforts from the Commonwealth, State and Territory and local governments;
- set more quantitative and operational targets for habitat areas and species population numbers, both on and off reserves, putting more focus on results in existing and new programmes and in instruments such as the National Reserve System;
- consider a major increase in financial resources to strengthen the hands-on management of protected areas and to fund acquisitions and conservation management agreements;
- further improve the knowledge base for Australian biodiversity management; expand research efforts, notably to support the preparation of inventories, improved monitoring and the development of the reserve system;
- improve the integration of biodiversity conservation objectives into the management of off-reserve land (both leasehold and freehold) and develop related new instruments (e.g. conservation easements, covenants, management agreements);
- further develop biological conservation programmes and mechanisms for the 14 per cent of Australia's land under indigenous ownership and management, in close co-operation with indigenous populations;
- further translate strategic commitments to sustainable agriculture, forestry and fishing into actual changes in agricultural, forestry and fishery practices.

***Water resources***

Australia's water resources are often scarce, and their quality is adversely affected by high turbidity, salinity and nutrient levels in parts of the country. After years of extensive development of freshwater resources, particularly for agriculture, water demand management and water quality degradation have become important

concerns. As co-operation between the Commonwealth and the States has increased, national initiatives and strategies have been established to deal with water sustainability and related land sustainability issues. The water reform agenda spearheaded by the Council of Australian Governments is stimulating a major overhaul of water management policies and practices. This overhaul, now well under way, supports true-cost water pricing by reviewing subsidies and cross-subsidies, as well as institutional reforms to separate service delivery from regulatory functions. Salinity control programmes have shown progress. Water quality at bathing beaches in urban areas is improving, reflecting investment in municipal waste water treatment. Groundwater management is now generally sound, with remedial programmes addressing overallocation, notably in the Great Artesian Basin, where the capping of bores has resulted in substantial reductions in water use. The Murray-Darling Basin Commission, set up to manage Australia's largest river basin across multiple jurisdictions, recently decided to cap existing allocations. About 36 per cent of Australian farmers participate in landcare groups. The Natural Heritage Trust will inject Commonwealth funds into many programmes promoting sustainable land and water use.

While Australia's consultative approach recognises that stakeholder support is crucial to successful implementation, in the past it has sometimes meant slow development of responses to water and land degradation issues, as well as the introduction of an array of often insufficiently co-ordinated policies and programmes. In many cases, progress is more apparent in terms of inputs and planning than in strongly positive environmental results. Australia's land and water resources thus remain under considerable pressure in many parts of the continent. Given the magnitude of the pressures and the delays in responses, current measures and funding will not be sufficient to halt or reverse the degradation of Australia's land and water resources. The impetus for removal of remaining point sources of nutrients should be maintained, along with efforts in large urban areas to improve the quality of stormwater management and of industrial pollution prevention and control. The coastal environment, which is under stress in heavily developed as well as some developing areas, needs to be better managed through a more integrated approach to planning and development at all levels of government. As the degree of farmer participation in landcare initiatives varies widely across the country, ways need to be found to increase it. Much work is also needed to identify unsustainable land use, both extensive and intensive, so that additional policy responses can be developed. Australia's water management lacks basic data on water quality. Where data do exist, they often are not collated nationally or are unavailable because of ownership issues.

It is recommended that consideration be given to the following proposals:

- continue to implement the water reform agenda, with focus on i) pricing water resources at true cost through removal of subsidies and cross-subsidies, and ii) making institutional changes leading to the separation of service delivery and regulatory functions;
- encourage integrated, river-catchment-based management programmes;
- pursue initiatives to further reduce point source contamination of watercourses from industrial activities and urban stormwater disposal, as well as nutrient and saline inflows from diffuse sources;
- give greater priority to: ensuring environmentally optimal flows in rivers under stress; making water management more sensitive to the needs of aquatic ecosystems; developing biological indicators of river health; and ensuring that flow regimes are based on the principle of mimicking natural flow regimes, within reasonable economic and social constraints;
- increase, through appropriate incentives, community participation in landcare programmes and ensure that the programmes are achieving environmental results in addressing sustainable development issues;
- monitor closely the benefits of operation of the Natural Heritage Trust, and be prepared to increase its funding if necessary;
- where existing land use is unsustainable, promote retirement of land from use, particularly as concerns extensive pastoralism.

***Waste***

Australia is a large generator of waste, almost all of which is landfilled. With awareness growing of the environmental impact of waste generation, both at point of disposal and throughout the life cycle of products, there is now a broad consensus in Australia on the need to improve waste management policies and practices. A major effort is under way to revise State and local waste management approaches, within the framework of a national strategy and objectives based on the waste hierarchy concept. Significant progress has been achieved concerning recycling, particularly of paper waste and beverage containers. A number of the recycling targets for 1995, set out in the 1992 waste minimisation and recycling strategy, have been achieved through a co-operative approach involving

different levels of government, industry and the general public. Hazardous waste imports and exports are now controlled in line with international agreements ratified by Australia.

There is considerable scope for improving waste management in Australia. First, there is no consistent waste classification system; nor is there reliable, comprehensive information on the amount and composition of waste streams, making it impossible to accurately define the composition of waste or rates of waste generation, or to evaluate waste management practices and performance. There is little information on the real costs of waste management or the relative cost-effectiveness of treatment and disposal options. Second, Australia's per capita waste generation is high, and almost all waste is landfilled. Too few local councils have as yet adopted waste management plans. The new package of waste minimisation measures and targets represents a promising evolution from the 1992 strategy, addressing the issue of waste minimisation at source. However, reaching the 50 per cent reduction target for waste going to landfill (60 per cent in New South Wales) by 2000 will require full implementation of this package, particularly the National Green and Organic Waste Management Strategy. Third, much progress is needed as regards the many relatively small and often uncontrolled landfills, and to achieve minimum environmental standards for them, particularly in urban and semi-urban areas. Fourth, waste charges generally remain well below management costs and economic instruments are little used in waste management. Fifth, hazardous waste management suffers from a notable lack of information and knowledge, and there is no national inventory of contaminated sites and related environmental risks.

It is recommended that consideration be given to the following proposals:

- examine opportunities for waste prevention in production, reduction of production waste, better use of raw materials and energy, less use of hazardous components, improved reparability and increased product life;
- promote the further development of local council waste management plans and co-ordinate them regionally so as to improve their technical and economic effectiveness;
- establish regulations for all technical, operational and environmental aspects of landfill creation, operation and closure so as to prevent and control emissions to water, air and soil, promote responsible land management and conservation and protect amenities;
- improve knowledge about the economics of waste management, notably as concerns cost calculation methods, including internal and external costs of collection, transport, recycling, pre-treatment and disposal; carry out a comprehensive analysis of the cost-effectiveness of various treatment, recycling and disposal options for all types of waste, taking into consideration the broad range of settlement patterns and climatic conditions in Australia;
- increase the use of economic instruments in waste management, notably by ensuring that waste charges cover the full cost of waste management and relate to the amount of waste generated, and by considering opportunities to introduce, for example, deposit refund systems;
- accelerate the development of the Australian Waste Database to provide a sound quantitative basis for policy making and evaluation, for both general and hazardous waste;
- establish an inventory of contaminated sites that pose a risk to human health or the environment, define a national or regional remediation programme, further clarify financial liability issues relating to site remediation and examine funding mechanisms for the rehabilitation of orphan sites.

***Air***

Overall, Australian cities do not have the acute air pollution problems found in a number of major cities in OECD countries, and air quality in Australia is generally good. Urban air quality has improved over the past ten years as a result of both air pollution management (characterised by voluntary approaches and the case-by-case method of licensing stationary sources) and structural changes such as the increased use of natural gas. The introduction of three-way catalytic converters in new vehicles in 1986 helped reduce emissions of $NO_x$, VOCs and CO. Recent reductions in airborne emissions of lead represent another achievement for Australia's air management policy, and one that can be considered exemplary in terms of co-operation among different levels of government, industry and the public. $SO_2$ concentrations in major urban airsheds are well below levels of concern: power stations are generally far from urban areas and the sulphur content of Australian coal is low. Efforts are being made in several cities to integrate air management considerations in transport and land use planning.

Nevertheless, surveys indicate that Australians' major environmental concern is air pollution, and public expectations for air quality management are high. A priority is to ensure that the improvements of the past ten years

are not offset by increased pollution pressures from industrial, agricultural, energy and transport activities. Substantial breaches of $SO_2$ guidelines have occurred near some industrial and mining sites. Agriculture is responsible for large shares of CO, $NO_x$, $CO_2$ and methane emissions. Total and energy-related $CO_2$ emissions are increasing. Urban areas, where 70 per cent of the population is concentrated, experience episodes of high pollution by CO, photochemical smog and particulates. Further measures to reduce $NO_x$, VOC and particulate emissions should be considered in the near future. Concerning new and in-use vehicles and fuel quality, a range of essentially regulatory measures applied in other OECD countries could make a cost-effective contribution to reducing emissions of these pollutants, which play a major role in urban air quality, particularly in areas of rapid growth such as south-east Queensland, Perth and western Sydney. The lack of a national approach to the adoption of ambient air quality guidelines has resulted in inconsistencies among States and Territories, and progress in setting national ambient air quality standards has been slow. The current air quality monitoring programme covers six capital cities and major industrial centres, but about 8 million people live outside monitored areas. Where air quality and emission data exist, they are dispersed among different industries and government agencies. As a result, Australia lacks a national database on air quality and emissions, which is essential for better definition and evaluation of air management strategies. Initiatives already in place, such as the National Pollutant Inventory and the call in the Intergovernmental Agreement on the Environment for a national approach to data collection and handling, could help rectify this situation, though neither initiative has yet been fully implemented.

It is recommended that consideration be given to the following proposals:

- take concrete actions to ensure compliance with the forthcoming National Environment Protection Measures, which will set national ambient air quality standards;
- establish a national database on air quality and emissions;
- extend monitoring to cover more of the 8 million people currently living outside monitored areas, and to better measure ground-level ozone, $PM_{10}$ and air toxics;
- in consultation with the oil industry, define a programme for improving fuel quality, notably with respect to reducing vapour pressure, sulphur content, and benzene and other aromatics;
- speed up the pace at which leaded gasoline is to be phased out;
- ensure that new vehicles are subject to emission standards equivalent to "best practice" standards in other OECD countries, for both gasoline and diesel vehicles;
- take measures to improve the maintenance and emission performance of in-use vehicles, including mandatory regular pollution checks for all cars; consider the cost-effectiveness of measures to accelerate fleet renewal, such as a premium for scrapping old vehicles;
- strengthen policies on energy efficiency, notably by accelerating the adoption of efficiency standards for non-residential buildings, domestic appliances and motor vehicles;
- intensify transport planning responses to air pollution, with the aim of reducing the need for private vehicle travel, notably in urban areas.

## 2. Integrating Environmental Concerns in Economic Decisions

Australia's GDP has increased by 35 per cent over the past ten years and its population by 14 per cent, higher than the OECD averages. Though some decoupling of environmental pressures and economic growth is taking place, it is a weak decoupling, with environmental pressures growing more slowly than GDP rather than decreasing.

The rate and structure of Australia's economic growth do not suggest any relief to the environment from economic pressures in the foreseeable future. Economic globalisation, and the related increase in exposure to international competition, are strongly influencing the Australian economy. The drive to increase productivity could lead to reductions in the use of some natural resources per unit of output but entail the degradation of others. The lowering of trade barriers could result in higher output in resource-based industries, driven by resource consumption by Australia's trade partners; effective environmental policies could help reduce any related environmental pressures. The need to attract international capital could lead to moves to reduce environmental protection and regulation, but could also spur improvement in environmental quality as a form of competitive advantage.

Better integration of environmental concerns into economic and sectoral policies and decisions is needed if environmental protection and sustainable development are to be achieved cost-effectively.

***Fostering sustainable development***

Australia has made considerable progress in developing a framework for the integration of environmental and economic policies. The 1992 National Strategy for Ecologically Sustainable Development, and the reports on its implementation, represent a nationwide commitment to translate the concept of sustainable development into national objectives and policy directions. The participation of Commonwealth, State/Territory and local governments, together with non-governmental groups, in the preparation of the strategy and in reviewing its implementation has given the strategy broad-based recognition and credibility.

More specific efforts towards ecologically sustainable development include the funds being made available under the Natural Heritage Trust and activities to integrate environmental considerations into federal and State/Territory sectoral policies. Examples are the National Forest Policy Statement, landcare programmes and water management policies. Success has been mixed in integrating environmental considerations into government-wide economic policies. Some progress is being made with "green procurement" by government institutions.

Nevertheless, like other OECD countries, Australia is facing the challenge of translating the principles of sustainable development into economic decisions and practices. In many cases, economic objectives take priority over environmental concerns, with most decision makers believing that the wealth created by economic activities will overcome environmental effects. In addition, process-oriented approaches often dominate, at the expense of a focus on environmental results. To respond to this imbalance, quantitative targets and timetables should be adopted, where appropriate, and peer reviews of the environmental performance of States and Territories would also be useful.

Microeconomic reform has generated more efficient pricing of goods and services and an attendant improvement in resource use. Australian governments generally provide little in the way of direct or indirect subsidies to the private sector. The agricultural sector, in particular, receives a producer subsidy equivalent of 9 per cent, compared with 36 per cent for the OECD as a whole. Nevertheless, there remains room for progress concerning water prices, as recognised in ongoing water reform efforts. Australia's wealth of cheap energy resources and low levels of taxation translate into low energy prices. Low energy prices play an essential part in the competitiveness of Australia's energy-intensive industries. In many sectors of the Australian economy, there is a potential for reducing greenhouse gas emissions through strengthened no-regrets measures. The Australian Government has consistently rejected higher energy taxation because of its negative impact on the economy and exports. Given the environmental problems directly and indirectly related to energy production and use, particularly the prospect of future commitments to curb greenhouse gas emissions, higher energy taxation should be considered as one way of internalising environmental externalities.

By and large, the role of economic analysis in environmental policy making often appears to be of secondary consideration, and greater weight is given to institutional responses. To aid in understanding of the environmental impact of different development options or packages of policy responses, appropriate analytical tools (e.g. sectoral, regional or national economic models) should be developed and systematically used.

Australia's federal system of government makes co-operation and the sharing of responsibilities on environment a particular challenge for all three levels of government. Australia has made substantial progress in this regard in recent years. Efforts to clarify responsibilities and enhance intergovernmental co-operative action have taken place in the context of the Council of Australian Governments and the Intergovernmental Committee on Ecologically Sustainable Development. This process should continue, based on the principle of addressing each environmental challenge at the appropriate level, and on meeting the need for public information and participation in forming and implementing policies. Australia places considerable emphasis on developing co-operative working relationships among the different levels of government.

It is recommended that consideration be given to the following proposals:

- develop quantitative targets and timetables to further the implementation of the National Strategy for Ecologically Sustainable Development;
- consider improvements in institutional mechanisms to more fully and consistently integrate environmental considerations into economic decisions at all levels of government;
- make greater use of economic analysis in designing environmental policies at both Commonwealth and State/Territory levels;
- consider higher energy taxation as one way of internalising environmental externalities;

- continue to strengthen co-operative working relationships among the Commonwealth, the States/Territories and local government, and explore the most efficient and effective structures for co-ordination between State and local government and among local authorities;
- promote changes in consumption and production patterns by ensuring that prices fully reflect costs, including environmental costs (e.g. for water and energy), and by providing appropriate environmental information to the public;
- accelerate the greening of government operations.

***Integration of environmental concerns in the mining industry***

Australia is mineral rich, with a great diversity of deposits. The mining industry plays a major role in Australia's economy, producing over one-third of the value of its export earnings. Mining is a cyclical industry, driven by international markets; the prices of minerals and costs of production remain key factors in the economics of deposits. However, environmental considerations and the costs of environmental management are increasingly important in determining the competitiveness and viability of mining projects.

In recent years, much progress has been made in promoting sound environmental practices within the mining industry, and in incorporating the principles of sustainable development into environmental or mining legislation. Regulations have been extended and upgraded across Australia, notably with respect to environmental requirements for exploration, during mining operations and after the closure of a mine. To ensure that mines are not left derelict and unrestored after closure, the use of performance bonds to cover rehabilitation costs, an innovative and promising economic instrument, has been introduced. Voluntary approaches (both government-industry agreements and industry-only initiatives) are also helping promote better environmental performance. Notable examples include the Australian Minerals Industry Code for Environmental Management and the Best Practice Environmental Management in Mining publications, which have become influential in Australia and beyond. Major improvements in corporate environmental management are visible at all stages of many mining operations. The mining industry has increased its environmental expenditure, though on average this still amounts to less than 1 per cent of the industry's income. Commonwealth and State/Territory authorities have helped reduce the environmental controversy often surrounding mining operations by developing information exchanges and linking the regulatory process to consultations with groups of stakeholder representatives.

Nevertheless, conflict persists, notably where exploration and mining are proposed in sensitive areas. In such cases, criticism may reflect a lack of faith in the objectivity of the regulatory process, fuelled by limitations on public access to relevant, comprehensive and timely information. Industry and public authorities need to further build credibility through continual commitment to sound environmental practices, including public consultation and disclosure of information, and especially through demonstrable results. Concern is expressed in Australia regarding the environmental assessment and approval processes at State/Territory level, notably the lack both of a set time limit for consideration of applications, and of standards for the content and procedures of environmental assessments and licence conditions. Several specific mining objectives set in the 1992 National Strategy for Ecologically Sustainable Development have yet to be met, notably with respect to community involvement and mine rehabilitation. The problems posed by Australia's legacy of abandoned mines are being addressed in a piecemeal fashion, without any clear knowledge of their overall extent and nature, or of the priorities and resources needed for rehabilitation.

It is recommended that consideration be given to the following proposals:

- continue to promote sound environmental practices within the mining industry; in particular, ensure the adoption of such practices by smaller mining operators, and monitor their implementation in all jurisdictions and across industry;
- further improve community consultation and information during exploration and mining approval processes and during mine operation, and ensure full public access to environmental information, by stimulating environmental reporting by companies to the public;
- develop an inventory of old mine sites across Australia as a basis for a strategy in which priorities for and expenditure on remediation can be clearly defined;
- develop mineral planning frameworks at Commonwealth and State/Territory levels, including regional ones where appropriate, to clarify issues related to access for exploration and mining, and to the sustainability of mining in areas where there is a need to balance resource use and conservation;
- harmonise the content, methodology and time-frames of environmental assessment and approval procedures and appeal procedures, ensuring that all levels of government agree upon and adhere to

them; provide local government with access to technical expertise to provide assistance in reviewing mining proposals and co-ordinating permit conditions.

## 3. International Co-operation

During the 1990s, Australia has considerably stepped up its involvement in international environmental co-operation, and it is now in the forefront with active participation and significant initiatives on environmental protection in regional and global forums. Until recently, international issues were mostly in the hands of the Commonwealth Government, but new procedures involve State Governments much more in international negotiations. The new spirit created by the 1992 Intergovernmental Agreement on the Environment should lead to an expansion of efforts to implement Agenda 21 at both State and local levels.

### *Achievements*

Concerning bilateral and regional co-operation, Australia has close environmental co-operation with New Zealand (in the framework of the Australian and New Zealand Environment and Conservation Council) and with Papua New Guinea. Australia has been actively promoting sustainable forest management in the South Pacific and Asia-Pacific regions. It has taken the lead in protecting Antarctica, banning mining and protecting fauna and flora there. Australia has helped South Pacific countries establish a large nuclear-free zone and has given them considerable development aid to protect their environments. Australia was an active supporter of the establishment of the Southern Oceans Sanctuary for whales.

Concerning worldwide commitments, Australia has given great attention to implementing nature protection conventions, particularly the World Heritage Convention, which covers the Great Barrier Reef Marine Park, the world's largest marine protected area. Australia has taken an exemplary position on a number of domestic biodiversity issues, and in advancing towards international objectives such as the protection of migrating birds. Programmes to protect the ozone layer have been implemented very effectively, ahead of international target dates, and with full participation of States/Territories and industry. Industry has voluntarily contributed towards the costs of efforts on phasing out ozone-depleting substances and oil spill preparedness. Considerable effort has been made to implement all environmental conventions dealing with maritime shipping. Concerning aid, Australia's system of environmental auditing of development assistance proposals is one of the most thorough in the world.

### *Areas for progress*

Most of Australia's international achievements are fairly recent. Much remains to be done to implement broad national strategies, especially when there are conflicts among groups of economic actors or between economic development and nature conservation. Australia has been slow to join the international liability and compensation regime in case of oil spills, and it ratified the London Convention with some delay. It was one of the few OECD countries to ask for a two-year exemption on the banning of industrial waste disposal at sea. While Australia now strictly controls exports of hazardous waste for disposal, it only recently began such controls on recyclable hazardous waste.

In the area of official development assistance, Australia is still committed to the UN target of 0.7 per cent of GNP, but its actual aid is decreasing and is now at 0.27 per cent. There has been significant growth in environmental aid since 1992, at the expense of other aid programmes.

Australia's achievements related to climate change appear likely to fall short of the country's initial goal to stabilise greenhouse gas emissions at 1990 levels by 2000. $CO_2$ emissions have increased since 1990, and, as in many other OECD countries, they continue to do so because the most effective measures either are not applied or will take a long time to produce effects. Furthermore, Australia, with its abundant cheap fossil fuel resources, has special circumstances as a large exporter of fossil fuels and energy-intensive products. Once the objectives of Australia's climate change policy are more clearly defined, it will be possible to assess whether the current voluntary measures promoted by the Commonwealth Government are adequate (considering that it is at State and local government level, and by industry and citizens, that they need to be implemented).

It is recommended that consideration be given to the following proposals:

- deepen bilateral and regional co-operation to better protect the environment, notably in the area of land-based sources of marine pollution;
- expand efforts to protect the marine environment, and to promote sustainable development in coastal areas, through co-operative action among relevant authorities;
- increase the volume of environmental aid to developing Pacific and Asian countries, with a view to helping them carry out more fully their responsibilities under global and regional conventions;
- further develop policy guidelines, programmes and objectives on Australia's response to the challenge of global climate change, and make greater use of regulatory measures and economic instruments to enable Australia to meet cost-effectively its current and future targets concerning climate change.

# AUSTRIA

## CONCLUSIONS AND RECOMMENDATIONS*

Austria has recognised the need to protect the environment since the early 1970s. This awareness has been heightened by the importance of the tourism industry in its economy and the pressures on the environment by sectors such as transport, energy, industry and agriculture. Federal and provincial governments have adopted generally ambitious environmental goals and policies. These have been reinforced by the social partnership that has long characterised decision making at both the federal and provincial levels.

As Austria is a land-locked country, in the middle of Europe, the quality of its environment is partly dependent on the progress achieved by its neighbours. With its recent membership of the European Union, and with the development of its relations with central and eastern Europe, there will be both further pressures on the Austrian environment and opportunities to co-operate with its closest partners on environmental progress.

The environmental challenge for the future lies in: i) finding the most cost-effective methods to prevent and control pollution; ii) moving further along the path of sustainable development, including in sectors such as tourism, energy, transport and agriculture; and iii) remaining at the forefront of international environmental progress.

This OECD report sets out the baseline for assessing future environmental progress, and it examines the environmental performance of Austria in three major areas:

i) preventing and controlling pollution;
ii) integrating environmental and economic decisions;
iii) international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This assessment includes both domestic objectives and international commitments, and is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in Austria.

### 1. Preventing and Controlling Pollution

Austria has been very successful in dealing with all major environmental issues of the late 1970s. Its achievements concerning conventional pollutants such as $SO_x$ (a reduction of 81 per cent between 1980 and 1992) put the country among the top in the OECD in this regard. Austria has enacted elaborate environmental legislation, developed detailed regulations and enforced its policies very strictly. The main emphasis has been on the use of end-of-pipe technology with a strong regulatory system. Austrian environmental expenditure in terms of GDP is among the highest in the OECD, and industry and municipalities have received substantial subsidies to support their endeavours. Results achieved can be partly explained by Austria's long tradition of consensus building through early dialogue with the social partners (industry and trade unions as well as commerce and labour chambers with compulsory membership), a widespread law-abiding attitude and a solid federal and provincial administrative structure.

#### *Air*

Most of the national emission reduction targets adopted by Austria are more stringent than those required by international agreements. The target level of the Sofia Protocol, stabilisation of $NO_x$ emissions at their 1987 level, has been surpassed (-22 per cent between 1987 and 1993). By 1992, Austria was already meeting the 80 per cent $SO_2$ reduction target of the 1994 Oslo Protocol, set for 2000; and per GDP emissions of $SO_2$ are among the lowest in the OECD. Substantial progress has also been made in reducing emissions of particulate matter (50 per cent).

Austria has used regulatory measures effectively to control air pollution. Stationary sources are controlled by national emission standards and licences that require the use of the best available technology. Individual licences may be more stringent than national standards should this be necessary to protect the local environment. Regulation of the sulphur content of fuel has been strengthened step by step. Austria has been a front runner in Europe in reducing emissions from motor vehicles. Unleaded gasoline was introduced in the mid-1980s, and from 1986, new emission standards meant that three-way catalytic converters had to be fitted on new gasoline-fuelled cars.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its May 1995 meeting.

In contrast to the downward trends of national emissions, the deposition of sulphates and nitrates has not diminished. Due to large transboundary influxes of these pollutants, accounting, *inter alia*, for 95 per cent of total sulphur deposition, critical loads of acidity were exceeded by as much as ten times in the most sensitive areas. Ground-level ozone is the most serious ambient air quality problem. As transport accounts for a large part of atmospheric emissions ($NO_x$, VOCs and $CO_2$), with the sector growing rapidly, the need for a more comprehensive and environmentally sensitive transport policy is urgent. Integration of environmental measures in sectoral policies such as energy and agriculture is also important.

It is therefore recommended that consideration be given to the following proposals:

— fully implement the measures already developed, and consider a broader range of instruments, including economic instruments, to reduce $CO_2$, $NO_x$ and VOC emissions;
— continue to pursue effective co-ordination among federal ministries on matters concerning emission regulations and enforcement, as well as among the federal, provincial and local levels of government;
— develop and implement a more comprehensive and environmentally sensitive transport policy, with measures to reduce vehicle emissions and to contain road traffic, including rail infrastructure development and integrated land use planning;
— promote the integration of air pollution concerns in energy and agricultural policies;
— extend the monitoring of hazardous air pollution and take appropriate remedial measures where required.

***Water***

The clean-up of many Alpine lakes, started in the early 1970s, constitutes a major Austrian success. Good progress has also been made towards the overall objective of reaching at least class II biological water quality in all Austrian rivers, although there is still some way to go. Since the 1990 amendment of the 1959 Water Act, greater attention has been paid to an integrated ecosystem approach. Good results are being achieved in restoring river ecosystems affected by hydraulic engineering works, but future hydro development could further diminish the country's stock of rivers with a natural flow regime. Water conservation efforts (elimination of leaks, use of the price mechanism) have effectively curbed demand. Very strict effluent standards are being imposed and the operational standard of both municipal and industrial waste water treatment plants is high. Compliance with the conditions of waste water permits appears very satisfactory as a result of an effective enforcement system.

The proportion of households connected to biological treatment plants is now about 70 per cent, while the maximum potential connection rate is estimated at 85 per cent. Significant investment is planned to achieve this goal, as well as to raise treatment standards of existing plants. Nutrients are no longer a major problem in Austrian rivers, but some emerging pollution problems, such as diffuse emissions from agriculture, require attention before they become worse. Further progress with the reduction of industrial discharges is likely to require greater use of cleaner production methods. While the regulatory approach has thus far been successful and will continue to play an important role, it would be desirable to employ additional instruments when and where they are likely to lead to more cost-effective solutions.

It is therefore recommended that consideration be given to the following proposals:

— further promote cleaner production methods in industry to achieve further reductions of polluting discharges; use a mix of measures, including economic instruments, to achieve this;
— direct further investments in municipal waste water treatment where they will be most cost-effective, for example by extending sewerage and waste water treatment services to communities not yet served;
— take further measures to reduce diffuse discharges from agriculture;
— give special attention to maintaining the quality of water bodies and aquatic ecosystems that are still close to their natural state, for instance in connection with hydraulic engineering activities; provide protection for remaining wetlands through physical planning and other instruments;
— strengthen policies to reduce the exposure of settlements to floods and landslides, and ensure that disaster damage compensation policies are consistent with them.

***Waste***

The 1990 Waste Management Act clearly established the "waste hierarchy" as the guiding principle for a waste management policy; the act mainly uses regulatory but also some economic instruments (e.g. deposit-refund systems) and voluntary agreements. Waste minimisation is promoted through waste prevention (e.g. waste licence requirements for industrial plants) and recycling. The recycling rate for paper is very high compared with other OECD countries; the separate collection of recyclable material and biogenic waste is well developed at the local level; several take-back obligations are being implemented to recover hazardous materials; and the Packaging Ordinance encourages recycling and will also lead to increased waste prevention.

With a broader definition of hazardous waste and the adoption and implementation of new regulations, the federal and provincial governments have significantly strengthened control of hazardous waste since 1991. Austria ratified the Basel Convention in 1993, but relevant regulations on waste export and import had already been implemented in 1991. For each export, the Federal Ministry for the Environment assesses the adequacy of the disposal measures in the importing country, and requires a financial guarantee to ensure alternative disposal in case the original plan is not carried out. The export and import of non-hazardous waste is also subject to licensing.

In spite of recent progress towards the waste hierarchy principles of the Waste Management Act, further achievements in waste management in Austria should be expected. Municipal waste generation is still high compared with a number of OECD countries. Waste management still focuses on regulating what is generated; attention should be given by all sectors of society to implementing measures to reduce the generation of waste.

It is therefore recommended that consideration be given to the following proposals:

— ensure further effective implementation of recent policies;
— develop production patterns and recycling practices that meet the Packaging Ordinance at the least environmental and economic cost;
— facilitate waste minimisation in the industrial sector; extend the use of plans for specific waste streams;
— improve waste treatment and disposal measures;
— ensure that there is appropriate treatment and disposal capacity for most hazardous waste in Austria.

## 2. Integrating Environmental and Economic Decisions

It is reasonable to state that the achievements described above, while effective, have not been reached at the lowest cost. Current approaches, largely based on regulations and best technology, may have to be streamlined and supplemented by efforts to integrate environmental and economic decisions. That way, further progress can be made on environmental problems that are already well under control, and remaining, more intractable ones can be addressed. Among the compelling reasons for modification are: i) the rising marginal costs of pollution abatement as treatment levels increase; ii) current budget deficits and public debt; and iii) the concern with exposure of the Austrian economy to international competition.

***Further improving cost-effectiveness***

Austria probably needs to reconsider its environmental legislation as a whole in order to streamline the content, reinforce the integrated approach and better allocate tasks among the various ministries and levels of government. This effort may require time, but would seem imperative if Austria wishes to pursue sustainable development in its legislation and policies. In the process, efforts should be made to reduce administrative complexities and increase cost-effectiveness of environmental measures. Goals for coming years might be the proper implementation of the National Environmental Plan and an improved permitting procedure.

Much of the public expenditure for the environment is still financed by the taxpayer rather than directly by the polluter or user. In line with the polluter pays principle, greater use of economic instruments with less subsidy for environmentally disruptive activities would help alleviate the budget burden, while improving cost-effectiveness and promoting the use of cleaner technology. Such moves might be supported by a shift from tax on labour to tax on natural resources, as well as a greater use of voluntary agreements and economic expertise in an administration that is still very much regulatory minded. The environmental and economic effects of industrial projects, economic policies, land use plans or regulations should be assessed in all relevant cases.

Austria has begun to change its traditional approach on pollution control to a more integrated approach involving all ministries, all levels of government and the many economic sectors. Consideration is being given to the integration of environmental and fiscal policies. Very ambitious environmental targets have been set for air pollutants, although it is not clear whether they will all be met in time. The expected adoption of the National Environmental Plan should help launch a new generation of environmental management.

It is recommended that further consideration be given to the following proposals:

- rationalise and simplify environmental legislation; take steps to simplify permitting procedures for industrial projects;
- proceed with the National Environmental Plan and strengthen co-ordination of environmental policies among various ministries and levels of government;
- review development subsidies for possible environmentally detrimental effects, to promote more sustainable production and consumption patterns;
- introduce new economic instruments, e.g. to control waste water discharges by industry;
- make further efforts at international level to harmonise pricing of road transport at full cost, to reflect environmental and other physical and social effects;
- adopt legislation on environmental liability in support of the polluter pays principle;
- make wider use of voluntary agreements, and publicise the commitments as well as the achievements under these agreements;
- launch special measures to promote environmental protection activities in small and medium-sized enterprises.

***Sectoral integration: energy***

Austria's energy policies have achieved good environmental results. Energy intensity per unit of GDP has been decreasing for most of the last 20 years, and is significantly lower than the average for OECD Europe. More than one-quarter of total primary energy supply consists of renewable resources (mostly hydro and biomass). Industrial combined heat and power plants are increasingly being built, although there is still much scope for further improvement (e.g. in the pulp and paper industry). The federal and provincial governments are continuing to strengthen the thermal insulation standards of buildings. About 8 per cent of the housing stock is connected to district heating systems, especially in Vienna, which has developed a large network; and the use of biomass as an energy source for district heating has grown considerably. Air pollutant emissions from energy use have been reduced significantly.

So far, energy efficiency improvements and the use of alternative forms of energy have been promoted mainly through subsidies. There has been some use of economic instruments in recent years (e.g. a progressive electricity tariff for domestic users in Vienna), but the incentive effects are still limited. Austria's target of reducing $CO_2$ emissions by 20 per cent over the period 1988-2005, from an already low level, will be difficult to reach. It will thus be necessary to develop aggressive, cost-effective programmes, and to implement them with determination. Further co-ordination of energy policies between the federal and provincial administrations will be needed. Economic instruments, including tax measures to internalise environmental costs, would be important in the strategy to provide incentives to all parties and promote cost-effective measures.

It is therefore recommended that consideration be given to the following proposals:

- strengthen energy efficiency measures in all sectors, including industry;
- consider an appropriate mix of instruments, including economic instruments (such as taxes and charges), demand-side management, regulations, voluntary agreements and information;
- strengthen the implementation of the comprehensive programme to reduce $CO_2$ emissions at federal and provincial levels as rapidly as possible; introduce an energy or $CO_2$ tax, taking account of policies adopted at EU level;
- continue to promote district heating and the use of biomass while giving attention to cost-effectiveness;
- further integrate energy and water management policies and carefully balance the need for further hydropower projects with other environmental objectives;
- develop public participation in relation to environmental impact assessment for energy projects.

***Sectoral integration: tourism***

Tourism is a major sector of the Austrian economy (15 per cent of GDP, 30 per cent with all associated activities; 18 per cent of all export receipts). The importance of the environment for tourism in Austria is reflected in many strategies within tourism policy, by government entities as well as by the private sector. For about 15 years, Austria has shown continuous progress in making its tourism sector more environmentally friendly. A wide range of measures has been adopted to move from quantitative growth to qualitative growth in the tourism industry. This was facilitated by the fact that environmental quality is a major sales factor for Austrian tourism. The measures relate to, *inter alia*, the management of tourism-related traffic, eco-labelling, "green" villages, land use, codes of practice and the rapid expansion of protected areas. In many respects (e.g. water quality improvement), progress has been sustained and very impressive. Agriculture may be detrimental to the environment if farming practices reflect only individual economic needs of producers. On the other hand, sustainable farming methods contribute positively to tourism development, for example by maintaining settlements in remote areas and protecting landscape and amenities, especially in mountain areas.

These achievements notwithstanding, improvements are still possible. For example, while some individual studies have been made, there is still insufficient information on the overall contribution of tourism to environmental pressures, the environmental expenditure of the tourism industry and other economic factors. Availability and provision of information on tourism and the environment vary by province: a multitude of definitions is used, for example with respect to nature protection. The Austrian Conference on Regional Planning provides the general framework and guidance for territorial development in all sectors. With Austria's accession to the European Union, institutional mechanisms to manage territorial development and planning might have to be strengthened. Spatial planning by provinces is yet incomplete but has gained pace in recent years, triggered by the entry of Austria into the European Union. Even where spatial master plans exist, their coherent translation into municipal land use plans has not always been visible. Little progress has been noted concerning tourism-related traffic, in particular long-distance traffic. Most tourism/environment policy measures have been regulatory, and substantial scope for the use of economic instruments remains.

It is therefore recommended that consideration be given to the following proposals:

- rapidly move towards the early implementation of the tourism measures in the National Environmental Plan when it is adopted;
- continue efforts to influence tourism demand patterns and to reduce the temporal and spatial concentration of the demand for tourism services;
- strengthen institutions and efforts for comprehensive and coherent territorial planning and land use planning, including implementation of the guidelines on sustainable territorial development at local level;
- consider increased use of economic instruments for reducing further the environmental impact of tourism;
- continue efforts to contain the negative effects of tourist transport and develop regional traffic concepts for the improved co-ordination of public transport;
- improve the information base on tourism and environment, working towards greater harmonisation of definitions (e.g. for biotope mapping) and management criteria across provinces, in particular in the field of nature protection;
- develop an overall plan for national parks in Austria, and continue efforts to create more national parks and increase the level of protection in protected areas.

## 3. International Co-operation

Austria is particularly concerned by international issues because of its situation in the middle of Europe and its exposure to transfrontier pollution as well as to transfrontier freight traffic. Before joining the European Union, Austria integrated EU environmental law into its legal system.

***Achievements***

Austrian policy to promote international co-operation in the environmental field over the last 25 years has been very successful. Bilateral relations were developed with eastern neighbours and, very early, with western neighbours. This co-operation has led to the exchange of information, further pollution abatement, bilateral land use planning commissions, binational parks, etc. Co-operation with the east has been supported by financial means, in particular the East-Ecofund.

Austria has succeeded in reducing its own contributions to transfrontier water pollution (e.g. in the Danube, Mur and Drau rivers), and also air pollution, while encouraging, pressing and assisting other European countries to do likewise. Austria has given great importance to the control of transit freight traffic by road, and has been able to achieve international agreement on this issue (which incorporates innovative instruments such as "eco-points"). It has also established an extensive network for mutual information in case of nuclear accident; and it has taken strict measures to control hazardous waste export to OECD Member countries and to avoid the export of hazardous waste to non-Member countries. Austria has also exercised leadership concerning the international legal regime to protect the ozone layer, and has met all its commitments ahead of schedule. It adopted ambitious national targets for $CO_2$ and a series of measures that, if rapidly enforced, would make it possible to stabilise $CO_2$ emissions at 1990 levels by 2000. Austria has taken many initiatives to strengthen international environmental law and was successful in its support for dispute avoidance and settlement mechanisms.

***Areas for progress***

Although the achievements are, again, very impressive, Austria may find it difficult to reach some of the objectives of its international environmental policy. While an agreement exists with the European Union concerning transit freight traffic, the expected growth in transit traffic appears unsustainable. Although Austria and other OECD countries have reduced their $SO_x$ emissions significantly, sulphur deposition in some areas of Austria is essentially unchanged. Little progress has been made concerning the creation of a "nuclear power free area"; also, few resources have been given by Austria to increase safety of nuclear power plants in eastern countries. Concerning trade in timber products, the voluntary labelling system proposed by the Austrian Government is not yet operational.

It is therefore recommended that consideration be given to the following proposals:

— ratify recent international environmental agreements (Annex III) and implement environmental policies promoted by the Austrian Government in international organisations and negotiations;
— adopt long-term plans to cope with unsustainable growth in transit freight traffic and stimulate the financing of appropriate transit infrastructure at a European level;
— finalise and implement as soon as possible protocols to the Alpine convention;
— strengthen co-operation with Danubian countries on water pollution, notably by establishing the permanent secretariat and by providing adequate funding for pollution control activities in the whole Danube basin;
— continue efforts to prevent existing CFCs in functioning second-hand appliances from being exported;
— pursue vigorously reductions in emissions of $CO_2$ and other greenhouse gases, in collaboration with other EU countries;
— give greater attention to environmental issues in development aid programmes, in particular by performing full environmental impact assessments in all appropriate cases and by providing financial resources in line with Austrian commitments at international level;
— continue efforts towards the development and adoption of international environmental law at the European level and, whenever possible, at global level; in particular, consider further development of international regimes for liability and compensation for environmental damage;
— provide more information at international level on achievements concerning environmental protection in Austria.

# BELGIUM

## CONCLUSIONS AND RECOMMENDATIONS*

In a country as densely populated and as developed as Belgium, the environment is exposed to intense pressures from human activities: as much as one-fourth of the territory consists of built-up areas and very dense networks of roads, railways and navigation canals; industry and very intensive animal breeding and crop cultivation impose further pressures on air, soil, water resources and nature. Under such conditions the challenge of making development economically, socially and environmentally sustainable is particularly acute.

In the two decades leading up to 1993, Belgium went through a series of institutional reforms which transformed the country into a federal state made up of three regions and three communities. The uncertainty associated with this long period of change may partly explain why Belgium has not made the same environmental progress as a number of other OECD Member countries. Since environmental responsibilities were clearly defined, however, much work has been carried out to create coherent environmental management frameworks and accelerate efforts to reduce the pollution burden.

In order to catch up on the backlog, the challenge is to: i) achieve and maintain a high level of effort to implement new environmental policies and strengthen environmental infrastructure; ii) further integrate environmental concerns in economic decisions; and iii) meet international environmental commitments.

This OECD report establishes a baseline for assessing future environmental progress and examines Belgium's environmental performance, i.e. the extent to which Belgium's domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to strengthening environmental performance in Belgium.

### 1. Implementing Environmental Policies

#### *Environmental reforms*

The results of past environmental management, as evidenced by the current state of the Belgian environment, must be qualified as uneven: whereas air quality on the whole is satisfactory and waste management is generally up-to-date, the state of nature and of many water resources is worrisome. A major effort has begun and will need to be sustained to repay the outstanding environmental debt.

A major institutional reform has been implemented, and as a result a modern environmental legislative framework is in place, and the federal and regional administrations are now fully exercising their environmental responsibilities. Federal authorities have important competencies in fiscal policies (e.g. ecotaxes), product standards, radiation protection, trade and international matters, and sustainable development issues (e.g. transport). Well-organised regional environmental administrations have adopted and are implementing advanced environmental policies reflecting different physical and socio-economic conditions. Flanders and Wallonia have adopted comprehensive environmental policy plans based on the pressure-state-response framework and state of the environment reports and covering the major economic sectors and key environmental themes. In the next stage more attention should be given to enhancing the cost-effectiveness of environmental policies in terms of the mix of instruments used for their implementation, the financing of environmental expenditure and further co-ordination among administrations.

A regulatory reform is proceeding. Positive steps have been taken to streamline permit procedures. A single permit approach has been instituted and associated with environmental impact assessment and industrial risk reporting for some large industrial installations. Inspection and enforcement of environmental policies are performed by federal or regional authorities. Courts are giving greater attention to environmental crimes. Belgium has also made good progress in introducing many economic instruments and in increasing the rates of taxes and charges on pollution and water abstraction. The use of ecotaxes to change consumption patterns is a very positive initiative which, however, has met many difficulties in implementation. Financial guarantees have been introduced for solid waste management and to strengthen the liability regime. A number of voluntary agreements are in use and

* Conclusions and Recommendations approved by the Group on Environmental Performance at its June 1998 meeting.

co-operation between administrations and industry is improving. Pollutant release and transfer registers and mandatory environmental reporting are being progressively implemented. Eco-advice is provided to small or medium-sized cities and enterprises. Although environmental data availability and co-ordination have improved, further development and harmonisation across the country of environmental monitoring, indicators and environment-related or "environmentally related" economic information are needed. More goal and performance-oriented environmental management is needed.

In Belgium, expenditure on pollution abatement and control now amounts to about 1.1 per cent of GDP. The financing of public environmental expenditure by environmental taxes and charges has progressed significantly in recent years. Nevertheless, Belgium faces the need to increase expenditure on environment if it wants to meet its domestic objectives as well as its EU and other international environmental commitments. This need partly arises from the limited environmental infrastructure to date (e.g. waste water treatment plants, solid waste disposal and treatment facilities) and, until recently, the limited attention given to nature conservation.

In the Belgian and EU contexts, harmonisation of environmental policies in the three regions is progressing and should help bring about a level playing field for industry. However, improved co-ordination within the federal administration, between federal and regional administrations, and within each regional administration will require further time and effort and political will. In the area of environmental laws and regulations, codification should be continued so as to produce a more coherent legal framework, delineate competencies more clearly, avoid overlaps, and clarify the obligations of all parties, whether public bodies or private entities.

It is therefore recommended that consideration be given to the following proposals:

- further increase efforts to improve environmental performance in each region, reach national objectives and satisfy international commitments;
- extend the single permit system, with appropriate co-ordination of the authorities concerned;
- strengthen environment inspectorates and the effectiveness of enforcement procedures;
- increase the rates of pollution taxes and charges so as to finance environmental infrastructure in line with the polluter-pays and user-pays principles;
- continue to monitor the state of the environment and collect environmental data from government and private sources within harmonised frameworks providing comparability across the country and including data on expenditure;
- codify environmental laws to improve their clarity and implementation;
- improve co-ordination between administrations dealing with environmental issues, with a view to increasing cost-effectiveness in policy-making and implementation;
- improve information exchange between regional environmental administrations in order to learn from each other's experience, co-ordinate actions and deal more effectively with common problems or problems arising along regional borders.

***Air***

Overall, good results have been achieved concerning air quality. Most of Belgium's air management objectives derive from various international commitments. Ambient air quality standards are generally satisfied. Since the mid-1980s Belgium has achieved a gradual and significant decoupling of $SO_x$ and $NO_x$ emissions from economic growth due to energy efficiency gains, a switch towards cleaner fuels and nuclear energy, and pollution control measures. Air quality and emission controls have been placed in a coherent management framework through the adoption of regional environmental planning. Monitoring has been improved, emission inventories established and public access to data guaranteed. Inspection and enforcement systems have been strengthened in all three regions. Emissions to air of heavy metals and toxic substances have been reduced significantly and 1999 targets have already been met for some substances (e.g. arsenic, carbon tetrachloride). The objectives of a 1991 voluntary agreement with the Belgian electricity industry were met ahead of schedule with emission reductions, compared to 1980, of almost 80 per cent for $SO_x$ and 42 per cent for $NO_x$.

Yet there are still a number of air quality problems. Concentrations of particulate matter in urban areas reflect the increasing traffic of diesel-fuelled vehicles and current fuel taxation favouring the use of diesel fuel over petrol. The share of ammonia in acidifying emissions is 29 per cent in Flanders, about as large as that of $NO_x$, but the problem has not yet been seriously addressed. Summer ozone is a problem in the most densely populated areas and existing measures to reduce emissions of VOCs and several heavy metals and toxic substances will most likely not be

adequate to meet 1999 targets. Efforts to improve energy efficiency, particularly in industry, have not been sufficiently proactive. Environmental and congestion problems caused by the steep increase in road traffic will not be solved without strategic transport planning.

It is therefore recommended that consideration be given to the following proposals:

- take integrated and cost-effective measures to reduce ammonia emissions from animal husbandry;
- strengthen current efforts to reduce emissions of VOCs and some of the toxic substances included in the agreements of the North Sea Conferences;
- improve energy efficiency, taking a more proactive approach that includes setting tangible targets;
- make greater use of voluntary agreements with industry to reduce emissions and improve energy efficiency;
- give high priority to strategic transport planning including the promotion of public transport for passengers and the development of freight transport by other means than road;
- continue to develop more rational pricing and taxation of transport to help internalise its environmental costs, for instance by raising diesel fuel taxes further;
- improve emission inspections of in-use vehicles.

***Water***

In spite of its ample rainfall, on a per capita basis Belgium is poor in water resources. Pressures resulting from high population density, industry and very intensive agriculture (animal husbandry and crop cultivation) are correspondingly high. The country is now making a determined management effort to make good the neglect of the past. Its activities are partly driven by EU and other international obligations (North Sea Conferences, OSPAR, Scheldt and Meuse rivers). Much work has been done in recent years to create a coherent water management framework of legislation, institutions, policies and plans. New water pricing and waste water charge and tax systems have been in place since the early 1990s to help finance the investments being made in new sewers and waste water treatment plants. Industrial pollution discharges have been reduced. The 1995 interim North Sea Conference targets for reducing discharges of heavy metals and micropollutants have been partially met.

Although the situation is more favourable in the less densely populated areas, surface water quality in heavily developed areas has remained poor. Aquatic biotopes are impoverished, with a shift from long-lived to short-lived fish species and a loss of diversity among vegetation living at the water's edge. It will be necessary to keep up a large financial effort for quite some time if surface and groundwater quality is to be restored and aquatic ecosystems brought back to health across the country. The level of urban waste water treatment, at 28 per cent, is among the lowest in the OECD and the deadlines of the corresponding EU directive will not be met. Only limited headway has been made in containing the heavy pressures from intensive agriculture; objectives relating to discharges of nitrogen from manure and chemical fertilisers, in particular, are far from being met and problems with drinking water supply, water quality and nature conservation remain. Groundwater resources are threatened by overpumping and, in agricultural areas, show high concentrations of nitrates.

It is therefore recommended that the following proposals be considered:

- strengthen water conservation efforts and reduce groundwater withdrawal by placing greater emphasis on demand management and by involving water utilities in achieving explicit objectives for efficient water use;
- further develop the system of waste water charges to better reflect the polluter-pays principle and reduce cross-subsidisation among users;
- further strengthen efforts to reduce industrial and municipal point source discharges to meet both regional and international treatment requirements, including by attracting private financial means to increase the rate of investment in sewerage and public waste water treatment plants; increase financial and technological efforts in the private sector (industry and agriculture) to reduce pollution at source;
- reduce the nitrogen load to water bodies, particularly from agriculture (commercial fertilisers and manure from intensive animal breeding);
- reduce the contamination of groundwater by pesticides;
- seek to strengthen stakeholder commitment to the integration of water and other policies; explore further integration mechanisms; build on existing approaches to integrated river basin management and formulate clear objectives in each river basin.

***Waste***

In 1974 Belgium was among the very first countries to adopt specific hazardous waste legislation, and in the mid-1980s waste management began to be tackled with determination. In the decade that followed, further federal and, in particular, regional legislation was passed and data collection was improved; agencies were created and instruments adopted, funding allocated and plans drawn up. Implementation is now in full swing and action can be reported at every stage of the waste hierarchy of prevention, recovery (i.e. reuse, recycling and energy recovery) and safe disposal. Each region is guided in its activities by a detailed multiannual waste management plan that contains many quantitative targets. In Flanders the first signs are appearing that the increase in per capita municipal waste generation, which continued until the mid-1990s, may have been curbed. Co-operation among the various administrations takes place when required. Regional administrations have successfully engaged local government in improving waste management.

Still, much work remains and progress is not uniform across the whole country. There is scope for extending waste prevention efforts. Recycling targets have been met for only some types of materials. Industrial waste management is hampered by insufficient information. Although expenditure on waste disposal has risen in the current decade, comparison with other European countries suggests the effort could be stepped up further. Siting of new landfill sites and incineration plants meets local opposition. The amounts of money so far allocated to cleaning up contaminated sites do not appear sufficient to meet long-term objectives.

It is therefore recommended that consideration be given to the following proposals:

- extend efforts to reduce waste at source; develop and implement green procurement programmes for government institutions;
- increase the rate of separate collection and encourage markets for recycled products;
- continue efforts to encourage stakeholder (e.g. citizen, industry, NGO) participation in waste management, including with respect to the siting of waste management facilities (e.g. new landfill sites, incinerators);
- examine waste charges and taxes with a view to strengthening implementation of the polluter-pays principle;
- make further efforts to improve policy-relevant information on waste generation and management, particularly concerning industrial waste;
- examine (including by taking a risk management approach) the objectives for cleaning up contaminated sites and the ways and means of meeting them.

## 2. Integrating Environmental Concerns in Economic Decisions

Environmental conditions and trends are strongly affected by changes in the major economic sectors (industry, energy, transport, agriculture). These changes therefore enhance or undermine the benefits of environmental policies. In order to move towards sustainable development and make policies as cost-effective as possible, environmental concerns must be integrated in economic and sectoral policies and programmes.

***Fostering sustainable development***

Belgium has incorporated the concept of sustainable development in its legislation and a federal plan for sustainable development is being prepared. Environmental and land use planning at regional and local levels have made progress. Sectoral plans have been drafted and initial measures have been taken. Interministerial integration is making progress. In several areas (e.g. $SO_x$, $NO_x$, use of nitrates and phosphate fertilisers) pressures on the environment have been decoupled from economic growth. Greening of government operations has just started.

However, several aspects of economic development are not yet sustainable in practice. Waste production is not yet stabilised and energy consumption is increasing; Brussels still does not have waste water treatment. Open land is disappearing and trends in biodiversity losses have not been reversed. The most troublesome aspects of economic development in Belgium are the very rapid growth in national and international road freight traffic, which is likely to continue for a number of years to come, and the very intensive animal husbandry, which generates very large quantities of nitrogen from manure. Sectoral integration is still weak and priorities seem to be given to economic growth in very traditional terms, with significant negative effects on the environment.

Belgium is committed to implementing the polluter-pays principle and the user-pays principle. Therefore, greater emphasis should be put on "getting the prices right" as an important element of a cost-effective mix of policy instruments. Internalising externalities and reducing subsidies, cross-subsidies and other forms of financial aid should help in implementing these principles more fully. Appropriate pricing (e.g. for water services and energy) and the increasing use of economic instruments should help shape more sustainable consumption patterns. This approach is consistent with the aims of reducing the public deficit and the cumulated public debt. An even greater emphasis should be given to the greening of fiscal measures.

Physical planning is now carried out more rigorously, but land use remains affected by urban sprawl and very dense transport networks. Land use planning instruments and the use of EIA should play an important role in the environmental management of the country. However, in many cases environmental concerns have not been part of local physical planning decisions, which have mostly had a traditional economic development bias.

It is therefore recommended that consideration be given to the following proposals:

- work with all government levels concerned towards coherence of sustainable development policies between the regional environmental plans and the Federal Plan for Sustainable Development; consult social partners and other stakeholders in this process; give high visibility to progress made;
- set federal and regional quantitative targets to meet national and international commitments and specify the responsibilities of individual economic sectors;
- increase the use of economic instruments, in line with the polluter-pays principle and the user-pays principle;
- further examine fiscal measures, including budgetary constraints and taxation principles, which increase pressure on the environment, and seek to introduce a green fiscal reform in support of sustainable development policies;
- integrate environmental concerns more fully in all physical and land use planning, bearing in mind the need to protect nature and the landscape;
- increase the effectiveness of EIA procedures in the granting of licences;
- make greater use of "green" procurement methods and encourage more environmentally friendly operation of public buildings;
- integrate environmental policies more closely with transport and agriculture policies so as to achieve more sustainable development;
- continue to stimulate changes in consumption patterns through appropriate pricing and provision of information on products and services.

***Integrated management of natural areas and forest ecosystems***

Human activities have fundamentally modified nature in most parts of Belgium, so that remaining "natural areas" are in fact semi-natural. Competing claims for remaining open space make it difficult for nature to retain a foothold. Having been inadequate in the past, planning efforts to halt and reverse the decline of nature are now being stepped up: in recent years environmental strategies, including biodiversity and sustainable forestry objectives, have been adopted and are being implemented. Regional nature conservation plans are in preparation in the three regions, and many municipalities are beginning to implement the local nature development plans they recently adopted. Plans for ecological networks covering the entire country have been worked out, are to be incorporated in local land use plans, and have the ambition to create new habitats. Twenty per cent of Belgian territory is still covered by forests, and forestry is a significant economic activity in the south-east of the country; forests have long been managed for sustained yield and the standing stock continues to increase. New sustainable forestry management practices are now being implemented with respect to publicly-owned forests and aim to reconcile the ecological, social and economic functions of these important ecosystems.

According to available evidence, past trends of habitat degradation and loss of biodiversity have not been reversed, although there are indicators of recovery. Financial efforts for nature protection have not been commensurate with the intense pressures on nature from urbanisation, transport and agriculture. Much that remains of great natural value is under threat from new development. Legal instruments to protect sensitive areas have been in place for 25 years, but the area protected remains small, fragmented and unrepresentative of the main ecosystem types: scarcely 2.6 per cent of the national territory is protected in terms of IUCN classification. Outside forests and protected areas there is little space for wild nature. Partly due to the absence of a long tradition of land use planning, settlement patterns have become very scattered and the land is extremely fragmented by the dense networks of

transport infrastructure. Despite the measures taken, little progress has so far been made in containing the strong pressures exerted by intensive cropping and animal husbandry on aquatic and terrestrial ecosystems. Further, 80 per cent of wetlands have been lost, and coastal waters are threatened by eutrophication. Public support for nature conservation needs to be encouraged in order to build a strong local constituency for implementation of the plans for ecological networks. Policy instruments that encourage private land owners to protect nature and biodiversity on their properties need to be further developed.

It is therefore recommended that the following proposals be considered:

- give higher priority to nature conservation;
- urgently complete and implement specific nature protection plans and biodiversity strategies, including measurable objectives and deadlines;
- expand protected areas on the basis of a strategic overview of sites of high ecological value; make protected areas more representative, e.g. by protecting permanent grasslands;
- enhance the protection of ecological values outside protected areas and forests;
- strongly implement the provisions for ecological networks at the local level through land use planning procedures;
- devise economic and other instruments to encourage farmers and other private owners to protect nature on their property (including forested land, small landscape elements);
- continue raising the nature awareness of the public and of local bodies;
- further pursue the efforts already begun to improve the knowledge base with respect to biodiversity and nature conservation;
- continue to implement sustainable forestry management on the basis of already accumulated experience, with due regard to the economic, ecological and social functions of forest resources;
- adopt and implement proposed legislation aiming to protect marine species and habitat.

***Sectoral integration: the chemical industry***

The chemical industry is one of the most important and most rapidly growing industrial sectors in Belgium. It is largely dominated by investment on the part of multinational enterprises and most of its products are for export and most installations are located in Flanders. As a result of strict laws and regulations and from a genuine commitment to environmental protection, the chemical industry has considerably reduced its emissions of the main pollutants to air and water and its production of waste, while its energy consumption and waste per unit of output have also decreased. In spite of large environmental investments, the chemical industry is growing steadily and its competitivity has not been affected. Regulation of the industry is based on licensing of installations, use of EIA, reporting requirements, and close supervision by public authorities. Information to the public is extensive and public participation in the licensing process is well-organised. The number of chemical accidents has decreased significantly. The liability regime has been strengthened. Many voluntary agreements have been adopted. The industry has promoted a responsible approach to environmental protection and has convinced its members to implement it. The industry pays environmental taxes based on the use of resources and on the externalities produced, which contribute to finance pollution control programmes. In addition, it pays administrative fees which finance control activities by public authorities. High risk facilities are under close scrutiny and physical planning measures are implemented to protect the surrounding population. Special financial measures are taken to cover the cost of remediation of disposal sites containing toxic waste.

Concerning chemical products management, progress has been made towards full implementation of EU directives and regulations. Consumption of pesticides grew in the 1980s and has stabilised in the 1990s at a level higher than the EU average. Strict regulations to protect workers exposed to pesticides have been implemented. A few ecotaxes on pesticides are in place and new ecotaxes on chemicals are being developed.

Although the results achieved in the chemical industry are striking, there are still problems which need to be addressed. This industry consumes more water and emits more $NO_x$ and $CO_2$ than ever before. There is a lack of clear targets to be met in each region so as to achieve overall sustainable development and meet the country's international environmental commitments. The division of responsibilities with respect to chemicals and effluents is a source of delays and difficulties in the chemical industry as a whole. Lack of uniformity in rules applying to the industry inside Belgium is a source of discrepancies in environmental expenditure. Inspectorates could be

strengthened so as to better control toxic substances. The adoption of a new framework law on product standards could help Belgium transpose EU directives more rapidly and exercise better supervision in this area.

It is recommended that consideration be given to the following proposals:

- seek greater harmonisation of environmental constraints on the chemical industry in the different regions, in order to provide a level playing field while increasing environmental protection throughout the country;
- increase co-operation between industry and public authorities so as to provide mutually comparable country-wide data on pollutant emissions, waste inventories, stocks of hazardous materials, and sales, imports and exports of hazardous products;
- set up regional objectives for emissions by the chemical industry and specify goals for achieving zero emissions;
- improve the administrative framework for the control of chemical products in order to improve co-ordination between public authorities, and streamline procedures for transposing EU directives;
- seek reduction of the use of pesticides;
- adopt and implement the draft framework law on product standards;
- reorganise and strengthen the inspectorate for monitoring compliance with regulations on the marketing of chemical products and ensure coherence with regional environmental inspectorates.

## 3. Meeting International Environmental Commitments

Belgium has always promoted international co-operation on environmental issues, but during the transition phase greater attention has been paid to domestic institutional issues than to new international initiatives and commitments. Belgium has a very open economy and seeks internationally agreed rules to protect the environment at the domestic and international levels and to avoid distortion in international trade.

Belgium is exposed to transfrontier pollution originating in neighbouring countries and is also a source of transfrontier pollution. It has carried out a successful programme of bilateral co-operation on local issues and has finally agreed to a system of international agreements to solve issues related to the quality and quantity of the waters of the Scheldt and the Meuse. The quality of the Scheldt and the Meuse has already improved. Releases of several pollutants to the North Sea have been reduced in line with agreed targets. Disposal and incineration of hazardous waste at sea have been banned. Emissions of $SO_x$ have been drastically reduced. An ambitious target for $CO_2$ emissions in 2000 was adopted and a plan to achieve it was developed. Owing to the use of voluntary agreements, consumption of ozone-depleting substances was reduced ahead of schedule. With respect to the Biodiversity Convention, Belgium created one of the first Internet sites containing most of the biodiversity data available in the country. Belgium also supports sustainable development activities at the federal and regional levels. It is promoting international legal instruments to protect the environment through commonly agreed rules.

While Belgium has made very significant progress over the last ten years, there are nevertheless areas where greater efforts would be needed to meet its EU and other international commitments. Implementation of all EU directives, in particular those concerning nitrates and urban waste water, is a major challenge in both political and financial terms. Phasing out priority hazardous substances and meeting the North Sea targets for all such substances will require greater efforts. Concerning marine pollution, many agreements still need to be ratified in order to protect Belgian interests and promote better emergency preparedness. Road traffic in Belgium is growing at a greater pace than GDP, leading to increases in $NO_x$ emissions. Concerning climate change, actions to reduce $CO_2$ emissions are limited and are not adequately supported by social partners; the stabilisation target set for 2000 will not be reached, as many of the measures foreseen have been implemented partially and with some delay; a new, more realistic programme to reduce GHG emissions needs to be prepared in order to encompass all GHG gases and implement commitments made at Kyoto. Aid to developing countries should have increased, but has actually decreased; environmental aid is quite limited and there is little environmental assessment of aid projects.

It is recommended that consideration be given to the following proposals:

- seek early ratification and implementation of recent international environmental agreements (Annex III);
- further streamline the process of co-ordinating work on international issues and achieve a greater sharing of tasks among the many administrations concerned in order to avoid unnecessary duplication of international activities;

- provide financial means for international co-operation to reflect the priority given to this matter;

*Bilateral and regional issues*

- further develop modalities with neighbouring countries to address environmental issues in border areas (e.g. EIA and hazardous facilities);
- develop closer co-operation in the management of the Scheldt and Meuse basins;
- pay greater attention to issues related to $NO_x$ emissions to air and take measures to alleviate the environmental effects of rapid growth in transport activities;
- continue the programmes aimed at reducing pollutant releases to the North Sea by increasing domestic waste water treatment and reducing agricultural run-off;

*Global issues*

- implement within the EU context realistic and effective greenhouse gas reduction programmes with quantified targets at national and regional levels, provide the means to achieve these targets, and adopt related mandatory measures at all levels;
- take concrete measures to monitor illegal traffic in existing CFCs and movements of hazardous waste more closely;
- develop and implement national, regional and local plans for sustainable development;
- develop suitable legal instruments to implement the principles included in the Rio Declaration in areas such as liability and greater use of EIA;
- increase environmental protection activities in the framework of official development aid.

# CANADA

## CONCLUSIONS AND RECOMMENDATIONS*

Canada's early economic development was built on a wealth and diversity of natural resources. Today, its natural resource based and open economy must face sustainability issues, such as the depletion of some stocks of its renewable resources and loss of biodiversity. Because of the country's vast size and low population density, pollution did not become a national concern until the latter part of this century. Over the last two decades, pollution of the Great Lakes, acid deposition, urban smog, toxic contamination of soil and groundwater, waste management, land use and consumption patterns have emerged as issues of political significance.

Environmental issues in the late 1980s and early 1990s were high on the agenda of Canadian governments at all levels, the provincial ones having particularly important responsibilities over pollution issues and natural resources. There was significant public concern about pollution issues and the sustainable use of natural resources. There was also increasing recognition by the private sector of the relevance to its own future prosperity of combining economic development with sustainable use of resources. As a result progress has been made, and the concept of sustainable development now figures prominently in Canadian governments' policies and is well accepted by all major stakeholders.

On its way towards sustainable development, Canada faces three challenges: difficulties in translating the concept into practical changes in economic decisions and practices and in economic signals; consumption and production patterns, which are often intensive in their use of natural resources; and increased concerns regarding the economy, employment and public deficits, which tend to reduce the prominence of environmental matters.

This OECD report sets out the baseline for assessing future environmental progress and examines the environmental performance of Canada in four major areas:

i) reducing the pollution burden;
ii) managing natural resources;
iii) integrating environmental and economic decision making;
iv) international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This assessment includes both domestic objectives and international commitments. It is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in Canada.

### 1. Reducing the Pollution Burden

The Canadian approach to pollution abatement and waste management involves a balance of consensus building, stakeholder participation, voluntary agreements, regulatory mechanisms and a focus on specific ecosystems. It may seem complex, costly and full of potential for free riding behaviour. Nevertheless, it is well adapted to the Canadian situation because: i) an adversarial approach would probably be more costly; ii) the constitutional situation encourages co-ordinated effort among governments; and iii) the scale of the country means that broad national strategies inevitably have to be tailored to specific regional conditions. It is also recognised in Canada that the credibility of the "voluntary/negotiated" approach requires transparent negotiations among polluters and stakeholders, periodic monitoring and public dissemination of results.

Considerable efforts are being made in Canada to fundamentally review the environmental regime and arrive at a better definition of roles and responsibilities within the current jurisdictional arrangements. The mosaic of legislative and regulatory instruments is progressively being streamlined through, for instance, the harmonisation work of the Canadian Council of Ministers of the Environment (CCME) and agreements between the Federal Government and some provincial governments. Progress on enforcement and compliance was made in the late 1980s and early 1990s and permit procedures are being simplified.

Economic pressures also play a role in encouraging environmentally sound production and consumption patterns. Examples are when banks and insurance companies assess whether their clients are acting in an

* Conclusions and Recommendations approved by the Group on Environmental Performance at its May 1995 meeting.

environmentally sound manner, when mutual funds avoid acquiring shares that are not environmentally "clean" and when buyers of Canadian commodities insist on these commodities being produced in line with good environmental practices and regulations.

***Water***

Water quantity and quality are adequate for most purposes. Extreme drought and floods are limited and serious pollution is confined to a few water systems. Considerable progress has been made in reducing some of the most serious pollution problems, especially in the areas of toxic chemicals and phosphorus loadings. Key manufacturing industries, such as pulp and paper, refining and aluminum, have significantly reduced their water pollution loadings in recent years.

However, new toxic chemicals continue to challenge the ingenuity of pollution control authorities; and assigning responsibility for non-point sources to individual polluters remains difficult. Pollution problems are often "going underground" even as more Canadians come to rely on groundwater sources. Drought and flood control programmes, though successful, can create a false sense of security, and those who benefit from them bear few of their costs. Environmental decisions should better recognise economic realities and the potential for progress towards more cost-effective management of water resources.

It is recommended that consideration be given to the following proposals:

— reduce the impact of agricultural activity on water quality, with special attention to nitrogen and phosphorus compounds, pesticides and suspended solids. This may require redirecting some funds traditionally devoted to water quantity issues and flood control. A combination of regulatory and non-regulatory, co-operative measures, based on direct contact with farmers, is likely to be the most fruitful;
— improve recognition and understanding of the relationship between water and economic variables, with: i) better data on expenditures, prices and financing; ii) more systematic analysis of the microeconomic conditions facing key water users; and iii) better understanding of the impact of agricultural, transportation and energy policies on water management;
— undertake a systematic review of subsidies for water supply and treatment infrastructure, and of water pricing policies, aiming at cost-effectiveness and long-term financing in the maintenance and upgrading of facilities. Subsidies for flood and drought control projects should also be critically reviewed in terms of their long-term impact on risk; and moves to full-cost pricing of water should be phased in to allow users, including farmers, to adapt to the new regime;
— enlarge the role of economic instruments in managing water resources. Water metering and conservation-related price structures would both help conserve resources and finance new infrastructure. Other examples include accelerated capital cost allowances, joint ventures with industry for water technology development, cost-recovery arrangements for water research and taxes earmarked for the restoration of degraded sites.

***Waste***

Municipal waste generation in Canada is very high because of the country's rich natural resources, consumption patterns and large landfill capacity. For both solid and hazardous waste, the Federal Government adopted a 50 per cent reduction target by 2000 from 1988 levels, stressing waste prevention and recycling. As a result, the amount of solid waste sent to final disposal decreased by 6 per cent between 1988 and 1992 and the amount of packaging waste disposed of was reduced by 21 per cent in the same period. Recycling has developed rapidly, but the rates of recycling are not high for municipal waste in most provinces and for industrial and hazardous waste. Waste prevention initiatives have not yet been very effective and available data suggest an increase in solid waste generation and packaging consumption up to 1992.

Solid waste disposal relies on landfilling; the use of incineration has been limited by public opposition. New and large landfill sites meet current criteria, but most smaller sites are still rudimentary.

International and interprovincial hazardous waste movements are controlled by nationwide systems. Hazardous waste trade is almost exclusively with the United States and controlled through a 1986 bilateral agreement. Canada ratified the Basel Convention in 1992 and has not exported hazardous waste to non-OECD countries since then.

It is recommended that consideration be given to the following proposals:

- further assess the waste reduction potential in each sector and waste stream; strengthen waste prevention and further promote recycling while giving proper attention to its cost-effectiveness; develop a mix of policy instruments, including a liability framework and economic instruments, so as to attain targets more cost-effectively;
- improve the technical characteristics of smaller landfill sites and consider increased use of incineration and composting;
- strengthen hazardous waste management in most provinces and increase hazardous waste disposal capacity in Canada;
- continue efforts to establish reliable waste statistics at national, provincial and sectoral levels, so as to be able to monitor policy implementation effectively;
- consider a long-term strategy to change production and consumption patterns to increase the efficiency of natural resource use and reduce waste generation.

***Air***

A broad national framework has been established for air quality management across Canada, including national programmes such as the National Action Program on Climate Change, the Acid Rain Control Program and the $NO_x$/VOCs Management Plan. The Air Quality Accord negotiated with the United States deals with a range of air issues, starting with acid deposition. The provinces, however, remain the key implements of air management policy, and their commitment is essential for success of national programmes. The National Air Issues Coordinating Mechanism, a joint initiative of the CCME and the Council of Energy Ministers, has proved to be an effective institutional arrangement to support the national framework and provincial involvement. The entrenchment of the consultative process in environmental management has led to a partnership approach to the details of many air management programmes, and the establishment of voluntary agreements with industry. As a result of wider-ranging national air pollution efforts since the mid-1980s, Canada has reached its emission reduction targets, both national and international. Ambient air quality has improved, notably as concerns levels of $SO_x$, lead and CO.

Nevertheless, Canada remains one of the top emitters among OECD countries, per capita and per unit of GDP, for $SO_x$, $NO_x$ and $CO_2$, and there are still areas where air quality is inadequate for human health and ecosystems. $SO_2$ emissions from both Canadian and US sources continue to contribute to the problem of acid deposition in eastern Canada. Consistent breaches of national and provincial ambient air quality standards for ozone (photochemical smog) have made it necessary to adopt a national strategy (the $NO_x$/VOCs Management Plan and vehicle emission limits); but growth in vehicle use will likely offset the reductions expected from this programme. $CO_2$ emissions are expected to increase over the 1990s.

It is recommended that consideration be given to the following proposals:

- continue to assess the need for further reductions in $SO_x$ emissions to ensure the long-term protection of eastern Canadian ecosystems and, if needed, consider new action; in this connection, translate national commitments concerning reduction of $SO_x$ emissions in eastern Canada into provincial commitments and implementation;
- examine options to reduce the contribution of on-road and off-road vehicles to $NO_x$ and VOC emissions;
- consider the scope for expanding the use of economic instruments in air management, such as taxes and charges in the road transport sector and tradable emission permits for $SO_2$;
- continue to pursue improved cost-effectiveness in air management through the use of voluntary agreements and steps towards integrated pollution prevention and control;
- develop as part of the harmonisation programme a cross-jurisdictional set of performance criteria to assess the achievement of the objectives of air management programmes.

## 2. Managing Natural Resources

Canada's terrestrial and marine ecosystems and natural resources are of very great environmental and economic value for the country. Ecosystems are subject to strong pressures in the south and to lower pressures in the more sparsely inhabited areas; Atlantic marine resources are subject to stronger harvesting and environmental pressures than those of the Arctic and the Pacific. Changes in forestry practices aim at a more sustainable development of forest resources.

***Ecosystem management***

Canada has succeeded in protecting very large surface areas of representative ecosystems, ranking high among OECD countries in that respect. Its wilderness areas are vast. Major steps have been taken at both the federal and provincial levels to protect representative ecosystems. An extensive system of parks and other protected areas has been created, covering 8.9 per cent of the territory; the target is to protect 12 per cent of the territory by 2000, and every year the extent of protected area grows. The populations of many species that were in danger are improving; the percentage of threatened or endangered species is small compared with other OECD countries.

The effects of agriculture, forestry, mining, industrialisation and urbanisation on ecosystems are now better understood and many steps have been taken to correct past inappropriate practices. All stakeholders and in particular environmental NGOs are participating actively in joint efforts to protect natural resources. International agreements concerning biodiversity have been ratified and implemented. Management of marine resources in the Pacific and Arctic oceans has been largely successful.

In many cases, however, the level of protection, as provided by law, is not very extensive: many activities that disturb ecosystems in some protected areas are still permitted. Increasing the level of protection of ecosystems will require considerable effort: achieving protection of 12 per cent of the land area by 2000 is a very challenging goal considering the current area under protection; increasing the size of existing protected areas will require strong political support and additional financial means. Special attention should be devoted to protecting ecosystems in areas close to the population centres in southern Canada; further efforts in this respect will be needed on the part of provinces and municipalities, which should develop plans to prevent construction in remaining natural areas. Conservation of the ground fish resource in the Atlantic has been unsuccessful due to a combination of inappropriate fishing practices and environmental change; fishery management methods will have to be upgraded to prevent further reductions in fish stocks and to help replenish the stocks.

It is recommended that further consideration be given to the following proposals:

- continue efforts to increase the extent of protected natural areas in line with the goals set for 2000 (protection of 12 per cent of the total territory and at least 5 per cent of each eco-zone); increase the level of protection in certain protected areas by, for instance, reducing flooding, logging and mining in sensitive areas; increase the total area both designated for protection and actually protected;
- develop a network of representative marine parks or marine conservation areas;
- adopt special programmes, including the use of financial incentives, to develop natural areas in or near urban and rural settings;
- give special consideration to wildlife protection in areas where there are severe pressures from human activities;
- integrate the goals of nature protection with agricultural, forestry and mining activities, and accelerate the adoption of sustainable-use practices for biological resources in all sectors of the economy, including agriculture, fishery and forestry; ensure that development and harvesting of forests in the west and of fisheries in the east is performed in a more sustainable manner.

***Forest resources***

Forests play an essential role in Canada, both in environmental and economic terms. Canadian forests occupy 416 million hectares (10 per cent of the Earth's wooded surface area, and nearly half of Canada's surface area); they are a fundamental part of most ecosystems, form the main roots of Canadian culture and support many activities. As a resource, they yield raw materials for forestry industries, which play a major role in the Canadian economy (providing 770 000 jobs, either directly or indirectly, 50 per cent of world sawn timber exports and 56 per cent of newsprint exports).

Until the middle of this century, forests were often harvested with little regard for the environment and the conservation of the resource. There followed a phase of management of the wood resources with a view to sustainable production of timber. Since the late 1980s, Canada has taken steps to ensure the sustainable development of its forest resources, taking account of a range of productive, environmental and social values. The commitment to sustainable development appears to be high. Canada's success in moving toward sustainable development of forest resources will require continuing the translation of Canada's national forestry strategy into practices on the ground. The degree of consultation with all parties involved is particularly high.

Quantitatively, renewal of Canada's forest resources is ensured thanks to policies that have been implemented for several years. Qualitatively, current forestry practices do not appear to be causing major damage in most Canadian forests. However, maintaining healthy forest ecosystems for a range of activities and values, and the need to protect the biodiversity of unique forests and natural areas across the country, such as the rain forests of the west coast, is a major public concern and has led to conflicts between harvesting and conservation. Private enterprises such as sawmills and pulp, paper and cardboard producers have made major progress in reducing levels of biochemical oxygen demand, suspended matter and toxic substances due to discharges to water. Further, industry is working at advancing closed loop technology.

Major efforts have recently begun to translate sustainable development objectives into forestry practices in British Columbia, Quebec and other provinces. As management of the great majority of commercial forests (80 per cent of which belong to the provinces) is licensed by the provinces to private companies, adequate economic and regulatory mechanisms are needed to ensure that licence holders internalise sustainable development goals. Significant progress is being made, in particular with respect to regulatory instruments. The current favourable economic conditions, with relatively high prices for sawn timber, favour such changes in forestry practices.

It is recommended that consideration be given to the following proposals:

- expand scientific knowledge of biodiversity of forest ecosystems and its measurement; evaluate the impact of harvesting methods, sylviculture and other forestry operations on biodiversity; continue the creation of networks of protected forest ecosystems with the aim of reaching 12 per cent of the total wooded area;
- develop and apply alternative forestry methods that better integrate productive, environmental and social values as alternatives to either total protection or harvesting for a variety of forest ecosystems across Canada, including the west coast rain forests;
- translate sustainable development objectives into the actual management of provincial forests through: i) improved technical and economic clauses in some licence agreements between the provincial governments and private companies; ii) the development of instruments, particularly economic instruments, to encourage non-government parties to take account of sustainable development objectives; iii) training in new techniques for company personnel; and iv) the development of statistical, legal and human resources in the provincial administrations for orientation and monitoring of forestry management according to new forestry codes;
- continue promoting at international level the sustainable development of all forest resources, with the objectives of: i) improving responses to global climate change and biodiversity issues; ii) combating trade distortions that may arise from exploitation of forest resources in certain countries without regard to the environment and the longer term; and iii) continuing efforts for certification of forest products produced in a manner consistent with sustainable development.

## 3. Integrating Environmental and Economic Decision Making

### *Integration of environmental concerns in economic development*

Canada has made considerable progress in developing a comprehensive and indicative environmental strategy based on the principle of sustainable development. At national level, the Green Plan represented a government-wide commitment to translate the concept of sustainable development into a range of qualitative and quantitative national objectives and policy measures. Broad consultation has been instrumental in providing the consensus needed for sustainable development commitments. Provinces and territories have also taken initiatives to promote sustainable development.

Notable achievements have been made in integrating environmental considerations into economic and sectoral policies. Examples include the legislated environmental assessment process, the environmental analysis of policy proposals and legislation, and the work of the national and provincial round tables on the environment and the economy; sustainable development plans completed for sectors such as agriculture, fisheries, forestry and industry; and, more recently, the introduction of legislation in the House of Commons that will establish a Commissioner of the Environment and Sustainable Development and will require federal departments to prepare sustainable development strategies and Cabinet Ministers to introduce them in Parliament.

Nevertheless, Canada, like other OECD countries, faces difficulties in translating the concept of sustainable development into practical changes in economic decisions and practices and in the efficiency of consumption and production patterns, which remain intensive in their use of natural resources. Further advances will be dependent upon:

i) strengthening institutional integration efforts along the lines already followed by Canada and ii) ensuring that economic signals are right.

It is recommended that consideration be given to the following proposals:

*Strengthening institutional integration*

- continue systematically to implement mechanisms of interministerial consultation and decision making concerning environmental and economic policies and sustainable development;
- pursue and strengthen the development and implementation of comprehensive environmental planning through the preparation of a new federal environmental policy plan and the definition and application of clear mechanisms to harmonise national and provincial environmental objectives and to promote the thorough implementation of international environmental commitments at both federal and provincial levels, notably by specifying responsibilities of each order of government;
- ensure that environmental assessment procedures are applied effectively to relevant projects and programmes with potential environmental significance, and that procedures at all levels of government are harmonised to avoid duplication;
- ensure that municipal land use planning takes account of sustainable development objectives and more effectively contributes to pollution abatement, nature conservation and risk prevention through the adoption, for example, of land use plans based on ecological boundaries;
- continue to develop a complete and reliable system of information on the state of the environment and develop data on related economic issues (public and private expenditures, employment, sustainable development, production and consumption patterns).

*Getting economic signals right*

- strengthen economic analysis of environmental policies to complement the strong existing scientific analysis; review systematically the compatibility of present policies and practices with the polluter pays principle and the user pays principle;
- move forward with the wider use of economic instruments to prevent pollution and conserve natural resources, in association with regulatory instruments and other instruments, such as voluntary agreements, to support a more cost-effective implementation of policies; in particular, apply economic instruments more widely to water services (charges for water supply and waste water treatment, realistic pricing of irrigation water);
- assess the effects of reducing financial assistance for the provision of environmental services and the exploitation of natural resources (e.g. direct and indirect subsidies, preferential loans, tax incentives); consider increasing environmental charges to improve economic and environmental effectiveness and reduce budget deficits;
- consider the potential for and effects of eco-taxes, for example energy taxes, as part of a general or partial tax reform.

***Integration of environmental concerns in energy policy***

Canada is an energy-rich country and a major exporter of all the main energy commodities (oil, gas, coal, uranium, electricity). Shifts in its fuel mix as well as a reduction in energy intensity over the last 20 years have helped reduce the carbon intensity of the economy and lower emissions of conventional air pollutants from the energy sector.

Over the last ten years, an institutional and regulatory framework to control pollution from energy activities such as oil and gas production has been created by federal and provincial authorities. Energy industries, especially the oil industry, have made considerable efforts to reduce their pollution loadings. Efforts to develop environmental assessment procedures, with appropriate federal-provincial harmonisation, are particularly relevant to the energy sector. Institutional mechanisms have been created to ensure that full consultation is carried out for policies and decisions concerning energy and environmental issues; these mechanisms have been instrumental in reducing the scope for future conflict and moving towards a broad consensus on environmentally sustainable energy patterns.

Nevertheless, the energy intensity of Canada remains very high. Current socio-economic projections indicate that $CO_2$ emissions could be about 13 per cent higher in 2000 than in 1990. Canada began to renew its energy efficiency efforts in 1991, despite low oil prices, largely because of their environmental benefits. These initiatives are essentially "no-regrets" measures: they make good economic sense in their own right and address a range of economic and

environmental policy objectives as well as those related to climate change. However, the implementation of some new measures seems to have been slow, notably with respect to efficiency standards for appliances and vehicles.

It is recommended that consideration be given to the following proposals:

- encourage greater energy conservation by additional policy measures, using a combination of voluntary, regulatory, economic and other instruments, particularly economic instruments such as taxes and charges, to achieve environmental goals at least cost;
- price electricity to reflect marginal cost of supply so as to provide more accurate economic signals to energy users than those given by current pricing methods and to help compensate for reductions in demand-side management programmes;
- ensure that any financial assistance to energy activities does not undermine efforts to improve energy efficiency;
- ensure that national energy and environmental objectives are translated into shared commitments between federal and provincial authorities; take steps to clearly allocate responsibilities and concrete actions.

## 4. International Co-operation

Over the last 25 years, Canada has played a leading role in the area of international environmental co-operation. It promoted the preparation of many international agreements and the progressive development of international environmental law. It has supported environmental activities in many international organisations as well as at regional level.

Canada has been a leader in setting up an international regime on the protection of the ozone layer and in complying rapidly with related international commitments. It also took steps towards promoting and adopting demanding objectives for addressing climate change issues, such as the Toronto target. It is a strong supporter of national and international activities to achieve sustainable development. Its level of development aid is fairly high in relative terms and the environment is a key component of the aid programme.

Co-operation on regional issues, such as air and water pollution and waterfowl conservation, is bilateral or trilateral. Significant improvement has taken place concerning reduction of $SO_x$ emissions. The pollution load of the Great Lakes has been reduced. Movements of hazardous waste have been regulated and contingency plans have been developed for emergencies along the Canada-US border.

Negotiation, ratification and implementation of international agreements can pose challenges for Canada because of its special federal-provincial relationships. Implementation is often a shared federal-provincial matter or a provincial responsibility. Concerning environmental protection in border areas, implementing the 1991 Espoo Convention and the 1992 Helsinki Convention should lead to significant improvements. In the area of climate change, stabilisation of greenhouse gases such as $CO_2$ by 2000 may prove very difficult within Canada because negotiations and allocation of efforts to meet the target have not been fully co-ordinated in the country. Further attention will have to be given to reducing acid precipitation to decrease lake acidification. Renewed efforts towards the development of international environmental law in a co-operative spirit could help resolve remaining problems that affect Canada and its natural resource based economy (involving fishery, forestry, protection of nature and habitats, etc.).

It is recommended that consideration be given to the following proposals:

- ratify and implement recent international agreements on environmental protection that have been adopted by most Member countries and, in some cases, have been signed by Canada (Annex III);
- continue to work out federal, provincial and territorial arrangements to improve the negotiation, ratification and implementation of international agreements, and ensure that all governments bear their share of the Canadian commitments, including those related to the achievement of nationwide emission targets;
- support, where needed, close co-operation at local level on environmental issues arising in border regions; ensure that US residents have access to Canadian courts and administrative proceedings on pollution issues equivalent to that accorded to Canadians by the United States; work out arrangements at provincial level to meet all the provisions of the UN-ECE conventions on environmental impact assessment (Espoo) and industrial accidents (Helsinki);
- make wider and more efficient use, where needed, of the consultative role of the International Joint Commission on solutions to transboundary pollution issues and on monitoring progress towards commonly agreed targets;

- develop further the domestic legal regime for compliance with internationally agreed rules concerning protection of the marine environment, abatement of coastal pollution, intervention in case of an accident at sea, compensation of damage to fisheries and other coastal interests;
- continue efforts to work out international agreements on the conservation of fish stocks;
- continue to promote the development of international environmental law by supporting further activities towards drafting an Earth Charter and determining environmental liability in selected areas.

# CZECH REPUBLIC

## CONCLUSIONS AND RECOMMENDATIONS

The Czech Republic is undergoing two major transitions: a major economic transition while returning to democracy and preparation for entry into the European Union. In the wake of the collapse of its traditional export markets, Czech Gross Domestic Product fell by more than 20 per cent before recovery began in 1993. Inflation and unemployment remained much lower than in most other European countries in transition. Many industrial enterprises were privatised and land ownership changed significantly.

During this period, the Czech Republic has substantially reduced environmental pressures and achieved tangible environmental results, in addition to those attributable to the decline of economic activities such as industry and agriculture. It has also implemented major legislative and institutional changes concerning the environment. Notwithstanding these successes, much of the accumulated contamination of the past is still in place and current emissions and discharges remain high compared to OECD average levels. The road towards environmental convergence with other European OECD countries will be a long one.

The challenge is therefore to: i) maintain a high level of effort to implement environmental policies and strengthen environmental infrastructure; ii) better integrate environmental concerns in economic decisions; and iii) meet the country's international environmental commitments.

This OECD report establishes a baseline for assessing future environmental progress and examines the Czech Republic's environmental performance, i.e. the extent to which its domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

### 1. Implementing Environmental Policies

#### *Environmental governance and democracy*

A set of new environmental laws was adopted immediately after the Velvet Revolution of 1989. The Ministry of the Environment was created in 1991. It has wide-ranging competencies and is in charge of preparing and implementing policies aimed at correcting many of the mistakes of the past and providing a healthier environment for citizens who used to live in some of the worst European "black spots". The Ministry of the Environment is co-ordinating institutes, agencies and regional administrations; in addition, other ministries such as the Ministry of Agriculture (for water) and the Ministry of Interior play significant roles in environmental protection. The environmental legal framework is now under revision. Draft text or bills are under discussion on polluted water standards, water management, waste, packaging, chemicals, genetically modified organisms (GMOs), environmental impact assessment (EIA), industrial accidents, air, integrated pollution prevention and control (IPPC), environmental management systems (EMAS), landscape protection areas, national parks, etc. Enactment of new environmental laws and the approximation of EU legislation are taking place at a slower pace than initially announced.

The environmental protection policies adopted and implemented in 1990 (Rainbow Programme) and 1995 (State Environmental Policy) have contributed to tangible results, such as large reductions in pollutant emissions and improvements in air and water quality. These policies were largely based on the effective use of regulatory instruments, associated to economic instruments and to sizeable environmental investment. The Czech Republic also uses a powerful system of EIA that applies to a range of projects, plans (e.g. territorial or transport plans) and policies (e.g. energy policies). Emissions and discharges from polluting installations must now satisfy national standards. A strong Czech Environmental Inspection is in place to improve further compliance with national laws. To make further progress, the new environmental policy under preparation should include more precise targets, concerning a large number of issues, than the earlier ones.

The quality of public information has very much improved: economic and environmental data are now obtainable, state of the environment reports are being published regularly, international environmental definitions and standards are increasingly used. Nevertheless, there remain serious information weaknesses (e.g. waste generation, environmental expenditure). Citizens' right of access to environmental information was recognised in 1990, but it was necessary to enact a law in 1998 to reinforce this right, and its implementation will require overcoming remaining inertia and continuing secretiveness inherited from past administrative practices. Formal implementation

of the OECD Recommendation on pollutant release and transfer registers is under consideration. Education on environmental topics, as well as awareness-raising, will be essential elements of a long-term policy.

It is therefore recommended to:

- strengthen monitoring and enforcement of laws and regulations at national, regional and local levels, and further ensure that polluters are effectively sanctioned;
- finalise as soon as possible the preparation of a new national environmental policy with goals, quantitative targets and deadlines, taking into account EU environmental standards and the steps in the accession process to EU membership;
- strengthen the capacity of the Ministry of the Environment, especially for economic analysis for developing the laws and regulations necessary for transposition of EU legislation;
- develop closer and more sustained relations with key stakeholders such as Members of Parliament, local authorities, industry and NGOs, with a view to raising environmental awareness and building stronger environmental constituencies;
- continue to develop the system for providing environmental information and implement the principles of free and easy access to this type of information, citizen participation in environmental decision making and access to justice on environmental issues.

***From environmental effectiveness to economic efficiency***

Very large efforts were needed to remove visible scars inherited from a period of disregard for the environment: highly polluted air and water bodies, derelict land and contaminated soil. The government which came to power just after the Velvet Revolution demonstrated a strong interest in protecting the environment. Huge environmental investments were decided in the early 1990s and made subsequently, mostly in air pollution abatement, but also in water pollution abatement and clean-up of contaminated soils, including clean-up of former Soviet Army bases and uranium mining waste dumps.

As a result, expenditure on environmental protection has risen steadily over the period 1990-96, reaching the level of 3 per cent of GDP; this included pollution abatement and control expenditure of about 2 per cent of GDP, which is sizeable compared to other OECD countries. Most of this amount is financed by the private sector with relatively little support by the State. Very large expenditure was made for controlling air pollution from power stations. The overall level of environmental expenditure is not likely to decrease in the future owing to new requirements related to approximation of EU legislation.

Economic incentives have been implemented, in particular charges on water abstraction, water pollution, air pollution, noise and waste. Economic sanctions can be applied when standards are exceeded. Charges and fines are collected by the State Environmental Fund (SEF), which uses the revenue to finance pollution abatement measures. The economic instruments in use are well-developed, and contribute to the financing of environmental investment but the rates of charges have mostly been set too low to induce polluters to reduce their emissions. Charges are also used to conserve natural resources and protect the landscape.

In a transition period it is customary to make use of subsidies to improve environmental protection more rapidly. In the Czech Republic, "crash" programmes were put into place to respond to unacceptable situations; industry and privatised public bodies have received subsidies or soft loans to enable them to control pollution. Although the level of overall subsidisation of environmental investment is now around only 14 per cent, greater implementation of the polluter-pays principle in all areas of environmental protection would be warranted. As large investment will be needed to better protect water, remove soil contamination and restore land, it will also be necessary to perform cost-benefit analyses to ensure that money is spent efficiently.

It is therefore recommended to:

- promote greater use of the polluter-pays principle and of internalisation of environmental costs, especially concerning water resources;
- increase rates of charges on polluting activities; make greater use of fines and increase their rates so that they function as a disincentive;

– develop a financing strategy for implementing environmental policies, especially in the areas of urban water supply, waste water treatment and waste management, through broadening sources of funding, the use of a mix of instruments and the greater implementation of the user-pays principle.

***Air***

Considerable progress was made in reducing emissions of conventional air pollutants with, for instance, a 68 per cent decrease in $SO_2$ emissions and a 50 per cent decrease in $NO_x$ emissions between 1987 and 1997. Apart from the effects of the sharp drop in economic output at the beginning of the 1990s, these emission reductions have mainly resulted from: i) some fuel switching from lignite and heavy fuel oil to natural gas; ii) massive investment in the retrofitting of large coal/lignite-fired power plants with desulphurisation equipment. Revenue from emission charges has helped finance the reduction of emissions from smaller emission sources. The Czech Republic has met, or is likely to meet, all its commitments to reduce emissions of conventional pollutants. More than 98 per cent of major, and more than 90 per cent of medium-sized, stationary pollution sources will be able to comply with the 1991 Clean Air Act, which requires existing plants to meet emission standards by the end of 1998. Local air quality has improved significantly, especially in terms of $SO_2$ and particulate matter. The country's monitoring system is comprehensive and well-established.

The success of the Czech Republic in meeting its main emission reduction targets should not obscure the fact that emissions of traditional pollutants remain among the highest in the OECD and that much work remains to be done. Estimates suggest that 23 per cent of the Czech population is exposed to air which does not meet quality standards for more than one parameter. Epidemiological studies have shown that air pollution is affecting human health and that acid deposition, although much reduced, still causes episodic forest damage. Energy intensity has fallen but remains high. It is difficult to promote energy efficiency improvements and renewable energy sources when energy prices are relatively low. Expected traffic growth will make it difficult to reduce $NO_x$ emissions and to control $NO_x$ and ozone concentrations.

It is therefore recommended to:

– review air quality priorities and make cost-effective choices of quantitative targets, including: i) further reducing emissions from small stationary sources; ii) tightening $NO_x$ emission standards for large combustion plants; iii) reducing emissions of $NO_x$ and VOCs from mobile sources; iv) focusing on emissions of VOCs in the fuel distribution chain;
– use a more cost-effective mix of policy instruments, including increasing the incentive function of emission charges;
– further integrate environmental concerns into energy policies, including through accelerating the reduction of energy price distortions that discourage energy saving and renewable energy use;
– develop, assess the environmental impacts of, and implement a comprehensive sustainable transport strategy incorporating land use and transport planning, as well as regulatory measures and pricing mechanisms that discourage car use, especially in urban areas;
– improve data collection and reporting on heavy metals and other toxic substances.

***Water***

Water resources in the Czech Republic are subject to moderately high pressures and need to be managed carefully. The approach to water management has changed radically over the past ten years; Czech water managers now take a more integrated approach and use a range of policy instruments. Among other reforms, the ownership of water supply and waste water disposal companies has been transferred to the regional/local level; service charges have been raised steadily and now cover the operational (but not the capital) cost of the services provided. These price rises contributed to a 30-35 per cent fall in water use from public supplies in 1989-96. Effluent discharges, particularly from larger municipal and industrial point sources, have been reduced markedly: overall, decreases have been 70 per cent for $BOD_5$, 54 per cent for suspended solids, 77 per cent for oil substances, 27 per cent for dissolved solids and 87 per cent for acidity/alkalinity. In the 1990s, the population connected to a sewage treatment station increased from 50.3 to 59.2 per cent and now equals the OECD average. The share of the volume of treated waste water to secondary and higher standard rose from 84 to 90 per cent. All these efforts have already begun to yield

results, and water quality in many rivers has improved, particularly in terms of organic pollution. With a sharp decline in output and in its use of commercial fertilisers and pesticides, pressures from agriculture on Czech waters have decreased markedly.

Yet the state of Czech water resources remains serious. Water quality in many parts of the country, particularly small watercourses, is still poor in terms of a number of pollutants, for instance microbial contamination. Groundwater quality standards (organic pollution, petroleum products and nitrates) are exceeded at a large proportion of measuring stations, and improvements are expected to occur slowly. Contaminated sediments will continue releasing toxic substances to aquatic ecosystems for a long time to come. The connection rate for both drinking water and sewerage networks needs to be increased and the monitoring of drinking water extended. Almost 5 000 small municipalities still lack waste water treatment facilities. There is slippage of various deadlines announced in the State Environment Policy (SEP) for the further evolution of the country's policy framework. Although a revised law on waste water charges announced for 1996 was adopted in March 1998, the revision of effluent limits (to meet targets of EU directives) and a substantial review of water management legislation had not been tabled in Parliament as of June 1998. Large parts of the country suffered very high flood damages in 1997 (3 per cent of GDP) and remain vulnerable to flood hazards.

It is therefore recommended to:

- prepare and enact a new water legislation with adequate effluent limits;
- set quantified water management objectives based on EU directives and on the agreements reached with respect to the protection of the Elbe, Morava-Danube and Oder;
- connect more households to water supply networks; extend the monitoring of and reporting on drinking water quality to all public systems;
- increase the number of people connected to sewerage systems and invest in waste water treatment plants;
- continue measures to establish a water pricing structure which encourages water conservation and takes account of social factors;
- continue to strengthen the ecosystem approach;
- reduce vulnerability to flood hazards by strengthening the integration of water management considerations in land use planning; further pursue physical measures to prevent flooding and reduce flood damage.

***Waste***

The current situation in the Czech Republic with regard to waste management can be characterised as follows: i) large quantities of waste produced and often accumulated on site by mining operations, manufacturing, industry, and utilities; ii) high proportion of hazardous waste to total waste produced; iii) predominance of landfilling as a waste disposal technique; iv) little use of waste as a source of secondary raw materials and energy; v) many sites still contaminated by previous industrial and military activities.

The number of inappropriately operated waste disposal facilities (landfills and incineration plants) has been dramatically reduced over the last few years. A cleaner production programme has encouraged companies to improve production process efficiency and reduce waste generation. A new Waste Management Act came into effect on 1 January 1998, replacing previous inadequate legislation. The Act is based on principles and approaches adopted in European Union waste regulations, OECD Council Acts and the Basel Convention; it also includes provisions for the creation of financial reserves for landfill reclamation and after-closure operations. The Act introduces the principle of producer responsibility with regard to packaging and packaging waste. Fees for landfilling have been introduced and their rate is to increase substantially over the next few years, especially as concerns hazardous waste. Decontamination of the sites of former Soviet military installations is well advanced and the remediation of contaminated industrial sites is proceeding as former state property is privatised.

However, the Czech Republic is lagging behind many other OECD countries in waste management. Recycling and utilisation technologies for secondary raw materials are inadequate, as is the capacity of the recycling industry. Landfilling remains by far the most commonly used waste disposal method, including for hazardous waste. Landfill fees are too low to encourage the implementation of more environmentally sound waste management techniques. Existing incineration capacity, though small, is currently far from being fully used. Industrial waste is produced at high rates and has accumulated at industrial sites over the years. No central facility for hazardous waste

treatment and disposal exists or is planned. Progress in rehabilitating the many inappropriate landfill sites which have been closed is slow, and a large number of illegal dumps are still in operation. There is still too little reliable information on waste generation and management.

It is therefore recommended to:

- elaborate, as soon as possible, action programmes for implementing the Waste Management Act, including the creation of a reliable information base and the definition of quantitative targets;
- gradually eliminate the differences which still exist between the Waste Management Act and relevant OECD and EU rules, in particular by reducing the number of exceptions to the "green" list of wastes destined for recovery;
- develop separate collection and recycling of municipal waste, introducing the appropriate economic instruments to serve as incentives;
- promote further use of low-waste and cleaner technologies in industry;
- develop the necessary facilities for proper disposal of hazardous waste and take the necessary regulatory and economic measures to ensure that these facilities are used;
- gradually raise the level of fees and charges to ensure full application of the polluter-pays and user-pays principles, for municipal as well as industrial and hazardous waste.

***Nature, forest resources and biodiversity***

There is a long tradition of nature conservation and forest management in the Czech Republic. Its rich natural and cultural heritage attracts many visitors and is therefore also a significant economic asset. Over the past ten years, some modern legal tools (e.g. the 1992 Act on Protection of Nature and the Landscape and the 1995 Forest Act) for conserving nature, maintaining biodiversity and managing forests sustainably have been introduced. About 15 per cent of Czech territory benefits from some form of protection and national parks are actively managed. Protection is given to a significant number of endangered and vulnerable species. Efforts are being made to safeguard the country's exceptional natural heritage in many rural areas as well as in the Czech cultural landscapes, some of which are on the UNESCO World Heritage list. Forestry practices have begun to change, in line with international trends towards greater species diversity and natural regeneration. The provisions for public participation found in nature legislation are the most effective in the country.

While some pressures on nature and on forest resources from agriculture and industry were reduced in the early 1990s, new pressures from current and future economic development (e.g. tourism, transport) need to be addressed. In order to avoid a gradual loss or deterioration of natural areas and valuable landscapes, a strategic approach to tourism should include means of containing the pressures from the growing number of tourists visiting national parks and other protected areas. The Czech National Biodiversity Strategy therefore needs to be completed and implemented as soon as possible. The link between nature and landscape protection activities and land use planning is still weak. Also, nature conservation considerations have so far not been sufficiently integrated in economic and sectoral decision making. In particular, the Territorial System of Ecological Stability could be more fully used in sectoral policies such as transport infrastructure planning. The environmental effectiveness of agri-environmental support measures could be improved.

It is therefore recommended to:

- urgently complete, adopt and implement the National Biodiversity Strategy and related action plans now under preparation;
- develop a sustainable tourism strategy for protected areas and consider ways in which visitor charges could contribute to financing maintenance and environmental costs;
- establish a comprehensive land use planning system, integrating nature conservation and landscape protection concerns and ensuring transparent public participation;
- create synergies among the policies of relevant ministries (Regional Development, Agriculture, Environment, Finance) to encourage rural land owners to take nature and landscape into account in land use decisions;
- ensure that planning of road infrastructure takes account of the Territorial System of Ecological Stability; examine legislation in other domains (e.g. the Construction Act) to find ways that nature conservation considerations could be taken into account;
- continue and extend the nature-friendly forestry practices indicated in the 1995 Forest Act;

- look for ways to enhance the environmental effectiveness of agri-environmental support measures and to integrate nature and biodiversity concerns in agricultural practices;
- strengthen expertise in nature conservation and biodiversity at district level.

## 2. Integrating Environmental Concerns in Economic Decisions

The social and economic transformations that began after 1989 have led to new democratic institutions and substantial progress towards creating a market economy in the Czech Republic. Overall, the economic transition did not present as high unemployment or inflation as in most other Central and Eastern European countries, and was encouraged by significant foreign direct investment and an effective privatisation process.

### *2.1 Decoupling and sustainable development*

Nevertheless, in the period 1990-1997, GDP fell sharply and then recovered, coming close to its 1990 level. During the same period, pollutant emissions fell considerably (e.g. -50 per cent for $SO_2$, -42 per cent for $NO_x$, -23 per cent for $CO_2$). This decoupling was the result of economic restructuring, changes in the energy supply and environmental efforts. However, pressures from sectors such as energy, industry, transport and tourism should be addressed in a cost-effective way.

The Czech Republic formally introduced the policy of sustainable development in its early environmental legislation. In more recent years, integration of environmental considerations in economic policies was not sufficiently reflected in the country's policies or its institutional structure, and the words "sustainable development" were not used. There is now renewed support for sustainable development and for stronger integration of environmental, economic and sectoral policies. Positive steps have been taken by the Ministry of the Environment and the Ministry of Industry and Trade to promote eco-labelling, environmental management systems, eco-auditing, etc. EIA provides a powerful instrument for integrating environmental concerns in projects, plans and policies. However, much greater interministerial co-operation would be needed in order to ensure that vertically-minded administrations tackle horizontal problems such as environmental protection. Similarly, there would be a need to create an effective interministerial body for sustainable development and other interministerial commissions to address such urgent issues as energy and transport; this should be accompanied by increasing consultation with other stakeholders (industry, labour unions, NGOs, local authorities).

Production patterns have significantly improved, with reduced pollutant emissions and less use of natural resources. Nevertheless, the Czech economy still presents levels of pollution and energy intensities per unit of GDP that are among the very highest of OECD countries. Concerning consumption patterns, the use of economic signals such as prices in previously subsidised sectors had a very positive impact on water and electricity use by households. Although prices have been liberalised, there are still significant water and energy subsidies for households and the level of gasoline taxation remains low. Continuing its move towards full pricing of natural resources would enable the Czech Republic to further reduce pollution and its natural resource use, while recognising social constraints.

It is therefore recommended to:

- integrate environmental concerns into policies and practices concerning sectors such as energy, transport, industry and tourism;
- speed up greening of the government and promote further development of the environmental goods and services industry;
- promote discussion of a new sustainable development strategy, building on the new State Environmental Policy and with participation by stakeholders;
- promote the use of cleaner technologies, energy saving and of alternative energy sources;
- pay special attention to integrating environmental concerns into fiscal policy;
- reduce subsidies in the water and energy sectors.

***Industry and the environment***

A centrally planned economy giving low priority to the environment, and a concentration of industrial activities in areas close to "cheap" energy sources (e.g. open cast brown coal mining), resulted in some parts of the Czech Republic being among the black spots and most heavily polluted areas of Europe (Northern Bohemia and Northern Moravia). Since the beginning of the transition period, important structural changes have taken place in industry through privatisation, market liberalisation, and foreign trade restructuring. Decline in industrial output, the closing down of some plants, and the modernisation of others, as well as large environmental investments have led to substantial environmental improvement. Through licensing and pollution charges, pollution control has been exercised over major and medium pollution sources. Overall, the rate of decrease in air and water pollution has been greater than that of the fall in industrial production. Through environmental investment, and the system of charges which provides revenue to the State Environmental Fund, industry is implementing the polluter-pays principle. The Ministry of the Environment and the Ministry of Industry and Trade have recently started promoting good housekeeping practices and environmental management in companies. Major companies are showing increasing responsiveness to the need to address environmental issues. In the context of privatisation, arrangements have been made to deal with past environmental damage; there is, however, a considerable backlog of polluted industrial sites. Access to international markets and the prospect of EU membership are important incentives for industry to bring its environmental performance up to western European standards.

As pollution and resource use intensities are still very high, further major efforts will be needed to achieve improved eco-efficiency. New laws on the prevention and management of industrial accidents, and on the handling and labelling of chemical substances, need to be enacted. Command and control approaches through permitting and large investments, mostly in end-of-pipe technologies, have proven environmentally effective and should now be supplemented by cost-effective preventive and partenarial approaches to waste management and minimisation, energy saving, and reduction of pollution intensities.

It is therefore recommended to:

- strengthen co-operation between the Ministry of the Environment and Ministry of Industry and Trade, with the aim of integrating and reinforcing the environmental dimension of industry policies and of taking cost-effectiveness more fully into account in environmental policy making;
- promote government-industry dialogue and partnership, creating proper conditions for developing preventive and integrative approaches, and focusing on actual environmental progress;
- further use and develop policies directed towards the promotion of integrated environmental management in companies (e.g. stimulation of "good housekeeping", use of environmental audits to identify low-cost solutions for improvements); give more attention to developing and implementing policies for small and medium-sized enterprises;
- elaborate a policy approach for industry including quantified environmental objectives with medium and long-term time frames; consider giving industry greater flexibility to choose the most cost-effective means of reaching these objectives;
- adopt laws concerning the prevention and management of industrial accidents and the handling and labelling of chemical substances;
- consider ways to accelerate the clean-up of past environmental damage, in particular polluted industrial sites which pose high risks to public health and the environment;
- further encourage the adoption of cleaner technologies by industry.

## 3. International Co-operation

Since the early 1990s, great progress has been made in international environmental co-operation. The Czech Republic became a party to most major international agreements on the environment; it became a member of the Council of Europe and of the OECD; and it fulfilled related environmental commitments. In addition, it has started the accession process for becoming a member of the EU, which will require vast changes in its environmental laws and regulations as well as stricter enforcement. Concerning official development assistance, it has already become a donor country and is supporting the Global Environment Facility.

The Czech Republic has reduced very significantly the discharge of pollution in its three main international rivers (Elbe, Morava, Oder), entered into agreements with neighbouring countries on the protection of these rivers and started to prepare national action programmes to further protect them. Concerning transfrontier air pollution, it has reduced its emissions of $SO_x$, $NO_x$ and VOC considerably and met all its international commitments in this area. In particular, it has equipped all its power stations with desulphurisation equipment. Emissions of $CO_2$ which decreased significantly from 1990 partly due to the fall in economic output, are likely to be in 2000 at a level well below that of 1990. Although $CO_2$ emissions are likely to grow as a result of economic growth, by 2010 they could still be about 8 per cent below the 1990 level, in line with the Kyoto target. The production and consumption of ODS, regulated by the Montreal Protocol, are now banned; a strict national law was adopted to restrict ODS use.

Although progress during the transition period has been remarkable, there are still areas of concern. Lack of adequate national legislation has prevented the Czech Republic from ratifying important conventions on water management and on industrial accidents or implementing related OECD Decisions and Recommendations. Concerning transfrontier air pollution, $SO_x$ and $NO_x$ emissions per capita and per unit of GDP are generally well above those in other European countries. Furthermore, in spite of the measures taken and reductions achieved, some parts of the Black Triangle are still seriously polluted. Changes in the level of $CO_2$ emissions in the Czech Republic have been linked for the most part to economic changes. Steps could be taken to further reduce $CO_2$ emissions through energy savings or improvements in energy efficiency; indeed, at present $CO_2$ emissions per capita and per unit of GDP are also high compared to the average for OECD Europe. Although the Czech Republic supported the Rio Declaration, it has taken relatively few initiatives at national level to face liability issues, to give legal force to the precautionary principle, to implement the principle of sustainable development, to prepare and adopt a national Agenda 21, or to increase public participation.

While it is understandable that a country in transition cannot deal early on with all environmental issues, future progress towards sustainable development and European integration will require priority setting, because of the scarcity of means available, and a wider democratic debate with greater information provision and the participation of all stakeholders. The emphasis given to international environmental issues, to harmonising national legislation with EU legislation and to implementing international agreements should be supported by greater human and financial resources. At the same time, activities aimed at collecting and using foreign funds should be pursued in order to improve the country's environment and reduce transfrontier pollution.

It is therefore recommended to:

- ratify and implement international environmental agreements (Annex III);
- enact national laws which would enable the Czech Republic to become a party to those significant international environmental agreements to which it is not yet a party;
- improve public awareness in relation to new environmental commitments associated with membership in the OECD and with EU accession;
- fully implement recent OECD Recommendations on environmental information and pollutant release and transfer registers;
- develop a national programme to reduce GHG emissions, improve energy efficiency and prepare for the adoption of appropriate legal measures;
- increase resources to carry out international commitments, to prepare accession to the EU and to enforce new legislation approximating that of the EU;
- make full use of opportunities for foreign assistance, with the aim of strengthening environmental infrastructure and contributing to the solution of priority international environmental problems.

# DENMARK

## CONCLUSIONS AND RECOMMENDATIONS*

Denmark's open economy thrives on trade and provides the country with high average incomes and extensive welfare benefits. Its landscapes are almost entirely shaped by human activities, notably the intensive agriculture that supports its large agro-food industry. Other major environmental pressures stem from its transport sector and from its energy supply structure, which relies almost exclusively on fossil fuels. In addition to the national dimension, environmental issues in Denmark have a strong international one. This is due to regional economic and environmental interdependencies (Nordic co-operation, North Sea and Baltic Sea pollution, transfrontier air pollution). Denmark is also strongly involved in global environmental issues and environmental aid.

In the 1990s, economic growth and participation in the European Union have provided the context for economic and environmental decision making in Denmark. Denmark has a well established practice of national environmental planning and the implementation of environmental policies is largely devolved to local authorities and is widely supported by public opinion. Environmental policies currently focus on the following themes: acid deposition, nutrient discharges and groundwater contamination, biodiversity, and global issues such as climate change. Measures to address these issues rely on a broad range of diverse and in some cases innovative policy instruments. In particular, the green tax reform introduced in the 1990s has made it possible to reduce taxation on income and labour, whilst increasing fiscal incentives to protect the environment.

This OECD report sets out the baseline for assessing future environmental progress and examines Denmark's environmental performance in three areas:

- implementation of environmental policies;
- integration of environmental concerns and economic decisions;
- international co-operation on environmental protection.

It also assesses the extent to which Denmark's domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in Denmark.

### 1. Implementing Environmental Policies

#### *Achievements and further progress*

Building on the solid institutional and regulatory foundations laid in the 1970s and 1980s, Denmark has in recent years taken stock of the remaining and new environmental challenges it faces and has extensively revised and upgraded its environmental legislation. Budgets and staffing have regularly and substantially increased in line with expanding responsibilities and policy priorities. The implementation of environmental responsibilities which are significantly devolved to municipal and county authorities has likewise improved. Land use regulations, particularly those applicable to rural and coastal areas, are rigorous; municipal and county administrations contribute to ensuring that spatial planning is an effective instrument for the protection of the environment, nature and landscapes. Danish environmental democracy is one of the most advanced of OECD countries. Policy making is open and consultative and a wide range of measures are in place to ensure public participation and stakeholder involvement, provision of and access to environmental information, as well as the right of administrative and legal appeal.

Denmark makes extensive use of economic instruments for environmental management: environmental charges, environmental taxes and other economic instruments (e.g. deposit-refund). Overall, the green tax reform, and more generally the use of economic instruments for environmental management, has led to important results: several loopholes in the taxation system that adversely affected the environment have been plugged, the environmental incentive effect of taxation has been improved and the changes have been revenue neutral with taxes on income and labour being reduced to compensate for higher environmental taxation. Pollution abatement and control expenditure in Denmark amounts to about 1 per cent of GDP, a level comparable to that of other Nordic countries and lower than in a number of other OECD countries. Overall, public environmental expenditure is covered by environmental charges and taxes, and the polluter pays principle is applied to households and industry.

* Conclusions and Recommendations to be discussed, amended and approved by the Group on Environmental Performance at its meeting in November 1998.

The 1990s have confirmed the effectiveness of this approach in continuing to control and reduce pollution from point sources. In particular significant progress has been achieved in reducing atmospheric emissions of conventional pollutants and discharges of organic substances, nutrients and heavy metals into water from municipal and industrial sources. Though this achievement is not always apparent at ecosystem level, air quality has improved, contaminated sites have been identified and are being cleaned up, and surface water quality is well above what it was in the 1970s. On the other hand, trends in waste generation and $CO_2$ emissions are not favourable. As the Danish economy continues to grow in the 1990s, environmental pressures from energy, agriculture and transport in particular are still strong. There is also concern for nutrient and pesticide discharges from agriculture.

There are opportunities to improve and refine environmental taxes applied in Denmark. The effectiveness of the differentiation of the carbon tax according to energy forms in meeting environmental goals, and the complexity of the system need to be reviewed; transport taxes need to be redesigned to influence emissions and fuel consumption through both fixed and variable transport costs; pesticide taxes are based on the price of the product and do not necessarily reflect the toxicity of the chemical used; the tax on water should be applied to all users of water, not only households. Recent moves to improve the conservation of coastal areas, notably the prohibition of construction within 300 metres of the shoreline, must be maintained and properly implemented. In the absence of a systematic national inventory of land use and the legal status of protected areas, it is difficult to assess precisely the actual results of policies developed since the early 1970s, notably in coastal areas that have been subject to the highest development pressures. Detailed information is available on public environmental expenditure, but there is no knowledge of the structure of and trends in private environmental expenditure.

It is recommended to:

- ensure the licensing process systemically considers waste prevention, and the efficiency of energy and other material inputs in order to accelerate the move towards cleaner technologies and processes;
- continue to monitor the enforcement of and compliance with environmental regulation, with particular attention to agriculture and fish farming;
- further pursue the green tax reform, calibrating environmental taxes to ensure their full environmental effectiveness and economic efficiency, notably those applied to $CO_2$, water, pesticides and transport;
- strengthen the use of economic analysis and economic instruments as part of environmental decision making, particularly with respect to decisions relating to pollution from agriculture;
- complete a systematic inventory of land use and land use changes in order to assess the effectiveness of spatial planning policies in terms of nature and environmental protection;
- improve the availability of data on private environmental expenditure, particularly by industry.

***Water management***

Awareness that Denmark's water resources are an asset that need conserving and protecting has grown in the last ten years. Substantial investments in improving waste water treatment by municipalities and industry have made it possible to meet the discharge reduction objectives set for point sources in the Action Plan for the Aquatic Environment. Plans to address nutrient and pesticide loadings have been elaborated, reviewed and regularly updated, with quantitative targets and deadlines, supported by a coherent institutional and planning framework at national, county and municipal level. The target reduction of the 1986 Pesticide Action Plan for pesticide sales was met in 1995, almost two years before the deadline. These achievements have been made through a range of mutually supporting regulatory and economic instruments, including licensing, strict discharge standards, and charges and taxes on water supply and waste water discharges. The protection of areas used for water supply and recent efforts to better define and protect water abstraction areas are beginning to have an effect on groundwater quality. Attention and work have been devoted to improving and restoring watercourses and other aquatic ecosystems. Much effort is being put into monitoring water quality, particularly for tracing pesticides and understanding their effects on drinking water.

Despite reductions in discharges of organic matter and nutrients from municipal and industrial point sources, most watercourses and lakes are a long way from meeting the quality objectives, pollution of groundwater has reached a level that threatens the current system of water supply based on small scale and simple treatment, and coastal waters are affected by eutrophication. Continued pollution from agricultural sources is the main cause for such modest results: the quantity of manure produced by Danish agriculture has not fallen significantly in the last ten years and increasingly exceeds field application capacity of individual farms, especially pig farms, which saw

their production increase by 30 per cent between 1987 and 1996. Whether Danish watercourses, lakes, groundwater and coastal wasters actually improve depends largely on the success of measures adopted in 1998 to reduce the nutrient load from field fertilisation and on those to reduce pesticide loadings.

It is recommended to:

- ensure the full implementation of the second Action Plan for the Aquatic Environment, including economic measures aimed at reducing agricultural nutrient loadings and closely monitor their effectiveness;
- strengthen the enforcement of existing environmental regulations relating to water pollution, notably for fish farms;
- consider the extension of the water tax to water users other than households;
- further develop watercourse maintenance improvement and restoration, notably for private watercourses, and upgrade their ecological condition;
- continue efforts to upgrade pesticide monitoring in groundwater and drinking water, as an essential input into priority setting in pesticide management policy;
- elaborate a national water management plan that would take a catchment area approach to both pollution and water resource issues;
- give more attention to the economic analysis of water management measures, and carry out a comprehensive assessment of the economic and environmental effectiveness of measures in different sectors (municipal, industrial, agricultural).

***Air management***

Denmark has made significant progress over the last two decades in reducing or containing emissions of conventional atmospheric pollutants. Between 1980 and 1995, while GDP increased by 36 per cent, $SO_x$ emissions dropped 67 per cent and those of $NO_x$ fell by 11 per cent. Such emission reductions have made it possible for Denmark to meet its national and international commitments, and have had a positive impact on local air quality. Urban air quality is generally good, though pollution episodes have been observed in unfavourable climatic conditions. These achievements result from a range of abatement measures, notably fuel quality standards, regulatory and economic instruments, as well as greater integration of environmental concerns in energy and transport policies. Many municipalities are committed to reducing the air pollution and other environmental impacts of transport. With the support of the Danish EPA, a major shift in local transport and physical planning policies is under way. Over the last two decades, Denmark has almost stabilised energy use during a period of continued economic growth. It has doubled the contribution made by renewable energy sources to the country's energy needs, and Danish industries have become leaders in environmentally favourable energy technologies such as wind turbines, which are now considered as a viable alternative to coal based power plants.

Nevertheless, Danish emissions of $SO_x$ and $NO_x$ per unit of GDP are relatively high in Europe and further reductions in emissions of atmospheric pollutants are necessary, particularly to reduce ozone levels and reduce acid deposition. Transport emissions play an increasingly central role in air pollution management and $CO_2$ emission reduction policies. Many of the measures will have to be directed at controlling the increase in road traffic and related emissions, though it is not clear to what extent current price levels and planned tax increases can significantly contribute to meeting these goals. The balance of taxation between the ownership of cars and the use of cars must be reviewed. Measures to reduce the average age of the car fleet should be considered. Energy efficiency should be further improved and energy substitution reviewed. Given the international context, the development of renewables in Denmark is unlikely to be supported by market based instruments such as large carbon taxes; renewables will therefore remain at best marginally competitive and will require a more interventionist approach. As a result, Denmark may incur costs by seeking to move faster than other countries on the rapid deployment of renewable energy.

It is recommended to:

- carefully monitor the effect of measures designed to reduce $NO_x$ and VOC emissions to ensure that they can contribute to meeting national and international objectives and are sufficient to provide a long term improvement in air quality, notably with respect to ozone levels;
- continue to reduce emissions resulting in acid deposition both in Denmark and elsewhere;

- ensure that efforts to support renewable energy and energy conservation are targeted at the most cost effective measures to reduce atmospheric emissions;
- consider the environmental effectiveness and economic efficiency of influencing variable transport costs, including the use of higher taxation of gasoline and road use pricing systems such as tolls;
- provide further support for the development of sustainable transport policies at county and municipal level;
- continue to ensure that public transport can compete with private car use through vigorous policies measures designed to discourage car use and support local and regional public transport.

***Chemical products and waste management***

The Danish system for the safe management of chemical products has been most successful for substances of concern in identified product uses (such as lead in gasoline, cation-active surfactants in detergents or chromium in wood impregnation products) and has used a combination of regulatory measures, voluntary agreements and economic incentives. Denmark has made a good start in setting priorities for action on unassessed existing substances, by establishing a list of unwanted substances and making best use of international co-operation. It has also made significant progress in pesticide management; in particular, the approval system for pesticide use has been improved, with the re-assessment of 209 active ingredients and the prohibition (or strict regulation) of the 29 ingredients of most concern.

To pursue its efforts to control chemicals, Denmark should maintain and improve the quality of the information in its chemical product database and reinforce its efforts to promote its initiatives internationally. As the decline in pesticide use seems to be largely due to improved low-dose products and a reduction in the arable land in production, the cost effectiveness of general measures to reduce pesticide use and specific measures of the pesticide approval system should be reviewed.

Danish waste management policy has largely met its objectives. Since the mid-1980s, there has been a substantial reduction in landfilling, and recycling/reuse has more than doubled over ten years, to 60 per cent of waste in 1996. Regulatory measures have been successfully supplemented by economic instruments. In particular, the waste tax, the waste charges and taxes on packaging have provided the incentive needed for reuse and recycling, while collection and recycling is mandatory for some waste. Deposit-refund systems for bottles has been effective and could be usefully extended to cans. Hazardous waste collection and treatment are well managed, with such waste increasingly being recycled. Denmark is addressing the problem of contaminated land; the proposed amendment of the Contaminated Sites Act should close remaining loopholes in the regulatory approach and ensure that progress in cleaning up all types of contaminated sites can resume.

Nevertheless, recent waste data show no trend towards a reduction in waste generation at source. In the absence of new measures aimed at waste reduction, stabilisation is unlikely, particularly if the economy continues to grow as it has since the early 1990s, largely driven by buoyant private consumption. To achieve waste reduction at source, a product policy to reduce waste generated and improve the quality of the waste, and medium to long term changes in both production and consumption patterns are needed.

It is recommended to:

- maintain and improve the quality of information in the chemical product database;
- consider how best to renew international efforts to identify priorities for action amongst existing chemical substances which have not yet been assessed;
- examine and take account of the relative cost effectiveness of general measures to reduce pesticide use and measures to improve the pesticides approval system;
- make more use of economic instruments (e.g. waste taxes and charges, deposit-refund) to encourage waste reduction at source, as well as recycling and reuse;
- develop a medium to long term policy to change production and consumption patterns, geared to reducing the amount of waste generated at source and influencing its composition;
- consider options for funding clean up measures for orphan contaminated sites.

***Nature conservation***

Denmark has adopted and is implementing an extensive body of nature conservation legislation in an effort to stop habitat loss and improve conditions for biodiversity. A large part of its territory is placed under various forms of protection (general habitat protection, conservation orders, protection zones along coast lines, Ramsar sites, EC Bird protection directives), covering almost all types of terrestrial ecosystems. A number of lakes, coastal meadows, humid permanent grassland, bogs, watercourses, uncultivated dry grasslands and heaths have undergone restoration since 1989. For a small number of species, suitable habitats have been re-established together with breeding and re-introduction programmes. The establishment of peri-urban forests and eco-schools are additional achievements. Denmark plays a significant part in international efforts for conservation of biodiversity, and has ratified most major conventions concerning wildlife and biodiversity.

There is however a great need for additional and continuous efforts for nature restoration and biodiversity protection. Freshwater ecosystems as well as marine ecosystems are often affected by agricultural pollution and little conservation of marine areas has been implemented. About 97 per cent of watercourses have been channelled or otherwise modified. Monitoring of changes in habitat quality and species richness is generally not well developed, and due to a lack of comprehensive area statistics, it is difficult to get an overall view of protected habitat area and land use changes. More attention should be given to nature management as part of agricultural practices including traditional grazing and hay harvesting. Ambitious domestic efforts at county level could be more effective if supported by a national ecological network concept. Denmark is not on the way towards fulfilling its afforestation objectives (including those for "re-creation"), which should give higher priority to deciduous forest plantations.

It is recommended to:

- continue the implementation of the national strategy for biological diversity and formulate a national action plan for nature protection, including quantitative targets and deadlines;
- develop a national ecological network in support of county efforts to develop ecological networks;
- continue the development of management plans for areas under conservation orders;
- continue to improve and extend the conservation of marine areas, and improve the integration of biodiversity concerns in fisheries policy;
- accelerate the implementation of the 300 metre dune and beach protection zones;
- investigate the possibility of establishing a network of national parks, which could include some of the most valuable coastal ecosystems, such as tidal flats, dune areas, cliff coasts and heaths;
- improve the integration of nature, landscape and biodiversity concerns in agricultural policies and practices;
- strengthen efforts to meet the objectives for afforestation and natural forest protection, and promote sustainable forestry practices;
- develop comprehensive nation-wide area statistics for all protected areas; and improve the co-ordination of biodiversity knowledge and nature monitoring as part of a comprehensive nation-wide monitoring programme.

## 2. Integrating Environmental Concerns in Economic Decisions

Despite much progress in decoupling the generation of some environmental pressures from GDP (e.g. $SO_2$, $NO_x$, water abstraction, nitrogenous fertiliser use), Denmark's national objectives and international commitments (e.g. waste generation, nitrate pollution of surface waters, GHG emissions) call for not only cost-effective environmental policy but also a significant strengthening of the integration of environmental concerns in economic and sectoral decision making. Such integration is seen as a key to improving environmental performance and moving towards sustainable development. This is because economic forces and changes in major economic sectors, such as transport, energy, fishery and agriculture, strongly influence environmental conditions and trends, and thus can enhance or counteract the benefits of environmental policies and technical progress.

***Environmental and economic policies***

Denmark's general development objectives presented in the 1997 government report "Denmark 2005" provide goals for 2005 concerning employment, public debt, environment and international action. The report recognises several dimensions to sustainable development, including concern for the welfare of future generations in

Denmark, and for development in central and eastern Europe and in developing countries. The 1994 White Paper on the Environment stresses the need for more sustainable agriculture, forestry and fisheries. Although there is no formal interministerial mechanism to deal with sustainable development in general, work is done at sectoral level and through environmental planning to translate sustainable development concepts into concrete action. The Danish local Agenda 21 campaign was launched in 1994.

Much progress has been made in sectoral integration at planning, budgeting and project levels. Sectoral plans such as the Energy 21 action plan, the 1991 sustainable development action plan for agriculture and the Traffic 2005 plan are important steps towards integration. Environmental planning in the form of general goal setting by periodic White Papers on the environment and specific action plans (concerning water, waste and pesticides) supports and extends these integration efforts. The next White Paper on environment is due in 1999.

Efforts made by Denmark to apply strategic environmental assessments (SEA) to government bills and proposals and to the national budget are innovative and exemplary. The greening of government operations was one of the major elements in the SEA of the 1998 national budget. With green auditing, action plans by many State institutions and public procurement plans, progress is real in Danish administrations. While the environmental evaluation carried out on the 1998 budget focused on the marginal effect of changes in the budget, it would be useful to also consider the whole structure of public funding and expenditure in terms of its environmental impact, notably for natural resources such as energy.

The strong link between project related EIA procedures and spatial planning should not lead to excessive flexibility and inconsistency in land use planning. While the rigour and precision of planning procedures need to be balanced by the possibility of applying for exemptions that will require an EIA, amendments to regional or municipal development plans can undermine planning procedures, particularly in rural areas.

There is no evidence that environmental measures and expenditure in Denmark have to date adversely affected its economic growth or international competitiveness. On the contrary, environmental protection has become an important selling point for Danish industry. The Danish eco-industry has a combined annual turnover of DKr 2 billion (50 per cent for export), and the Danish wind turbine industry has an annual turnover of over DKr 4 billion (80 per cent for export).

It is recommended to:

- pursue and further develop strategic environmental assessments, notably with respect to sectoral policy proposals and the national budget, in order to promote and evaluate progress towards sustainable development;
- continue and strengthen the integration of environmental concerns in planning and policies relating to agriculture, transport, energy and fisheries;
- ensure cost-effective implementation of sectoral plans with respect to environmental targets; review the cost-effectiveness of environmental actions in an intersectoral context;
- strengthen efforts to improve the environmental performance of government including the implementation of environmental action plans by public institutions, sustainable public procurement, and the management of buildings and offices;
- carry out a comprehensive review of existing fiscal and other subsidies in terms of their environmental impact, particularly for natural resources.

***Integration of environmental concerns in agricultural policy***

Over the last ten years, the structural adjustment of Danish agriculture has led to higher concentration and specialisation of agricultural production, particularly in the livestock sector. Livestock, with 11 million pigs and 13 million broilers, makes up for 70 per cent of the value of agricultural production. There has been a decrease in the number of farms (by 40 per cent) and cattle (by 30 per cent), but the agricultural area has only decreased by 4 per cent and still accounts for almost two-thirds of Denmark's total area, and the density of pigs per hectare has increased by 20 per cent. Two-thirds of agricultural production is exported and agriculture represents 22 per cent of total exports. Overall, agriculture has had adverse impacts on the environment: extensive loss of biodiversity due to farm amalgamation and the drainage of wetland for farming, high levels of nitrogen discharges into surface water, high contribution to eutrophisation of surface and coastal waters, contamination of groundwater from pesticides, ammonia volatilisation due to over-fertilisation with manure, despite reduced pressures from the use of commercial fertilisers.

Some environmental objectives relating to the agricultural sector have been met. In particular, progress has been made in reducing ammonia emissions from agriculture and the phosphorus discharge reduction target has been met. Objectives have also been met for pesticide use, as the consumption of active ingredients has decreased. Less distortion in agricultural production through the reduction of market price support, in the context of Common Agricultural Policy reform, should contribute to promoting a more efficient use of natural resources. The measures implemented have included very detailed regulations and standards and, increasingly, economic instruments, such as a tax on pesticides, direct payments linked to environmental outcomes, and, more recently, a tax on excess consumption of nitrogen. The designation of Sensitive Farming Areas (SFAs) addresses the site-specificity of many environmental issues associated with farming activity. The number of farmers engaged in organic production has substantially increased in recent years, partly due to increased incentives to convert; certified organic farms now account for 3.5 per cent of the total agricultural area. Efforts have been made to include an environmental dimension in research, training and advisory services.

Environmental objectives in the agricultural sector that relate to water still require a major effort. The objective of reducing nitrogen discharges to water by 50 per cent by 1997 could not be achieved and the deadline has had to be extended to 2000, with more stringent measures recently introduced. The frequency of treatment by pesticides has remained high. A balance needs to be reached between the targeting of measures to environmental concerns in the agricultural sector, and the public resources required to implement and enforce such measures. In particular, the cost-effectiveness of economic instruments in agri-environmental policy greatly depends on the transaction costs involved (implementation, enforcement and monitoring costs). The level of incentives associated with SFAs has not always been attractive enough to reach voluntary agreements with farmers in groundwater protection areas, which raises the issue of the costs and benefits associated with agri-environmental measures. Little has been done on nature conservation as part of agricultural policies, although the protection of semi-natural grassland against agricultural intensification or abandonment has contributed to enhancing biodiversity and wildlife habitat.

It is recommended to:

- develop a comprehensive agri-environmental strategy regrouping all the various environmental objectives associated with farming activity, and providing a framework for the designation of Sensitive Farming Areas;
- give greater attention to nature conservation and biodiversity protection policy objectives;
- continue efforts in integrating environmental concerns in research, training and advisory services;
- ensure that policy measures are more closely targeted to the desired environmental outcomes;
- give greater attention to the economic and environmental costs and benefits associated with the implementation of policy measures, and their compatibility with the polluter pays principle;
- strengthen the enforcement of environmental regulations and standards in agriculture;
- improve the monitoring and evaluation of the environmental performance of agriculture.

## 3. International Co-operation

International issues play a major part in Danish environmental policy and environmental matters are high on the agenda of Danish foreign policy. This is a consequence of regional ecological interdependencies, within Northern Europe and as a riparian state of both the North Sea and the Baltic Sea. This is also a consequence of regional economic interdependencies, notably within the European Union and with other Nordic States. In addition, Denmark promotes international environmental co-operation and environmentally sustainable development world-wide for reasons of solidarity. With other like-minded countries, Denmark's proactive stance on protecting the environment through international co-operation has played an influential role in a number of international negotiations. Denmark is particularly active within the EU context to drive European policies towards sustainable development and to influence EU positions in global environmental negotiations.

For its part, Denmark has met or is well on the way to meeting its international commitments concerning discharges of phosphorous and heavy metals in the Baltic and the North Sea, and atmospheric emissions of $SO_2$, $NO_x$ and VOCs. It has taken expensive measures to reduce inputs of nitrogen to coastal waters from waste water treatment plants. It has phased out or reduced its emissions of ozone depleting substances ahead of internationally agreed deadlines. It is one of the few OECD countries that have introduced a carbon tax on energy products to reduce $CO_2$ emissions. Denmark is doing its share to reduce marine pollution and control maritime traffic according to MARPOL commitments, and is promoting international agreements to control the spread of persistent organic chemicals in the global environment.

Denmark devotes the highest official development assistance effort among OECD-DAC countries: over 1 per cent of GNP in 1996. Including assistance to Central and Eastern Europe, Denmark's overall aid is well above one per cent of GNP. This level enjoys wide public support. The environmental component of ODA reaches about 13 per cent and is set to increase with the higher budget appropriations planned for the Environmental and Disaster Relief Facility. Environmental assessment is applied to all development projects. In recent years, Denmark has granted much financial support for environmental action in Central and Eastern Europe. Its contribution to the Global Environmental Facility is high.

Though Denmark mostly lives up to the high standards of international environmental co-operation it strives for, there is scope for progress in a number of areas. Denmark has been slow to ratify some international agreements (e.g. 1982 UN Convention on the Law of the Sea). Further significant reductions in nutrient discharges from agricultural sources are needed to meet Denmark's international commitments relating to the protection of marine waters. Denmark has not so far succeeded in limiting its $CO_2$ emissions, which were well above 1990 levels in 1995 and 1996 and seem unlikely to stabilise at 1990 levels by 2000. Denmark therefore needs to review its range of policy options concerning energy efficiency and substitution, as well as energy and transport pricing and taxation (towards internalisation for all end users). Denmark's national $CO_2$ emission data differs from those measured internationally, as Denmark adjusts its emission data for temperature variations and, unlike other countries, for trade in electricity.

It is recommended to:

- accelerate the ratification of international environmental agreements already signed (Annex III), notably concerning the protection of the marine environment;
- closely monitor the implementation of measures to reduce nutrient discharges to the marine environment and ensure that Denmark's related international commitments are achieved;
- consider additional measures needed to meet $CO_2$ emission reduction targets, particularly in the energy and transport sectors;
- review the basis for adjusting $CO_2$ emission data according to energy trade and temperature variations, to ensure compatibility with methodologies used in other OECD countries and internationally;
- continue to play an exemplary role in development aid, notably by maintaining a high level of official development assistance with a large environmental component.

# FINLAND

## CONCLUSIONS AND RECOMMENDATIONS*

For economic development and trade, Finland relies strongly on forest resources and some energy-intensive industries such as pulp and paper, metallurgy and the manufacture of metal products. Thus, despite its low population density, Finland has experienced relatively high pressures on its sensitive environment as regards both use of natural resources and pollution. During the 1980s, the Finnish economy grew faster than those of most OECD countries, but in 1991 it went into deep recession. After contracting by 11.5 per cent between 1990 and 1993, GDP was almost back at its 1990 level by 1996.

The late 1980s and the first half of the 1990s saw significant changes in the definition and implementation of Finland's environmental policies. The introduction of framework legislation and regulations, and the maturing of the regional and municipal environmental administrations, have extended and modernised environmental management in many areas, partly as a result of Finland's adhesion to the European Union. The fall in economic and industrial activity of the early 1990s brought relief in some pressures on the environment. As the economy returns to stronger growth, the major challenge for the remaining years of the decade is to integrate the concept and practice of sustainable development in all sectors of the economy. Domestic issues such as sound waste management, nature conservation and groundwater protection, as well as international issues such as acidification of inland waters, eutrophication of the Baltic Sea and control of greenhouse gas emissions, are on the environmental agenda of the mid-1990s.

This OECD report sets out the baseline for assessing future environmental progress, and examines Finland's environmental performance in three areas:

- implementation of environmental policies;
- integration of environmental concerns and economic decisions;
- international co-operation on environmental protection.

It also assesses the extent to which Finland's domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in Finland.

### 1. Implementing Environmental Policies

#### *Achievements and further progress*

After the formal creation of the Ministry of the Environment in 1983, it was necessary to consolidate environmental administrations, and to create regional and municipal environmental institutions and expertise. This has largely been achieved in the ten years since the 1986/87 OECD review of Finnish environmental policies. The 13 Regional Environment Centres of the Ministry of the Environment are taking on increased environmental responsibilities and supporting environmental progress at local level. Municipalities are carrying out their new environmental responsibilities. The institutions for environmental management are thus well in place. Some institutional adjustments may be needed, for instance to balance nature conservation and forest resource management and to move towards integrated pollution prevention and control.

The legislative and regulatory framework for environmental management has been considerably extended and updated in the 1990s. This effort has undoubtedly contributed to the reduction in conventional pollution observed in Finland, and further benefits should be felt as the implementation of these new measures reaches completion. Finland implements environmental policies through a mix of instruments: mainly regulatory instruments, supplemented by a range of economic and social instruments, land use planning and voluntary agreements.

Regulatory instruments are principally applied case by case without the use of binding ambient standards or emission limits, with water management (via the Water Courts) separated from air and waste management (carried out by the environmental administration per se) and from nature management. Several EU directives have had or will have a considerable impact on Finnish environmental legislation. These include the directives on urban waste water, nitrates, habitats, environmental impact assessment (EIA) and integrated pollution prevention and control.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its June 1997 meeting.

A number of economic instruments, including the world's first carbon tax, have been introduced in Finland to supplement regulatory instruments and to support the financing of environmental protection measures taken by public authorities. The main purpose of environmental taxes and charges is to promote changes in production and consumption patterns. At central government level, earmarking of revenues is used only exceptionally. The rates of taxes and charges are not always sufficient to promote changes in behaviour, however, and there is also room to introduce new instruments. At municipal level, most pollution abatement and control expenditure is financed by user fees.

Overall, pollution abatement and control expenditure amounts to 1.1 per cent of GDP, and this is financed in line with the polluter pays principle more than in most OECD countries. There is no evidence that this effort has affected the overall competitiveness of the private sector. On the contrary, Finnish industry sees environmental performance as an important element of its own competitive advantage. Significant increases in expenditure for water and waste related services are likely to be needed.

Nevertheless, the cost-effectiveness of environmental policies should be further strengthened. An integrated pollution prevention system is needed, and legislation to this end has been proposed. The implementation of environmental regulation is evolving from the traditional Finnish case-by-case approach to practices incorporating the body of EU regulation based on quality standards or emission limits. In line with the EU Common Agricultural Policy, large subsidies are provided for agricultural production, a small part of which is allocated to specific agri-environmental measures. Though environmental data availability is generally satisfactory, the coverage and timeliness of environmental information needed for policy formulation should be improved.

To promote greater environmental and economic effectiveness, it is recommended that consideration be given to the following proposals:

- consider ways and means to foster the development of more cost-effective integrated pollution prevention and control for industrial facilities;
- continue working towards greater use of economic instruments to promote more cost-effective environmental policies; consider possibilities for increasing the rates of certain charges in order to give appropriate price signals to consumers and also to finance environmental investments and services provided by public authorities in conformity with the polluter pays principle; consider new environmental taxes and charges without necessarily raising the overall tax burden;
- ensure that the coverage and timeliness of environmental data respond to the needs of policy formulation and implementation; further develop environmental performance indicators and environmental accounting.

***Water management***

Finland's abundant water resources are more than adequate to meet the needs of its population and industry. Water quality is good by conventional criteria in most rivers and lakes; however, the humus content is naturally high and there are risks posed by acidification and eutrophication. The quality of drinking water has substantially improved with increased use of groundwater and improved water treatment, and now generally meets health-based standards. Substantial progress has been made in reducing discharges from industry and municipalities. In industry, especially the pulp and paper industry, process changes and pollution control have led to large reductions in discharges of phosphorus, BOD, organochlorines and heavy metals. Municipal sewage collection and treatment has also improved, bringing reductions in related discharges of organic matter and phosphorus. These achievements largely result from case-by-case use of the permitting system to introduce best available technologies, and careful planning of investments with a view to meeting specified domestic and international targets (e.g. those of the Convention on the Protection of the Marine Environment of the Baltic Sea Area). Water management programmes now address a wider, more stringent set of pollution reduction targets.

Nevertheless, Finland faces a major challenge concerning reduction of nitrogen discharges, and thus has much work to do implementing the EU nitrate and urban waste water directives, as well as contributing to limiting the alarming levels of eutrophication of the Baltic Sea. Reaching targets for nitrogen removal involves a very large investment in waste water treatment, as well as improved control of nutrient loadings from agriculture, forestry and fish farming. The national targets for the reduction of toxic industrial discharges are also challenging. The case-by-case approach to licensing discharges should be complemented by a greater emphasis on setting quality objectives for

water and aquatic ecosystems. EU membership and the changing emphasis in Finland's water problems may be a reason to emphasise a river basin perspective and integrated pollution prevention and control.

It is recommended that consideration be given to the following proposals:

- continue to take more effective measures to reduce nitrogen and phosphorus discharges from agriculture and other sectors, and to invest in nitrogen removal for municipal waste water;
- continually monitor progress in meeting domestic and international objectives concerning nutrients, both overall and by sector;
- give further attention to the appropriate use and disposal of sewage sludge;
- monitor progress in reducing toxic industrial discharges in the context of a permitting system evolving towards integrated pollution prevention;
- consider wider use of economic instruments to improve the environmental and economic efficiency of water management policy and to help finance needed investments;
- place greater emphasis on receiving water and ecosystem conditions (in relation to relevant EU water directives) and a river basin perspective in water management, notably through river basin based Integrated Water Resource Management Plans;
- further increase the use of groundwater sources for drinking water supply, strengthen monitoring systems for groundwater quality and resources, and upgrade regional and local groundwater quality assessment and information systems.

***Air management***

Finland has made progress in reducing or containing emissions of conventional atmospheric pollutants, with an 81 per cent decline for $SO_x$ and stabilisation for $NO_x$ over 1980-95. This is largely a result of structural changes in the economy and in energy production, as well as abatement measures such as fuel quality standards, permitting, environmental taxes and voluntary agreements. The Ministry of the Environment's practice of setting up task forces on emission reduction plans related to Finland's international commitments has also proved effective. Finland has met all its commitments on conventional pollutants and ozone-depleting substances. Air quality has improved in terms of pollutants such as $SO_2$ and lead, and acid deposition has declined. The adoption of an Action Programme for Reducing the Adverse Effects of Transport on the Environment shows Finland's recognition of the importance of emissions from transport.

Finland's progress is less striking than it seems, however, since emissions per unit of GDP and per capita were very high in the mid-1980s, and the 1991-93 recession helped contain some emission growth. There is some uncertainty on the potential for reductions in the late 1990s and beyond 2000. $CO_2$ emissions grew by 1.3 per cent over 1990-95, though annual variations have ranged from -12 per cent to 12 per cent during this period; $CO_2$ emissions are not likely to reach their maximum in the 1990s. Finland's commitment to the Sofia Declaration of a 30 per cent $NO_x$ reduction between 1980 and 1998 is proving to be a challenge, as is a 30 per cent VOC emission reduction target for 1999 compared with 1988. Increasing road traffic is fuelling growth in road transport's share of emissions of $CO_2$. Some relatively low energy prices, for instance for electricity, make it difficult to promote renewable energy resources and energy efficiency improvements. Though the Government has developed a broad range of energy efficiency policies and programmes, additional measures would be necessary to achieve the significant potential for energy savings that remains, and thereby limit emissions.

It is recommended that consideration be given to the following proposals:

- continue to improve cost-effectiveness in air management through the combined use of economic instruments, regulations and voluntary agreements and emphasis on integrated pollution prevention and control;
- ensure that environmental taxation of energy products is well defined and announced, as part of a clear framework for the integration of environmental concerns into energy policies, to help energy users and producers plan emission reduction measures more efficiently;
- further promote energy efficiency improvements and the use of renewable energy resources;
- develop and implement a strategy to contain the increase in road traffic and reduce its environmental effect; this strategy would include, as appropriate, land use and transport planning, and regulatory measures and pricing mechanisms designed to limit car use, especially in urban areas.

***Waste management***

Finland has also made progress in recent years in addressing its waste management problems. The 1993 Waste Act took account of the concepts of waste reduction and prevention, as well as the hierarchy of waste management options. Economic instruments have been introduced to support the stricter new regulations. The number of landfills has been reduced by two-thirds and the quality of waste management in landfills has improved significantly. Industrial waste management has also improved significantly in the last ten years, with recovery rates reaching an average of 61 per cent in 1994. Business awareness of the need to address waste management is growing, and more industries are undertaking waste prevention and recovery measures. Collection of hazardous waste has become more efficient and treatment capacity is by and large sufficient for the short to medium term. The 1996 national waste plan includes many ambitious targets for waste reduction and recovery over the next five to ten years. Efforts have been made to inventory contaminated sites and assess the environmental risks they pose.

The new policy and plan have to be implemented, however, and waste monitoring has to be carried out if progress and performance are to be evaluated. Without broad-ranging waste prevention measures, industrial waste generation is expected to increase in the next few years as industrial production expands following the end of the recession. The Ministry of the Environment needs to promote its cleaner production programme, ensuring active industry-wide promotion of the concept, as well as initiating producer responsibility programmes. Voluntary agreements aimed at waste minimisation should also be actively pursued. Meeting the recovery targets of the national waste plan will require substantial development of selective sorting, particularly at municipal level. Measures to address the issue of contaminated land are recent, and their effectiveness will need to be carefully monitored to ensure that they are sufficient; in particular, the contribution of revenue from the waste tax to the funding of clean-up measures for orphan sites will have to be assessed regularly.

It is recommended that consideration be given to the following proposals:

- further implement with determination the overall waste management policy, including the use of economic instruments, and consider moving towards integrated pollution prevention and control;
- step up efforts to establish reliable, timely, consistent and internationally comparable waste data at national, regional and local level to support the monitoring of policy implementation;
- vigorously implement a specific waste prevention programme;
- initiate producer responsibility programmes for selected waste streams;
- examine the economic and environmental effectiveness of waste management options, notably recycling and incineration with energy recovery;
- consider a medium- to long-term strategy to change production and consumption patterns in order to increase the efficiency of natural resource use and prevent waste generation;
- ensure the timely and comprehensive implementation of the remediation programme for contaminated sites, as well as its appropriate monitoring and continuous evaluation.

***Nature conservation***

Finland has recently accelerated its programmes for establishing protected areas. Additional resources have been allocated to complete these programmes over 12 years. There have been successes with individual species protection projects, such as that concerning the white-tailed sea eagle. Finland is party to all the global wildlife conventions and most regional ones. As part of the programme to acquire land for nature conservation, it has recently allocated funds to the protection of habitats important for threatened species. Good progress has been made on plants, and conservation programmes cover more than 50 plant species. A system of fines for illegal collecting, killing, hunting or removal of wild plants and animals is a unique way to protect species.

Nevertheless, the state of Finland's nature is still highly vulnerable. Pressures from forestry have been the main threats to biodiversity; changes in forestry practices are relatively recent and have yet to prove their effectiveness. The total amount of land under protection (8.1 per cent of total area, IUCN categories I to V) is below the IUCN guideline of 10 per cent and there is considerable variation of achievement between different ecosystems and different parts of the country. Conservation outside protected areas and the far north has been neglected. The conservation of shores, wetlands and old growth forests presents particular problems. There is not enough variety in the tools used to promote nature conservation. The 1923 Nature Conservation Act proved inadequate to protect species outside designated reserves. In addition, enforcement of species protection laws outside reserves is poor: neither local authorities nor the police have taken the lead in this area. A number of these issues are addressed by

the 1996 Nature Conservation Act and Forest Act, as well as the forthcoming national biodiversity strategy. An underlying institutional weakness affects Finland's nature conservation performance, as responsibility for conservation is shared among at least five government bodies, all of which also have duties that can conflict with conservation. The establishment of a green belt of protected areas in the Finnish-Russian border area should be further supported.

It is therefore recommended that consideration be given to the following proposals:

- give high priority to the implementation of the 1996 Nature Conservation Act, finalise and implement the government strategy on biological diversity, and monitor progress towards explicit nature conservation targets (e.g. on protected areas);
- reconsider institutional arrangements for nature conservation with a view to promoting more focused, independent and transparent arrangements for delivering public nature conservation services; review the relationship between conservation and commercial functions;
- seek to carry out nature conservation more cost-effectively through partnerships involving, for instance, state bodies offering grants to meet some conservation costs incurred by owners, voluntary bodies or conservation trusts of interested parties and individuals acquiring land for conservation, and Finnish-based industries and conservation bodies sponsoring individual species and providing joint project funding;
- in co-operation with other Baltic Sea states and the European Commission, intensify the implementation and development of the Salmon Action Plan to increase the protection of the wild Baltic salmon and reconsider the case for imposing a moratorium on salmon fishing.

## 2. Integrating Environmental Concerns and Economic Decisions

### *Integration of environmental concerns in economic policies*

Promoting sustainable development has been a key goal for Finland since the late 1980s. Industry has been successful in decoupling discharges of suspended solids and BOD, as well as emissions of $SO_x$, from production. This was partly achieved through cleaner production processes (e.g. new pulp and paper mills and smelters). Many actions have been taken to adopt and implement sustainable development programmes in municipalities covering half the population of the country.

In the early 1990s, by contrast, the economic recession was not always accompanied by a commensurate fall in environmental pressures. Pressures from the energy sector, such as $CO_2$ emissions, actually rose. Agriculture and fish farming are recognised as sources of serious eutrophication. Concern about the sustainability of forestry practices has been expressed, notably with respect to biodiversity.

Today, green consumerism, eco-labelling and eco-certification concerns, and awareness of environmental considerations in public procurement, as well as government policy aiming at full cost pricing of goods and services, are encouraging developments for consumption patterns in Finland. However, road traffic intensity remains very high, well above the OECD average, as is the energy intensity of the country's economy; the latter is a consequence of a very energy-intensive production structure, low population density, a harsh climate, and some relatively low energy prices, such as those for electricity.

Finnish authorities are aware of the importance of integrating environmental considerations into various sectors to buttress the cost-effectiveness of their environmental efforts and are using institutional mechanisms to do so. Finland has introduced environmental considerations into sectoral plans for transport, forestry, agriculture, energy and industry. The 1994 Action Programme for Reducing the Adverse Effects of Transport on the Environment is a good example and includes specific environmental targets. Lower taxation of income and labour has been compensated in part by the new landfill tax, and restructured and increased energy taxation. The use of quantitative environmental objectives and targets is relatively limited in other sectoral plans, however.

The National Environmental Policy Programme 2005, prepared by the Ministry of the Environment in 1995, is Finland's first comprehensive environmental planning effort. Actions needed to achieve a sustainable society are examined by focusing on sectors with a particularly significant impact on the environment. This programme, although it lacks quantitative objectives and targets, should stimulate interministerial progress in integrating environmental concerns in sectoral policies and lead to clearer commitments, including sectoral targets

like those for transport. To promote active co-operation towards sustainable development across society, the Finnish National Commission on Sustainable Development, chaired by the Prime Minister, was created in 1993. Its mandate was renewed by the new Government in the spring of 1996. It is drawing up an action programme for sustainable development, which is expected to be completed in the autumn of 1997. In addition, local Agenda 21 work is under way in many municipalities.

Environmental impact assessment of projects, a major tool for external integration, was adopted only in 1994, after very long preparation. Sixty projects, including several roads and motorways, have been subject to an EIA procedure. The application of EIA to policies and plans required in the EIA Act has been studied and pilot projects have been conducted. Council of State guidelines are being drafted, as are guidelines for assessing the environmental impact of government bills.

It is therefore recommended that consideration be given to the following proposals:

- strengthen institutional mechanisms to encourage better integration of environmental concerns in sectoral policies, particularly those concerning agriculture, energy and regional development;
- set quantitative environmental objectives and deadlines for implementation in comprehensive plans;
- continue to integrate environmental concerns in fiscal policies;
- identify environmentally damaging subsidies and remove them, as far as is possible;
- widen the use of EIA at project level and develop EIA for strategic programmes and plans;
- pursue efforts to modify consumption and production patterns through consumer information, appropriate pricing and other means; strengthen and speed up the greening of government operations.

***Integration of environmental concerns in the forestry sector***

Sustainable development of wood resources is now secured in quantitative terms in Finland. The forested area, which was already very extensive, is increasing. Annual mean increments in standing timber have exceeded felling for several decades and the distribution of age classes is satisfactory for production purposes. Forest management techniques increasingly integrate environmental concerns. Intensification of sylvicultural methods with a harmful impact have largely been discarded. Objectives relating to the integration of environmental concerns in the forestry sector, and especially to the maintenance of biological diversity in commercial forests, are taken into account in the Forest Act adopted in 1996. On the whole, pollution discharges into water and air from forestry related industries are well under control. Finland's international commitment to sustainable development of forest resources is considerable. This is reflected by the Helsinki process and by co-operation with neighbouring countries and regions. Although certain points of contention inevitably remain, the main social actors and the general public agree on the need to maintain the forestry sector to drive the Finnish economy while achieving effective environmental protection.

The forestry sector is changing: Finnish wood industries are concentrated in three major multinational groups; the state has experienced drastic budget restrictions; and private owners can no longer negotiate standing timber prices collectively. Instead, prices are negotiated regionally between the companies and representatives of forest owners. Care should be taken to ensure that this new balance does not jeopardise the priority given to environmental objectives. Funding or compensation programmes for environmental actions are largely financed by the state from its reduced budget. Suitable methods for taking biodiversity into account are not yet fully operational on a scientific or technical level. Suitable operational methods to effectively monitor objectives relating to biodiversity maintenance are being developed, despite theoretical difficulties and a lack of data on the components of diversity (key habitats, old forests, etc.). A broad based working group on forest certification approved in April 1997 a set of criteria for certification of forest management in Finland.

It is recommended that consideration be given to the following proposals:

- give high priority to the implementation of the 1996 Forest Act and the Act on the Financing of Sustainable Forestry, with their emphasis on integrating environmental concerns in forestry policies and practices;
- pursue and expand research on the operation of forest ecosystems so as to characterise their biological diversity in more detail, to develop operational methods for evaluating the effects of various forest management practices on biological diversity, to understand the ecosystems' natural dynamics better and to develop forest management techniques ensuring very long-term stability of forest populations while respecting these dynamics;
- assess more closely the role of forests and the forestry sector in the overall carbon balance and review the various uses of forest biomass (including energy production) accordingly;
- further develop and implement operational systems (e.g. criteria and indicators) to monitor the practical application of the principles of sustainable forest management;
- expand financing for environmental actions by involving other sources than the state budget, focusing in particular on the actors likely to benefit from the economic-environment "double dividend" expected from more sustainable management of wood resources worldwide;
- further develop certification schemes and standards for forest management and labelling of forest products in support of sustainable forest management;
- continue promoting internationally the sustainable development of all forest resources and pursuing related international co-operation.

## 3. International Co-operation

Finland has developed an elaborate network of co-operative regional activities to promote sustainable development and combat transboundary pollution. Co-operation with Russia, Estonia and other central and eastern European countries has progressed considerably in recent years. Finland and other OECD countries have provided technical know-how and financial contributions. Significant progress is being made in the Barents Sea region to prevent major environmental risks. Regional co-operation has also led to a significant decrease of acid deposition in Finland, which reduced its own $SO_x$ emissions by 80 per cent, well ahead of its international commitments; further progress would require improved emission abatement from Russia and Estonia. Finland is phasing out use of ozone-depleting substances ahead of internationally agreed schedules. Before becoming a member of the European Union, Finland had introduced EU environmental legislation in its legal system, with only a few exceptions. In the preparation of Finnish positions on EU proposals, various ministries and stakeholders are consulted; this transparency has helped increase the social acceptability of EU common policy. Finland actively supports the development of international environmental law, particularly the preparation and adoption of new legally binding instruments. It gave the original impetus to some international agreements and is supporting new mechanisms to facilitate and verify the implementation of agreements. It provides strong support to NGOs, which contribute to its development policy, and it channels a sizable part of its official development assistance through NGOs. In the area of international trade, Finland would support restrictive trade measures where environmentally justified and arising from multilateral agreements, but is against unilateral action. It is aware that foreign public opinion concerning environmental protection in Finland can affect its exports. Finland actively promotes international co-operation to further sustainable development of forest resources.

The significant success of Finnish foreign policy in the area of the environment has not been sufficient to solve a number of issues. Eutrophication in the Baltic Sea, and in particular in the Gulf of Finland, has increased and bloom episodes are more frequent. Like other Baltic Sea states, Finland has agreed to reduce its nitrogen releases to marine waters by 50 per cent, but it did not take the measures needed to meet this objective by the 1995 deadline. $NO_x$ deposition, which was supposed to have been decreased by 30 per cent from the 1980 level, will have fallen by only 15 per cent by 1998. Combating pollution from diffuse sources proved more difficult than expected. Concerning climate change, Finland has proposed ambitious targets in international negotiations but has had to revise its national objective of stabilising $CO_2$ emissions at the 1990 level, and accept that $CO_2$ emissions would continue to grow until 2000. Furthermore, it is still unclear whether $CO_2$ emissions will stop growing after 2000, since measures taken so far are not enough to reverse the trend. Finland's difficulties in reducing emissions of nitrates, $NO_x$ and $CO_2$ while enhancing exports point to a need for much closer integration of environmental and other policies, in particular those for agriculture and energy. As an EU member, Finland has found it difficult to meet the deadlines in the habitat and urban waste water directives. Modifications of its legal set-up are slow, especially because Finland protects land owner property rights very strongly. In the area of development aid, Finland had to decrease its level of aid when it

met severe economic difficulties in the early 1990s, though it is now committed to bringing this level back to 0.4 per cent of GNP by 2000.

It is recommended that consideration be given to the following proposals:

- ratify environmental agreements already signed in areas such as maritime transport, prevention of industrial accidents and compensation for environmental damage (Annex III);
- continue to invest in waste water treatment to reduce nitrogen releases in the Baltic Sea and take more effective measures to reduce nitrogen releases from agriculture and fish farms, with a view to reaching the 50 per cent reduction target;
- strengthen nationally and internationally co-operative programmes with central and eastern European countries to facilitate the construction and use of facilities that would reduce transboundary air pollution and marine pollution in the Gulf of Finland;
- strongly support the creation of a green belt of protected natural areas along both sides of the Finnish-Russian border;
- set targets for greenhouse gas emissions beyond 2000 and develop corresponding strategies; adopt technical and fiscal measures ensuring that energy policies take better account of commitments concerning $CO_2$ emissions;
- restore the level of official development assistance, according to a set schedule, to the UN target of 0.7 per cent of GNP as soon as budgetary constraints permit.

# FRANCE

## CONCLUSIONS AND RECOMMENDATIONS*

France responded at an early stage to pressures on the environment from industrialisation and urban development, setting up institutions with special responsibility for pollution control and natural resource management. Its environmental policy, within a comprehensive legislative framework, is implemented at different levels of government, relies upon co-operation between the relevant authorities and private stakeholders and makes use of a wide array of instruments, including regulations, economic instruments, planning and voluntary measures. From the start, French policy has shaped and been shaped by the development of environmental policy at the European level.

In the 1990s, French environmental policy has received new impetus from the implementation of the National Environment Plan, stronger implementation and incorporation of the concept of sustainable development. The current trend is towards efficient natural resource management, environment related job creation, reductions in public health expenditure, enhancement of urban environmental quality and protection of nature and landscapes. Now that France has achieved control of industrial air and water pollution and established the basis for an effective waste management system, present environmental issues focus on pollution from agriculture and transport, air quality in major cities, expansion of the network of protected areas and protection of coastal areas.

This OECD report sets out the baseline for assessing future environmental progress, and examines France's environmental performance in three areas:

- implementation of environmental policy;
- integration of environmental concerns into economic decision making;
- international co-operation on environmental protection.

It also assesses the extent to which France's domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in France.

### 1. Implementing Environmental Policies

A set of laws on environmental protection, regional and urban development and devolution forms a highly comprehensive institutional and legal framework consistent with the principle of subsidiarity. The Ministry of the Environment, founded in 1971, was given greater resources in the early 1990s, together with supervision of specialised agencies and decentralised services. Most of the environmental expenditure in France is carried out by public authorities, particularly at regional and local level. At national level, the Ministries of Research, of Industry, of Equipment, of Health and of Agriculture, Fisheries and Food also make a substantial contribution to efforts aiming at environmental protection.

#### *Results and effectiveness of implementation*

Through the combined use of regulations, economic instruments, planning procedures and voluntary actions, environmental policy is, on the whole, both effective and well balanced. Integrated pollution prevention and control (air, water, waste and risk management) for the 68 000 classified facilities that must undergo authorisation, as well as increasing pressure from the inspectorates of such facilities for industry to achieve environmental objectives, have proved effective. France makes wide use of economic instruments; it applies the polluter pays principle and is aiming to get prices right for natural resources. Planning also plays a role through the National Environment Plan, central-regional planning contracts, and local land use, marine resource, water and risk management plans. Voluntary agreements have been used to encourage industry to invest in pollution control. Substantial environmental R&D efforts, both public and private, are being made. The gradual strengthening of environmental policy implementation and of related funding, as well as the systematic use of economic instruments, have contributed to economic effectiveness and growth in investment. For example, very good results have been obtained for point-source pollution, especially in industry.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its November 1996 meeting.

Environmental policy is not always adequately implemented, however. Often polluters are not identified or have been granted waivers, and sanctions are rarely used to discourage environmental offences. Despite efforts by the central administration, problems remain in certain municipalities because of lack of resources or political resolve. Examples concern sewerage and waste water treatment, flood risk prevention plans, urban traffic management and related pollution, and implementation of the coastal law. Substantial efforts still need to be made to combat pollution at municipal level and from agriculture; to these ends, major investments are planned and the rates of charges are being raised significantly. The rapid expansion of environmental legislation and regulation has made environmental law overly complex; the forthcoming adoption and publication of an Environment Code should help improve understanding of the laws and encourage their more systematic implementation.

To promote greater environmental and economic effectiveness, it is recommended that consideration be given to the following proposals:

- continue to use economic instruments, and increase and differentiate the rate and basis of environmental taxes and charges; continue to provide for the means to finance the increased public and private investment needed to ensure the success of environmental policy;
- make greater use of economic assessments and cost-benefit analysis or, failing this, cost-effectiveness analysis in formulating environmental policies;
- increase environmental monitoring and make comparative assessments of how environmental protection measures are implemented in the country's different regions and major cities;
- within a tradition of consultation, seek to improve the enforcement of laws and regulations; ensure that the relevant authorities fully implement regulations, reinforce the corps of inspectors and apply criminal or administrative sanctions to infringements;
- maintain support for R&D and job training related to the environment;
- continue to apply life-cycle analysis as well as analysis of externalities, and improve the quality and availability of data.

***Water***

France has abundant water resources and a wide variety of aquatic ecosystems of high ecological quality. The institutional structure, comprising River Basin Committees and Water Agencies, has made it possible for water resources to be managed by drainage basin, with involvement of all stakeholders, since the late 1960s. It has also ensured substantial funding through application of the polluter pays and user pays principles. The increase in water prices during the 1990s has allowed investment levels to be stepped up. At present, 77 per cent of the population is connected to waste water treatment facilities. The authorities are strengthening the role of economic instruments and applying the principle of "water paying for water". The corresponding means have made possible a major reduction in pollutant discharges by industry, and should be sufficient to reduce pollution generated by municipalities to meet the EU targets for 2000. The quality of bathing waters has markedly improved in the past 15 years. Master plans for water management and development are being drawn up to broaden the scope of planning procedures.

Over the past few years, both the general public and the authorities have become aware of the importance of certain problems: overuse of resources compounded by periods of drought; catastrophic flooding; occasionally substandard drinking water, particularly in terms of microbiological quality and nitrates; unsatisfactory waste water treatment in many cities; agricultural pollution (from intensive livestock raising and use of fertilisers and pesticides) affecting the quality of surface and groundwater; and insufficient attention to aquatic ecosystem management. Prices and charges for agricultural water use fall well short of covering the costs of supply.

It is recommended that consideration be given to the following proposals:

- increase the dissuasive strength of regulatory requirements by making greater use of the enforcement powers of the State's decentralised services; consider simplifying and reorganising decision-making powers with regard to implementation of regulations; ensure that decision making is entrusted to the decentralised authorities of the State;
- further apply the strategy of internalising costs through charges and prices to finance water policy, as is already done with industry and local authorities;
- continue efforts to improve the performance of sewerage and waste water treatment facilities; maintain efforts to ensure that local authorities build the facilities necessary to meet objectives;

- take measures to curb excessive withdrawals for irrigation and to reduce agricultural pollution of surface and groundwater (from intensive cultivation and livestock raising); strengthen economic signals within the agriculture sector (charges and prices) and the integration of policies relating to water into agricultural policies and practices;
- strengthen the assessment criteria relating to the impact of projects on aquatic ecosystems;
- strengthen controls on land use in areas subject to flooding;
- step up monitoring of drinking water and of the quality of watercourses and aquifers.

***Air***

Significant progress has been made concerning emissions of the main pollutants as well as of $CO_2$, and France has met its international commitments. For instance, emissions of $SO_2$ and $NO_x$ have fallen since 1980 by 72 and 14 per cent, respectively; $CO_2$ emissions have fallen by 27 per cent. All these emissions are among the lowest in the OECD both per unit of GDP and per capita. Reductions have been achieved in all economic sectors except transport. This progress is the result of structural changes in the economy, improved energy efficiency, the use of nuclear power to generate electricity and the implementation of environmental policies that generally combine pollution control regulations (e.g. integrated pollution control in classified facilities, vehicle emission standards) with economic instruments (e.g. earmarked charges on air pollution, tax differentials favouring low-sulphur and unleaded fuels). Air quality has greatly improved throughout France as regards $SO_2$ and lead, as well as locally near major stationary sources.

Many pollution episodes still occur, however, mainly related to emissions from road transport. The formation of photochemical smog due to $NO_x$ and VOC emissions, as well as increased emissions of fine particulates as a result of rapid growth in the diesel vehicle fleet, are serious causes for concern over public health in major cities. Efforts related to air management should therefore be stepped up considerably as regards such pollution. This requires a broader strategy involving environmental planning, efforts to increase cost-effectiveness in the implementation of regulations and the use of economic instruments, and integration of air pollution concerns into sectoral policies such as those for transport and energy (e.g. energy conservation in dwellings, in public buildings and in small and medium-sized enterprises).

It is recommended that consideration be given to the following proposals:

- draw up a national air pollution control strategy that combines a timetable setting out quantitative targets with sectoral measures whose cost-effectiveness has been assessed;
- enforce regulations more vigorously, notably by inspecting classified facilities more often and increasing the severity of administrative and criminal sanctions;
- make greater use of economic instruments for air management, notably as regards taxes levied on mobile sources;
- enhance the integration of air pollution concerns in the definition of national and local policies on land use, urban planning, energy and transport;
- continue to extend and modernise the air quality monitoring network, particularly to accommodate new concerns about fine particulate emissions and ground-level ozone.

***Waste***

France's waste management policy is based on legislation introduced in the mid-1970s on waste disposal, recovery of materials and integrated pollution control at classified industrial facilities, as well as a 1992 law that is intended to end landfilling of raw waste by 2002 and that gives priority to prevention and to recycling and recovery. Charges on landfilling of household and similar waste and on special industrial waste, along with a fee on packaging, are levied to support this policy. At département level, plans regarding the disposal of household and similar waste are largely in place. France was a driving force in negotiations on transboundary movements of waste, and rapidly implemented the Basel Convention. This wide-ranging policy has already shown positive results. Economic instruments play a major role in the financing of national waste management policy. Household waste collection services are available to almost the entire population. Industry is active in the management of packaging waste (e.g. through the Eco-Emballages system). Contractual, regulatory or economic measures to encourage waste recycling and recovery have led to progress in the 1980s and 1990s, although the recycling rates are not yet among the highest in the OECD. France has an effective network of treatment and disposal facilities for industrial waste,

efficiently managed in accordance with the regulations on classified facilities, and its capacity is amply sufficient to meet current needs for the treatment of domestic and imported waste. An inventory of contaminated sites and soil has been made.

It now remains to ensure that this policy is properly implemented. With regard to household waste, some départements have adopted a policy of separate collection, recovery and recycling, while others appear to have opted for incineration alone, which could adversely affect less developed systems for material recovery and recycling. The role of economic instruments in achieving objectives for waste reduction at source or material recovery is limited. With regard to industrial waste, better data on flows and stocks are needed; small and medium-sized enterprises should assume greater responsibility for such waste, and efforts are needed to dispel uncertainty over the environmental impact of the various waste management options. More generally, measures to promote waste reduction at source have yet to be defined. Clean-up of contaminated sites and soil has only just begun.

It is recommended that consideration be given to the following proposals:

- take the necessary steps at national level to direct and harmonise waste disposal plans at the level of départements and regions, to ensure that the objectives of waste reduction at source, recycling/recovery and treatment are fully met;
- step up current efforts affecting all relevant stakeholders so that, by 2002, all waste is sent to treatment centres and final waste storage facilities, with traditional landfilling of raw waste completely halted;
- promote the creation of regional centres for final waste**;**
- adopt measures to promote waste reduction at source; increase the rate of recovery and find markets for recycled products; develop separate collection of toxic materials in household waste as well as their treatment;
- review the effectiveness of waste management regulations, particularly with regard to the priority goals of prevention, reduction and recycling/recovery;
- accelerate the clean-up of contaminated sites and soil identified as priority cases.

***Biodiversity and nature conservation***

Despite pressures on nature from economic activities, France has preserved rural areas and natural habitats of great variety and biological value. Its landscapes and its fauna and flora, which represent four of the five major biogeographical areas found in Europe, are ecological, economic and cultural assets. The legal and institutional framework for nature protection is comprehensive, particularly with regard to protected areas and land management. Stringently protected natural areas make up 10 per cent of the territory. Protection and management programmes for endangered species have led to the re-establishment or reintroduction of certain species. Significant resources are devoted to an overall strategy aimed at better knowledge and protection of France's natural heritage. The 1990 National Environment Plan provides a framework for a very ambitious biodiversity conservation policy; some of its objectives have already been met, but substantial funding will continue to be needed in coming years. France has met most of its international commitments concerning nature conservation, has taken various international initiatives (e.g. with regard to whale sanctuaries and trade in ivory) and provides considerable financial assistance for nature protection through bilateral and multilateral aid programmes.

While France is vigorously pursuing a policy of designating protected areas, the country's national parks, nature reserves and regional parks may nevertheless not be immune to environmental damage. The process of devolution has often led to priority being given at local level to economic interests rather than nature management; in many cases it has yet to be determined what approach to regional and local development offers the best balance between nature conservation and economic interests. Given the extent of its rural areas, France should pay particular attention to agri-environmental measures and should better integrate management of land use and biodiversity; greater consistency is needed in support measures, in terms of both the amounts given and the choice of priorities at regional level. Forest fires continue to cause serious concern. France has yet to finalise its list of protected nature sites under the EU habitat directive. Biological data collection and the creation and use of inventories rely largely on networks of volunteers.

It is recommended that consideration be given to the following proposals:

- develop and adopt a co-ordinated set of biodiversity objectives for habitats and species;
- make more resources available for biodiversity research;

- ensure that legal instruments for the protection of the countryside are implemented, particularly in the case of recently adopted instruments;
- increase the degree to which socio-economic and environmental considerations are incorporated in the designation and management of protected areas, as well as the public's commitment to such a policy, so as to improve safeguards against the pressures on such areas, particularly national parks;
- ensure that concerns relating to landscape protection are properly taken into account by national and local authorities in sectoral policies;
- give priority to measures aimed at sustainable development of agriculture, especially by ensuring greater environmental consistency in agricultural support measures.

## 2. Integrating Environmental Concerns and Economic Decisions

The integration of environmental concerns into economic and sectoral decision making is essential to improving environmental performance and moving towards sustainable development. Such integration is also needed to achieve cost-effective responses to environmental challenges. Economic forces and changes in such major sectors as energy, industry, agriculture, transport and tourism strongly influence environmental conditions and trends, and hence can either enhance or diminish the benefits of environmental policy and technical progress.

### *Strengthening institutional integration*

The pursuit of strategies geared towards sustainable development and protection of the natural heritage is a constant in France's environmental policy. The Minister of the Environment chairs the Interministerial Committee for the Environment and is involved in all major government decisions of relevance to the environment. The Ministry of the Environment closely collaborates with stakeholders (industry, unions, non-profit associations, subnational authorities). However, despite high prices for road fuels and water, household consumption remains high. As for consumption patterns in government operations, France has to implement a policy of "greening" of public administrations, combining environmental effectiveness and economic efficiency.

Decoupling of economic growth and certain environmental pressures has been achieved, with a marked reduction since 1980 in emissions of a wide range of air pollutants, while GDP grew 30 per cent. More recently, decoupling has also been observed with regard to phosphates, nitrogenous fertilisers and pesticides. In the past 15 years, however, waste generation and agricultural water use have increased. And growth rates for road traffic and for construction in certain tourist areas have matched or exceeded that of GDP.

French expenditure on environmental protection has risen steadily, reaching 1.6 per cent of GDP in 1994. There is no sign of environmental measures having affected the overall competitiveness of the French economy. The private sector is showing an increasingly positive attitude towards environmental protection. The number of jobs related to the environment sector is more than 275 000, or around 1.2 per cent of total employment. Public and private investment expenditure will need to rise still more to meet national or EU objectives, notably for water and waste management. Since the authorities apply the polluter pays and user pays principles, direct and indirect subsidies for environmental protection are generally being reduced gradually.

The National Environment Plan, debated by the Parliament and approved by the Government in 1990, provided an integrated approach to a variety of environmental concerns and allowed France to rapidly put in place strengthened and lasting environmental institutions and funding. A new plan with qualitative and quantitative targets would enable France to continue and step up this first effort at environmental planning at the national level, which has already had highly positive results.

The integration of environmental policies into economic decisions has been approached in different ways according to economic sector. It is very extensive for industry, particularly with regard to the most hazardous, and formerly the most polluting, industrial facilities. This is due partly to the existence of a corps of government inspectors who thoroughly review permit applications and inspect licensed facilities; and partly to the fact that urban planning and civil protection regulations are taken into account from the outset in the licensing process. Policy integration has also been effective in the energy sector. For agriculture and transport, the results of efforts at integration remain insufficient.

It would seem necessary to give priority to abolishing or reducing subsidies that are potentially damaging to the environment, particularly for agriculture and transport. And when the French tax system is overhauled, it

would be advisable to give greater consideration to the environmental effects of fiscal instruments. Efforts at integration would be more effective if government decisions regarding national plans and programmes, infrastructure projects and draft legislation were assessed in terms of their environmental impact.

Since 1977, environmental impact assessments (EIAs) are carried out for a great many projects. Measures have been taken to extend the list of projects, improve the quality of EIAs and increase public participation. France has a long history of public consultation and has introduced new measures to make such consultation more effective and less formal. Public information is regularly made available on the state of the environment, economic aspects or the quality of environmental media, through high-quality summary reports and through publications focusing on particular themes. Innovative work is being carried out on environmental performance indicators.

To promote greater policy integration, it is recommended that consideration be given to the following proposals:

- strengthen institutional mechanisms to encourage better integration of environmental and sectoral policies, notably through environmental impact assessment of plans and programmes and draft legislation;
- draw up a national plan for sustainable development and set quantitative targets for environmental protection, including a breakdown by economic sector;
- continue at all levels of government to specify plans and programmes that contribute to environmental protection;
- pursue efforts to modify consumption and production patterns through appropriate pricing, consumer information, etc.; strengthen and speed the implementation of the policy on the "greening" of government consumption patterns;
- as far as possible, abolish subsidies that are damaging to the environment; catalogue all tax provisions that are unfavourable to the environment and amend them accordingly;
- continue to develop quantitative performance indicators; carry out all necessary measurements of ambient environmental quality and polluting emissions and ensure that information on the environment is widely circulated;
- ensure that all these policies are followed up on a partnership basis and accompanied by a balanced use of regulatory and economic instruments.

***Sectoral integration: transport***

Many measures have been taken to reduce the environmental impact of transport. For vehicles, the measures include regular mandatory inspections (1992), stricter emission standards (1993), new regulations on noise (1995), increased recycling of scrapped cars and the pending new law on air quality (1996), which should strengthen these measures. France has among the highest road fuel taxes in the OECD, and has introduced cleaner fuels (containing less sulphur and lead). In the past ten years, better account has been taken of the environmental effects of transport infrastructure projects, with improved public enquiry and EIA procedures, the "1 per cent for landscaping" requirement on motorway projects and curbs on noise. The development and construction of public transport using advanced technologies (the high-speed train system, automated urban rail and tramways), as well as support for combined rail-road transport, should also be noted. All these actions have helped reduce the environmental effects of road transport, but have not managed to bring them fully under control.

In France, as in other OECD Member countries, passenger and freight mobility has risen considerably in the past 15 years, stimulated by the growth of trade within France and by European economic integration. As a result, transport, particularly road transport, is exerting considerable pressure on the environment. The transport sector's share of pollutant emissions has risen as emissions from stationary sources have declined and traffic has continued to grow. Photochemical smog in major cities and emissions of fine particulates from a very large diesel vehicle fleet give serious cause for concern over public health. Transport is also the largest single source of noise, which one in four inhabitants cite as a nuisance. Municipal measures to curb private car use have been weak. To achieve sustainable development of transport, integrating environmental concerns, would require stronger measures on vehicles, road fuels, infrastructure and traffic. Such an approach should focus on controlling growth in transport demand, encouraging users to switch to less polluting, safer and more efficient transport modes and adopting a pricing policy under which users would bear all costs of infrastructure and environmental externalities.

It is recommended that consideration be given to the following proposals:

- increase the integration of environmental concerns into transport policy, particularly in the transport planning and programming phases; clarify the contribution of transport policy to the achievement of environmental objectives, particularly those regarding conventional pollutants, noise and the greenhouse effect; set targets for the reduction of emissions in transport;
- develop more rational pricing and taxation of transport to help internalise its environmental costs, notably by raising diesel fuel taxes and the axle tax;
- improve conditions for competition among different modes of freight transport, including by taking account of environmental externalities;
- continue to encourage the provision of economically and environmentally attractive public transport systems in urban areas; introduce regulatory and pricing mechanisms to limit car use in congested areas, e.g. tolls on urban expressways, improved enforcement of parking regulations and greater use of parking fees in major cities; contribute to solving the problems of urban freight transport;
- improve policy co-ordination and the division of responsibilities between the State and the regional and municipal authorities, and promote an intermodal approach to transport;
- continue R&D efforts aimed at developing less polluting, more energy-efficient vehicles, as well as public transport in low-density areas.

***Sectoral integration: coastal areas***

France has a comprehensive array of legislative and regulatory instruments for the protection of coastal areas. General objectives as well as quantified targets relating to environmental protection have been adopted, such as the conservation of an "unspoilt third" of France's coastal zone and preservation of 40 per cent of its coastline from construction, and quality targets for bathing waters. France has adopted a coastal law banning construction within 100 metres of the foreshore, and has created a Coastal Conservatory to acquire coastal land attractive to developers to ensure that it is properly protected and managed. The conservatory and the authorities have been able to protect 17 per cent of the coastline and restore damaged or neglected sites. France has improved the bacteriological quality of bathing waters; its success rate is one of the best in Europe (over 93 per cent of bathing waters are of good quality). There has been no major oil spill in French territorial waters for 15 years, but in the event of a spill France is equipped to intervene and has developed new ways of combating oil pollution that have proved effective.

There is room for further progress, however. The concept of sustainable development in coastal areas, especially sustainable development of tourism, does not appear to have been understood by certain decision makers, who advocate short-term economic development and increased construction along the coast. The building up of coastal areas, which started in the 1960s, has perhaps slowed since the boom years of the early 1980s, but nonetheless remains significant. No instruments are in place to measure the loss of coastline to development, and financial instruments to discourage development are not being applied widely enough. Most land use plans are not being revised to bring them into line with the coastal law. The preparation of marine resource plans is proceeding only slowly. Progress in combating marine pollution has been uneven. High priority has been given to sewerage and waste water treatment, but efforts to combat pollution by nitrates from agriculture need to be stepped up. The quality of fresh water reaching the sea has hardly changed in ten years. Due to insufficient treatment of waste water, water quality in shellfish beds is not always up to standard. Insufficient progress has been made in identifying natural sites requiring protection. France has not yet met some of its international commitments on discharges of heavy metals and nitrates into the sea.

It is recommended that consideration be given to the following proposals:

- strengthen mechanisms of integration for the actions of different administrations so as to pursue a policy of sustainable development in coastal areas that takes full account of economic potential and nature protection;
- ensure that environmental concerns are integrated into decisions at local level on urban development, infrastructure and tourist activities in coastal areas;
- proceed with the full implementation of the coastal law, notably by increasing funding for preparation of marine resource plans, and bring land use plans into line with the legislation;
- initiate and pursue stakeholder consultation on regional or national action plans for coastal areas, taking account of quantitative targets for strict protection of the coastline and sensitive areas;

- provide increased support to the Coastal Conservatory so as to rapidly conclude planned property transactions;
- make greater use of economic and budgetary instruments to step up protection of coastal areas and reduce the economic disparities among coastal municipalities with a view to achieving sustainable development;
- continue efforts to prevent accidental releases of pollutants and to equip coastal municipalities with sewerage and waste water treatment plants, and complete the equipment of networks with detention basins;
- increase efforts to track trends in urban development, in the protection of sensitive areas and in land-based marine pollution to determine whether quantitative targets are being met.

## 3. International Co-operation

France is actively participating in international co-operation on environmental protection. It has made and continues to make a significant contribution to the development of international environmental law and has been responsible for many initiatives that have led to exceptional achievements (e.g. the Paris Convention for Protection of the North-east Atlantic Marine Environment, the Mediterranean Action Plan, instruments concerning the protection of the Antarctic and whale sanctuaries). France has met most of its international obligations, including those at EU level, with regard to environmental protection. Once the world's second largest producer of CFCs, France halted such production before the agreed deadline and introduced substitutes. France, a major industrial country, has sharply reduced its $CO_2$ emissions and set a target of limiting per capita emission levels, which it has already met and is expected to maintain to 2000. While $CO_2$ emissions will be higher in 2000 than in 1990, overall emissions of greenhouse gases should be brought back in 2000 to the 1990 levels. In terms of cross-border and regional co-operation, France has met its commitments on air pollution and has introduced the instruments needed for enhanced environmental protection at the European level and in border regions. Its achievements in the area of development aid are particularly remarkable: France provides more aid in relative terms than any other G-7 country, and in 1995 it was the second highest donor in absolute terms. The environmental component of this aid is very large. France provides substantial aid to African countries and significant aid to central and eastern European countries. Along with Germany, France proposed the creation of the Global Environment Facility.

Despite the efforts made, progress is still needed. It will not be easy for France to meet the Sofia Declaration target of a 30 per cent reduction in $NO_x$ by 1998. France still needs to make substantial investments to reduce land-based marine pollution, especially as concerns the 50 per cent reduction target for nitrates. France helped draft the Convention on Civil Liability for Activities Dangerous to the Environment, but has not yet signed it. French co-operation with developing countries, notably in the area of environmental protection, is carried out by several ministries; it would be helpful if the public were more aware of this work. The effect of the recent reduction in overall aid levels on environmental aid should be spelt out.

It is recommended that consideration be given to the following proposals:

- ratify and implement recent international agreements on environmental protection (Annex III), particularly those relating to VOCs, EIAs and the protection of the North-east Atlantic;
- deepen cross-border co-operation with neighbouring countries and find a solution to a few practical and legal problems related to the environment that remain in border regions;
- strengthen measures to reduce non-point-source discharges of heavy metals and nitrates into the Channel and the North Sea;
- assess the progress of the national climate change programme; set quantitative targets for greenhouse gas emissions beyond 2000 in the context of international negotiations and define strategies to meet these targets in each sector, notably by stepping up efforts to improve energy efficiency;
- contribute to the development of environmental law with a view to improve its implementation and to adopt international regulations on civil liability;
- carry out regular reviews of all international commitments with regard to environmental protection to determine to what extent they have been implemented in France and whether measures taken to meet international obligations are adequate;
- make more information available on France's international environmental protection activities and work to improve awareness of these activities in other countries.

# GERMANY

## CONCLUSIONS AND RECOMMENDATIONS*

Germany's high population density, industrialisation level, location in central Europe and dependence on fossil fuels for its energy supply have contributed to making environmental protection a public concern and a policy priority. The decoupling of economic growth from the flow of several major pollutants over the past two decades is indicative of Germany's remarkable achievement in reconciling economic growth and environmental objectives.

Important challenges remain, however: waste disposal, pollution from the agriculture and transport sectors, to cite a few priorities at national level; and regional pollution and climate change at international level, where Germany has both a vital stake in ensuring progress and the will and capacity to help the international community. That it has accepted this international responsibility is a clear sign of its commitment to environmental protection.

Germany's environmental concerns have also increased substantially with unification. Keeping to its ambitious environmental restoration schedule during a period of economic slowdown will, very likely, take a special resolve, given the heavy investments required. However, the benefits of "staying the course" are substantial, not only for residents of Germany, but also for others, notably because such resolve and progress have a strong exemplary value.

The OECD report has set out the baseline for assessing environmental progress in the future, and has examined Germany's environmental performance in three major areas:

- reduction of the pollution burden, with separate analysis of western Germany and eastern Germany;
- integration of environmental and sectoral decision-making;
- international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This included both domestic objectives and international commitments, as well as environmental effectiveness and economic efficiency criteria.

### 1. Reducing the Pollution Burden in Western Germany

#### *Achievements*

Remarkable progress has been made in western Germany in dealing with a number of the pressing environmental problems identifies over the past two decades. This is particularly true for pollutants emitted from stationary sources, including sulphur oxides, particulate and certain heavy metal emissions from industrial and thermal power plants; waste water discharges from households and industry; and management of municipal waste. This progress is demonstrated both by the extent of achievement of environmental policy objectives and by absolute improvements in environmental quality.

The scale of these achievements becomes even clearer if they are seen against the deterioration that would have occurred had nothing been done. In fact, western Germany — like several other OECD countries — has achieved a decoupling of economic growth from the flow of several major pollutants. For example, over the 1980s, while GDP grew by 23 per cent, air emissions declined by 71 per cent for $SO_2$ and 35 per cent for particulates. This decoupling is a necessary steps towards sustainable economic growth for Germany.

Progress on air pollution was triggered initially be concerns in the late 1960s with health risks in certain industrialised areas, and then in the early 1980s with forest damage ("Waldsterben"). This progress is partly the result of energy efficiency gains and of the stability or decline of the shares of coal, lignite and oil in the energy supply. It also results from air m management programmes which address numerous substances from a variety of sources and which are uniformly implemented across the country. These programmes are mostly based on the use of "best-available technology" and a mix of emission, fuel-quality and product standards. Overall, the air management programmes have proven to be environmentally effective in achieving objectives adopted, as well as in reducing health risks and improving ambient air quality with respect to targeted air pollutants.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its December 1992 meeting.

Water pollution abatement and control programmes have followed a somewhat similar pattern over the past two decades in western Germany. Considerable investment in the construction and renewal of sewers and of municipal and industrial waste water treatment plants has led to country-wide purification of waste water prior to discharge. With respect to targeted pollutants from point sources, such as suspended matter, oxygen-demanding organic substances and some heavy metals, investments have also contributed directly to improvements in the corresponding quality parameters of water bodies. Overall, the water management programmes have also proven to be environmentally effective in achieving objectives and improving the quality of surface waters with respect to targeted water pollutants.

Concerning waste management in western Germany, efforts have focused on achieving three major objectives: i) ensuring that wastes are sent to final disposal with minimum damage to the environment, ii) preventing or reducing waste generation, and iii) enhancing waste recovery, reuse and recycling. Available information suggests that these objectives have been generally achieved: i) the environment has been better protected by the introduction of rigorous disposal standards and stringent requirements for incinerators, ii) total quantities of municipal and industrial wastes have not increased over the past two decades, and iii) recovery rates for "industrial wastes" have steadily increased since 1977.

Direct expenditure for pollution abatement and control in Germany has grown slowly over time from 1.3 per cent of GDP in the mid-1979s to 1.65 per cent in 1990. Most of this expenditure has been devoted to water pollution abatement and has mainly been borne by the public sector. On the other hand, air pollution abatement has been funded principally by the private sector. As a percentage of GDP, Germany's environmental expenditure is one of the highest among the OECD countries. This effort has been accompanied by a share of government R&D expenditure devoted to environmental purposes which is also among the highest for OECD countries.

The demand for pollution-abatement technologies, clean production technologies, environmental consulting services and environment-related R&D have generated an "eco-industry" in Germany which is estimated to generate employment of 320 000 people, to have a turnover exceeding DM 40 billion and to export 40 per cent of its production volume. Available studies assessing the economic value of environmental protection in western Germany show that most environmental policy measures investigated produce benefits, in terms of avoided environmental damage, which clearly exceed costs.

***Enhancing environmental performance in western Germany***

Some pollution problems have proven difficult to solve in a number of countries including Germany, and strategies are being developed or tested to address them. This is the case with some air pollution problems which may require the development of ambient quality standards or objectives by the relevant fora in the following cases: carcinogens; ground-level ozone; acidified soils and fresh waters; and if possible for particularly sensitives ecosystems, such as forests. Further measures in the transport sector need to be taken to achieve acceptable quality levels. This is also the case with water pollution from diffuse agricultural sources, which is now one of the most difficult environmental challenges facing Germany: widespread use of pesticides and fertilizers in agriculture causes ground water contamination; nitrate pollution in particular adversely affects public water supplies, streams and coastal waters in some areas. Water quality standards for nitrogen compounds in fresh and ground water should be developed by the relevant fora in order to protect sensitive marine waters. Policy measures to avoid further nitrate contamination of ground water and marine waters also need to be taken.

Germany is facing severe capacity limits for waste disposal, and public opposition to the installation of new landfill or incinerator sites. Consequently, efforts to increase waste recovery and to reduce waste generation have been stepped up, including the use of charges and subsidies to foster waste prevention and recycling, as well as the use of "eco-labels" such as the Blue Angel. Also, the recent and innovative Packaging Ordinance further supports Germany's waste objectives. These actions, however, need time to have an effect on the environment and it is too early to evaluate their cost-effectiveness. Among areas deserving more attention are the economic aspects and overall costs of current waste management policy, especially with regard to the costs of achieving high recovery rates, and the effect on industrial competitiveness and international trade of certain high-cost waste management measures. Further problems such as contaminated soil sites are still subject to ongoing research in Germany on remedial technologies and costs.

It is further not certain that achievements described in the previous section have been reached at the lowest cost. Current approaches, primarily based on country-wide uniform regulations and technological progress, may have to be supplemented to obtain further results for environmental problems that are already well under control, and

to address the more intractable remaining problems. Among the compelling reasons for modifications suggested below are rising marginal costs of pollution abatement as environmental quality improves, and current financial constraints. Improved priority setting and more cost-effective choices of actions are required.

First, the wider use of differentiated measure linked to ecosystems characteristics might be considered. For instance, varying delays could be adopted when introducing best-available technology into existing installations. This would offer the advantage of achieving environmental goals or targets more cost-effectively by targeting expenditure towards certain areas, processes or industries. This approach has already been used successfully in Germany to solve selected environmental problems, and may imply further use of financial transfers.

Secondly, the use of economic instruments (e.g. fees, charges and deposit-refund systems) could be expanded in Germany in combination with regulatory instruments to achieve environmental objectives more cost-effectively. Experience with waste water charges provides a precedent concerning water management. Other areas, such as air and waste management, could also benefit from a wider use of economic instruments to address, for instance, the challenges posed by $CO_2$ emission targets. A review of the various subsidies used to stimulate environmental protection may also be needed, particularly with regard to their environmental and economic effectiveness.

Thirdly, close-co-operation between government and industry has resulted in more scientifically-based and timely decisions. Voluntary environmental agreements in industrial sectors, such as the chemical industry, have also led to more rapid, flexible and cost-effective implementation of a number of environmental objectives; The use of voluntary agreements could be extended while ensuring that their terms and level of compliance are properly monitored. Streamlining regulations and increasing the attention paid to small and medium-sized enterprises could also yield both environmental and economic benefits.

Fourthly, Germany has responded to the need to increase public information on the environment, for instance by making available general environmental data and environmental reports as well as specific data on individual facilities or projects. This is a necessary step towards more effective public participation in decision-making concerning the environment, and more influential environmental impact assessments of projects. Implementation of federal laws and regulations at the Länder level should, however, be strengthened in order to implement principles adopted at both international and national levels in relation to informing foreign populations and authorities. Länder should ensure that the data on the state of the environment which they gather are made available at federal level for national and international use.

## 2. Environmental Restoration in the New Länder

The unification Treaty of October 1990 established the immediate validity of the entire legal and administrative system of the Federal Republic of Germany for the new Länder, including for environmental matters. The goal is to close the disparity in ecological conditions between eastern and western Germany as soon as possible. It is too early to evaluate environmental performance in eastern Germany since environmental requirements have been defined only recently.

A preliminary assessment of the state of the environment in the New Länder can, however, be made. It suggest that environmental damage is serious, but concentrated in certain areas. For certain media (e.g. water, air), the situation in eastern Germany is comparable to that in western Germany two or three decades ago. Other issues such as damage from poor lignite mining practices and on former military sites are specific to eastern Germany. A number of environmental pressures have already been dramatically reduced since unification, such as $SO_2$ and particulate emissions. This is mainly due to the massive decline in economic activity (of the order of 50 per cent over two years). The risk from nuclear plants has been curtailed with their closure. It is worth noting that most of eastern Germany is in relatively good environmental condition, and data show that concentrations of pollutants in ambient air such as $NO_2$ and ground level ozone are generally lower than in the western part of the country.

The overall cost of environmental restoration is still uncertain, as it includes liability for possible decontamination of polluted sites such as those encountered by the Treuhandanstalt during the privatisation process. Estimates of the total expenditure for environmental reconstruction vary between DM 80 and 320 billion. A large part of this expenditure (e.g. waste water treatment) is the responsibility of municipalities and authorities of the new Länder.

The New Länder remain in a transitional phase, and are only starting to build up new administrative structures and in-depth knowledge of the large body of western German legislation and regulations. Timetables for environmental restoration in the eastern part of the country may therefore prove overly ambitious in certain areas. As in western Germany, priority-setting for environmental action, ensuring the cost-effectiveness of environmental protection measures, and integrating economic and environmental goals, are essential to the future environmental performance of the new Länder.

## 3. Integration of Environmental and Sectoral Decision-Making

Economic forces and structural changes in major economic sectors strongly influence environmental conditions and trends in Germany, and can enhance or counteract the benefits of environmental regulations and technical progress. The integration of environmental concerns into sectoral decision-making is therefore a key to environmental performance and sustainable development as well as to cost-effectiveness in the responses to environmental challenges. It should in Germany, as in other OECD countries, receive increased attention.

### *Energy*

Development in the energy sector have contributed, as in a number of OECD countries, to improved environmental performance in western Germany: the economy's energy intensity has improved significantly despite energy price decreases in the 1980s; and the energy supply structure has evolved towards a diversification of environmental impacts, though Germany still relies on fossil fuels for 84 per cent of its requirements, including coal for 27 per cent. In eastern Germany, energy intensity is much higher than in the western part of the country, and the energy mix is very different, with a high share of lignite (69 per cent in 1989); however, there have already been major changes in supply and demand patterns in the east with the closure of all nuclear power plants and a fall in energy demand corresponding to the decline in industrial activity. More recently, the German government's ambitious target of a 25-30 per cent reduction of $CO_2$ emissions by the year 2005 has moved the energy sector to centre-stage in environmental policy considerations.

Taking into account energy price trends and international economic interdependence, further attention and efforts need to be directed to the integration of environmental concerns into energy policies dealing with:

- the restructuring of eastern Germany's energy supply;
- energy efficiency and conservation, particularly for dwelling and motor vehicles;
- the shares of different fuels in the energy supply;
- technological progress and related upgrading of regulations; and
- the extension of the use of market-oriented instruments, and particularly sets of taxes and charges.

### *Transport*

Several measures taken in the transport sector have helped to contain its environmentally adverse effects in western Germany: the adoption of motor vehicle standards and incentives to accelerate the replacement of older vehicles by cleaner and quieter ones; improved fuel quality including tax differential incentives to increase sales of unleaded gasoline; effective inspection and maintenance programmes for vehicles in use; transport system management and urban public transport improvements. However, the benefits of these measures have been more than offset by traffic growth, and particularly the growth of road transport.

Consequently, transport's share in total emissions of traditional air pollutants has grown and ozone air pollution remains of concern. Transport-related $CO_2$ emissions have nearly doubled over the past two decades; transport energy consumption and energy intensity have increased, partly reflecting a decline in the relative price of gasoline over the 1980s. This expansion of traffic in Germany is likely to be reinforced by the creation of the single market in the European Community, the consequences of unification including the expansion of the fleet in eastern Germany, and the growing traffic flows with central and eastern European countries.

Environmental pressures from transport, combined with land scarcity, congestion costs, accidents and constraints on public funding, suggest that the sustainable development of this sector will depend critically on improved integration of transport and environmental policies. Among the areas requiring further attention are:

- the restructuring of eastern Germany's transport systems, with a view to preventing environmental pressures;

- the incorporation of environmental concerns into transport policy definition and implementation, and into transport planning, notably to eliminate obstacles to the development of more environmentally friendly modes (e.g. rail transport and waterways);
- technological progress towards highly energy-efficient, clean and quiet vehicles as well as limitations on the weight, engine power and speed of cars and lorries;
- traffic management, including speed limits on motorways, road pricing as well as other measures to limit the use of vehicles when and where necessary;
- the extended use of economic instruments so that prices better reflect environmental damage related to transport (e.g. the currently proposed vehicle tax incorporating an environmental rationale); the review of economic and environmental effects of fiscal instruments such as tax deductions for commuting by car.

***Industry***

Structural adjustments in industry over the past two decades have tended to be beneficial for the environment: a relative decline of some of the most polluting sectors such as iron and steel; turnover of obsolete equipment accompanied by plant and equipment modernisation, leading to higher productivity and cleaner processes; and the emergence of an eco-industry on domestic and international markets.

The one industry reviewed in the OECD report, the chemical industry, has taken a leading role in German industry's overall contribution to improving the environment. Very large investments have been made and important reductions in releases of pollutants have rapidly been obtained. The principle of preventive action has been implemented through various notification and assessment programmes in which the German chemical industry has been very active. Voluntary agreements have been made to reduce the production of certain substances. In the future, public disclosure of information on pollution from individual firms would help achieve even greater protection of the environment and induce firms which are lagging behind to behave more like the leaders of the sector. Greater use of risk analysis and of the life-cycle concept in the chemical sector should also contribute to more cost-effective management of environmental problems caused by chemicals.

## 4. International co-operation

In view of its economic and ecological links with neighboring countries and the world in general, Germany faces a number of significant international environmental challenges.

***Bilateral co-operation***

Germany has concluded and implemented numerous agreements to deal with environmental problems arising in frontier areas with its nine neighboring countries, covering water quality, treatment of waste water, treatment of waste, land-use planning, protection of the landscape and nature reserves, and information and consultation on hazardous facilities. As a result concrete progress has been achieved, for instance in reducing pressures on shared ecosystems (e.g. the Wadden Sea) or in protecting local populations from risks arising in industrialised frontier areas (e.g. the Basel area).

***Regional co-operation***

Germany has succeeded in abating atmospheric emissions of sulphur oxides much sooner than the deadlines specified in international agreements, and expects to achieve a very significant decrease in emissions of nitrogen oxides by 1997. However, difficulties will arise if further reductions of nitrogen oxides have to be achieved, for instance to reduce the contribution of airborne pollutants to nitrification of the seas.

Over the last 20 years, the quality of international water bodies such as the Rhine and Lake Constance has improved remarkably in western Germany and steps are planned to reintroduce aquatic life into streams where it has disappeared. By and large, transfrontier pollution along the country's western borders is now less severe, and steps are being taken to achieve similar results on all eastern borders.

Emissions from diffuse sources such as traffic and agriculture have, however, not yet been adequately reduced. These include emissions of nitrates and ammonia, which contribute to the pollution of the North Sea and Baltic Sea. Germany, like other European countries, will need to develop and implement new measures to address

these problems. This may require the use of policy objectives concerning both emissions and ecological quality, as was done successfully in the case of the Rhine.

Emissions from central and eastern Europe result in considerable transfrontier pollution. Economic development and environmental efforts in these countries should both be taken into account when setting up international co-operation. This could include stepping up efforts to provide assistance in the environment field to eastern neighbors.

***Worldwide co-operation***

Germany has been very successful in reducing its emissions of CFCs to prevent ozone depletion and will stop all production and consumption of CFCs at the latest in 1994. Activities aimed at stabilising and even reducing $CO_2$ emissions within the country have already been initiated. Progress concerning related global problems will be influenced by the position taken by Germany within the European context. In particular, greater emphasis should be given to the use of the economic and financial instruments to solve international problems efficiently while seeking an equitable distribution of the financial burden.

As a highly industrialised country, Germany plays a leading role in creating and exporting modern technologies and new substances, some of which create risks to man or the environment. Controls on the export of hazardous substances and wastes have been implemented in Germany. The social responsibilities of Germany and other industrialised countries in solving global environmental problems and avoiding hazardous exports require strict application of guidelines and regulations adopted to protect the environment of less-industrialised countries. Controls on exports of certain substances or technologies would be justified in this context. For instance, and within the framework of the Basel Convention, more work will be needed to ensure that residual material or wastes which Germany knows to be hazardous wastes in the importing country do not leave Germany without the consent of public authorities and of the importing country, even if such substances are not considered to be hazardous wastes in Germany.

Germany's decision, announced in Rio, to increase its international financial assistance from 0.4 to 0.7 per cent of GNP as soon as possible should help provide the financial means to support sustainable development in developing countries including German initiatives to protect the environment worldwide, for instance concerning tropical forests. While aiming at that target, German support for central and eastern Europe must also be taken into account.

Overall, Germany has played a leading role in solving international problems at bilateral, regional and world levels and has achieved considerable results. However, international environmental challenges are such that in the future Germany will have to sustain its efforts in seeking and promoting international responses, in both its own interest and in that of the rest of the world. This will entain taking into account both the environmental and economic aspects of development and ensuring the competitiveness of German industry, as well as contributing to environmental effectiveness and to global sustainable development.

# GREECE

## CONCLUSIONS AND RECOMMENDATIONS*

Since 1990, Greece has been undergoing major economic reforms, accelerated in recent years, and geared towards participating in the European Monetary Union. GDP has grown by over 3% a year since 1996, bringing its per capita level to 70% of the OECD Europe average. Strict fiscal and monetary policies have led to declines in inflation and the budget deficit. This economic development has benefited from overall good environmental conditions and significant natural resources (e.g. supporting tourism, agriculture, fisheries) and has contributed to pressures on the environment (e.g. from industry, energy, transport, urbanisation).

Greece's major efforts towards economic convergence have been only partially matched by "environmental convergence" efforts aimed at improving the quality of life in larger cities, maintaining environmental quality in tourist areas and building modern environmental infrastructure financed by national and EU funding. As a result, Greece continues to face many environmental challenges: controlling air emissions from transport and from large power and industrial plants, reconciling water resource supply and demand, reducing effluents to water from municipal and agricultural sources, improving waste prevention and elimination, protecting land and coastal resources, and conserving biodiversity and terrestrial and marine ecosystems. Prospects of economic growth and rising income levels will generate both increased pressure on the environment and greater demand for environmental quality. This makes it all the more necessary for Greece to: i) strengthen the effectiveness and cost-effectiveness of environmental policies; ii) better integrate environmental concerns in economic decisions; and iii) continue its international co-operation.

This OECD report establishes a baseline for assessing future environmental progress and examines Greece's environmental performance, i.e. the extent to which its domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

### 1. Implementing Environmental Policies

Greece generally has good environmental quality. In some important areas where environmental quality was impaired, the situation has improved in recent years (air quality in Athens, restoration of architectural and historical heritage). In others (e.g. bathing water quality) deterioration has been prevented. Yet, several standard OECD indicators show that Greece has high pollution intensity: emissions of $CO_2$, $SO_x$ and $NO_x$ per unit of GDP are among the highest in OECD Europe and the level of waste water treatment is among the lowest.

Greece should soon begin to see further environmental progress as a result of management and financial efforts made since the mid-1990s. Its environmental policy has been modernised and driven by EU environmental legislation, a search for improved quality of life in the larger cities (Athens, Thessaloniki) and, to some extent, the advantages of a positive environmental image internationally (e.g. for tourism). Nevertheless, the remaining environmental progress to be made, along with economic growth prospects and the likely increase in environmental demands as income grows, necessitate environmental reform. This reform has already begun, for instance with interministerial co-operation producing progress in areas such as energy issues; with devolution of environmental responsibilities to prefectural and municipal authorities as a result of recent institutional reform; and with increased involvement of other actors (e.g. industry, environmental NGOs and local stakeholders) in environmental progress.

#### *Strengthening the effectiveness and cost-effectiveness of environmental policies*

Concerning environmental legislation and regulations, much progress has been made. However, some implementing decrees and ministerial decisions still need to be put in place, and EU directives have not always been fully integrated in the relevant national laws. Given that many of the main environmental laws date from the 1970s and 1980s, there is a case for gradually streamlining and updating environmental legislation, at the same time allowing a greater role for newer policy tools, such as economic and social instruments.

* Conclusions and Recommendations approved by the Working Party on Environmental Performance at its November 1999 meeting.

Lack of enforcement has been the Achilles' heel of policy implementation, weakening the effectiveness of environmental regulations and permitting. This situation can be expected to improve once the proposed environmental inspectorate, with its dedicated body of inspectors, is up and running; the new system will need to operate transparently, with regular reporting to the regulated community and the public about information, inspections, warnings, sanctions and other actions of the inspectorate. Environmental impact assessment (EIA), which in Greece is associated with environmental permitting, has proved a useful instrument in a number of areas, and its quality and effectiveness have improved in recent years. The very positive results of surveillance and enforcement concerning marine pollution are also encouraging.

Investment in environmental infrastructure has been a major feature of Greek environmental policy since the mid-1990s. Six year action programmes (Operational Environment Programme, environmental programmes under the Cohesion Fund, environmental actions carried out in the framework of the Regional Operational Programmes, or the Sectoral Operational Programmes) are the centrepieces of environmental progress. They address major environmental problems and facilitate the financing of much new environmental infrastructure. Overall pollution abatement and control (PAC) expenditure now equals around 1% of GDP, much of it focused on waste- and water-related investment and supported by the EU Structural and Cohesion Funds. Care should be taken to follow up these financial injections with everyday environmental management capacities, and to prepare for the time when EU funding decreases.

Limited use has been made of economic instruments; some have been effective, such as the package of measures to renew Athens's car fleet and the use of marine pollution fines, collected in a special fund (Blue Fund), which are used for pollution abatement. There are also user charges, like the special levy imposed on vehicle fuel, aimed at raising revenue (Green Fund). Although water charges in the Athens area provide incentives for environmentally friendly behaviour by consumers, tariff structures often do not. Water and energy prices are still far from being based on full internalisation of social costs. The government has long used various subsidies to achieve environmental objectives (e.g. installation of end-of-pipe devices and cleaner technology, energy conservation), but not accompanied by pollution or user charges. Not enough attention has been paid to economic analysis and the cost-effectiveness of policies.

Although efforts have been made to raise public awareness of environmental issues, lack of familiarity with the concept of sustainable development still constitutes a handicap for policy implementation. The government, industry associations and environmental NGOs have made sizable efforts at environmental education and public awareness raising; these need to be continued, fostering better environmental information and a broader understanding of the polluter pays and user pays principles. Periodic reporting on the state of the environment, tracking of environmental progress and performance through environmental indicators, and a pollutant release and transfer register (PRTR) should all be established. The administration could also do more to organise early consultation with stakeholders when developing new policies, plans and strategies.

It is therefore recommended to:

- continue to gradually streamline, complement and update environmental legislation;
- urgently improve enforcement of environmental and land use regulations, carrying out the plans to create a dedicated environmental inspectorate and ensuring transparency vis-à-vis the regulated community and the public, through regular reporting about actions such as information, inspections, warnings and sanctions;
- strengthen environmental administrative and managerial capacity at national, regional, prefectural and municipal levels, with focus on making more use of economic analysis and a partnership management approach to improve the cost-effectiveness of environmental policies;
- move towards full application of the polluter pays and user pays principles, reviewing water and energy prices and making fuller use of economic instruments;
- continue to encourage public participation through i) co-operation with NGOs in carrying out and financing environmental education for schools and professional groups, and ii) consultation with stakeholders in the development of new government policies and action plans;
- strengthen the role of industry associations in raising environmental awareness, expertise and management standards, particularly at small and medium-sized enterprises;
- ensure the publication of comprehensive environmental information (e.g. periodic state of the environment reports, environmental indicators, PRTR).

***Water***

While Greece is generously endowed with water resources, their uneven distribution makes the management of their sustainable use a complex task. Pressure on water quantity mainly results from increasing use for irrigation and, to a lesser extent, by households. The quality of inland surface waters is very satisfactory, with some exceptions (e.g. eutrophication of shallow lakes); the quality of coastal waters is also very good, though some black spots exist, mainly near large urban centres. The main pollution sources are household waste water and agricultural pollution (e.g. from excessive use of fertilisers).

Measures have been taken to limit household water consumption. In particular, legal limits have been established for water supply in urban areas, and water prices have been sharply increased for high consumption levels. In rural areas, the transfer of collective irrigation networks to user associations is a step towards more sustainable use of water by farmers. Implementation of EU legislation, and EU funding, have been decisive in the ongoing rapid development of municipal waste water infrastructure (though operational effectiveness and the extent of coverage still need improvement). Waste water treatment plants have been established in industrial areas. Protection zones have been designated to restrict agricultural pollution around vulnerable drinking water sources.

However, water resource management has mainly been in the hands of central authorities and has primarily focused on granting concessions for water withdrawal and use. The decentralisation and devolution process is helping create the conditions for a move towards an integrated, partnership approach to water resource management at water basin level, the principles of which are part of the 1987 Water Management Law (e.g. establishment of Regional Water Committees). Before major new water projects are undertaken, economic analysis and EIA should be used to ensure that economic, environmental, hydrological and social objectives are sufficiently considered. In rural areas, many collective irrigation systems need to be modernised and rehabilitated, and much greater efforts should be made towards cost recovery of irrigation water supply in line with pertinent EU legislation (e.g. EU draft framework directive on water management). In urban areas, the operation and maintenance of new waste water infrastructure will require additional human and financial resources; training of skilled personnel to operate treatment plants should be given high priority. Tariffs for water services should be increased (with appropriate attention to income disparities) to cover, ultimately, the costs of related investment, maintenance and operating expenditure. Introducing a pollution charge based on pollutant load and toxicity would provide incentives for industry to adopt production processes that minimise effluents. A sustainable financing regime should be elaborated, aiming at national funding and full cost recovery in the medium term.

It is therefore recommended to:

- develop an overall water resource management strategy by water basin, addressing both quantity and quality issues; establish basin councils to reinforce co-operation and partnership among all relevant authorities and water users;
- improve enforcement of water legislation through strengthened field inspectorates;
- raise tariffs for water services to better cover their costs, with appropriate attention given to income disparities;
- continue to develop sewerage networks, waste water treatment capacity and connection of the population to these services; train skilled personnel to operate municipal and industrial waste water treatment plants;
- continue the transfer to users of irrigation facilities, and establish mechanisms to strengthen cost recovery;
- pursue efforts aimed at protecting zones around vulnerable aquifers;
- pursue efforts to monitor surface water quality and strengthen and extend monitoring of groundwater quality;
- make full use of EIA procedures and cost-benefit analysis before major new water projects are undertaken.

***Air***

Over the past ten years, urban air quality has greatly improved in Athens, where ambient levels of $SO_2$, $NO_2$, CO and lead now generally respect air quality limits. This is the result of a range of measures implemented with determination: restriction and relocation of industrial activities, restriction of road traffic (alternate licence plate system), extensive pedestrian areas, promotion of public transport (first subway line, bus fleet improvements) and fuel quality improvement for industry and households. The construction of two additional subway lines and the relocation of the airport will further strengthen this success. Nationwide, since the mid-1990s, measures have been launched to

improve energy efficiency in power generation and industry. Although energy intensity now equals the OECD Europe average, it shows one of the most rapidly increasing trends among OECD countries. Energy reform generally integrates air quality management concerns effectively, and the resulting environmental benefits should gradually become evident. In particular, the supply of natural gas to power generation is increasing and its use by industry and households is expected. Use of renewable energy sources is also progressing. Flue gas desulphurisation equipment has been installed at two refineries and at the largest unit of the Megalopolis lignite-fired power plant. Major improvements to public transport are under way in Athens and Thessaloniki. A programme in the early 1990s resulted in the scrapping of many old cars.

However, the intensity of air pollution emissions is very high, overall; emissions of $SO_x$, $NO_x$ and $CO_2$ per unit of GDP exceed the OECD Europe averages by 100%, 42% and 38%, respectively. $SO_x$ emissions from large combustion plants somewhat exceed the ceiling established by EU directive. The use of lignite to produce most of the nation's electricity plays a major role in emissions of particulate matter and $SO_x$, and no decoupling of $SO_x$ emissions from GDP growth has yet been achieved. Rapidly increasing NMVOC emissions signal the need to control emissions from refineries and two-stroke engines, and to deal with urban ozone formation. Investments are still needed to bring down emissions. Systems for ambient air quality monitoring and emission inventorying are insufficient. Economic instruments should be better used to integrate air quality objectives into the energy and transport sectors. Overall, the investment effort on air pollution abatement and control has been low (less than 1°/oo of GDP) and needs to be enhanced.

It is therefore recommended to:

- implement with determination energy conservation programmes, and stimulate the uptake of more energy efficient technologies by power plants and industries;
- continue to encourage rapid growth in the use of natural gas (e.g. for power supply and household appliances) and renewables (e.g. in the islands);
- continue to promote the use of cleaner fuels (e.g. as regards sulphur content and lead content) by industry and households;
- strengthen efforts to reduce $SO_x$ emissions (e.g. from lignite-fired power plants), NMVOC emissions (e.g. from refineries) and $NO_x$ emissions (e.g. from transport);
- improve enforcement of air-related regulations through strengthened field inspectorates;
- pursue the development of a national emission inventory and expand the ambient air monitoring network, harmonising measurement methods between stations and expanding the list of pollutants monitored (e.g. $PM_{10}$ and/or $PM_{2.5}$, PAHs, heavy metals);
- further develop and introduce measures aimed at replacing highly polluting road vehicles;
- further develop the use of economic instruments to integrate air management objectives into energy and transport policies and practices.

***Nature***

Greece is endowed with a very high diversity of species and habitats. Nature conservation has long been legislated: the first national park was created in 1938. A range of protected areas has been established: national parks, aesthetic forests, natural monuments, game reserves, etc. Efforts have been made in recent years to protect marine ecosystems and coastal areas by creating nature reserves and marine parks. Measures have been taken to improve the institutional arrangements for the operation and management of protected areas. Measures to protect species include access restrictions, limited user rights, compensation for loss of income, purchase of land, and information and awareness campaigns. Despite chronic forest fires, the forest area has increased by one-third since the 1970s due to reforestation and natural regeneration. Nature conservation NGOs have organised public awareness and information campaigns. Greece has ratified most international agreements on biodiversity and nature conservation.

However, the total area under protection is small. Although some management plans are under preparation, management of protected areas should be more developed, parternership-based and effective; very few aesthetic forests and natural monuments are actually protected, and management plans for national parks should be prepared. Concerning the conservation of species, information has been insufficient to make the public aware of which plants and animals are protected. A more systematic assessment of the impact of urban, housing and tourism development on coastal and island natural ecosystems, both within and outside protected areas, should be undertaken as a matter of priority. The conservation of strips of virgin coastline, particularly those harbouring special ecosytems, should be considered as an integral element of coastal management, and appropriate funding made available.

Enforcement of national legislation is often too slow or lacking, and inspection and prosecution are impeded by lack of staff. Setting up of an institutional co-ordination mechanism between the Ministry of Environment, Physical Planning and Public Works and the other ministries, agencies and environmental NGOs involved in nature conservation would greatly facilitate planning and implementation, as well as enforcement.

It is therefore recommended to:

- speed up the process of putting in place a National Biodiversity Conservation Strategy and Action Plan, thereby providing a coherent framework for nature conservation and for the identification of ecosystems, species, landscapes and landscape features that should receive special management and protection;
- increase the total surface of protected area, including marine ecosystems and coastal areas, and ensure that they are effectively protected, particularly through management plans;
- establish a national ecological network, including existing protected areas and Natura 2000 sites;
- strengthen co-operation and partnership among ministries and agencies responsible for nature conservation at the planning and implementation stages; strengthen the administrative capacity of the central, regional and local authorities to implement conservation programmes;
- increase public awareness and reinforce information and education programmes on nature conservation problems;
- prepare a comprehensive assessment of the impact of urban, housing and tourism development on coastal and island natural ecosystems, and implement measures to protect species and habitats in these areas.

## 2. Towards Sustainable Development

Economic forces and changes in such major sectors as industry, energy, agriculture, transport and tourism strongly influence environmental conditions and trends, and hence either enhance or diminish the benefits of environmental policies and technological progress. Further integration of environmental concerns in economic, sectoral and social policies is needed to achieve cost-effective environmental protection and sustainable development in a rapidly growing country like Greece.

### *Integrating environmental concerns in economic decisions*

Progress to date on the integration of environmental concerns into economic policies has been uneven. The Council of State (High Court) has played a positive role in defining the content of framework environmental legislation and providing a practical interpretation of the term sustainable development in case law. Good integration of decisions has taken place in the energy sector, and satisfactory integration in areas under the responsibility of the Ministry of Environment, Physical Planning and Public Works (e.g. physical planning and housing policy), but in other sectors integration efforts have remained ad hoc. The practice of EIA has contributed to integration, but has worked better in some areas than in others: in tourism, aquaculture, road, and other major infrastructure projects the influence has been noticeable, but less so in the licensing of quarries.

The degree of horizontal co-ordination and institutional integration taking place among government departments could be significantly improved. The relatively large number of government agencies with environmental responsibilities, the dearth of formal integration mechanisms and the strong hierarchical nature of Greek public administration make it difficult to formulate and implement integrated environmental policies. A special effort should be made to develop a culture of joint problem solving. The degree of subsidisation of sectors (e.g. energy, transport) should be reviewed in order to assess the potential for progress in both economic and environmental effectiveness (i.e. “win-win” potential) and the potential for enhanced domestic financing and pricing of related services.

The dominant influence of EU directives and EU funding on Greek environmental policy seems to have pushed national objectives to the background to some extent. To extract the greatest benefit from the operational programmes for the next period, and to move Greek environmental policy from remediation and investment to prevention and management, these programmes need to be put at the service of a strategic perspective. A comprehensive national strategic plan for the environment, based on a wide ranging consultation process and setting

specific objectives and targets, would help achieve this and also give substance to Greece's ambition to build on its natural and historical heritage.

The decentralisation and devolution of government now under way has yet to deliver adequate local institutional capacity in the environmental field, or to clarify responsibilities. The mechanism of local Agenda 21s should be further promoted as a tool for integration. The extension of the partnership approach to environmental management is desirable, in line with decentralisation and devolution, and with existing legislation. For instance, the management of river basins, protected areas and local (urban or coastal) Agenda 21 development activities could benefit from involving a range of stakeholders.

Greek public and private PAC expenditure was stepped up in the mid-1990s and now is of the order of 1% of GDP. Overall environmental expenditure, which also includes water supply and nature protection, is estimated at 1.3% of GDP. These figures are similar to those of other "cohesion countries", but are significantly lower than in a number of OECD countries. As much of the present expenditure is financed with temporary EU assistance, sooner or later measures will have to be taken to develop a sustainable financing regime based on national funding. This could be achieved, for instance, by privatising municipal water and waste services, taking into account social disparities.

It is therefore recommended to:

- develop further the integration of environmental concerns into policies and practices concerning specific sectors (e.g. industry, transport, agriculture, tourism), aiming, inter alia, for a decoupling of environmental pressures from economic growth;
- seek to build transport and energy infrastructure further, relying both on external financing and on enhanced domestic means by progressively raising of prices of related services so as to cover a larger proportion of the costs, more in line with the user pays principle;
- continue to improve the integrative role of EIA, including by encouraging greater and better-informed public participation;
- make effective use of the proposed National Co-ordination Mechanism for Sustainable Development and encourage local government to adopt and implement local Agenda 21 plans;
- strengthen the capacity of prefectures and local governments to carry out their new environmental functions, making more use of partnership in management;
- continue to develop a strategic, long-term approach to environmental management, notably through the adoption of a comprehensive national plan for the environment with clear qualitative and quantitative objectives and targets;
- develop a framework for sustainable financing of both investment and operation and maintenance of environmental infrastructure and services.

***Towards sustainable urban and coastal development***

Since the mid-1980s, major efforts have been made to restore urban centres, improve urban amenities and limit urban pollution. For instance, Athenians and visitors to Athens now enjoy good air quality, improved water and waste management services, large pedestrian areas (archeological, green, shopping or residential zones), a subway system and modernised public transport, renovated historical buildings and improved urban amenities. The 2004 Olympic Games provide a further opportunity to improve the urban environment in Athens. Major investments in municipal waste water treatment plants will soon result in better coastal water quality. Greece has passed framework legislation on the control of development in urban areas, and land use plans have been elaborated for nearly all major urban areas. EIA is used for major projects. Development of a long needed national cadastre is well under way, and priority is properly being given to the registration of lands at high risk of illegal development. Important responsibilities for implementing urban and coastal land use regulations have been devolved to municipal and prefectural authorities. Architectural committees are an example of how local initiatives can function to control the quality of the built environment through consensus. Some island areas have fostered balanced development based on tourism, farming and fishing, preserving cultural and natural assets.

However, the concentration of population and economic activities in coastal areas, as well as the resulting pressures, have increased significantly and will continue to do so, creating new challenges for these areas. Enforcement of land use regulations and building codes remains very weak, leading to problems such as widespread illegal construction of vacation homes and marinas in coastal areas near major cities and tourist destinations. Co-ordination between development and conservation goals in the coastal zone needs improvement. The recent

legislative framework for integrated management of coastal areas has to be further developed. Nor is there systematic monitoring of the land use, ecological or landscape quality of coastal areas. Preparation for the management of environmental catastrophes, including flood and earthquake, should be further improved, especially in high-density urban and coastal areas. Proper disposal of municipal solid waste remains a challenge, though efforts have begun recently to address it.

It is therefore recommended to:

- complete the national cadastre as soon as possible;
- strengthen enforcement of land use regulations and building codes through increased capacity and presence of national and local administrations at territorial levels, making full use of mechanisms to involve citizens in relevant decision-making processes;
- further involve local authorities and other appropriate local partners in the preparation of land use plans;
- pursue the implementation of the recent institutional law on spatial planning and sustainable development, through specific legal instruments for the sustainable development of coastal areas providing for monitoring of the state of coastal areas, protection measures for the coastal land strip and coastal waters, and full protection of designated natural coastal areas of high ecological and cultural value;
- elaborate and implement a national plan for integrated coastal zone management, including measures to ensure the preservation of coastal lands of special natural value (e.g. through a coastal land bank);
- develop integrated, partnership-based sustainable development strategies under local Agenda 21 plans in appropriate urban and coastal areas;
- review measures to control industrial growth in urban areas, examining them from environmental, economic and social points of view;
- enhance emergency planning for the prevention and mitigation of flood and earthquake damage, especially in areas where population and physical assets are concentrated.

***Towards sustainable tourism***

Tourism in Greece is based on exceptional natural and cultural assets. Recent tourism policy recognises this, and seeks to protect these assets and to promote energy conservation in the tourism sector. EIA is widely used to assess tourism infrastructure projects. Building standards and land use zoning mechanisms are in place. Operating licences for tourism establishments often include conditions relating to environmental management. Waste water treatment capacity and waste management have improved in major tourist areas. A number of hotels have voluntarily adopted environmental management systems, and NGOs have launched some sustainable tourism initiatives in coastal and rural areas. Public information and training programmes relating to environmental management of tourism impacts are in effect.

The traditional Greek marketing focus on price competitive, quantitative tourism has resulted in large increases in numbers of tourists, and thus more environmental pressure, accompanied by decreasing expenditure per tourist. Meanwhile, heavy use of subsidies may be leading to oversupply of tourism infrastructure, and appears to have contributed to the geographic concentration of tourism activities and related environmental pressures. Enforcement of building codes and zoning in the sector is weak, leading to widespread illegal construction of vacation homes in coastal areas near tourist destinations. Integrating environmental concerns within tourism policy remains a challenge, in terms both of conserving nature, water and energy resources, and of more effectively minimising generation of solid waste, waste water, congestion and noise. Hence recent tourism policy emphasises: i) making better use of existing capacity by spreading tourism demand in time and space; ii) raising the quality standards and environmental performance of tourism infrastructure and services; and iii) achieving a better "mix" of tourism with diversified products such as ecotourism, conference tourism, health spa tourism, and cultural or rural tourism. This new policy emphasis should be further strengthened and implemented.

It is therefore recommended to:

- pursue the development of a national action plan for sustainable tourism development, detailing measures to integrate environmental concerns into tourism activities;
- improve the information base on tourism and the environment; develop related indicators, and monitor progress towards sustainable tourism;
- strengthen enforcement of regulatory measures, in particular those related to pollution, land use planning, and construction of buildings in coastal areas;
- continue to develop infrastructure for waste water treatment and solid waste disposal in or near tourism-intensive areas, and define financial mechanisms to cover operation and maintenance;
- expand the use of transport and traffic management for tourism-intensive areas;
- continue to promote sustainable development of islands, building on complementarities among tourism, farming, fishing and other activities.

## 3. International Co-operation

Greece's achievements in international environmental co-operation are extensive. They contribute to the positive international image of the environment in Greece, which attracts large numbers of international tourists and should be reinforced at the time of the 2004 Olympics. In spite of its limited environmental administrative capacity and its level of economic development, Greece has transposed nearly all EU environmental directives and ratified most relevant international agreements. Consequently its environmental policy and law have been very much influenced by legal development at international level. To implement EU directives, Greece has benefited from considerable EU financial support. This has made it possible to improve energy and transport infrastructure and to start building a network of modern waste water treatment plants.

The political changes in central and eastern Europe gave Greece new opportunities to strengthen co-operation with its neighbours and establish new links with Balkan states and others in the region; this co-operation has already had positive results concerning transboundary waters. Greece has increased its involvement in the protection of marine waters, both by better preventing pollution from land-based sources and by improving emergency preparedness in case of an accidental spill at sea. Its marine area is under constant surveillance and ships are visited in its harbours to verify compliance. The Blue Fund was created to collect pollution fines and use them to enhance pollution prevention; this approach, linked to imposition of stiff fines, has proved very useful. Greece has ratified the MARPOL Convention and all its annexes, and has launched activities to raise awareness among Greek seamen. Concerning climate change, Greece aims to meet its emission targets under EU burden sharing: its greenhouse gas emissions will be authorised to grow, but at a much lower rate than GDP. Meeting the emission targets will nevertheless be a challenge and will require strict energy conservation measures. Greece has created an interministerial committee to handle this issue and has submitted its national action plan. In addition, Greece has asked to join the OECD Development Assistance Committee and has decided to raise its official development assistance (bilateral and multilateral) from 0.12% of GNP in 1995 to 0.2% in 2001; part of this aid is for environmental protection.

The very significant changes that Greece has introduced in its international involvement concerning environmental protection have not always had all the expected results because of implementation deficiencies at domestic level. The degree of actual implementation of national environmental legislation based on international obligations is not well known because of lack of inspection. The Sofia Protocol was not fully implemented and as a result $NO_x$ emissions have continued to increase. Marine pollution from land-based sources is actually being reduced; on the other hand, some delays have occurred regarding the ratification of recent amendments and protocols to the Barcelona Convention. Little publicity has been given to OECD legal acts, which have not been implemented beyond what is required under EU law. To better protect nature in areas of international significance, additional, practical measures are needed. The growing responsibility for international environmental activities is assigned to a small staff whose size is frozen; as a result there is a discrepancy between formal transposition of international environmental commitments into Greek law, and their actual implementation.

It is therefore recommended to:

- ratify international environmental agreements already signed or supported by Greece (Annex III);
- continue transposing EU environmental directives and fully implement them;
- reinforce domestic means and institutional capacities available for fulfilment of duties related to international environmental co-operation;
- ensure full implementation of international commitments on nature protection;
- continue to implement measures aimed at preventing and mitigating marine pollution;
- strengthen measures aimed at conserving energy, with a view to combating climate change and reducing air pollution;
- take appropriate measures so as to be able to meet international commitments concerning $SO_x$ emissions and stabilisation targets for $NO_x$ emissions.

# HUNGARY

## CONCLUSIONS AND RECOMMENDATIONS*

Hungary has been undergoing a major economic transition in the 1990s, marked by a return to democracy and preparation for accession to the European Union. Following the collapse of its traditional export markets, Gross Domestic Product fell nearly 20 per cent. Recovery then began in 1993 and GDP has recently returned to its 1990 level. In 1998, Hungary experienced GDP growth of 5 per cent; 85 per cent of GDP is now generated in the private sector. The macro-economic stabilisation package introduced in 1995 led to reduction of inflation to 14 per cent in 1998. Hungary has received the highest levels of foreign direct investment among Central and Eastern European countries.

During this period, environmental pressures have been substantially reduced. Air pollutant emissions and pollution loads to water have decreased significantly due to both the fall in industrial production in the early 1990s and investment in pollution abatement and control. Further, Hungary has implemented major legislative and institutional changes concerning the environment and the first National Environmental Programme was adopted by Parliament in 1997. Notwithstanding these achievements, emissions of air pollutants per unit of GDP remain high compared with OECD averages, much of the necessary communal sewerage and sewage treatment infrastructure still needs to be created, and waste management remains weak. On several issues, the road towards environmental convergence with other European OECD countries will be a long one.

The challenge is therefore to: i) implement environmental policies and strengthen environmental infrastructure; ii) better integrate environmental concerns in economic decisions; and iii) further the country's international environmental efforts.

This OECD report establishes a baseline for assessing future environmental progress and examines Hungary's environmental performance, i.e. the extent to which its domestic objectives and international commitments are being met, based on environmental sustainability and economic efficiency criteria. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

### 1. Implementing Environmental Policies

#### *Environmental governance and democracy*

Although some environmental legislation dates to the mid-1970s, the most important pieces of legislation have been enacted since 1990 and a new set of modern environmental laws was adopted in the mid-1990s. The Ministry for Environment was created in 1987 and is in charge of overall environmental policy planning, as well as co-ordination of environmental policy measures. Other ministries involved in environmental policy implementation are: Transport, Communication and Water Management; Agriculture and Regional Development; Economic Affairs; National Cultural Heritage; Health; and Interior.

The first National Environmental Programme (NEP) covers the period 1997 to 2002. The NEP takes into account the Environmental Action Programme for Central and Eastern Europe, the Fifth EU Action Programme and Agenda 21. The Government Programme for 1998 to 2002 has introduced a legal harmonisation programme with the aim of achieving, by 2002, complete approximation of Hungarian environmental laws with EU legislation.

Environmental policies implemented in the 1990s have contributed to reductions in pollutant emissions and improvement in air and water quality. These policies are largely based on the use of regulatory and economic instruments, and have been accompanied by sizeable environmental investment. However, inadequate enforcement is a major concern. Increasing fines for non-compliance could provide increased resources for inspectorates, while improving compliance with national emission and discharge standards. Hungary's Environmental Impact Assessment (EIA) system has been applied to a range of projects, but there is not yet a comprehensive scheme for the strategic environmental impact assessment of policies, plans and programmes.

* Conclusions and Recommendations approved by the Working Party on Environmental Performance at its November 1999 meeting.

Access to environmental information has improved (e.g. state of the environment reports are being published regularly), but there is a need to strengthen mechanisms for implementation of the legal guarantees for obtaining environmental information. Further efforts will be needed to fully implement the OECD Recommendation on Implementing Pollutant Release and Transfer Registers (PRTRs). Important efforts have been made regarding environmental education. Giving more attention to environmental issues in the media should contribute to raising public awareness.

It is recommended to:

- 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;
- 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;
- 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;
- continue to develop the system for providing environmental information, implement the principles of free and easy access to this type of information, and pursue environmental education efforts.

***From environmental effectiveness to economic efficiency***

In the early 1990s, extensive efforts were needed to address the negative environmental impacts of past industrial activities. Large environmental investments have been made in the 1990s, mostly in water pollution abatement, but also in waste management and air pollution abatement. Clean-up of former Soviet Army bases, and landscape rehabilitation at closed mines, have also been given priority. Environmental investment is shared equally between the public and private sectors. Until 1997, pollution abatement and control expenditure has remained stable at about 1.5 per cent of GDP, which is sizeable compared to other OECD countries. Implementing the requirements of EU directives (e.g. waste water treatment, waste management) will require very significant additional expenditure, to be sustained over the long term. Financing of this expenditure will reflect sustainable development choices balancing economic, environmental and social objectives. Over the period 1997 to 2002, the overall level of environmental expenditure is planned to increase annually by 15 per cent.

Economic instruments have been implemented, in particular charges on water abstraction, water pollution, municipal waste, land, mineral extraction and products (fuels, packaging materials, tyres, etc.). Economic sanctions may be applied when emission and discharge standards are exceeded. The revenue from charges and fines goes to environmental funds, particularly the Central Environmental Protection Fund (CEPF), and to local authorities, which use the revenue to finance pollution abatement measures. These economic instruments, together with fiscal measures, contribute to the financing of environmental investments. This scheme of earmarked funding should be maintained, even though the CEPF has been integrated into the central budget. The use of economic instruments should be expanded to induce polluters to further reduce emissions in a cost-effective way. In particular, the proposed introduction of emission charges for water, air and soil pollutants would create better incentives for industries to invest in cleaner production processes. Integration of environmental concerns into fiscal policy also needs to be further developed, and the current system of tax differentiation needs to be adjusted towards EU requirements.

Hungarian legislation has not yet given legal force to the polluter pays principle. Although only 30 per cent of environmental investment overall is not paid for by polluters, there are still many situations in which subsidies for environmental investments are provided to private firms. Despite increases in domestic water prices and the introduction of a municipal waste charge, state subsidies continue to be provided to municipalities for domestic water supply and sewage treatment, and for municipal waste collection and treatment services. As considerable investments will be required in order to better protect water and upgrade waste management, it will be necessary to perform cost-benefit analyses of investment options to ensure that money is spent effectively.

It is recommended to:

- gradually decrease public subsidies for environmental investments in the private sector;
- 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;
- pursue further integration of environmental concerns into fiscal policy, in particular within the framework of the taxation system reform.

***Air***

Since 1990, Hungary has achieved large reductions in air pollutant emissions and significant improvements in ambient air quality. The economic slowdown in the early 1990s was an important factor in the reduction of stationary source emissions, as a result of which industrial zones have enjoyed better air quality. Major energy sector reform carried out since 1994 has contributed to decoupling of $SO_x$ and $NO_x$ emissions from economic growth. Since 1995, Hungary has made considerable progress towards privatisation and reducing price distortions in the energy sector. The electricity and natural gas utilities, most of the power stations and the Hungarian National Oil and Gas Company have been privatised. Prices of oil products, coal and LPG have been deregulated, and related direct government subsidies have been eliminated. Electricity and natural gas prices have been adjusted towards cost-recovery levels, and cross-subsidies between consumer groups have been eliminated. Investment in electrostatic precipitators has greatly reduced particulate emissions from power generation. Strict regulatory measures relating to vehicles and roads, as well as a tightening of fuel quality standards, have also contributed to emissions reductions. Complete phase-out of leaded fuel was achieved in April 1999.

However, about half the country's population is exposed to serious or moderate air pollution. Studies have demonstrated positive correlations between ambient air quality and respiratory morbidity and mortality in Hungary. High particulate and tropospheric ozone concentrations are still serious problems in Budapest. Recent increases in ambient concentrations of $NO_x$ and ozone raise the question of whether recent air quality gains will be lasting in the face of sustained economic growth. Regulations concerning stationary source emissions and ambient air quality standards need to be updated, and the system of ambient air quality monitoring should be enhanced. The growing motor vehicle fleet threatens to undermine recent air quality improvements, especially in urban areas. Energy efficiency in the residential and transport sectors is poor and requires attention. Financing energy efficiency improvements remains a challenge.

It is recommended to:

- 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 $SO_x$ and $NO_x$ emissions from large coal/lignite-fired power plants, where such investment is shown to be cost-effective;
- 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);
- 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. $PM_{2.5}$ and $PM_{10}$), toxic substances and heavy metals.

***Water***

Overall, surface water quality has improved in the 1990s following the decline in industrial production. Measures taken since the early 1970s have been successful in improving water quality at Lake Balaton. Monitoring of surface water quality is thorough, and data are published in a timely manner owing to a high quality Regional Environmental Protection Inspectorate network. Water use intensity is low. Flood protection along major rivers and land drainage networks protect over one-quarter of the country. Most of the population is supplied with piped water. Protection zones, where polluting activities are restricted, have been established around vulnerable water supply areas.

However, much remains to be done to meet the need for sewerage, and for sewage and waste water treatment. Only 60 per cent of the population is connected to public sewerage and only 22 per cent to sewage treatment. Nearly 80 per cent of Budapest's effluents are discharged untreated, directly to the Danube. Industrial waste water discharge control is not enforced in a dissuasive or comprehensive way. Bacterial contamination occurs almost all along the Danube and Tisza rivers. Secondary water courses are highly polluted, particularly in the vicinity of major urban centres. Nitrates in shallow groundwater exceed the limit value at many locations, particularly near settlements. Monitoring of groundwater quality is inadequate, especially given that it is the source of 90 per cent of Hungary's drinking water. More than half the flood protection levees are in need of either maintenance or upgrading. A decreasing water table remains a problem on the sandy plain between the Danube and Tisza rivers. Major efforts are needed to revise water legislation and implement it effectively. Considerable investment will be necessary to comply with the EU 1991 urban waste water treatment directive. Water prices will have to be increased, with appropriate attention to affordability concerns. The required flow of information and co-operation among institutions and users would benefit from a river basin approach to water management, facilitating the establishment and harmonisation of investment priorities. The similar geographical definitions of the regional offices of the Ministry of Transport, Communication and Water Management, and the Ministry for Environment, concerned with water-related issues have helped create the conditions for implementing such an approach.

It is recommended to:

- 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.

***Waste***

Hungary has made relatively recent and piecemeal progress in this area. The greatest attention so far has been paid to hazardous waste. A 1996 Government Decree clearly defines the responsibilities of the generator, and licences for handling and disposal of hazardous waste are now systematically reviewed. Results have also been obtained, through the application of the 1995 Product Charge Act, to a number of types of waste and the distribution of part of the revenues to support collection of used batteries, old refrigerators and refrigerants, packaging materials and used tyres. The quantity of industrial waste produced annually drastically decreased in the early nineties, following the decline in industrial production, and should now be monitored in view of current industrial growth. The recent creation of the National Cleaner Production Centre is helping introduce low-waste technologies in production processes.

The lack of comprehensive waste management legislation that clearly defines responsibilities, establishes the waste management hierarchy, and emphasises prevention and recovery has so far prevented the realisation of the objectives restated on several occasions in government declarations since 1991. Hungary faces very serious waste

management problems. Municipal waste collection does not cover 15 per cent of the population; most of the collected waste is landfilled in small communal facilities which, for the most part, do not conform to environmental regulations. Separate collection of municipal solid waste does not exist, apart from some sporadic and experimental attempts. Large amounts of industrial hazardous waste have accumulated over the last decades awaiting treatment. Treatment capacity is still largely insufficient. The list of wastes considered hazardous should be revised to make it consistent with international regulations: the 1996 Decree embodies the principles and implementation rules of the Basel Convention but does not recognise the OECD "green" list, thus restricting movements of wastes destined for recovery. As part of a special remediation programme adopted in 1996, a survey of sites contaminated by past military and industrial activities was launched and clean-up measures are being taken in the most urgent cases, especially regarding abandoned Soviet Army facilities. The resources devoted to the programme will need to be increased to cope with the magnitude of the problem within a reasonable period of time.

It is recommended to:

- adopt as soon as possible comprehensive waste management legislation, firmly establishing the preference for waste reduction and recovery over disposal, and clearly defining the responsibilities of the various parties concerned, including local authorities; develop a detailed action plan, based on the polluter pays principle;
- promote prevention and minimisation of waste generation, as well as separate collection and recycling of municipal solid waste (paper, glass, green waste, hazardous materials, etc.);
- close down unsatisfactory communal landfills and replace them with a modern network of larger treatment and disposal facilities for municipal waste, to be developed on a regional or county basis;
- increase the present incineration and treatment capacity for hazardous waste, and establish regional facilities for safe disposal of accumulated and recently generated hazardous waste, sewage sludge and hospital waste;
- revise the classification and list of hazardous wastes in conformity with relevant international conventions and regulations; adopt and implement the OECD "green" list of wastes destined for recovery;
- accelerate the implementation of environmental clean-up programmes on the basis of risk assessment for contaminated sites and for decommissioned communal landfills and dumpsites.

***Nature***

For many years, Hungary has made substantial efforts to increase the extent of both forest cover and areas under legal protection. These efforts culminated with the adoption in 1996 of legislation on the protection of forests and on nature conservation. About 20 per cent of the national territory is covered by forests (with the aim of reaching 25 per cent in the longer term) and around 9 per cent is under various forms of legal protection. Four new national parks were established in 1997. All bogs, caves and grave mounds are now protected. Several previously threatened species have been reintroduced. Hungary is an active party to many international agreements and conventions on nature and biodiversity conservation. The work of personnel employed in nature conservation is well co-ordinated among scientific institutions, local governments and NGOs.

Despite these undeniable achievements of the 1990s, further efforts are needed to improve nature conservation in Hungary. The ongoing land privatisation process has been accompanied by conflicts between nature conservation objectives and the interests of farmers and hunters. The proportion of protected areas under strict protection should be increased, and management of protected areas further improved. A comprehensive network of protected areas remains to be created. Outside protected areas, better integration of nature conservation objectives in agricultural, regional development, transport and tourism policies should be set as a top priority.

It is recommended to:

- put in place the National Biodiversity Strategy (and associated Action Plan), to provide a comprehensive framework for ecosystem and species conservation at both the national and local levels;
- establish a national ecological network, in relation with the Pan-European Ecological Network;
- continue efforts to increase the share of the national territory designated as protected areas, especially the proportion under strict protection, and adopt management plans;
- improve the integration of nature conservation objectives in sectoral policies, primarily agriculture, regional development, transport and tourism;

- make wider use of Environmental Impact Assessments, extending their scope to encourage nature conservation objectives, 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; develop visitors centres and nature trails.

## 2. Integrating Environmental Concerns in Economic Decisions

Economic forces and changes in such major sectors as industry, energy, agriculture and transport strongly influence environmental conditions and trends, and hence either enhance or diminish the benefits of environmental policies and technical progress. Further integration of environmental concerns in economic, sectoral and social policies is needed to achieve cost-effective environmental protection and sustainable development in Hungary.

### *Decoupling and sustainable development*

In the period 1990 to 1993, GDP, industrial output and agricultural production all declined markedly; this contributed to a significant reduction of air and water pollution and a sharp decrease in the use of agricultural chemicals. GDP then recovered to its 1990 level. There are good indications that the increase in industrial production has not been accompanied by a similar increase in pollution. This decoupling is the result of both the modernisation of industry and the implementation of new environmental legislation. In particular, the rapidly developing privatisation process, combined with a high share of foreign direct investment, has led in many cases to the introduction of cleaner production processes and to cleaner products. However, waste management remains a problem.

To follow up on the Rio process, an interministerial commission on sustainable development was created and local Agenda 21 activities have been launched with the support of NGOs. However, there is a lack of local and regional environmental co-ordination other than at the initiative of municipalities. Efforts have been made to integrate environmental concerns into sectoral policies in the context of sustainable development. EIA applies to a range of projects and plays an important integrative role. These efforts should be strengthened in order to develop long-term sectoral policies that take environmental considerations fully into account. Self-responsibility is developing in industry (e.g. environmental management systems, eco-auditing). A national voluntary eco-labelling programme has been introduced under the supervision of the Ministry for Environment. Re-use and recycling should be strengthened at all levels of consumption, to save resources and raise public awareness.

Production patterns have significantly improved in industry, with reduced pollutant emissions and less intensive use of natural resources. Nevertheless, energy intensity per unit of GDP is still 20 per cent above the OECD average. Concerning consumption patterns, the use of economic signals such as progressive pricing in previously subsidised sectors has had a very positive impact on water use by households. There are still significant water subsidies for households. Continuing its move towards full pricing of natural resources would enable Hungary to further reduce pollution and natural resource use; however, social constraints (affordability) must be taken into account in setting prices. Problems such as deterioration of public transportation, increasing energy use by households and increasing municipal waste persist.

It is recommended to:

- pursue efforts to integrate environmental concerns into sectoral policies and practices, in particular energy, industry, agriculture, transport and other services;
- start discussion of a new sustainable development strategy, building on the National Environmental Programme and with participation by local stakeholders;
- extend the application of Environmental Impact Assessment to the strategic dimensions of sectoral programmes and policies;
- continue to promote the use of cleaner technologies, energy-saving devices and the use of renewable energy sources;
- promote wider use of eco-labelling and energy efficiency labelling;
- stimulate re-use and recycling at all levels of consumption.

***Transport and environment***

The transport sector plays an important role in the Hungarian economy, contributing to regional development and to European integration. The 1996 Hungarian Transport Policy establishes environmental sustainability as an objective in transport sector development. Concerning road vehicles, Hungary has implemented stringent vehicle emissions standards and an in-use vehicle emissions inspection programme is in place. Differentiated import duties, excise taxes and VATs are all used to favour the purchase of newer, more energy-efficient and cleaner vehicles. A differentiated annual vehicle tax further strengthens the incentive to buy less-polluting vehicles. A vehicle-scrapping programme has been used to reduce the number of vehicles with two-stroke engines. Concerning fuel quality, Hungary has adopted stringent standards and major improvements have been made. Concerning traffic, significant fuel price adjustments have served to moderate demand for road transport, some improvements to public transport systems have been made, particularly in Budapest, and the development of combined transport has helped offset some air emissions from transit traffic.

However, transport is a major and growing source of air pollution in Hungary, particularly road transport. The rates of accidents and deaths from road transport are very high. Poorly maintained road surfaces contribute to safety and noise problems. Over 50 per cent of the population lives in dwellings exposed to high noise levels (greater than 65 dBA). Measures to renew the vehicle fleet, such as inspection and maintenance programmes and vehicle-scrapping schemes, should be further used. Parking regulation is weakly enforced. Tax rebates encourage use of private cars. Infrastructure investment policy does not adequately consider long-term demand management and sustainability goals for the transport sector. Investment in public transport has been inadequate in recent years, making the sector less competitive with road transport. Major investments are needed in order to upgrade inland navigation and railway systems to meet international standards.

It is recommended to**:**

- 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 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.

## 3. International Co-operation

Overall, Hungary's achievements in the area of international co-operation are very good: it was able to meet nearly all its international commitments while undergoing a rapid change from a centrally planned to a market economy. This achievement has been facilitated by strong reorganisation of the economy, with GDP decreasing until 1993 and subsequently rebounding.

On a bilateral basis, Hungary has established new environmental relations with its seven neighbouring countries. A few far-reaching bilateral agreements have been signed and others are pending. Positive steps have been taken to improve nature protection in border areas. A bilateral dispute concerning water management and nature protection came before the International Court of Justice, and subsequent to a decision of the Court, the two countries endeavoured to solve the issue on a bilateral basis. The targets set in multilateral agreements for emissions of $SO_2$, $NO_x$, VOCs, CFCs and halons have all been met and some have been surpassed. The pollution load on the Danube basin from Hungary has been drastically reduced. Emissions of greenhouse gases have been reduced. Emissions of

$CO_2$ in 2000 will be lower than in 1990. The target set under the Kyoto Protocol is likely to be reached despite new economic growth. The Aarhus principles on access to environmental information and public participation have been adopted; Hungary has signed all UN-ECE agreements on environmental issues. Hungary joined the OECD in 1996 and is seeking to accede to the European Union. As a result, there is a strong effort to harmonise its environmental legislation with the legislation of EU countries, which are also members of the OECD.

Although Hungary's performance concerning international relations is excellent, the transposition of some international commitments into domestic law may be a source of concern. Hungary is faced with the very large task of changing its laws, regulations and approaches to environmental protection, while at the same time having to adapt to new economic and political circumstances. A number of laws and regulations needed to implement OECD Decisions and Recommendations which Hungary has accepted are still at the drafting stage. Means to prepare new environmental laws, and to implement and enforce existing ones, are not being increased, casting some doubt on the possibility of meeting the self-imposed deadline for approximation of the EU acquis, and of ensuring that Hungary's environmental infrastructure is comparable with that of its EU partners. Apart from issues directly related to environmental legislation, there are serious difficulties in implementing an integrated approach to pollution prevention and control and introducing the sustainable development concepts adopted at Rio.

It is recommended to:

- ratify and implement relevant international environmental agreements which Hungary has negotiated or signed (Annex III);
- speed up the process of revising and adapting domestic environmental legislation to meet international commitments;
- strengthen the approximation effort to adopt EU acquis in the field of environment, in order to meet Hungary's self-imposed target of 2002;
- adopt new legislation on waste and further regulations on chemicals safety and industrial accidents to enable Hungary to meet its obligations under OECD Acts;
- increase resources to prepare for EU accession and to enforce new legislation approximating that of the EU;
- undertake a full analysis of the cost of implementing and enforcing EU legislation in areas such as water, air and waste, with a view to preparing a long-term plan for financing these outlays;
- strengthen regional co-operation concerning the Upper Tisza area, and implement the Sofia Danube Convention;
- implement cost-effective measures to improve energy efficiency, with a view to improving the country's energy balance while participating in the global effort to address climate change.

# ICELAND

## CONCLUSIONS AND RECOMMENDATIONS*

After rapid economic expansion during the 1970s and much of the 1980s, Iceland is now in a phase of sluggish growth. In the coming years, the country's development will largely depend on the sustainable development of its natural resource base and on its comparative advantage of having an environment which is both clean and perceived as clean. Together with international issues relating, for instance, to the protection of the sea and the atmosphere, these facts have pushed environmental protection and its relationship with development towards the top of the list of priorities in public opinion polls and onto the country's agenda.

The OECD report has set out the baseline for assessing environmental progress and examines the environmental performance of Iceland in four major strategic areas:

- management of natural resources;
- reduction of the pollution burden;
- integration of environmental and economic decision-making;
- international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. Iceland's environmental objectives are generally expressed as broad aims, or as more specific qualitative goals. They are not, however, expressed as quantitative targets, with the notable exception of the fisheries management system. This applies equally to domestic objectives and to international commitments.

This Chapter highlights the Conclusions and Recommendations of the OECD's appraisal of Iceland's environmental performance.

### 1. Baseline

The Icelandic economy remains highly dependent on marine resources and particularly on the production and export of fish products. Currently, total annual fish catches in Iceland reach about 1.5 million tonnes, a figure which represents the highest fish catch, per capita or per unit of GDP, of any OECD country. The recruitment of the most important fish stocks has been satisfactory except of cod during recent years. Fish products represent 75 per cent of the country's merchandise exports. Since establishing full control over the fishing grounds around the country in the mid-1970s, Iceland has gradually developed a system of fisheries management organised around: i) the annual specification by species of a Total Allowable Catch (TAC), ii) a system of individual transferable quotas, and iii) several accompanying technical enforcement and economic measures.

Concerning terrestrial resources, Iceland is characterised by:

- a stable biodiversity, with no mammal species and very few other species being threatened and with thriving local populations of flora and fauna;
- abundant and high quality inland freshwater resources, with ground water currently supplying most of the population; water is also bottled and exported;
- freshwater fish stocks which are in good condition and are of high quality;
- major development of hydro and geothermal energy resources which currently provide over 60 per cent of total primary energy supply; and
- soil erosion, which affects some three-quarters of total land area, and is considered by Icelandic authorities to be one of the most immediate environmental problems; over-grazing is one of the leading causes in many areas.

Measured ambient concentration levels of pollutants in Iceland are generally low, and are far below those in other OECD countries. This applies equally to air and water pollution. It mainly reflects low emissions due to low population density (only 260 000 inhabitants in an island of 103 000 $km^2$ ), the low level of industrialisation, a favourable energy supply structure, and the very low level of crop production and limited use of agrochemicals; it also reflects a low level of transfrontier pollution. There is, however, concern about localised pollution sources and about the emergence of diffuse pollution problems. Currently, 6 per cent of the national population is connected to secondary waste water treatment plants. Transport growth (with an increase of over 200 per cent in the number of

* Conclusions and Recommendations approved by the Group on Environmental Performance at its December 1992 meeting.

cars over the period 1970-1990) has contributed to an increase in national atmospheric emissions of carbon monoxide, nitrogen oxides and volatile organic compounds; there have been occasional periods of smog in the Reykjavik area.

Regarding the institutional and administrative baseline, important aspects include the following:

- The Ministry for the Environment was established in 1990, centralising the major environmental protection responsibilities.
- The Government's 1991 White Paper identifies a broad range of environmental initiatives relating to preservation and utilisation of land, measures to combat pollution of the sea, waste disposal and sewage, environmental research, international co-operation and the dissemination of environmental information to the public.
- An important body of laws and regulations exists pertaining to various environmental issues, including nature conservation, wildlife management, land rehabilitation, pollution control and management of natural resources.
- Newer environmental legislation is under preparation concerning, among others, environmental impact assessment, the development of the central highlands, and public right-to-know measures.
- Within a two-tier government structure, decentralised approaches are often effectively used to promote more environmentally aware behaviour. There is a tradition of consultation in policy planning in the drafting of legislation and in the regulatory process.

## 2. Environmental performance

### *Managing natural resources*

*Marine resources*

The biological goal of ensuring the conservation of fish stocks is being achieved for most species, albeit with a degree of precariousness for some species such as cod. The newest version of the fisheries management system implemented in 1991 should contribute further to achieving this goal. The economic efficiency of the fishing industry has benefited from the fisheries management system and has increased over a period of several years; economic distortions appear to be relatively absent. The sustainable yield of fish stocks, however, is point of concern, next to the policy directed at improving the economic efficiency of the fishing industry. Provision for the transfer of quotas between vessels has opened up possibilities for fishing operators to combine their rights and use fewer vessels, thereby reducing costs. Prices are now set by the market. Iceland's fisheries are not subsidised and they continue to make a large contribution to the country's standard of living.

Although the Icelandic fisheries management system thus appears to be achieving its basic biological and economic goals, potential adjustments should be considered: closing the gap between the recommended and actual fish catches would help to improve protection of stocks; attention could be given to structural adjustment assistance to disadvantaged groups or communities. Iceland, like other countries, could also improve its scientific knowledge concerning the biological, hydrological and climatic determinants of fish stocks, as well as carrying out other research into the conservation of fish stocks, the interdependence between species and marine ecology.

*Terrestrial resources*

The Government of Iceland is committed to facilitating and promoting environmentally sound utilisation of terrestrial resources. The Ministry for the Environment as well as the institutions under its auspices are thus actively engaged in co-operating with sectoral Ministries, non-governmental organisations and the public in order to promote the development of Iceland's terrestrial resources in a manner that is consistent with nature conservation and sustainable development objectives. In that respect, important progress has been make in updating and harmonising environmental legislation. There are many examples of how Iceland's efforts to achieve sound management of terrestrial resources over the long term have brought mutually reinforcing environmental and economic benefits in the short term. There are also cases of progress at the policy level; this has not always been reflected through actual performance outcomes. Important challenges still exist in regard to reconciling nature conservation, agriculture, energy, tourism and recreation objectives, as well as co-ordinating national interests with those of local communities, associations and larger development agencies and enterprises.

Concerning specific terrestrial resources, the following observations can be made:

Policies aimed at promoting biodiversity have had considerable success with respect to: a) expanding "protected and conserved" areas (from 0.5 to 9 per cent of the national territory between 1970 and 1990); b) reversing legislation which encouraged the extermination of a few species and revising legislation to incorporate the principle that wild terrestrial mammals and birds are to be conserved; c) reducing subsidies for wet lands drainage; and d) maintaining user rights for farmers protecting birds such as eider ducks. However, difficulties stem from the lack of funding for the enforcement of nature protection and uncertainty over land rights in uninhabited areas. A more ambitious target could be set for protected areas.

Maintenance of the quantity and high quality of freshwater fish stocks has been aided by: a) efficient aquaculture techniques, b) an innovative system of management for sport fishing, and c) bans on ocean catches of salmon. It has also benefited from extremely clean lakes and rivers. However, the effects on the genetic integrity of future fish stocks resulting from the mixing of wild salmon with those raised by aquaculture methods are a potential concern.

Policies aimed at protecting soil and vegetation and reversing erosion have led to widespread involvement of the public involvement effectively and facilitate the establishment of longer-term priorities. However, given the extent of the erosion problem and budgetary restraints, there remains a fundamental need for the identification of priorities and for economic analysis of projects and programmes.

An integrated approach to the planning and management of the central highlands is needed in order to reconcile nature protection, agriculture, energy and tourism development objectives. The management of the central highlands' terrestrial resources in the 1990s should undergo a transformation similar to that experienced by marine resources in the 1980s, that is, a transition from a regime endangering the resource base to a regime managed in the long-term interests of the various parties and the nation as a whole. This could involve: a) a consensus on the appropriate structures and administrative mechanisms; b) a development strategy, a Master Plan and the integration of environmental impact assessments into project planning and design; c) management changes in order to strengthen the enforcement of legislation and regulations, as well as to develop voluntary support and the use of economic instruments; d) establishing mechanisms for fund collection and allocation; and e) the clarification of property rights.

***Reducing the pollution burden***

The need for a clean and unspoiled environment to respond to the demand from the Icelandic public, to support exports of fish and other "clean" products, and to attract foreign tourists, calls not only for strengthening of the implementation of existing policies, but also for more specific objectives and increased efforts concerning pollution prevention and control.

The endorsement of the Polluter-Pays Principle, the preventive role of the substitution of renewable energy for fossil fuels, the use of economic instruments (differential taxation in favour of unleaded petrol, fees on the collection of waste from business, fees on single-use plastic shopping bags and deposits for beverage containers) are all important elements of the current policy. It would be appropriate to concentrate short-term attention and efforts on the following:

- The national waste management strategy adopted in 1991 needs to be implemented with adequate funding as well as strengthened co-operation among local governments and between central and local government.
- Waste water disposal should be better assessed and waste water treatment expanded where necessary; in the Reykjavik urban area, a reduction of releases of pollutants into the sea should be sought taking into account the receiving capacity of Icelandic waters for nutrients; water protection legislation should be revised and strengthened.
- Energy efficiency and pollution abatement in the transport sector will continue, and the introduction of cleaner cars is already under way. Further attention should also be given to the fishing fleet.
- Regarding global environmental problems, climate change-related greenhouse gas emissions should be given particular attention, as a substantial share comes from aluminium production and could expand if a new aluminium plant was built. Options to reduce greenhouse gas emissions should be considered, including a carbon tax.

***Integrating environmental and economic decision-making***

There is scope in Iceland for better integration of environmental and economic decision-making, mostly within the existing institutional and administrative framework, and by expanding and diversifying the use of policy instruments.

*Institutional and administrative arrangements*

At governmental and parliamentary level, the establishment of the new Ministry for the Environment, the creation of a Parliamentary Environment Committee and the adoption by the government of a White Paper are recent initiatives which will promote the integration of environmental concerns into decision-making concerning areas such as energy, agriculture, fisheries, tourism and the budget.

At departmental level, the Government has taken initial steps towards improving policy co-ordination on environmental affairs between the new Ministry for the Environment, resource management ministries and other central bodies. The Ministry for the Environment is responsible for this co-ordination through various ad hoc committees. However, effective servicing by such committees may be constrained by the relatively small staff and limited economic expertise of the Ministry for the Environment. Further efforts will be needed to enhance the co-ordinating role of the Ministry for the Environment and to foster the integration of environmental concerns into the activities of other Ministries through more systematic consultation of the Ministry for the Environment.

At local government level, integration can be pursued through many useful mechanisms to co-ordinate central government actions with local governments in the field of environmental and resource conservation development and implementation; examples are the Nature Conservation Council, the National Physical Planning Agency and the Soil Conservation Service. Nonetheless, there are cases concerning management of the central highlands and waste management, for example, where co-operation needs to be organised and strengthened.

Major interested groups have adequate opportunities to participate in policy, planning and regulatory processes within government, with provision for such participation in many cases being stipulated in law.

*Instruments used for policy development and implementation*

Reliance on improving public environmental awareness has had success in a number of areas, such as tree planting and activities to combat soil erosion, but in other areas, such as off-road travel and construction of mountain huts, there appears to be a need for more rigorous enforcement of laws and regulations.

The use of economic instruments and the adoption of the Polluter-Pays Principle are already contributing to the integration of decision-making, but their scope could be extended, particularly to waste management, sewage disposal and treatment, and the protection and management of the central highlands, as well as in the transport and industrial sectors. These instruments also contribute to diversifying sources of financing for environmental activities.

Important gaps still remain regarding basic physical and economic information about the state of the environment, the stresses it is under, and carrying capacity. Efforts to improve environmental research, monitoring , indicators and information should be strengthened. Available information might be brought more systematically to the public's attention.

Further instruments might be considered:

- A strategic national environmental plan, based on the Government's White Paper, could set out short- and long-term goals for sustainable development and selected targets, outline funding levels and sources and propose corresponding implementation strategies;
- Environmental impact assessments of major projects could build on the approval and implementation of the legislation currently being prepared, as well as the necessary accompanying guidelines to ensure the balanced consideration of environmental and economic factors across government departments and agencies; and
- Land-use planning should be improved and property rights specified, especially in the management of the central highlands.

These instruments should be viewed as mechanisms which can promote and assist integrated and consultative decision-making. They, in turn, can also help balance attention between short-term and long-term issues,

sectoral and integrated decisions, as well as individual and community interests. Furthermore, they can help forge further partnerships and consensus with enterprises, trade unions and associations.

*Sectoral integration*

Structural adjustment is now under way in the agricultural sector, and will, inter alia, help replace price support with direct income support and reduce production to the level of domestic demand. Environmental pressures may be reduced through: a) encouraging a shift towards other more environmentally "friendly" activities such as eco-tourism and organised sport fishing, and b) further reducing the number of sheep and the associated pressures on vegetation cover and soil erosion. Progress has been made in reducing pressures on wetlands as agricultural subsidies for wetlands drainage have been greatly reduced. However, further adjustments are required, such as curbing the increase in the number of horses (more than 50 per cent over the last ten years) and confining grazing to areas which can sustain the pressure.

Structural adjustments, already accomplished in the energy sector with the expansion of renewable energy use, have had important beneficial effects on the environment. Studies of environmental impacts are being carried out for hydro power resources. Nonetheless, this model approach should be extended to projects and plans for the development of other energy resources. Iceland has the highest energy consumption per unit of GDP among OECD countries. Improving energy efficiency might be considered in terms of its contribution to meeting several objectives: nature conservation pollution reduction, energy conservation and energy security. In addition, work is being undertaken to study and find solutions to the environmental impacts of geothermal energy harnessing.

Pressures on the environment resulting from the rapid increase of tourism and recreation pose a major challenge for Iceland (*e.g.* an increase of more than 200 per cent in numbers of foreign tourists over the last ten years). Policies have already promoted an increasing awareness of the importance of Iceland's relatively unspoiled environment for tourism; incentives for off-peak travel have contributed to relieving pressures on heavily visited sites. However, a reinforced co-ordinated strategy appears necessary, including, for instance: strengthening institutional mechanisms, particularly as regards co-ordination between the Tourist Board and the Nature Conservation Council; increasing permanent and voluntary staff support; using a range of pricing measures to internalise the environmental costs of tourism, including toll charges on roads into the central highlands, sales of passes for entry into national parks or conservation areas, camping fees and permits and increased taxes on four-wheel-drive vehicles and snowmobiles, and taking steps to spread demand for visits to natural parks and recreation areas.

*Financing*

A better integration of environmental and economic decision-making should generally help to enhance the benefits of pollution control and natural resource conservation, while helping to contain the need for environmental expenditure. Regarding the latter, preventive and structural measures, for instance, are often less costly than curative measures. Greater use of economic instruments and reliance on the Polluter-Pays Principle can increase the cost-effectiveness of implemented policies. Economies of scale and reduced unit treatment costs can be achieved by co-operation between municipalities in the provision of environmental services such as waste treatment.

Nevertheless, increases in environmental expenditure appear indispensable in order to fulfil Iceland's environmental objectives, particularly those expressed in the Government's 1991 White Paper. This applies, for instance, to waste management objectives, to nature conservation (there are only three full-time park wardens in the whole country), to increased monitoring and research and to strengthening links between the Ministry for Environment and other Ministries and the international community.

Besides some increase in central and local government spending for environmental progress, additional sources of financing also need to be considered, such as increased reliance on service charges for publicly provided environmental services, mobilising the private sector to provide voluntary contributions to environmental causes, and international borrowing.

***International co-operation***

Iceland has taken a very active role in protecting the ocean against pollution and in conserving natural resources. It supports the progressive development of international environmental lax relating to the sea and is now

ratifying a growing number of international agreements addressing environmental protection. An explicit aim of the Icelandic government is "to play an active part in international co-operation on conserving the environment, at least in those aspects directly related to Iceland's national interests, such as control of atmospheric and marine pollution". The ongoing harmonisation of numerous European Community Directives with Icelandic environmental law within the framework of the recent EEA Agreement between countries of the European Communities and of EFTA, as well as the country's participation in the activities of the Nordic Council and the Arctic co-operation process, are major features of Iceland's present international environmental efforts.

Iceland has achieved progress in a number of areas of international significance:

- It has promoted a high degree of protection of the sea and has fully implemented requirements under Marpol. Iceland's particular location at the junction of the eastern and western areas of the North Atlantic may promote further co-operation between all North Atlantic countries to improve protection of the marine environment.
- Iceland's emissions of carbon dioxide benefit from the country's heavy reliance on renewable energy; its emissions of CFCs and halons are decreasing.
- Nature is well protected in Iceland, more so than in many other OECD countries, and very few species are threatened. Two Ramsar sites are nevertheless at risk of being affected by current industrial activities.

Areas deserving further attention include the following ones:

- The development of a long term environmental strategy and environmental policy directed at the sustainable yield of fish stocks and, in this respect, directed at the integration of environmental and economic policies.
- Concerning development assistance, Iceland has a great capacity for providing useful technical assistance in environment-related areas, such as sustainable management of fish resources, geothermal energy and hydro power and monitoring of natural disasters. However, its overall financial assistance (0.1 per cent of GDP in 1992) is not comparable to that of other OECD countries.
- In line with the Government's aim of "strengthening the image of Iceland as having a clean and unspoiled natural environment", Iceland will have to set an example in avoiding pollution of the sea, atmosphere, and its own natural resources, and should consider giving greater support to international initiatives to ensure sustainable development of all natural resources.
- In particular, in the coming years, Iceland may want to consider: measures to improve its preparedness for accidental marine pollution; launching co-operative activities within the framework of the Rovaniemi Declaration on Arctic co-operation; further developing its whaling policy and explaining it at international level; and choosing a target concerning emissions of greenhouse gases or carbon dioxide.
- To support Iceland's international activities, there will be a need to strengthen the staff of the Ministry for the Environment for dealing with international environmental relations, as well as to provide additional and better data to international organisations and to increase research activities concerning pollution of the sea and of the atmosphere.

# IRELAND

## CONCLUSIONS AND RECOMMENDATIONS*

Ireland has achieved remarkable economic performance in recent years: its GDP has grown by 9% annually since 1994, and its GDP per capita now surpasses the EU average. This has been made possible, inter alia, by a large inflow of foreign direct investment (2% of GDP annually) and considerable EU net transfers (in the range of 3-4% of GDP annually). With relatively low average population density, Ireland is experiencing rapid suburbanisation and population growth.

The new Irish economy (a large share of which is now made of the booming electronics and pharmaceuticals industries) is less energy and material intensive per unit of GDP than it was several years ago. However, absolute pressures on the environment have continued to increase, even if less rapidly than GDP. Ireland continues to face many environmental challenges, in particular controlling air emissions from transport and energy production, reducing pollution loading to water from municipal and agricultural sources, and improving waste management and nature protection. These challenges largely reflect insufficient environmental infrastructure, together with changes in consumption patterns associated with recent increases in per capita income. This makes it all the more necessary for Ireland to: i) further implement environmental policies and strengthen environmental infrastructure; ii) better integrate environmental concerns into economic decisions; and iii) reinforce international environmental co-operation.

This OECD report establishes a baseline for assessing future environmental progress and examines Ireland's environmental performance, i.e. the extent to which its domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

### 1. Implementing Environmental Policies

Ireland generally has good environmental quality. Thanks to its environmental policies and to the "new economy", energy and material intensities fell in the 1990s. However, despite progress in some areas, particularly with regard to reducing emissions and effluents from industry, pollution intensities are often high compared to those in other European countries. Major challenges remain concerning environmental pressures from energy production and agriculture, in particular from intensive livestock rearing. Pressures from municipal waste water are gradually decreasing with progress in waste water treatment, but they remain high. There are growing problems relating to changes in consumption patterns: for example, waste generation, transport and urban sprawl, particularly in the Dublin and Cork areas. To achieve higher environmental performance, Ireland will need to implement its environmental policies in a more cost-effective way. Due to insufficient investments in the past and requirements relating to new populations and urban development, it should increase its financial efforts to build a full-fledged modern environmental infrastructure.

#### *Improving the cost-effectiveness of environmental policies and strengthening environmental infrastructure*

Ireland has a modern and coherent body of environmental law. EU environmental law is fully transposed in national law. Most environmental legislation is less than ten years old; the new Planning and Development Bill consolidates physical planning legislation since 1963 and substantially updates strategic spatial planning at regional and local levels**.** The Environmental Protection Agency (EPA) plays an effective role in implementing environmental policy and monitoring performance, particularly through Integrated Pollution Control (IPC) for large industrial plants. Nevertheless, the EPA should have a more prominent role in licensing by local authorities and capacity building at the local level. Local authorities are responsible for managing municipal waste, water supply and waste water collection and treatment. For investment purposes they depend to a very large extent upon financing channelled by the Department of Environment and Local Government (DOELG), whether the funds come from European sources or national taxpayers. Up until now, Ireland has made only limited use of economic instruments to address pollution issues. Eliminating water charges for households was a step in the wrong direction. However, Ireland is progressively implementing a comprehensive charging system in respect of non-residential users. In a period of substantial investment in housing construction, water meters should be installed on new dwellings. Proposals for an increase in energy taxation, balanced by reductions in social charges, have been studied but not yet applied.

* Conclusions and Recommendations reviewed and approved by the Working Party on Environmental Performance at its meeting on 4 July 2000.

In the 1990s, Ireland launched investment programmes to build waste water collection and treatment facilities with a large share of EU support. Some time will be required to complete these programmes. As important investments in water supply, waste water treatment, waste treatment and air pollution control are still needed, Ireland should step up its national environmental investment effort. Environmental operating expenditure will also grow. In the 1990s, environmental expenditure (i.e. pollution abatement and control expenditure, together with that on water supply and nature protection) increased but did not exceed 1% of GDP. Pollution abatement and control expenditure represents 0.6% of GDP, less than in most other OECD countries. Since EU support will progressively be phased out as a consequence of its economic performance, Ireland must prepare for a much more significant public and private financial effort with regard to environmental investment and management. Even if the Irish budget situation has improved, environmental expenditure will increasingly need to be covered by charges levied on polluters and resource users. Recent public-private partnerships in water services (e.g. build-operate-transfer projects) are steps in this direction.

In the 1990s, Ireland renovated its environmental monitoring and reporting capacity (e.g. State of the Environment reports, environmental indicators) and set up effective arrangements to translate into practice public access to environmental information (e.g. access to licenses, EIA processes and courts). The national environmental information centre (ENFO) provides valuable free access to a wide range of environment related information and is particularly active in environmental education.

It is recommended to:

- extend the positive experiences of the IPC licensing scheme to a number of other activities not yet covered;
- foster co-operation between EPA and local authorities in licensing and enforcement, e.g. through training and capacity building;
- extend the use of economic instruments that help inform polluters and resource users of the true costs of their activities;
- make the introduction of revenue neutral eco-taxation a subject in the new partnership agreement among the social partners;
- prepare for increased national financing of environmental expenditure, given the need for higher investments in water supply, waste water treatment, waste management facilities and air pollution control, likely increases in current expenditure, and the planned reduction of EU support;
- extend the range of environmental projects using public-private partnerships.

***Water***

Ireland has a well-developed system for monitoring water quality in rivers, lakes, groundwater and marine bathing water; data indicate that the state of Irish water quality is generally satisfactory. The institutional and legal systems, the latter influenced by EU legislation, address national major water management challenges. During a decade of rapid economic growth, Ireland has taken the measure of the water challenge it faces. A large programme of investment in water supply and waste water treatment put in place in the 1990s is progressing; between 1994 and 1999, this programme benefited from large EU support. A number of farmers are required to adopt nutrient management plans. They receive direct payments as part of the Rural Environmental Protection Scheme (REPS) to support water quality protection measures**.** Integrated Pollution Control, implemented under the responsibility of the Environmental Protection Agency, includes licensing of waste water discharges from large industrial facilities. Efforts are being made to improve co-ordination among the various institutions involved in water management, in particular by promoting water basin management. Flood prevention schemes are well-maintained.

Since systematic records began to be kept in the early 1970s, there has been a substantial decline in water quality in Ireland's rivers and streams. This is nowadays largely attributable to increased nutrients from crop and livestock production. There are still "black spot" areas near urban centres that lack facilities to provide advanced urban waste water treatment. Improved enforcement of regulations and implementation of planning schemes are needed, especially in rural areas. The ecological management of water bodies should also be improved. Leakage from water supply systems accounts for as much as 45% of the water in distribution systems in some urban areas. Drinking water quality in rural areas is variable: up to 400 000 people may receive drinking water of substandard quality. Control of water pollution and of public water supply is supervised by the DOELG, which should facilitate consolidation of the various pieces of water legislation. Household water charges were discontinued in 1997, but charges applying to industrial and commercial establishments have not been abolished. Local authorities' expenditure on water services is mainly covered by the central government budget. To ultimately cover increasing capital and

operational expenditures associated with water management, the User-Pays and Polluter-Pays Principles should be progressively applied. Public-private partnerships could also be encouraged, to address Ireland's challenging infrastructure deficit in the light of reduced EU funding. Overall, Ireland's water policies must meet very significant challenges. They are beginning to move towards better balancing of investment and operational management, better central and partenarial management, and autonomous and less EU-dependent financing.

It is recommended to:

- strengthen catchment management**,** with a greater role for river basin districts, and promote participatory approaches to the development of catchment plans;
- consolidate water legislation in order to increase accountability and clarify responsibilities;
- accelerate development of statutory nutrient management plans and by-laws for controlling water pollution from agriculture;
- develop voluntary initiatives aimed at water quality enhancement, such as contracts between fishermen and farmers to protect rivers;
- progressively apply the User-Pays and Polluter-Pays Principles to water pricing policy concerning both households and economic sectors, taking account of social and distributional concerns;
- promote greater private sector involvement in providing water services, technical expertise and access to financing;
- improve drinking water quality where necessary, especially regarding group water schemes;
- continue efforts to reduce leakage from water supplies to acceptable levels;
- develop ecosystem-based environmental quality objectives that are more holistic than current water management objectives, and that take into account nature conservation objectives;
- extend the highly effective surface water monitoring system to consider nature conservation issues, including habitat issues.

***Air***

Ambient air quality is high in small cities and rural areas and has improved significantly in large cities in regard to smoke, $SO_x$ and lead. Since 1990, Ireland has successfully implemented a range of regulatory measures to improve urban air quality and reduce air emissions associated with transport and the housing sector. EU vehicle and fuel standards have been implemented. A ban on bituminous coal (instituted in Dublin in 1990, in Cork in 1995 and subsequently in ten other urban areas) has drastically reduced smoke emissions and improved urban air quality. Ireland achieved considerable energy intensity reductions in the 1990s, driven to a large extent by "dematerialisation" of the economy and increased market penetration by natural gas (21% of TPES). It uses some economic instruments to support air quality management objectives (e.g. in the transport sector).

Despite recent transformation of Irish industry, per capita air pollutant emissions (kg/per capita) remain considerably higher than the OECD Europe average: by 62% for $SO_x$, 20% for $NO_x$ and 30% for $CO_2$. Despite recent progress, the emissions intensity (kg/USD 1 000) of the Irish economy exceeds the OECD Europe average by 25% for $SO_x$ and 11% for $CO_2$. During the 1990s, Ireland did not take adequate steps to meet a number of international commitments to reduce emissions of certain pollutants, as envisaged in the Oslo and Sofia Protocols. Urgent measures are needed to improve emissions control, especially since Irish power stations continue to burn "dirty fuels". Some steps are being taken (e.g. decision to implement IPC licensing for all power plants by the end of 2002; there is a voluntary cap on $SO_x$ emissions from the power sector). Continued use of peat for power production, especially its continued subsidisation, should be re-evaluated. Peat's energy conversion efficiency is low, associated air emissions are rather high, and the environmental impact of peat harvesting is severe. Assuring that peat-fired plants are subject to IPC licensing from 2002, as scheduled, should be made a priority**.** Wider use of economic and fiscal measures to encourage use of cleaner fuels and cleaner energy should be given more consideration. In addition, several concerns about urban air quality (e.g. regarding $PM_{10}$, $NO_x$, VOCs and $O_3$) will require attention in the near future. Because of the rapid growth of its economy in recent years, Ireland confronts the challenge of using newly available resources to reduce emissions, notably in the face of greater energy demand, changing consumption patterns and increased commuting.

It is recommended to:

- develop and implement a national plan to reduce air pollutant emissions, to be co-ordinated with development plans for key sectors (e.g. transport, energy), and, inter alia, to identify cost-effective measures to reduce emissions of $SO_x$, $NO_x$, VOCs and GHGs;
- design and implement additional measures aimed at improving energy efficiency in industry and in the residential and commercial sectors, with consideration given to energy standards, pricing, and economic and fiscal incentives;
- continue to promote the use of cleaner energy (renewables, natural gas) compared with other sources of primary energy supply (coal, peat, oil);
- retrofit power plants with flue gas desulphurisation or denitrification equipment, to the extent that this is more cost-effective than creating incentives to use low-sulphur oil and coal; confirm a timetable for progressive phase-out of existing peat-fired power plants, especially those over ten years old;
- continue to implement the IPC licensing scheme and explore means to strengthen local authorities' monitoring and inspection capabilities, to ensure that facilities not licensed under the IPC scheme are adequately regulated;
- examine the environmental effectiveness and economic efficiency of variable transport costs, giving consideration to the use of higher taxation of motor vehicle fuels and the introduction of road-use pricing systems (e.g. use of tolls);
- further develop monitoring of ambient concentrations of $PM_{10}$, $NO_x$, VOCs and $O_3$, particularly in major cities.

***Waste***

Progress in waste management has been made in recent years, following enactment of a comprehensive Waste Management Act in 1996. The EPA has carried out detailed inventories of waste generation and landfill conditions; local authorities have prepared waste management plans providing for development of new waste infrastructure at the regional level. Industrial and municipal waste treatment and disposal facilities are now subject to IPC licensing by the EPA. The EPA has prepared a draft National Hazardous Waste Management Plan, currently at the public consultation stage. Ireland has ratified the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal; it also conforms to the OECD Council Decision on Transfrontier Movements of Wastes Destined for Recovery Operations.

Waste management is the environmental area which, until recently, received the least attention in Ireland. Almost all municipal waste is disposed in landfills, most of which require to be upgraded to meet adequate environmental standards. Recycling rates are low and do not meet national targets. Recycling of construction and demolition waste needs to be encouraged. Neither regulatory nor economic measures are currently used to encourage recycling or reclamation of transport related wastes. More effort is needed to improve waste prevention and reduction, in particular through promoting development of low waste generation technologies. Efforts to increase separate collection of municipal waste should be pursued. Collection and disposal of end-of-life vehicles, used oil, tyres and batteries needs to be improved. It is estimated that 20% of the hazardous waste generated is not reported, of which a significant part is from the agricultural sector. Serious efforts are needed to increase the capacity to treat hazardous waste. Only one-half of municipal waste management costs are recovered through waste charges and landfill gate fees. The Polluter-Pays Principle should be applied more widely, in particular through applying household waste charges in all local authorities and, to the extent possible, linking them to the quantity of waste disposed. There is considerable scope for increased private sector involvement and investment in waste management.

It is recommended to:

- implement waste management legislation at the local level, in particular through completing the adoption of regional waste management plans;
- pursue efforts to close down or upgrade unsatisfactory municipal landfills as part of the development of a modern network of treatment and disposal facilities**;**
- promote prevention of waste generation, in particular by encouraging the uptake of low waste generation technologies;
- improve recovery and recycling of municipal and industrial wastes, including construction and demolition wastes, organic materials and transport wastes (used oil, lubricants and tyres);
- apply more fully the Polluter-Pays Principle, in particular through the general use of household waste charges and the proper pricing of landfill waste disposal, and promote private sector involvement in waste management;
- enhance hazardous waste treatment capacity (e.g. incineration), in particular by adopting and implementing the National Hazardous Waste Management Plan;
- further develop producer responsibility initiatives aimed at improving waste recovery performance.

## 2. Towards Sustainable Development

***Integrating environmental concerns in economic decisions***

During the 1990s, Ireland experienced i) steady economic growth (the highest among OECD countries); ii) structural change, with the rapid growth of, inter alia, information technology and biotechnology based industries; iii) improved income levels; and iv) a growing population and suburbanisation, particularly in Dublin, Cork and other coastal areas. Tourism has expanded rapidly, building on the country's "green image". This move towards a "new economy" has translated into a decrease in the energy and material intensities of production (per unit of GDP), but not an absolute decrease in environmental pressures. Overall, only a weak decoupling has taken place, compared to best international practices. Transition to the new economy has also translated into higher land prices and an increase in environmental pressures relating to consumption: greater waste generation, greater motorisation and mobility, greater land consumption, and related demands for environmental infrastructure.

Some sectors and industries that have serious negative impacts on the environment continue to benefit from low taxation and from subsidies, including EU support. For example, peat based electricity production is controversial given its low economic efficiency (as a subsidised activity) and environmental effects (air emissions, damage to landscapes and habitats); economic incentives with regard to agriculture should be reconsidered under the revised EU Common Agricultural Policy, to take advantage of "cross-compliance" opportunities (making farm support conditional on compliance with environmental standards) and agri-environmental payments (under the REPS programme).

In 1997, Ireland issued a national Strategy for Sustainable Development covering economic, social and environmental concerns. To implement this strategy, a high level inter-ministerial committee (the Environmental Network) and National Sustainable Development Partnership (Comhar) have been established. Comhar, which brings together a range of social partners, should help raise awareness, monitor progress and mobilise public support. Strategic environmental assessment has been introduced to systematically assess potential impacts of sectoral policies on the environment and sustainable development. They should be implemented in the context of the new National Development Plan 2000-06, marked by a significant phasing out of EU support.

Ireland has recognised a need to reform and strengthen its spatial planning framework at the national and regional level. The new Planning and Development Bill, when enacted and implemented, should introduce a more strategic and integrated approach to territorial development at the sub-national level. Strategic planning guidelines for the Dublin area have shown the way. A national spatial strategy should be prepared, providing a framework for longer-term spatial development at the national level. Systematic analysis of current and future pressures on Ireland's coastal zones, and of policy options to manage their future development and protection, needs to be carried out.

Local Agenda 21s have been initiated. The Environmental Partnership Fund, supporting participatory local co-operation projects, will help broaden the local movement for sustainable development and encourage the activities of NGOs.

It is recommended to:

- make the national Sustainable Development Strategy fully operational, particularly within the context of the National Development Plan 2000-06 and other sectoral policy initiatives;
- promote better integration of environmental concerns in sectoral policies, for example by using environmental impact assessments of plans, programmes and projects;
- reduce distortions created by subsidies for energy and agricultural production, and consider using cross-compliance mechanisms if support payments are granted;
- adopt and implement the new planning and development bill, providing a greater role for strategic guidelines and regional co-ordination on protection and development of urban and coastal areas;
- complete and implement the national spatial strategy to provide a framework for long-term spatial development at the national level;
- facilitate participation and partnership of local community groups and environmental NGOs in preparing, implementing and monitoring Local Agenda 21 initiatives, including through the Environmental Partnership Fund.

***Towards sustainable transport***

Since 1994, Ireland has successfully implemented a range of regulatory measures to reduce negative environmental externalities associated with transport. EU vehicle and fuel standards have been implemented effectively and on time. Leaded fuel was phased out from 1 January 2000. A national scrapping programme between 1995 and 1997 led to the removal of some 61 000 old vehicles (6% of the fleet at the time). Wide-ranging traffic management measures implemented in the Dublin region since 1997 (e.g. environmental traffic cells, parking management, dedicated bus corridors) have helped reduce congestion significantly. Economic instruments (taxes on vehicle sales, fuel and registration) are used to encourage the purchase of smaller and/or cleaner vehicles. Public transport passes provided to employees are given tax exempt status, and expenses associated with passenger car commuting are not deductible from income tax. EIA procedures, which are well-established in Ireland, are routinely applied in the case of large transport projects; public participation appears to be active and adequate.

Nevertheless, there is a need to expand transport infrastructure, particularly motorways, high-quality dual carriageways, public transport and links to ports and airports. This need has thus far been largely addressed through use of EU funds. Public-private partnerships are not widely utilised, and the User-Pays Principle is weakly implemented; their increased application should be considered, especially in view of increasing operational and maintenance expenditure and reduced EU support. Co-ordination of responses to increases in both international freight movement and passenger traffic has not yet been adequately addressed: the result is over-concentration of traffic in the Dublin area. Poor land use planning and the lack of integration of spatial planning with traffic management objectives, together with rising land prices and income levels, have encouraged urban sprawl and increasing personal mobility. The recently passed Strategic Planning Guidelines for the Dublin Area may help address this problem. Overall, there is not enough emphasis on taxing vehicle use, and possibly too much on vehicle ownership. Fuel prices are relatively low compared to those in neighbouring countries; apart from two bridges in Dublin, road tolls have not yet been used. Ireland's implementation of emissions testing for in-use vehicles, which has been delayed, should be given priority. Looking ahead, decisions made in the late 1990s will provide certain benefits, but the likely continuation of economic growth will generate further increases in freight traffic, urban sprawl and personal mobility. This will present major challenges regarding the environment and sustainable development.

It is recommended to:

- accelerate and expand application of in-use vehicle emissions testing (including for second-hand imports);
- continue to implement inter-modal demand management measures in Dublin and other major cities, in order to stimulate demand for public transport and limit demand for private vehicles (e.g. environmental traffic cells, parking management, dedicated bus corridors);
- accelerate completion of congestion-alleviating road infrastructure (e.g. by-passes, ring roads, tunnels);
- implement measures (e.g. planning, economic incentives) to shift freight and passenger traffic out of Dublin to the extent feasible;
- seek better application of the User-Pays Principle to road transport, giving special consideration to an increase in vehicle use taxation (e.g. fuel taxation) relative to ownership taxation (e.g. vehicle registration, sales tax), and to other economic instruments.

## 3. International Co-operation

Ireland, which is heavily dependent on both exports and imports of goods and services, is attracting foreign direct investment flows. It wants at the same time to retain its "green" image in order to promote agricultural exports and attract international tourism. Beginning its full-scale international environmental co-operation relatively recently, Ireland has ratified a very large number of significant international agreements on protection of the environment during the last 15 years while transposing very thoroughly nearly all EU directives. Irish environmental law has been driven to a large extent by that of Europe, and investment in environmental protection has mainly been funded by EU Structural and Cohesion Funds. Ireland is the cohesion country that has attracted the greatest amount of European support. At the same time, its economic development during the 1990s has been the most rapid in Europe: it is now the cohesion country with the highest GDP per capita and is a very active partner in the framework of the EU.

Ireland actively participates in global environmental co-operation, as well as North-east Atlantic and Pan-European co-operative activities. It has banned disposal of industrial waste and of sewage sludge at sea, together with incineration at sea. Progress has been made concerning surveillance of ships in the Irish Sea that transport hazardous goods or radioactive material. Prior notification of passage is taking place on an increasing basis. Ireland

co-operates with Northern Ireland on many local issues, and further progress can be expected. Co-operation with the United Kingdom on protection of the marine environment has been thorough and fruitful. Ireland has contributed to the protection of biological diversity by designating a significant part of its territory for conservation, in the framework of EU directives or under the Ramsar Convention. It has also designated all of its marine waters as a whale sanctuary. Ireland has increased aid to developing countries since 1992 by the largest percentage of all DAC countries; its level of aid is now much higher than the DAC average.

Reflecting the lower priority given to international issues over many years, as well as its unexpectedly rapid economic growth, Ireland has had difficulty meeting agreed emissions targets. $NO_x$ emissions have increased since 1994 instead of being stabilised at their 1987 level, as agreed under the Sofia Protocol. The national target for $CO_2$ emissions in 2000 will most likely be exceeded, as measures taken so far are inadequate. $SO_2$ emissions, which are significant in relative terms (compared with those in other western European countries), will require substantial reduction in 2000 to meet requirements of the Oslo Protocol. Ireland is the only EU country that did not sign the Protocol on VOCs. In addition, implementation of a number of EU directives is not fully consistent with EU deadlines (e.g. for drinking water quality in a number of small rural communities, and for a large number of Habitat sites). Progress towards developing Local Agenda 21s has been fairly slow. Concerning protection of the marine environment from land based sources of pollution, measures have been initiated but have had little effect so far. In the context of energy policy, exploitation of peat bogs of European significance has been subsidised and has led to the disruption of peat habitats and to large emissions of greenhouse gases per unit of electricity produced by peat-fuelled power stations.

Major difficulties probably lie ahead, due to progressive reduction of EU funding and the increasing operating costs and investment expenditure for new facilities. Challenges include meeting deadlines for completing waste water treatment plants, requirements for higher drinking water quality, and new international commitments concerning reduction of air emissions (Kyoto, Gothenburg). Stringent measures to control air emissions now need to be taken, having been postponed for a considerable time.

It is recommended to:

- strengthen co-operation with Northern Ireland on all relevant aspects of environmental protection and nature conservation in boundary regions and, where appropriate, on an all-island basis;
- promote activities at the local, national and international level aimed at protecting the marine environment, in particular from land based sources of pollution;
- ensure effective protection of designated nature protection areas under international or EU schemes by increasing resources for management and conservation, public consultation and awareness raising, and for compensating affected parties where necessary;
- give particular attention to protecting peat bogs of great ecological significance;
- adopt and strengthen measures to reduce emissions of $SO_2$ and $NO_x$ with a view to meeting international commitments;
- take measures to reduce VOCs emissions with a view to conforming to international standards (EU legislation, Gothenburg);
- take measures to limit increases of greenhouse gas emissions to meet the Kyoto target, despite rapid economic growth;
- continue ongoing efforts to increase Irish official development aid.

# ITALY

## CONCLUSIONS AND RECOMMENDATIONS*

Italy's high population density and high level of industrialisation, the diversity and sensitivity of its natural patrimony, and the importance of its cultural heritage are all factors which have made the protection of the environment a matter of public concern in Italy.

After experiencing over the 1970s and 1980s a rapid growth of the economy and of the associated environmental pressures, Italy has since the mid-1980s strengthened its environmental institutions, laws and policies, made them consistent with European Community directives, and taken an active role in international co-operation concerning the environment.

Today, in the midst of economic structural reforms and adjustments, the challenge to move towards sustainable development largely depends on Italy achieving its economic and environmental objectives through the strengthening of the implementation of its environmental policies and the integration of environmental, sectoral and economic policies.

This OECD report sets out the baseline for assessing future environmental progress and examines the environmental performance of Italy in three major areas:

i) implementation of environmental policies;
ii) integration of environmental and economic decision-making;
iii) international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This assessment includes both domestic objectives and international commitments, and is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in Italy.

### 1. Implementing Environmental Policies

***Strengthening the national environmental institutions and management***

The Ministry of the Environment was created in 1986; staff and financing were gradually allocated to it. It soon set up a Three-year Programme to co-ordinate and integrate the activities of the various ministries with regard to the environment. It prepared and achieved adoption of an impressive set of new and often innovative laws and regulations in the field of the environment, including European Community directives. It has instituted economic instruments (e.g. charge on liquid effluents, charge on household waste, creation of a pollution insurance market) which reinforce the regulatory approach. Dialogue with the social partners has been positive. The Italian NGOs have been vigorous and effective.

But Italy's environmental performance suffers from the relative weakness of the institutions in charge of environmental management, beginning with those at the central level. It also suffers from the complexity of its environment laws, which are difficult to enforce and pose problems not only for the concerned sectors, but also for the public administration. The Ministry of the Environment is under-resources to carry out its tasks of implementing environmental policies and of promoting, within government as a whole, sustainable development initiatives. Its support structures — e.g. the National Environmental Protection Agency — have yet to be set up.

It is recommended that consideration be given to the following proposals:

— strengthen the human and budgetary resources of the Ministry of the Environment and review its structure, to better integrate into governmental action as a whole, the operational concepts of sustainable development;

* Conclusions and Recommendations approved by the Group on Environmental Performance at its June 1994 meeting.

- provide the National Environmental Protection Agency with the capacity to give the Ministry of the Environment scientific and technical back-up, and to monitor the state of the environment;
- provide financing for environment protection action programmes arising from national, European Community or international initiatives;
- promote the simplification of current legislation and regulations in order to make them easier to enforce;
- strengthen accountability mechanisms (e.g. result-oriented management and post-facto reporting of performance) for all levels of government and industry.

***Strengthening regional and local environmental management***

Italy's environmental performance also suffers from the relative weakness of the regional and local institutions in charge of its environmental management. Great efforts will have to be made so that the regions actually play their role fully in environment matters: liaison between the central government and the regions should be improved, particularly in planning and spending capacity; efforts to simplify and harmonize environmental law should be strengthened, and procedures should be simplified so as to reduce administrative delays. At the local level, serious efforts must be made to combat the laxness which, for too many years, has been typical of local environmental management in certain regions and to improve the management of environmental services.

It is recommended that consideration be given to the following proposals:

- define more clearly the regions' responsibilities with regard to environmental management (environmental information, regional state of the environment reports, specialised implementation and enforcement agencies, etc.);
- ensure that the regional and local levels are endowed with adequate financial resources, by instituting environmental charges and eco-taxes and streamlining the procedures for transferring funds from the central level to the regional and local levels;
- identify and report on weaknesses or gaps in the enforcement of environment protection measures at the regional or local level by setting up mobile monitoring teams at the central level; such teams could further review the consistency of implementation among regions and of the implementation by regions of international obligations.

***Nature and landscape conservation***

Beyond the long-standing protection efforts targeted at scenic and sensitive areas and at animal species protection, the Framework Law on Protected Areas, in 1991, and the Law on Hunting, in 1992, have given fresh impetus to nature conservation. Together, these two laws provide Italy with a very modern concept of nature protection. One of the goals is to protect 10 per cent of Italy's total land area with parks and reserves, and vigorous efforts have been made to achieve this objective: designation of more than a million hectares of new national parks, creation of central support structures, establishment of management committees for most protected areas, presence of all major ecosystems in the network of protected areas. There are also some successes in respect of wild animals with several species growing in numbers (e.g. the mouflon), extending their habitat (e.g. the wolf), or re-appearing (e.g. the lynx) after a long absence. Italy has ratified all main international conventions concerning wildlife and biodiversity.

However, some other animal species are suffering from loss of habitat, the effects of pollution (e.g. the otter), hunting pressures (e.g. the roe-deer), or introduction of non-indigenous animals (e.g. the grey partridge). Many individual wild plant species as well as the state of the vegetation are cause for concern. There is no national legislation which specifically protects wild plants and their habitats outside protected areas, and regional efforts are limited. There has been little determination to implement the innovative "Galasso" law on the protection of landscapes.

It is recommended that consideration be given to the following proposals:

- implement strictly the 1991 Framework Law on Protected Areas, with the allocation of sufficient personnel and financial resources, and a clear timetable for creating and establishing protected areas;

- strengthen the management of parks and natural reserves, through: incorporation of sustainable development goals in management plans; the application of the agri-environmental measures of the common agricultural policy of the European Community; effective public participation mechanisms; strict enforcement of the rules applying within protected areas;
- strengthen the management of fauna and flora species by: making the "Nature Census" operational and carrying out wildlife inventories; developing a national strategy for wildlife management; fully implementing European Community directive 79/409/EEC on the conservation of wild birds; taking measures to protect wild plants;
- better protect landscapes through the re-activation of the implementation and enforcement of the Galasso law, including setting new timetables for the formulation of landscape plans by the regions, and action by central government in cases where the regions fail to act; strictly enforce environmental and physical planning rules in respect of new building and construction projects.

***Air***

Urban air quality has improved in a number of cities. Total emissions of $SO_2$ and lead have decreased and have been decoupled from GDP and fossil fuel use. The integration of environmental concerns into energy policies and transport policies is proceeding well and has already been translated into a variety of effective policy measures. A national air monitoring network is being developed.

However, limit values for a number of pollutants and in several urban areas are breached regularly. Concerning a number of pollutants such as $NO_x$, VOC and CO2, energy efficiency gains have been largely nullified by the growth of pressures from other sectors such as transport. The cultural heritage of the country suffers from the impacts of air pollution. No region or province has yet finalised its air quality plan and emissions inventory. Several of the policy instruments provided by the 1988 Industrial Air Pollution Law have yet to be applied. As in other countries, the commitment to a 30 per cent reduction in $NO_x$ and VOC emissions is likely to be difficult to achieve within the deadlines, unless Italy fully implements and strengthens the actions and plans already adopted in the industrial and transport sectors. The Seveso directive has not been implemented in practice, and emergency preparedness to deal with major industrial accidents is likely to prove inadequate, although measures already taken go in the right direction.

It is recommended that consideration be given to the following proposals:

- ensure the completion of the air quality plans and emissions inventories provided for in the 1988 Act with appropriate public involvement in the former;
- implement effectively the law on air pollution from industrial plants and subsequent decrees, with expanded human resources, priority setting, and financing through appropriate fees;
- review efforts to assess and minimize the impact of air pollution on Italy's cultural heritage;
- review and implement strategies to achieve the emission targets concerning $NO_x$ and VOCs and strengthen efforts concerning both the transport sector and stationary sources;
- approve and implement action plans to deal more rapidly with high risk "Seveso" sites.

***Waste***

Over the last ten years, much effort has been devoted to putting in place a modern system of waste management. A comprehensive although complex legislative and administrative framework has been created, regional waste management plans have been drawn up, and the overall need for waste treatment capacity has been identified. The target for the recycling of glass has been met. The system of consortiums for the collection and recycling of waste (used lube-oil, old lead car batteries, glass liquid containers and plastic liquid containers) has proven to be effective already for some products, and potentially effective for some others. An effective control system for the transfrontier movements of hazardous waste has been established.

However, only 65 per cent of municipal waste is disposed adequately and most of this is still by landfilling. The programmed objectives to move towards modern treatment methods (e.g. incineration) have not been achieved. For industrial waste, and particularly hazardous waste, there is a shortage of treatment capacity.

To build on the progress made in recent years, it is recommended that consideration be given to the following proposals:

- take determined action to increase the share of up-to-date treatment capacity for municipal waste, and install additional treatment capacity for industrial and particularly hazardous waste to overcome the present shortage in this area;
- consolidate the current legislation and regulations and make them easier to understand and enforce;
- implement procedures and legislation for the recovery and recycling of both municipal and industrial waste;
- extend the use of economic instruments and of the Polluter Pays Principle in support of municipal waste management activities (e.g. local funding);
- ensure that regions and local authorities update their waste management plans, and move towards a pooling of waste treatment facilities among several communities in order to improve the quality of plant design and operation;
- take further measures to avoid local resistance against the sitting of new waste management facilities: requiring public involvement at an early stage of the planning process and appropriate public information from all levels of government and industry on their waste management performance;
- complete and implement the regional plans for the reclamation of contaminated sites.

***Water***

Overall the environmental performance of Italy concerning water is not fully satisfactory. While most bathing waters comply with standards, the lower reaches of most rivers are highly polluted (organic and microbial pollution, nutrients, persistent chemicals, heavy metals), and groundwater contamination (nitrates, pesticides) is widespread. The withdrawal of freshwater resources is high and in places water shortages have to be faced. A significant share of the population is not constantly and adequately served by public water supply during summer. Much of the country's wastewater is still being discharged with little or no treatment, including cities like Milan, Florence and Palermo.

However, the legislative and institutional elements of a modern system of water management are in place. The identification of the river basin as the principal unit of management has been a positive step towards integrating various water management activities. However, actual implementation has not kept pace with the growing pressures on the country's water resources. Among the major obstacles are low water prices, the fragmentation of the provision of water services, administrative action that is mostly process- rather than result-oriented, and limited spending capability.

In line with existing legislation and the recent Law 36/1994, it is recommended that consideration be given to the following proposals:

- use water more efficiently by upgrading existing water reticulation systems and implementing demand management measures (including increases in the prices of water resources and water services) for households as well as agricultural and industrial users;
- carry out the consolidation of the water utilities;
- ensure that the action plan to meet the EC directive on urban wastewater establishes clear priorities and that the measures are adequately funded;
- undertake urgently an increased investment effort in both drinking water supply and wastewater treatment, on the basis of the new funding regime which enables charging the full capital and operating costs of providing water services;
- ensure the proper functioning of new and existing wastewater treatment plants and promote better compliance with discharge permit conditions;
- make all river basin authorities fully operational as soon as possible, and give priority to the formulation and implementation of river basin plans as the main instrument for integrated water management (including the setting of ambient water quality standards to guide permitting authorities, and giving due weight to ecosystem management).

## 2. Integrating Environmental and Economic Decision Making

### *Environmental and economic policies*

The integration of environmental concerns into economic and sectoral decision making is a key to sustainable development, and improves cost-effectiveness in achieving environmental objectives. At the same time, economic forces and production and consumption patterns in major economic sectors (e.g. energy, transport, manufacturing, tourism, agriculture) exercise a strong influence on environmental conditions and trends. This influence can either enhance or detract from the benefits of environmental policies and technical progress. Such integration, in Italy as in other OECD countries, should be given full attention.

It is recommended that consideration be given to the following proposals:

- establish or re-establish appropriate mechanisms of inter-ministerial consultation and decision making concerning environmental and economic policies, and sustainable development at both Ministerial and administrative levels; establish more systematic consultations with representatives of industry and NGOs in decision-making on environmental and economic policies;
- assess critically the results of the first Three-year Environmental Management Programme and monitor the implementation of the second one; launch the preparation of the next one, with appropriate contributions from the various ministries involved in strategic planning related to environmental matters, consultation of the various tiers of government, and coverage of both domestic and international environmental issues;
- implement the national plan adopted in response to Agenda 21, with full inter-ministerial co-operation; its principles and measures should be integrated in yearly financial laws and the Three-year Environmental Management Programmes and their updates;
- extend the use of economic instruments, in relation to regulatory and other instruments such as voluntary agreements, at national and local levels; fully consider the potential for and the effects of eco-taxes in the case of a general or partial tax reform;
- ensure that an environmental assessment is integrated in government plans and programmes that have potential environmental significance;
- extend environmental impact assessment procedures to projects included in Annex 2 of the European Community directive, and integrate into EIA procedures all existing environmental permitting requirements to establish a system requiring a single environmental permit;
- strengthen the role of the Ministry of the Environment in the dissemination and sharing of positive management experiences at local and regional level (e.g. waste management, nature protection);
- continue to develop a complete and reliable system of information on the state of the environment and on related economic issues (expenditures, employment, sustainable development, consumption and productions patterns);
- develop public participation and public access to environmental information and data; in particular, public enquiries should be extended to all projects submitted to environmental impact assessment;
- use land use planning and land use regulation more effectively to serve pollution abatement, nature conservation and risk prevention.

### *The case of Venice*

In respect of the problems of the city and the lagoon of Venice, a good level of integrated planning and decision-making is now being achieved, and a new public agency has been established for bringing together in a single body the co-ordination of technical and planning issues. Progress is being made with the implementation of the tangible issues on the agenda (i.e. the high-tide barriers, the restoration of the sand banks in the lagoon), but progress is needed to address the more intractable issues, such as tourism and the protection of the city's cultural heritage, which is of great international importance.

It is therefore recommended that consideration be given to the following proposals:

- introduce a greater degree of economic, social and environmental assessment, and invite a greater degree of public participation, in all decision making processes affecting the future of Venice;
- consider means of limiting tourism peak loads (including access fees) where these endanger the cultural heritage of the historic city;

— promote joint public-private funding and partnerships for the restoration and maintenance of the city's cultural heritage;
— limit the shipment of hazardous materials through the lagoon;
— plan for the financing and construction of a sewerage system for historic Venice, strengthen efforts to reduce discharges from industrial and agricultural activities, and relocate, if necessary, activities that are not compatible with the conservation of the city and the lagoon.

***Sectoral integration: energy***

On the whole, Italy has succeeded well, over the 1980s and early 1990s, in integrating environmental and energy policies. Italy has achieved very low energy intensity (the lowest of OECD countries in 1991, expressed in energy use per unit of GDP in purchasing power parities). This reflects principally the lasting and effective implementation of energy policies that emphasise the development and use of energy-efficient technology, and the use of a mix of instruments including high energy taxes and prices. Within existing constraints, the country has, de facto, simultaneously pursued the three objectives of minimisation of its dependence on energy imports, production of fiscal revenues, and limiting air pollution.

This integration builds on interministerial co-operation at central level, a National Energy Plan followed by implementation, further regional energy plans, initiatives taken and activities carried out beyond government (e.g. by ENEL). Initially driven by high energy prices during the 1970s and early 1980s, the industrial sector has played an important role in the reduction of energy intensity, both directly by developing and introducing new, efficient technologies, and indirectly by producing energy-saving products. The public has also played an integrative role through its involvement in the development of policies (e.g. referendum leading to the moratorium on nuclear power generation) and projects (public enquiries and environmental impact assessment procedures). The energy production sector has contributed to environmental progress by reducing $SO_2$ and $NO_x$ emission in electricity production (by increasing the use of natural gas and low sulphur fuel oil, beginning to install desulphurisation and denitrification equipment, and also developing electricity imports); by producing cleaner and higher quality oil products in refineries; and by the expansion of district heating.

If the international target has been achieved for $SO_2$ emissions (Helsinki protocol), achieving targets for $NO_x$ emissions (Sofia protocol and Sofia declaration) and VOC emissions (Geneva protocol) will require renewed efforts from the energy sector. $CO_2$ emissions, because they are low in relation to those of most other OECD countries, will be difficult to stabilise, as shown by the national plan analysis.

It is recommended that consideration be given to the following proposals:

— achieving further reductions in $SO_2$ and $NO_x$ emissions from major installations, e.g. by speeding up the installation of desulphurisation and denitrification equipment;
— formulating and carrying out an implementation programme for the control and stabilisation of $CO_2$ emissions to achieve the target set in the national plan;
— preparing a long term strategy to deal with $NO_x$ emissions;
— further pursuing energy efficient production and consumption patterns;
— further implementing effectively its pollution abatement policy, monitoring its results and integrating environmental concerns in the planned restructuring of the energy sector.

***Sectoral integration: transport***

Overall, Italy has made progress, over the 1980s and early 1990s, in integrating environmental and transport policies. However, the environmental results of the actions taken are not as significant as they could have been due to the growth of the transport sector, and of its road component in particular. Many environmentally effective actions have been taken at local level concerning urban traffic management: they range from traffic restriction in central areas through entry permits (e.g. Bologna) and traffic restrictions affecting cars not meeting the most recent exhaust emission standards (e.g. Bologna, Milan, Naples), to traffic-free areas (e.g. Florence), or the use of computer assisted traffic control systems (e.g. Genoa). Other actions have been taken at national level, since the creation of the Ministry of the Environment to better integrate environment and transport policies: exhaust emission regulation in line with EC Directives, fuel quality improvements, use of alternative fuels, urban air quality plans (required from 15 major metropolitan areas), effective EIA procedures for large infrastructure projects. Within overall transport policy, a number of positive steps towards better integration of environmental concerns in transport policies have been taken:

attempts to promote coastal shipping and combined rail-road transport; creation of an Intergovernmental Committee for the Economic Planning of Transport, although for a short period; a clear recognition in the current national transport plan of the importance of environmental concerns, of existing shortcomings and necessary actions. Further, Italy's transport sector presents several key necessary conditions for an effective integration of environmental concerns in transport policies: relatively limited fiscal distortions which would favour environmentally less friendly modes; taxes and prices concerning diesel fuels, leaded and unleaded gasoline, among the highest of OECD countries; financial assistance and promotional efforts for public transport in urban areas.

However, the results of these many actions have been undermined by the growth of the transport sector. In Italy, road traffic (both freight and passenger) and car ownership have grown at particularly high rates. $NO_x$, VOCs, and $CO_2$ emissions as well as noise from transport have yet to be brought under control, as in many other countries. Although some benefit should be derived from the progressive replacement of vehicles by relatively less polluting ones and the implementation of the more environmentally sensitive national transport plan, a more effective implementation of the measures taken and a strengthening of the integration of environmental concerns in transport policies are required, to contain or reduce the pressures on the environment from this growing sector. Urban traffic congestion remains widespread and public transport is often not as cost-effective as it could be.

It is recommended that consideration be given to the following proposals:

- re-establish an intergovernmental committee to ensure integrated economic and environmental planning of transport;
- draw lessons from those policies and actions which have already showed positive results, especially at city level, and encourage the sharing of these experiences;
- strengthen the enforcement of regulations concerning emission standards and vehicle maintenance;
- promote the implementation of a mix of concerted measures (measures concerning transport infrastructures, land use policies and planning, vehicles, traffic management, taxes and rates, public transport services, air quality plans, etc.) at national, regional and local levels;
- balance the modal split in transport supply through actively promoting and making competitive alternatives to road transport including combined freight transport and local public transport services; in particular, develop a long term strategy and medium term action plan to reduce significantly the share of road transport in long distance freight movements;
- strengthen international co-operation concerning cross-border transport.

## 3. International Co-operation

Italy very actively supports international co-operation concerning the environment. It has ratified most agreements and is implementing nearly all European Community directives. Joint activities are carried out with its neighbours in order to protect frontier regions and common lakes. Marine reserves were created along its coasts and, at international level, an international sanctuary for marine mammals was agreed upon. Much attention is paid to protecting its coastline against pollution from shipping. Strong and effective measures have been taken to prevent illegal export of hazardous waste. Italy took measures to reduce production of CFCs and created a deposit-refund system for domestic equipment containing CFCs. It ratified the Climate Change Framework Convention and has adopted a national plan to stabilise its $CO_2$ emissions. Italy is supporting international initiatives to protect nature, it created a sizeable network of protected areas and ratified the Biodiversity Convention. Italy has adopted a national environmental plan, in response to Agenda 21.

While the overall record is positive, there is still room for improvement. Implementation of international agreements and of European Community directives is not always satisfactory due to a lack of resources at the national, regional and local levels. A number of conventions will have to be ratified in the near future to better protect the Alpine and marine environments. As several other countries, Italy could face difficulties in meeting its international commitments concerning $NO_x$, VOCs and $CO_2$ in the future, because of traffic growth. As a member of the G-7, Italy should improve its performance in the field of the environment through the provision of appropriate resources. This includes, in particular, increasing the role of international environmental affairs in the relevant ministries and providing administrative support to meet precise commitments (e.g. transfer of information, implementing national plans and strategies). From a financial point of view, an increase in the aid to GDP ratio would be in line with targets adopted within UN or announced at Rio.

Based on the above assessment, it is recommended that consideration be given to the following proposals:

— ratifying and implementing a number of recent international agreements (Annexes III.A and III.B);
— improving co-ordination on the protection of the marine environment;
— improving interministerial consultation on international environmental issues;
— ensuring a better protection of the coastline by reinforcing the means available to prevent marine disasters and to cope with their consequences;
— adapting the domestic legal regime for hazardous waste to the new Community regulation and the Basel convention;
— giving a higher priority to the protection of natural areas of international significance;
— strengthening co-operation with southern Mediterranean countries and with developing countries by increasing environmental aid in regional and in multilateral institutions.

# JAPAN

## CONCLUSIONS AND RECOMMENDATIONS*

The Japanese economy went through major structural changes in the 1970s and 1980s, with a shift from heavy polluting industry, often along the coasts, to processing and assembling industries in inland areas and to services in urban areas. These changes were accompanied by major investments to increase energy efficiency, and by a significant rise in land prices. Imports of energy, food and other raw materials are important for the Japanese economy. Population and economic activities are extremely concentrated in dense metropolitan areas and coastal plains; two-thirds of the Japanese archipelago is mountainous and covered with forest. After rapid economic expansion during the 1970s (4.5 per cent increase in GDP per year) and 1980s (5.1 per cent), Japan is now in a phase of sluggish growth.

During post-war reconstruction and the 1960s, efforts to stimulate economic growth through public and private investment, but without proper care for the environment, led not only to heavy pollution and irreversible damage to the natural environment but also to serious health problems (Minamata disease, Itai-Itai disease, asthma). Public concern prompted the adoption in 1967 of the Basic Law for Environmental Pollution Control, and the creation in 1971 of the Environment Agency. Both provided the main basis and impetus in the 1970s for major achievements concerning pollution control policies and efforts in nature conservation. Results, acknowledged in the 1977 OECD review of environmental policies in Japan, were consolidated in the 1980s. The early 1990s have witnessed increased attention in Japan to domestic and global environmental issues such as municipal and industrial waste management, $NO_x$ and conventional water pollution, climate change and environmental aid. The Diet approved a new Basic Law on the Environment in 1993.

Today, the Environment Agency is principally responsible for pollution control and nature conservation, while other agencies and ministries cover a large part of waste issues (Ministry of Health and Welfare), environment-related technological issues and management of industrial environmental issues (Ministry of International Trade and Industry), the management of forests, the conservation of fisheries resources and the approval of agricultural chemicals (Ministry of Agriculture, Forestry and Fisheries), road vehicle pollution control (Ministry of Transport) and urban planning, public works such as sewerage, city parks and roads, and the preservation of rivers (Ministry of Construction).

This OECD report sets out the baseline for assessing future environmental progress and examines the environmental performance of Japan in four major areas:

i) reducing the pollution burden;
ii) enhancing the quality of life: urban amenities and nature conservation;
iii) integrating environmental and economic decision making;
iv) addressing international issues.

In each of these areas, the extent to which government policy objectives are being met has been assessed, including both domestic objectives and international commitments, and environmental effectiveness and economic efficiency criteria are taken into consideration. A number of proposals are put forward that could contribute to further environmental progress in Japan.

### 1. Reducing the Pollution Burden

#### *Achievements*

Over the past two decades Japan has had the largest economic growth among G7 countries, while substantially reducing emissions of a number of pollutants in the atmosphere and toxic substances in water, and further containing the growth of other pollutants and of waste production. For instance, while economic growth increased over the period by 122 per cent, $SO_x$ emissions decreased by 82 per cent and $NO_x$ emissions by 21 per cent, the best performance among OECD countries. This decoupling was achieved through economic structural changes, increased energy efficiency and effective environmental policies. These successes have proved that environmental policies and economic development can be mutually supportive; the competitiveness of Japanese industry has not suffered overall and has even benefited in some sectors (e.g. the automobile industry and the pollution control equipment sector).

* Conclusions and Recommendations approved by the Group on Environmental Performance at its November 1993 meeting.

Concerning air, Japan has achieved remarkable results in the past two decades, reducing $SO_2$, $NO_x$ and CO emissions through co-operation by all levels of government and industry. It has also contained the increase in $CO_2$ emissions. This progress, triggered initially by concern in the late 1960s about health risks in industrial and urban areas, is largely due to the combined effect of major structural changes in the economy, energy efficiency measures, changes in the fuel mix and advanced emission control technology. An ambitious regulatory policy to attain national ambient air quality standards was implemented with great effectiveness in co-operation with local authorities and industry. Investment concerning stationary sources was made principally in the 1970s and chiefly by the private sector. Replacement of vehicle fleets was done more gradually, but earlier than in other OECD countries.

Japan also has set very clear objectives concerning waste management, and its performance in achieving these objectives is good. All measures are designed to allow economic development while minimising quantities of waste disposed into or onto the land. Incineration and stepped up recycling/reuse were the key methods to reduce landfill pressure. So far, Japan has used technology to win the race between dwindling land-based capacity and waste generation. Related costs have been high, and are increasing: waste management costs in Japan amount to about Y 5 000 billion per year or Y 40 000 per inhabitant.

Results concerning water are less striking overall. They are focused on hazardous substances such as heavy metals and toxic chemicals identified as key targets in the late 1960s; environmental quality standards (EQS) for such hazardous substances related to human health have been met. Action has also been taken concerning organic substances and nutrients: environmental quality and effluent standards have been set nationwide, and local governments have further strengthened source-orientated measures in many designated areas. The sewerage system is being developed and night soil is no longer dumped untreated at sea. New EQS and related new standards for drinking water as well as effluent standards went into force in 1993. Frameworks for co-operation to cope with water pollution on lake and river-basin bases have been widely established. Within these frameworks, the central, prefectural and municipal governments share responsibility. Measures have also been taken to prevent salt intrusion and ground subsidence due to groundwater overextraction.

Japan's progress has been driven mainly by the adoption of very strict standards and the use of best available technologies to solve the most pressing environmental problems. For instance, the use of flue gas desulphurisation and denitrification units has proved environmentally effective in the achievement of air quality standards and limitation of air emissions. The emphasis put by Japan on a technology-forcing regulatory approach led the Government to invest heavily in environment-related R&D, and to provide some subsidy for pollution control investment.

Nationwide standards have often been supplemented by stricter local ordinances and guidelines from prefectural or municipal governments, as well as agreements with industry (40 000 currently in effect) that help adapt efforts to local conditions. Japan has created a system of pollution control managers and controllers for larger companies; 400 000 persons have been trained in environmental protection over the past two decades. Industry has in many cases, of its own initiative, created environmental management systems. As a result of serious pollution cases, the legal system was modified to introduce strict liability and to set up a compensation fund to indemnify sufferers of air pollution even if the cause could not be established.

In 1990, pollution abatement and control expenditure by the public and private sectors was about 1.6 per cent of GDP, and Japan ranked among the OECD countries that invest the most in pollution abatement and control, with a figure of 3.4 per cent of gross fixed capital formation.

***Enhancing environmental performance***

Current challenges facing Japan with respect to air pollution, waste management and water pollution relate mainly to harmonising the development of economic production and consumption patterns with a healthy environment for future generations. They will require Japan not only to build on experience so as to continue its efforts, but also to develop additional, innovative approaches.

*Air management*

Remaining air pollution issues in Japan concern $NO_2$, photochemical oxidants, fine particulates and hazardous substances. Beyond the transport-related proposals identified below, it is recommended that consideration be given to the following:

- As has been done in the case of $NO_2$, a strategy should be developed to move towards the attainment of EQS for fine particulate matter and photochemical oxidants.
- Further consideration should be given to monitoring of hazardous air pollutants, especially carcinogens such as benzene, and persistent, bioaccumulative substances such as dioxins and heavy metals.
- Taking into account the potential for transfer of air pollutants to other media such as water and soil, more emphasis should be given to preventive measures.

*Waste management*

With rising standards of living, people have more leisure time and disposable income; this usually means more consumption in general, and therefore increased municipal solid waste generation. To the extent that consumer goods are produced by Japanese industry, industrial waste generation will also increase. At the same time, the yen is appreciating; therefore, industry will be more inclined to import virgin feedstock than to invest in recycling/recovery operations (increased waste collection by citizens has already glutted secondary materials markets).

It is thus recommended that consideration be given to the following proposals:

- Wider use of economic instruments (e.g. user charges, deposit-refund) could help ensure that each consumer and firm is well aware that generating waste means high and increasing costs of collection, treatment and disposal.
- Systematic monitoring of closed and operating landfill sites for leaks and soil pollution should be carried out periodically; the analysis of inspectorate reports concerning on-site disposal should be centralised to help ensure that all enterprises dispose of industrial waste properly.
- Recently adopted regulations should be fully implemented to ensure that hospital waste, especially infectious waste, is properly managed.
- The reduction of waste generation should receive greater attention, including the adoption of a long term strategy of technology innovation and public education. This could include information to consumers and producers, and education of children.

*Water management*

Improving water quality remains a major challenge for Japan. Despite some progress as a result of continuous investment in sewerage systems, compliance with quality standards for the living environment in rivers, lakes, reservoirs and coastal waters is insufficient. This is because improvement of sewerage systems has not kept up with rapid increases in population, urbanisation and pollution loading. In that respect, the equipment in Japan remains much less extensive than in other major industrialised countries.

Concerning investment programmes for collection and treatment of waste water, a growth rate of 2 per cent per year of population served by sewerage (the present target rate of expansion) will not be sufficient to solve the problems of malodorous drinking water and eutrophication before 2000. To speed up such investment programmes:

- part of Japan's economic stimulus packages should be allocated to water pollution control infrastructure;
- new programmes concerning advanced waste water treatment plants (e.g. treating nutrients) should be launched and financed;
- to support such programmes, targets should be set for the pollution loads discharged by individual sources or by waste water treatment plants, and also for the total loading of water bodies.

For broader water pollution management programmes, it is recommended that greater attention be given to:

- combating pollution from diffuse sources (pesticide use, run-off from roads, atmospheric deposition, etc.);
- reducing nitrogenous and phosphorous loadings;
- improving the monitoring of groundwater (e.g. for pesticides) and soil contamination;
- enhancing financial means for water pollution control, including increased use of charges for waste water collection and treatment.

These developments could take place as part of a water management policy expanding i) from the present human-orientated approach to include more ecosystem management concerns; ii) from a remedial to a more preventive approach; and iii) towards a multimedia approach in setting EQS, given the relationships among water, sediments and air. In particular, close co-ordination concerning pollution from diffuse sources is important.

## 2. Quality of Life

Since the mid-1970s, improvement in living standards, increased leisure time and abatement of acute pollution problems have helped bring about a shift in public demand towards a lifestyle stressing improved quality of life, notably access to nature and pleasant urban surroundings.

### *Nature conservation*

Significant improvements are beginning to appear in the field of wildlife conservation, especially in the protection of endangered species: the 1991 "Red Data Book of Japan" and the 1992 Law Concerning the Conservation of Endangered Species of Wild Fauna and Flora provide a framework to establish effective recovery programmes. Japan gave legal protection to landscapes of scenic importance and sites of cultural significance in the 1930s; an extensive network of national parks, quasi-national parks and prefectural natural parks was created, now covering 14.1 per cent of the territory. On an international level, Japan is playing a full role in the implementation of international conventions relating to conservation of biodiversity and protection of the natural heritage. Japan's adoption of the goal of sustainable development is also a step towards improving nature protection.

Despite these positive signs, there is a gap between Japan's stated policy objectives and the general trends over the past two decades: a decrease in natural forest, alteration of lakes, watercourses and coastlines and endangerment of many animals and plants. It is debatable whether the traditional notion of "organic unity" between the Japanese people and nature applies in a highly urbanised society that is losing its historic ties with rural society. Economic growth and urbanisation have generated and continue to place heavy pressures on the natural environment.

Therefore, it is recommended that consideration be given to the drawing up of a national nature conservation strategy, through the co-operative efforts of all relevant ministries and agencies, and in consultation with local authorities and citizen groups. The collection of scientific information, the monitoring of ecosystem conditions through the "Green Census" surveys and the publication of these data already provide a firm basis for such a national strategy. As part of this strategy, it would be desirable to establish conservation goals and quantitative targets, particularly directed at the following needs:

- improving protection and management of national parks;
- reserving representative samples of various ecosystems, and increasing areas that are strictly conserved for their natural characteristics;
- increasing financial and human resources for park management;
- improving the management of national forests to better maintain this renewable resource;
- reviewing management approaches to nature conservation in forests.

### *Urban amenities*

As recommended in the 1977 OECD review of environmental policies in Japan, expanding urban amenities has become an important part of environmental and other policies, including those relating to urban planning, construction and preservation of cultural properties. In each of these policy areas, laws concerning a pleasant environment have been introduced. Measures include zoning and regulation, public projects and subsidy programmes. Central and local governments have set goals and targets for such public projects as city parks, sidewalks and waterside areas. Extensive public investments were and are being made, such as the Y 5 000 billion to increase city parks in a development plan for 1991-1995 and the road development programme. As a result of such efforts, major achievements can be identified concerning city parks, waterside areas, pedestrian areas, the urban landscape and preservation of Japan's architectural heritage. They are also the results of integration of central and local government efforts.

However, progress has been retarded by the growth and the concentration of activities, putting heavy pressure on urban amenities. Road traffic noise has not been reduced, though measures on noise sources have been strengthened. Many complaints are registered about vibration and offensive odours. The amount of peri-urban greenery has been shrinking in the Tokyo metropolitan area. Strong private land use rights and pressures from development due to economic growth have hindered improvement of urban amenities. To deal with this situation attempts have been made to improve zoning systems and to implement regulatory measures effectively.

It is therefore recommended that consideration be given to the following proposals:

- Integrated and co-ordinated implementation of various sectoral policies relating to amenities should be developed. Concerning noise abatement and urban greenery, progress could be achieved on the basis of comprehensive urban environmental plans of municipalities and also within a comprehensive national environmental plan.
- A larger number of local governments should take the initiative to design and implement a comprehensive amenity policy, taking full account of distinctive local characteristics, and with active participation by community residents and local enterprises.
- Economic instruments (e.g. charges, user fees and local taxes) should be considered in order to improve urban amenities and contribute to their funding.
- Existing zoning and other regulatory measures should be applied effectively to help preserve the environment from undesirable development.
- Remaining natural parts of urban and peri-urban areas, such as forests, wetlands and water bodies, should be protected more effectively.
- Amenity concerns should be integrated in land use planning, economic plans and comprehensive development plans. Redistribution of the excessive concentration of activities in the Tokyo metropolitan area is a particularly important and urgent issue.

***Consumption and time-use patterns***

Consumption patterns in Japan are increasingly dependent on packaged goods, durable goods and the automobile; consequently, more waste and pollution are generated and more natural resources, such as oil, water and wood, tend to be consumed. The growth in private transport is leading to increased congestion, among other things, and at the same time is dispersing leisure activities and related environmental problems. Time-use patterns are marked by a rapid increase in leisure and tourism activities; this in turn tends to increase air pollution and the number of second homes, golf courses and ski resorts in environmentally sensitive areas, for instance around lakes, along seashores and in mountains.

The likely continuation of these trends through the 1990s and beyond raises a major issue for Japan: how to prevent the general rise in income levels, and shifts in consumption and leisure time activities, from being transformed into increasingly resource-intensive and environmentally harmful consumption patterns. What policies and incentives could be introduced to encourage people to keep or adopt environmentally friendly consumption patterns and ways of life?

## 3. Integrating Environmental and Economic Decision Making

The integration of environmental concerns into economic and sectoral decision making is a key to improving environmental performance and moving towards sustainable development. Policy integration is also essential to achieve cost-effectiveness in responses to environmental challenges. This is because economic forces and changes in major economic sectors (e.g. transport, energy, manufacturing, construction, agriculture, forestry) strongly influence environmental conditions and trends, and thus can either enhance or counteract the benefits of environmental policies and technical progress. Such integration, in Japan as in other OECD countries, should receive increased attention.

***Integrating economic and environmental policies***

Although, as mentioned earlier, Japan achieved some "decoupling" between economic growth and emissions of some traditional pollutants, the integration of environmental concerns into economic and sectoral policies could still be very much improved. Agencies and ministries seem to act independently in a spirit of competition rather than co-operating fully. As a consequence the following measures are recommended:

- A comprehensive national environmental plan should be established to better integrate the contribution of various agencies involved in strategic planning related to environmental matters. Such a plan should not be based on a sectoral or one-medium approach, but take a co-ordinated and integrated approach and be multimedia-orientated. It should contain clear goals and, where possible, quantified targets covering pollution abatement, environmental amenities, nature conservation and natural resource use. It should address both domestic and international environmental issues.
- Environmental impact assessment (EIA) procedures should be used more systematically and thoroughly, and be mandatory for all major projects.

- The public should be given access to environmental information and data, including information on voluntary agreements between any levels of government and industry, and information on emission registers; exceptions to this general principle should be limited to defined circumstances. Various forms of environmental reporting should be developed by private enterprises. Public awareness of and participation in decision making concerning the environment should be enhanced.
- Land use planning and regulation should be used more effectively to serve pollution abatement, nature conservation and urban amenity objectives. For instance, zoning and regulatory measures included in detailed land use plans should be more rigorously implemented.

From an economic point of view, it would be desirable to:

- review the cost-effectiveness of current approaches to achieving standards, and employ cost-benefit analysis, particularly for public projects;
- make greater use of economic instruments, such as fees, taxes, charges and deposit-refund systems, after appropriate analysis and consultation, and whenever they can help achieve environmental and economic effectiveness;
- review any financial assistance schemes such as subsidies, tax incentives, preferential loan arrangements and similar measures to stimulate pollution abatement and control, with a view to assessing their environmental and economic effectiveness as well as their compatibility with the polluter-pays principle;
- examine pricing policies or tariff structures for such key natural resources as energy and water, to ensure that they take environmental considerations into full account; to this end, a review of financial assistance schemes that might lead to overuse of resources would be timely and useful.

***Integrating environmental concerns in transport policy***

In terms of emissions, Japanese cars are relatively clean, due to strict ambient air quality standards, ambitious and early air emission regulations for cars, and efficient enforcement. All gasoline is lead-free. Japan will implement comprehensive measures including the use of cleaner trucks and buses, measures on freight and passenger flows, and traffic improvements. Stringent speed limits also play an important part in reducing emissions and fuel consumption in road transport.

Structural features of the transport sector, compared with other OECD countries, are also favourable from a pollution control perspective. The modal breakdown is characterised by highly attractive passenger railway systems between major cities and within metropolitan areas, and a high share of coastal freight shipping (45 per cent). Within cities, economic incentives favour public transport: companies cover an important part of public transport commuting expenses for their employees, whereas employees receive no tax deduction and usually no company support for commuting by car.

However, the growth of traffic, particularly of road traffic, tends to offset some of the environmental benefits of past policies, and noise and $NO_x$ pollution remain major concerns, especially in metropolitan areas. Further, while designing new transport facilities, it is necessary to give full consideration to their environmental impact, including effects on land use and nature conservation. It is recommended that the following proposals be considered:

- A package of incentives and disincentives should be developed to slow or reverse the shift towards more polluting modes of passenger and freight transport. The quality of public transport, while high, should be upgraded. Road construction (e.g. bypasses, inter-sections) should further help reduce local congestion.
- Measures to control $NO_x$ and particulate matter pollution from diesel vehicles should be strengthened. The target values for noise emissions from trucks should further be reviewed and possibly adjusted to conform to the levels that can be achieved using the best available technology. Japan should also attempt to take the lead in developing emission standards for ships, and in promoting other emission reduction measures, especially for $CO_2$, $NO_x$ and $SO_2$. Measures to reduce evaporative emissions from gasoline handling should also be considered.
- A comprehensive transport development plan should be drawn up. It should go beyond existing road infrastructure planning to encompass all transport modes, cover investment as well as management issues, and better integrate environmental concerns. Large transport infrastructure projects should be subject to systematic, early and public environmental impact assessments.

## 4. International Issues

### *Japan's contribution to combating climate change*

One of the most remarkable features of Japan's performance in the past 20 years has been the decoupling of energy use, $CO_2$ emissions and economic growth. This has been due largely to changes in the structure of the economy, diversification of the fuel mix and major energy efficiency improvements. Since the late 1980s, however, economic growth, appreciation of the yen and low oil prices have shifted attention away from energy conservation, and energy efficiency programmes have slowed.

Japan's approach on global environmental issues places significant emphasis on restraining energy demand growth and increasing energy efficiency, and climate change mitigation policies and targets adopted since 1990 have clearly provided a new impetus. Measures already taken include the introduction of stricter energy efficiency standards, increases in financial incentives for energy conservation investments and a major effort in greenhouse gas-related technology R&D. In addition, a broad interministerial and interagency consensus was reached in the Action Programme to Arrest Global Warming. The emphasis has been on co-ordinated action in recent institutional changes, and the Ministry of International Trade and Industry has developed a follow-up sectoral climate change strategy for industry, energy and R&D.

Japan's climate change strategy does not underestimate the difficulty involved in reaching greenhouse gas limitation targets set for the turn of the century; nevertheless, addressing the climate change issue will also involve longer term changes in technology and shifts in production and consumption patterns.

It is recommended that consideration be given to the following:

- The administration should further integrate its actions on climate change issues and continue to follow up on the Action Programme to Arrest Global Warming, notably in transport, buildings and agriculture.
- Care should be taken that actions to address climate change are developed both within the time frame and targets of the Action Programme, and beyond, to cover longer term technological and lifestyle changes.
- Incentives should be provided for the use of more fuel-efficient, lower $CO_2$ emitting passenger cars, commercial vehicles, public transportation equipment and ships.
- In the industrial sector, efforts should continue to sustain high levels of energy efficiency and to encourage further improvement, notably through technological progress.
- Energy pricing and taxation systems should be examined to ensure that they are not undermining Japan's efforts to address the climate change issue.
- The mix of policy instruments being used or considered should be reviewed, including economic instruments, regulation, voluntary agreements and education. Economic instruments such as taxes and charges are used less in Japan than in a number of OECD countries and, after appropriate analysis and consultation, may have a stronger role to play in helping Japan achieve its goals at least cost.

### *International co-operation*

Japan is fully committed to achieving the goal of sustainable development and is fully aware of the international dimension of many environmental issues. It was one of the first OECD Member countries to create a government structure to deal with global environmental issues, and it has increased its financial investments and thereby generated strong public awareness and support for global issues. New policy measures are helping to ensure that international agreements are rapidly ratified and implemented. Over the past few years, significant progress has been made in implementing conventions signed many years earlier. Japan also hosts international organisations, such as the International Tropical Timber Organisation, and has convened numerous international meetings on environmental issues.

In the area of official development assistance (ODA), Japan is the world's largest donor country (excluding forgiveness of non-ODA debt such as export credit and military debts). With the absolute level of aid as well as the ratio of environmental aid to total aid both growing, Japan is providing significant new and additional resources for environmental aid at the global level.

At the regional level, Japan is playing a growing role by increasing exchanges of scientific information, providing training and know-how to neighbouring countries, improving transfers of technology and increasing its bilateral funding. Official aid and direct private investment are increasingly being examined with full consideration of their environmental effects.

Concerning marine pollution, strong measures have been taken to reduce oil spills and avoid accidents near Japan and in the Malacca Strait. In the area of exports of hazardous products and waste, exporting firms are acting more responsibly, following "prior informed consent" procedures with growing frequency. No hazardous waste is being exported for final disposal to developing countries.

To enable Japan to play an even stronger role in international environmental affairs, it is recommended that consideration be given to the following proposals:

- Continue to strengthen international co-operation at subregional and regional levels. This may include management of fisheries, prevention of land-based marine pollution, prevention of oil spills and compensation for oil spill damage, monitoring for radioactive pollution of the seas, monitoring of acid precipitation and addressing the issues of imports of tropical timber and exports of hazardous products.
- Continue to implement at international level the principles adopted in Rio, particularly concerning preparation of EIAs for overseas projects, provision of information to communities overseas concerning environmental risks from Japanese activities abroad, promotion of the best available technology in developing countries and support for sustainably managed forests in tropical countries.
- Continue to provide financial contributions for environmental assistance to developing countries and/or multilateral funds, ensuring that they are commensurate with the country's international economic role and GDP.

Overall, Japan is playing a strong and expanding role in solving international environmental problems, and this deserves to be recognised. In recent years it has signed and implemented international agreements, and significantly stepped up its contributions to environment-related development assistance and to multilateral institutions dealing with global environmental issues. Nonetheless, the international environmental challenges are such that Japanese initiatives will be essential in the years immediately ahead. The potential damage from transboundary pollution and global pollution from outside its borders, the impact of its activities on the natural resources and ecosystems of other countries, and its economic capacity and technological know-how are compelling reasons for Japan to be deeply engaged in international environmental affairs.

# KOREA

## CONCLUSIONS AND RECOMMENDATIONS*

Environmental conditions in the Republic of Korea should be understood in the context of the country's extremely high population density and the rapid pace of its economic development over the past 25 years: both are the highest in the OECD. In the 1970s and early 1980s rapid industrialisation and urbanisation gave rise to severe environmental degradation. In the 1990s, environmental protection has been given greater emphasis and efforts are being made to render development sustainable.

Korea is now an OECD Member country. Its economy already is the ninth largest in the OECD and is converging towards OECD averages in terms of many indicators. In this period of transition, production and consumption growth are likely to continue generating strong pressures on the environment that are not offset by favourable changes in production and consumption patterns. But Korea's economic growth is also generating the means to achieve environmental convergence very quickly if it implements its policies and programmes with resolve.

The challenge of further improving environmental performance in Korea lies in: i) meeting standards and commitments equivalent to those of other OECD countries; ii) strengthening the integration of environmental concerns in sectoral and economic decision making; and iii) assuming international environmental responsibilities commensurate with its level of economic development.

This OECD report sets out the baseline for assessing future environmental progress, and it examines the environmental performance of Korea: the extent to which government domestic objectives and international commitments are being met. A number of recommendations are put forward that could contribute to further environmental progress in Korea.

### 1. Implementing Environmental Policies

#### *Achievements and further progress*

Korea is acting vigorously to solve environmental problems neglected in the early decades of its remarkable economic development. Almost the entire body of environmental legislation now in use has been adopted or updated over the last six years. Implementation of environmental policies is proceeding progressively and pollution abatement and control expenditure has been steady at 1.5 per cent of GDP. The country is being equipped with environmental infrastructure; regulatory and economic instruments are in use; local government plays an increasing role in implementing policies; and environmental information and public participation are increasingly called upon. The 1995 Green Vision 21 document recognises the considerable efforts needed to rehabilitate Korea's environment, and provides an ambitious schedule for reinforced environmental protection in an expected context of high economic growth and pressures on the environment.

Korea's regulatory system is characterised by a combination of generally applicable rules and a "place-based" approach where necessitated by intense development pressures or a vulnerable environment; the main instruments are emission/discharge permits, ambient environmental standards and the designation of zones where special conditions apply. A formal enforcement programme is in place with inspections, fines and indictments. A number of the standards and limits have been tightened gradually over recent years; this process needs to continue, as for certain standards there still is some distance to go before they are equivalent to those in other OECD countries. The changes being made to the permitting system go in the right direction, and the introduction of integrated pollution control for water and air permits would be a logical next step.

Korea has been creative in adding an array of economic instruments to its set of regulatory instruments; these include emission charges, environmental quality improvement charges, traffic congestion charges, energy taxes, a deposit-refund system and a waste management charge. Revenue from such instruments accounted for about 13 per cent of the Ministry of Environment budget in 1994 and is on the increase. However, the rates at which economic instruments have been applied are still too low to significantly affect behaviour, as shown, for example, by the low rate of recycling resulting from waste deposit-refund programmes.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its April 1997 meeting.

Korea has a tradition of strong central government. Local government, however, spends 83 per cent of overall public environmental expenditure (including pollution abatement and control expenditure), or about 1 per cent of GDP, and recently greater environmental decision making power has been devolved to local level. This process is not yet functioning as well as it should; local governments need to build up expertise in implementing and enforcing environmental protection measures to tackle, for example, compliance problems involving smaller factories and enterprises.

Korean industry has benefited from the Government's export-oriented policies, including relatively lenient environmental constraints. The latter are now gradually being tightened, and the more progressive exporting industries are adopting environmental management systems and applying them to their subsidiaries worldwide. The experience of these large enterprises should be shared with small and medium-sized industries, often subcontractors to the large firms, which still lack the required awareness and know-how.

The Government recognises the contribution a well-informed citizenry can make to protecting the environment. A good beginning has been made concerning the provision of environmental information to stakeholders in environmental management, but much more could be done so that relevant information becomes available in a way that assists NGOs and citizen groups to play their proper democratic role and that allows consumers to make the right choices. A full scale pollutant release and transfer register should be established. Studies on the short- and long-term health and environmental effects of pollution should be carried out, and their results made generally available.

It is therefore recommended that consideration be given to the following proposals:

- implement environmental policies with determination and along the lines already defined;
- pursue current efforts to bring the environmental infrastructure to the desired level;
- continue gradually tightening environmental standards and discharge/emission limits;
- continue improving the effectiveness of economic instruments, including raising the rates at which they are applied;
- strengthen the capacity of local government to carry out its new environmental functions;
- strengthen the role of industry associations in raising environmental awareness, expertise and management standards among small and medium-sized firms;
- give the public access to environmental information to encourage well-informed debate on environmental issues, exceptions to this general principle being limited to defined circumstances; educate consumers regarding the health and environmental effects of current production and consumption practices.

***Water management***

Over the last 30 years, Korea has built an extensive system of dams, reservoirs and other hydraulic works that now supplies water for agriculture, industry and households and protects industrial and urban areas from devastating floods; implementation of the latest stage of this programme, the 1990 Long-Term Water Resource Management Master Plan, is on target. Over the last 20 years, construction of municipal sewerage networks and waste water treatment plants has progressed and the country is on the way to closing the gap with other OECD Member countries. A serious effort has been made over the last decade to bring industrial discharges under control, and enforcement of permit conditions has improved. In the 1990s, Korea has adopted an up-to-date body of water legislation providing some of the tools for integrated quantity and quality management of the resource. Several of the 1997 interim targets of Green Vision 21 are likely to be achieved, such as the population connection rates for piped water supply (86 per cent) and for sewage treatment (55 per cent).

However, strong pressures on Korean water resources from very dense settlement and fast growing economic production lead to many problems with ambient quality for rivers, lakes and coastal waters. The 1997 target of 42 per cent of rivers meeting class I or II standards is far from being achieved. Eutrophication of lakes and reservoirs poses problems for aquatic biota and for water supply intakes. While a good start has been made in guaranteeing minimum flows in rivers, more emphasis needs to be given to the needs of aquatic ecosystems. Operational standards at smaller sewage and waste water treatment plants are not always adequate to meet effluent limits. Lack of awareness and know-how prevents smaller industries from achieving a satisfactory standard of environmental performance. Enforcement needs to be strengthened further. The financial effort to upgrade sewerage and waste water treatment infrastructure needs to be stepped up if both the Green Vision objective of an 80 per cent connection rate in 2005 and more stringent planned effluent limits are to be satisfied. Proposals to further adjust the

water pricing and charging regime need to be implemented to encourage water conservation. The fragmentation of water management responsibilities and the vertical structure of the institutions involved make it difficult to establish a culture of joint problem solving that would integrate quantity, quality and ecological management of water bodies.

It is therefore recommended that consideration be given to the following proposals:

- establish a system of comprehensive river basin planning, taking account of water quantity and quality issues as well as land use and ecological aspects, and involving stakeholders at an early stage;
- further pursue measures to establish a correct water pricing regime and consider giving a greater role to the private sector in the provision of water services;
- ensure the protection of groundwater aquifers against contamination and examine how the use of good quality groundwater can be limited to purposes necessitating such quality;
- institute quality assurance systems at waste water treatment plants to ensure high operational effectiveness at plants of all sizes, and pursue efforts to find long-term solutions for the treatment of sewage sludge;
- ensure that small and medium-sized enterprises comply with effluent standards, through effective monitoring, enforcement and appropriate transfer of environmental awareness and know-how.

***Air management***

Korea has in the 1990s managed to slightly decrease emissions of $SO_2$ and total suspended particulates (TSP) and achieved substantial declines in CO and hydrocarbon emissions, while $NO_x$ emissions have risen, against a background of rapid economic growth. Not apparent from this list is that emissions from heating have been cut very substantially, while emissions of conventional pollutants from industry, transport and energy generation have risen or been stable. Relative progress has largely been achieved through energy policies (with a change in the fuel mix towards nuclear power and liquefied natural gas) and through environmental policies resulting in increased supply of low-sulphur, low-lead fuels and implementation of regulations. Ambient air quality in the major metropolitan areas has improved over the last decade as average annual concentrations of $SO_x$ and particulates have tended downward. Current national standards for the annual average values of most pollutants are generally met. Air quality standards and emission limits are gradually being tightened and brought into line with those of other OECD countries. The 1990 Air Quality Preservation Act provides the basis for an effective air management policy and a gradual strengthening of standards, including focused action on designated air preservation zones.

Nevertheless, Korea faces a difficult challenge in implementing its air management policies and in containing its air emissions with local, regional and global impact. Ambient air quality in the big cities frequently does not comply with national or WHO standards for the 24, 8 or 1 hour averages and generates public health concerns relating to ozone, $NO_x$ and $PM_{10}$. Only limited attention has been paid to controlling hazardous air pollutants. The level of $SO_x$ emissions per unit of GDP is among the highest in the OECD. Korea has yet to achieve major decoupling of $SO_x$, $NO_x$ and TSP pollution from economic growth. $CO_2$ emissions have closely followed GDP growth, and their level per unit of GDP is close to the OECD average. According to IEA sources, $CO_2$ emissions are projected to be 80 per cent higher in 2000 than in 1990. Energy prices do not always reflect full costs. While some use has been made of economic instruments, there is much room to enlarge their role, for example by pursuing the plan to transform Environmental Improvement Charges into true pollution fees fully consistent with the polluter pays principle. Continuing expansion of industrial production and the growth of traffic are powerful driving forces pushing up emissions; the question arises whether existing measures, along with those indicated in Green Vision 21, will be able to meet the challenge of improving air quality in Korean cities and contributing significantly to international efforts to master regional and global environmental effects of air pollution.

It is therefore recommended that consideration be given to the following proposals:

- pursue the measures already announced in Green Vision 21 and place more emphasis on control of hazardous air pollutants;
- set health-based air quality standards for the metropolitan areas in line with international practice, and follow up with concrete implementation plans and timetables;
- improve the air management capability of local government, and make municipalities and counties effective in enforcing emission permits and responsible for reporting air quality and emission data to the public and the Government;
- extend the use of economic instruments as a tool for improving air quality;
- implement measures to adjust energy prices in order to promote energy conservation;

- set further energy conservation objectives, including targets and deadlines for the major energy using sectors, in particular for energy-intensive industries;
- further pursue an energy supply policy integrating environmental concerns fully, and further reduce the sulphur content of heavy oil and diesel fuel;
- give full attention to preventing industrial accidents and being prepared to respond to such accidents if they do occur by implementing procedures recommended at international level.

***Waste management***

Korea has elaborated and implemented a very comprehensive waste management policy during the early 1990s and has adopted a comprehensive waste management plan with ambitious targets for disposal and recycling. It has set up a detailed institutional structure and has organised full devolution of waste management to local authorities. Generation of household waste is decreasing as a result of technological changes and the use of a new economic instrument (taxation of garbage collection bags). A smaller portion of waste is being sent to landfills and a larger share is being recycled. Economic incentives (deposit-refund systems and waste disposal charges) are in place to promote recycling of certain products. They have proved very successful for certain types of products. New large landfills are better controlled and cause less pollution than their predecessors. A growing number of incinerators are put into operation each year. Transboundary movements of waste are now carefully checked.

While waste management has generally kept pace with economic development, there are still serious difficulties to overcome and large investments to be made if waste is to be safely managed in Korea. Basic data concerning waste disposal and its effects on the environment are not yet fully available. Expenditure to rehabilitate polluted soil is as yet only in the planning stage. Most landfills do not meet technical standards in force and some need serious remediation work. Most landfills cannot accept much new waste because they are nearly full. Many incinerators are planned but few built, and difficulties exist with public opinion concerning emission of pollutants. In 1995, people living near disposal facilities acquired rights to compensation for the facilities' negative effects, but payment has yet to be made in many places. Generation of industrial waste is growing more rapidly than GDP. Treatment plants for hazardous waste are rare and need to be built. In many cases economic instruments do not meet their aim, partly because charges are too low. Subsidies are being provided to overcome the lack of producer responsibility and difficulties in creating a stable recycling industry. While the polluter pays principle is considered fully applicable in the area of waste management, much remains to be done to reduce provision of financial aid by the central Government.

It is therefore recommended that consideration be given to the following proposals:

- better monitor generation of domestic and industrial waste so as to observe results of waste management policies and detect emerging problems;
- increase the level of investment in waste management, in particular to build incinerators;
- increase rates of the deposit-refund system and the waste treatment charge to reduce waste generation and to cover disposal costs;
- improve the level of technology performance in relation to integrated waste policy management, in areas including: leachate treatment and gas recovery in landfills and prevention of hazardous waste contamination; use of efficient composting technologies; equipment of incinerators with efficient processes for minimising pollutant emission and converting waste to energy; and development of recycling technologies;
- reduce food waste production, decrease the water content of such waste and improve enforcement of laws on food waste;
- alleviate public concern near waste disposal facilities by adopting stricter emission standards, improving monitoring of emissions and paying adequate compensation; reduce government subsidisation of recycling by shifting greater responsibility to producers and creating adequate economic incentives to reduce waste generation;
- speed up remediation of contaminated soil.

***Nature conservation***

Korea has established most of the legislative framework needed for nature protection and is stepping up implementation efforts. The replanting of the country's forests following the depletion and degradation caused by decades of overharvesting and the destruction of war is the most remarkable achievement among Korean efforts

towards the protection of nature; nearly 65 per cent of the country's land area is again covered in trees. A large part of the land territory of Korea, and some marine areas, are under some form of protection. In the first half of the 1990s, a beginning was made to give sensitive habitats a high level of protection. Fees supplement public financing of nature protection in designated areas. Korea acceded to CITES in 1993 and ratified the Convention on Biological Diversity in 1994. The concept of ecological networks was introduced in 1995.

Nevertheless, rapid economic development continues to put strong pressures on nature, including pollution from agriculture, industry and municipalities, affecting aquatic ecosystems; pressures from recreational demands on protected areas; indiscriminate use of some natural resources; and reclamation of land or destruction of sensitive ecosystems like wetlands and tidal flats. Korea has begun to move towards modern nature conservation but still lacks scientific information to formulate well-focused policies. For protected areas, the degree of protection is relatively low. More ecological corridors need to be created to overcome fragmentation of natural areas Other than designating species at risk as protected, little appears to have been done in the way of more proactive species protection measures, such as recovery programmes. Illegal hunting and overfishing of some species occur. The institutional capacity for nature conservation still appears limited; the fragmentation of responsibilities at national level reduces the effectiveness of policy formulation and implementation. There is increasing concern that some of Korea's semi-natural forest will be transformed into plantation forest.

It is therefore recommended that consideration be given to the following proposals:

- urgently adopt and implement a national biodiversity strategy;
- extend the areas benefiting from a high degree of protection, in accordance with the objectives of Green Vision 21, including wetlands and coastal areas; outside protected areas, strengthen existing efforts to take greater account of landscape values;
- place more emphasis on species protection measures, such as protection of habitats, creation of further ecological corridors connecting protected habitats, more stringent measures against illegal hunting and trading in products of endangered species, and species recovery programmes;
- take further measures to reduce visitor impact on natural areas and to more fully preserve protected areas from construction of recreation and tourist facilities;
- rationalise the institutional responsibilities for nature conservation and develop partnerships with all relevant stakeholders for ecosystem management;
- strengthen the scientific basis for nature protection;
- further integrate environmental concerns in forestry, agricultural and fishery policies and ensure that forestry, agricultural and fishing practices evolve towards a sustainable and environmentally conscious approach.

## 2. Integrating Environmental and Economic Decisions

### *Integration of environmental concerns in economic policies*

After a long period of rapid economic growth, Korea has in the first half of the 1990s put in place environmental institutions and legislation, and taken a number of measures that have begun to contain some of the pressures on the environment. Notwithstanding average economic growth rates of 8 per cent per year, some progress is being made, but as yet there is no broad improvement of actual environmental quality. Moreover, certain indicators suggest that some pressures are growing faster than GDP; for example, energy supply and road traffic elasticity are 1.3 and 1.7, respectively, higher than the level of many OECD countries.

Korea's rapid economic and institutional transformations add to the environmental challenge it is facing. If Korea, as a newly developed country, wants to fully benefit from a win-win situation where problems are prevented rather than remedied, it will be necessary to better integrate environmental concerns in economic and sectoral policies.

Public and private pollution abatement and control expenditure is estimated to have remained fairly constant in 1992-95 at 1.5 per cent of GDP, but grew by almost 30 per cent in real terms. About half of this expenditure is public, and of that share more than 90 per cent is accounted for by local government. Almost 70 per cent of the expenditure by business is in the manufacturing sector. This expenditure does not appear to have affected the overall international competitiveness of Korean industry, and in fact has permitted the emergence of a Korean eco-industry.

The two main strategic environmental planning documents, the "Presidential Vision for Environmental Welfare" and Green Vision 21, provide clear and ambitious perspectives and a number of environmental and quantitative objectives. They will help rally the efforts of a relatively large number of government agencies with environmental responsibilities. However, the traditionally vertical structure of Korean public administration makes it difficult to formulate and implement integrated environmental policies: official co-ordination procedures do not always work well, and a culture of joint problem solving needs to be developed. Notably, the fragmentation of responsibilities for nature protection hinders the adoption of an ecosystem approach, and the separation of water quantity and quality management cannot promote integrated management of the resource.

Integration of environmental concerns in economic and sectoral policies is still in its early stages. The current five-year economic development plan contains some energy conservation and efficiency measures, and some sectoral plans pay attention to environmental concerns. But more systematic efforts should be made to introduce environmental concerns in strategies for changes in the industry, energy and transport sectors, and a review is needed of sectoral support measures that are harmful to the environment.

The use of the EIA process should be expanded as a mechanism for integrating environmental concerns in decisions and designs for sectoral projects (e.g. transport, energy, agricultural, recreational and environmental projects) and as a means of associating various stakeholders and ensuring public consultation and participation.

The expected growth and changing pattern of consumption are likely to lead to significant increases in water use, waste generation and demand for transport and recreational facilities. Measures to render consumption more environmentally friendly, such as those already initiated concerning eco-labelling and the greening of government operations, or simply to help in getting the prices of national resources right, will need to be strongly implemented to counteract the growth in environmental pressures that will result from these trends.

It is therefore recommended that consideration be given to the following proposals:

- maintain a strong commitment of all sectors in the implementation of Green Vision 21 and other environmental and sectoral plans;
- develop efforts and new approaches to integrate environmental concerns into policies formulated in the different administrations, and in the practices of the relevant economic sectors; in particular, strengthen integration with regard to the energy, transport and agriculture sectors and in fiscal policies; give specific attention to environmentally harmful subsidies and fiscal deductions;
- develop new approaches to involving major stakeholders in participating in strategic environmental planning and the definition of concrete targets and deadlines;
- extend EIA procedures to better integrate environmental concerns in sectoral projects and programmes;
- expand the use of public consultation procedures and engage all interested parties early in the deliberations on public projects or major permitting decisions;
- strengthen the liability legislation in order to better compensate for damage to the environment in line with the polluter pays principle.

***Sectoral integration: transport***

Vehicle use causes significant air pollution and other environmental problems. Trucks and buses are the source of two-thirds of the transport-related air emissions in Korea. In Seoul about 77 per cent of the air pollution comes from motor vehicle exhaust. Gradual tightening of the technical regulations for vehicles has resulted in a fleet that meets relatively low emission standards and by 2000 will meet standards comparable to those of Japan and the United States. Stringency of inspection regulations guarantees that vehicles in use perform well environmentally. Fuel quality has been improved significantly with lower-sulfur diesel fuel and generalised use of unleaded gasoline. An extensive fleet of LNG taxis is in use and cars powered by unconventional fuels are being developed. An innovative programme to introduce lower-emission vehicles using alternative fuels is expected to result in a gradually increasing share for these vehicles after 2000. Some economic instruments are being applied to discourage the use of private cars.

The progress achieved so far has enabled the transport system to fulfil its purpose without excessive disturbance of the environment. Nevertheless, the situation in terms of pollution and congestion is worsening. $NO_x$ and ozone levels are increasing in large cities; volatile organic compounds are not yet controlled. The average speed of traffic in many cities is decreasing and the economic cost of congestion is growing. It is expected that the success

of measures taken so far will be more than offset by the volume increase of car and truck use. In spite of considerable efforts to create a modern transport infrastructure, road and rail capacity remain insufficient to accommodate demand effectively. The decreasing prices of fuel, especially diesel fuel, have helped the development of the road transport sector. In light of the expected further increase of transport demand, the Government is formulating a new national infrastructure plan for the period to 2011. It will contain measures to extend road capacity, promote multimodal freight transport and public transport and discourage private car use. Price incentives to support this policy have been or will be implemented. Concerns on $CO_2$ emissions have not been integrated in transport policies. Further efforts concerning transport demand management and achieving a better modal balance, taking into account environmental and congestion externalities, are needed. For such a policy to succeed, more comprehensive transport planning is essential, with integration of environmental concerns in transport policy.

It is recommended that consideration be given to the following proposals:

- develop comprehensive transport planning, integrating environmental concerns and specifying quantitative targets for transport related pollution levels;
- continue to promote development and use of less polluting vehicles; strengthen measures to reduce emissions from trucks and other diesel vehicles;
- expand the involvement of the public and of environmental NGOs and the use of EIA in defining and implementing transport policies and infrastructure projects;
- continue to develop freight transport modes less harmful to the environment;
- expand the use of economic instruments, such as fuel taxation, parking fees and road pricing, to reduce vehicle traffic;
- pursue integration of transport policies and land use policies to link public transport and activities requiring mobility.

## 3. International Co-operation

Most of Korea's international environmental co-operation activities have been initiated during the 1990s, after the country had reached a sufficiently high level of economic development and the Government was ready to support a new vision for environmental protection that went beyond addressing local issues. While its progress in defining policies is impressive, there are relatively few international agreements against which its environmental performance can be judged.

Korea has been most successful, first, in promoting a series of bilateral and regional agreements aimed at addressing emerging environmental issues and at establishing a scientific basis on which to build mutual trust and understanding. Second, it has ratified many international agreements, reported on the progress achieved towards their implementation and met all its international commitments. It has also taken up environmental obligations arising from its new membership in the OECD and has undertaken many activities to provide follow-up to commitments arising from UNCED; in particular, it has adopted a national Agenda 21 action plan and promoted similar activities at local level. Third, Korea has decided to address issues related to the sea in an integrated way by creating a single ministry for all matters concerning the marine environment, marine resources and marine shipping. Stringent new measures concerning oil tanker safety have been taken to avert oil spills. Fourth, institutions have been set up to provide development aid to developing countries. Fifth, significant restrictive measures on trade have been introduced concerning protection of endangered species and movements of hazardous waste.

However, in a number of international environmental areas, progress still is needed, particularly since solving global environmental issues requires involvement by all countries according to their economic capabilities. Concerning climate change, Korea has not yet developed a strategy and policy to reflect adequately its new economic position as well as the rapid growth forecast for the years to come. Concerning the ozone layer, Korea has announced its plan to cease both production and use of CFCs before 2005. Concerning acid precipitation, in the absence of internationally agreed emission targets for $SO_x$ and $NO_x$, Korea stabilised $SO_x$ emissions over 1990-94, but emissions are projected to increase unless additional measures are taken. Concerning marine waters, it has not yet set limits for total nitrogen or phosphorus releases even though red tides are increasing in frequency. Concerning oil spill preparedness and response, the investments it has made for clean-up are still inadequate to deal with a medium-sized oil spill; furthermore, in the area of coastal zone management, many new far-reaching initiatives will be required. The rapid development of nuclear energy in Korea has to be accompanied by an adequate liability and compensation regime. Concerning official development assistance, Korea is providing 0.03 per cent of GNP as ODA but should draw up a schedule to increase its aid to reach the OECD-DAC average. In all these areas, there would be merit in integrating more closely the declared objectives of Korean environmental diplomacy with the industrial, economic

and financial objectives and capabilities of the country, to improve Korea's image as a trade partner carrying out its fair share of common responsibilities on global and international environmental issues.

It is therefore recommended that consideration be given to the following proposals:

- seek to improve support by the Korean public for international co-operation activities;
- continue efforts towards ratification and implementation of international agreements and OECD legal instruments, and publicise periodic reviews of actions taken to implement international environmental commitments;
- increase the means available to deal with international environmental issues and to meet Korea's new international role;
- develop international policies reflecting OECD membership, taking into account Korea's high rate of economic growth;
- develop a balanced and scheduled strategy concerning climate change issues;
- tackle marine pollution problems arising in the Yellow and South Seas, starting with pollution in Korean waters and eutrophication of shallow coastal waters;
- strengthen oil pollution prevention, preparedness and response and the compensation regime for oil pollution damage, on the basis of the polluter pays principle;
- join ongoing international efforts to strengthen the liability and compensation regime for nuclear damage;
- expand aid to developing countries and the environmental component thereof, in line with Korea's economic development.

# LUXEMBOURG

## CONCLUSIONS AND RECOMMENDATIONS[1]

During the 1990s, Luxembourg's economy experienced strong growth (averaging 7% a year), and the resident population rose 1.1% a year. Pressures on the environment from production generally decreased over this period, while pressure from consumption (traffic pollution, waste generation, suburban expansion) increased with rises in population and personal income. Luxembourg is highly interdependent economically and environmentally with neighbouring countries and Europe as a whole, with exports and imports reaching 95% of GDP, 94% of electricity imported, much industrial waste exported, transboundary air and water pollution, and large numbers of foreign vehicles present. One-third of the workforce lives outside Luxembourg.

Luxembourg has set ambitious environmental objectives. During the 1990s, EU directives had a decisive influence on the country's environmental policy. In combination with industrial contraction and restructuring, environmental policy has led to significant progress on conventional pollutants. Diffuse and consumption-linked pollution, deterioration of the natural environment and waste generation are not yet under control. The coming challenges are: i) to implement more cost-effective environmental policies; ii) to integrate environmental concerns more fully into economic decision making; and iii) to continue and to expand international co-operation.

This OECD report establishes a baseline for assessing future environmental progress and examines Luxembourg's environmental performance, i.e. the extent to which its domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

### 1. Implementation of Environmental Policies

#### *Strengthening the cost-effectiveness of environmental policies*

Environmental policy in Luxembourg rests chiefly on environmental laws and regulations. These set strict standards and are comprehensive. They have been strongly influenced by EU directives on the environment and regulatory approaches in neighbouring countries (e.g. best available technology).

Environmental agencies set emission standards for industrial establishments on a case by case basis. Enforcement should be strengthened and private-sector initiatives to enhance environmental management (e.g. under the EMAS programme) should be further encouraged. Environmental data and indicators need to be better developed and more extensively used in designing, implementing and assessing policy.

Public expenditure on pollution control and nature conservation represents around 0.75% of GDP. This includes current expenditure and investment by national and local authorities. The Environmental Protection Fund and the Water Management Fund support in particular local authority investments in environmental infrastructure at varying rates, covering up to 100% of capital costs. Information on private-sector expenditure is not collected.

Luxembourg has endorsed the polluter pays and user pays principles. In practice, however, polluters usually do not meet the costs they generate, nor do users of environmental services bear their costs. Little use is made of economic instruments to internalise negative externalities. Local authorities set charges for waste disposal and waste water treatment, which are generally low since communes as a rule meet only 10% of infrastructure investment costs. Taxes on motor vehicle fuel are set so as to maximise tax revenue, and over half of all motor fuel is sold to non-residents. This "gasoline tourism" has adverse environmental effects. A government intention to introduce environmental taxes, first broached in 1994, has not yet been acted on.

1 Conclusions and Recommendations reviewed and approved by the Group on Environmental Performance at its meeting in July 2000.

It is recommended to:

- better respond to the environmental challenges arising from continued growth in consumption, mobility and land use;
- translate medium- and long-term strategic plans into priorities for environmental management and financing;
- apply the polluter pays and user pays principles more fully (e.g. in the management of waste, waste water and energy);
- increase the use of economic instruments for waste and water management at the local level;
- strengthen the enforcement of environmental laws and regulations;
- develop voluntary initiatives in the industrial sector (environmental management, audits, etc.);
- improve environmental information (data, indicators).

***Air***

Luxembourg has met or will shortly meet all its international commitments to reduce emissions of atmospheric pollutants. Emissions of most conventional pollutants have been decoupled from economic growth, chiefly as a result of the shift to a largely service economy and technological changes in industry. Since 1990, emissions of $SO_x$, $NO_x$ and CO have fallen by approximately 75%, 25%, and 70%; $CO_2$ emissions have fallen by approximately 20%. The many regulatory measures that have been applied include improving fuel quality for industrial and household use, ending sales of leaded gasoline, limiting industrial and transport emissions and mandating technical inspection of motor vehicles. Air quality is good in Luxembourg and ambient air standards are generally met, except for ozone.

Since 1994 exceedances of ambient thresholds for tropospheric ozone, in both urban and rural areas, indicate the need to better control regional emissions of $NO_x$ and NMVOCs, in particular from vehicles. In 1999 Luxembourg set particularly ambitious targets to reduce emissions of $SO_x$, $NO_x$ and VOCs under the Gothenburg Protocol. It will achieve these objectives only if concerns about air quality are more fully integrated into decisions concerning transport, energy, economic policy and taxation. To that end, economic instruments could be used to influence energy consumers' behaviour, and economic analysis could be used to improve selection of policy measures. In particular it would be appropriate to examine the environmental effectiveness and economic efficiency of fiscal instruments such as an environmental surtax on motor vehicle fuels.

It is recommended to:

- define and implement the measures needed to meet commitments on emissions to air ($CO_2$, $NO_x$ and NMVOCs), including economic instruments;
- continue to develop and promote public transport at regional level, and to internalise the external costs of road transport (e.g. with an environmental surtax on motor vehicle fuels);
- resolutely apply energy-saving programmes, particularly for transport and the residential/commercial sector, with priority on the most cost-effective measures;
- strengthen co-operation between national and communal authorities in enforcing regulations on atmospheric emissions;
- develop and implement a regional plan for the prevention and control of tropospheric ozone (aiming at $NO_x$, VOCs and ozone), in co-operation with neighbouring countries.

***Waste***

Luxembourg has a comprehensive set of laws and regulations for waste management based on prevention and recovery. A national waste plan is being prepared. Numerous information and awareness measures are directed at households and the commercial sector. Separate collection, covering all recoverable components, takes place throughout the country. Disposal infrastructure has been modernised and brought into line with standards. Non-compliant facilities, such as landfills for inert waste, hospital incinerators and a national landfill for non-household waste, have been closed. Work has begun on establishing a register of polluted sites and on cleaning up former landfills and other contaminated sites. Technological change in the steel industry (conversion from blast to electric arc furnaces) has helped to reduce quantities of industrial waste, and to transform this industry into one specialising in the recovery of scrap from well beyond the country's borders. Several other industrial sectors (glass, aluminium, construction) also use high proportions of recovered materials.

To meet the quantified targets in the National Plan for Sustainable Development cost-effectively, enforcement of some regulations should be stepped up and economic instruments used more fully. Volumes of municipal waste are increasing under the dual impetus of population growth and rising per capita generation of waste. The polluter pays principle is applied only partially. Over half of Luxembourg's industrial, commercial and service waste is exported. Accordingly, firms should systematically establish waste prevention and management plans, and efforts to find reliable medium- and long-term disposal capacity should be made, including through bilateral or multilateral co-operation with neighbouring regions. Substantial efforts are needed to manage hospital waste more effectively.

It is recommended to:

- finalise and implement the National Waste Management Plan;
- emphasize efforts to reduce volumes of municipal waste (e.g. through implementing of harmonised taxation by all local authorities, application of the polluter pays principle, awareness campaigns on waste prevention, efforts to change consumption patterns);
- assure more efficient utilisation of municipal waste treatment capacity;
- pursue the prevention of industrial, commercial and service waste generation (via waste prevention and management plans, improved dialogue with public authorities, advisory services to promote producer-responsibility, economic instruments, voluntary agreements), and the reuse/recovery of such waste;
- assure on a long term basis the disposal of Luxembourg's final industrial waste through making increased use of national disposal capacities and through concluding agreements with neighbouring countries;
- manage hospital waste effectively, respecting the proximity principle;
- speed up the establishment of a register of polluted sites and the clean-up of contaminated sites.

***Nature***

In response to pressures on the natural environment from development (agriculture, urbanisation, transport infrastructure, tourism), Luxembourg has introduced laws and regulations to protect nature and has built up a satisfactory, well organised body of information of species, including inventories of fauna and flora, and red lists. Significant public expenditure, on the order of 0.12% of GDP, is allocated to nature conservation, including backing for the activities of several NGOs. The National Plan for Sustainable Development contains a strategic vision and a set of objectives concerning biodiversity, forests, agriculture, soil and watercourses. Luxembourg has ratified all international conventions on nature conservation. In the "green belt" (i.e. all land not covered by physical development plans), building is allowed only for farming or public purposes. A ban on forest clearance has played a major role in protecting woodland habitats. Forest policy has reverted to a more sustainable approach, involving acknowledgement of the economic, environmental and social functions of woodlands, natural regeneration of deciduous areas and a shift from conifer plantations to deciduous or mixed planting. Purchases of woodland by the public authorities have expanded the area of forest in public ownership by 37% over the past ten years.

However, nearly 20 years after passage of the 1982 Conservation of Nature and Natural Resources Act, despite ambitious statements of intent, just 1% of the national territory is classified as conservation areas (24 reserves have been established, out of a projected 140) and 6.2% as special protection areas (15 SPAs, under the EU birds directive). The Upper Sure natural park was completed in 1999 but two other projects, including the Our park proposed in the 1964 Clervaux Treaty with Germany, have yet to be implemented in practice. The management of these areas is inadequate, with a lack of multi-year management plans and qualified staff. The conservation areas, at present highly fragmented, are to be extended (under the habitats directive) and included in a national ecological network as part of the EU's Natura 2000 system. The modernisation of agriculture has greatly contributed to the depletion of biodiversity in Luxembourg. The agri-environmental programme (providing assistance for shifts to extensive stockbreeding and arable farming, support for organic farming, introduction of structures for landscape protection, etc.) is not sufficiently utilised and ought to be strengthened. A policy to conserve the agricultural environment, integrating the restoration of natural habitats in farm management, would be desirable. Sustainable management of private forest (54% of the total) is difficult because much of the land is in small plots.

It is recommended to:

- use information on species and their habitats more effectively to define priorities for nature conservation and build public awareness of these priorities;
- increase the extent of protected areas by activating the Luxembourg component of the Natura 2000 network, and by realising the Germany-Luxembourg and France-Germany-Luxembourg natural parks, in co-operation with these neighbouring countries;
- strengthen protection of conservation areas by establishing and applying multi-year management plans for existing SPAs and for special conservation areas;
- boost the resources for nature conservation and promote partnerships among central and local government and social partners;
- control water pollution and continue rehabilitation of aquatic ecosystems;
- continue efforts towards sustainable forestry;
- significantly step up agri-environmental efforts as well as measures to promote sustainable physical development (partnerships, intercommunal syndicates, integration of nature conservation concerns in agriculture policy, progress towards sustainable farming and tourism practices).

## 2. Towards Sustainable Development

### *Integrating environmental issues in economic decision making*

Despite rapid growth of GDP and the population, several pressures on the environment have diminished significantly in Luxembourg. This decoupling is chiefly the outcome of a shift to a largely service economy, with rapid expansion in the tertiary sector replacing the former dominance of steelmaking. But the striking economic performance, and the greater household affluence that it brings, are generating challenges for the protection of the environment and nature. The construction sector is expanding swiftly, the car ownership rate is Europe's highest and environmental policies have to cope with the consequences of changing consumption patterns entailing greater volumes of waste, more traffic, spreading suburbs and the related demand for environmental infrastructure.

With few exceptions, environmental concerns are not yet fully integrated into sectoral policies. In agriculture policy, EU initiatives to promote more environment-friendly farming should be followed up more diligently. In energy, transport and fiscal policy, environmental concerns seem to carry little weight. Overall, Luxembourg primarily emphasises economic and social development, protection of agriculture, development of road transport and growth in household consumption.

The ambitious National Plan for Sustainable Development covers the economic, environmental and social dimensions of sustainability. It lists current realities and operations and sets them against scenarios for the future; it identifies priorities for action; it covers all major economic sectors and all relevant environmental management issues. Drawn up by the Ministry of the Environment, with the backing of an interministerial working group, it was approved by the government in 1999 for consultation. Parliamentary debate as well as broad consultation of the population are to take place on this document during 2000. This process should lead to clarification of objectives and deadlines, and encourage local Agenda 21 initiatives. It should also be co-ordinated more closely with the process of physical development planning.

Environmental impact assessments (EIAs) could be strengthened in terms of both projects and policies. Mechanisms for public consultations and dispute mediation should be expanded.

It is recommended to:

- further specify the National Plan for Sustainable Development with quantified objectives and deadlines, following broad consultation with government agencies and social partners;
- institutionalise a high-level body for interministerial co-ordination on sustainable development;
- translate the National Plan for Sustainable Development into practical measures for fuller integration of environmental concerns in sectoral policies, particularly agriculture and transport policy;
- consider the introduction of environmental taxes and charges, possibly in the context of broader fiscal reform;
- strengthen EIAs in terms of both coverage and policy;
- develop partnership approaches for local environmental management (e.g. local Agenda 21 initiatives).

***Energy and the environment***

During the 1990s, final energy consumption in industry fell by 30% thanks to the contraction of steelmaking, enhanced energy efficiency (estimated at 13%) and structural and technological change. A key factor is that, largely because of the replacement of blast furnaces by electric arc processes, energy consumption in the steel industry has fallen substantially in recent years. Since 1990, the use of solid fuels has fallen by 60%, while the use of natural gas has risen by 50%. Natural gas is increasingly used by industry and households, and the trend will continue when a new gas turbine/steam co-generation plant is commissioned in 2001. Use of renewable energy sources is progressing, despite their limited potential. The Energy Efficiency Act (1993) seeks to promote energy saving in all sectors and to reduce dependence on conventional energy forms by encouraging the use of renewables. A national strategy to reduce greenhouse gases was developed in May 2000. Voluntary agreements have been used effectively to encourage greater energy efficiency in a number of industrial sectors.

In the 1990s Luxembourg's energy intensity fell by 33%, but it is still 9% above the average for OECD Europe. In the late 1990s, $CO_2$ emissions per unit of GDP were 20% above the OECD Europe average, even though 94% of the electricity consumed in Luxembourg is imported. The level of excess emissions would not be substantially different if emissions from vehicle fuels sold in Luxembourg but consumed abroad were deducted, and emissions arising abroad from the generation of electricity consumed in Luxembourg were added. Energy consumption by transport, largely accounted for by road vehicles, has risen 54% since 1990. Taxes on vehicle fuel, lower than in neighbouring countries, attract substantial purchases by non-residents (50-70% of fuel sales). Similarly, energy consumption in the residential/commercial sector has risen 40% since 1990. Subsidies have been the main tools used to encourage better energy efficiency and use of alternative energy sources, but with little take-up by industry. The incentive effects of the few economic instruments employed in recent years have been small. To achieve the targets in the National Plan for Sustainable Development, Luxembourg will have to consider additional measures, particularly to reduce energy intensity. Allocation of subsidies for renewables should be associated with stringent economic analysis.

It is recommended to:

- specify the energy-related objectives and measures in the National Plan for Sustainable Development, involving all parties concerned;
- strengthen incentives for energy efficiency, particularly in the transport and residential/commercial sectors;
- seek to progressively increase the price of motor vehicle fuels so as to encourage savings in motor fuel consumption, reduce emissions and achieve fuller internalisation of external costs;
- make use of economic analysis to support the choice of subsidies for renewable energy development;
- establish an effective follow-up and evaluation system for energy efficiency incentives;
- conduct a more systematic assessment of the environmental impacts of the use of the main energy sources.

## 3. International Co-operation

Luxembourg has successfully helped deepen bilateral and regional co-operation on environmental matters. It has rapidly implemented most EU directives and ratified most major international environmental agreements. Luxembourg's environmental standards are frequently high, and striking achievements such as recovering CFCs from discarded refrigerators deserve mention. River water quality has improved and transboundary water pollution has diminished. With regard to atmospheric pollutants, international targets for $SO_x$ have been more than met. Targets for $NO_x$ and VOCs have been reached or will be soon. On $CO_2$ emissions, the very ambitious targets that Luxembourg has set itself for 2000 and 2005 will probably be met. To reach the target of reducing emissions by 2008-12 by 28% over 1990 levels, as laid out in an EU agreement, current measures will need to be stepped up. Luxembourg is among the most generous providers of official development assistance, and the level of aid has increased considerably in recent years.

While the achievements in international co-operation are wholly positive, there remain areas to which insufficient resources have been devoted or where political will has been somewhat lacking. Several EU directives have not yet been fully implemented. Strategies and plans of real effectiveness are lacking in many spheres, particularly for waste, chemicals, atmospheric pollutants and $CO_2$. Investment in tertiary wastewater treatment plants has not been on schedule. Transboundary river pollution and the resulting soil pollution have not diminished as much as had been hoped. Substantial efforts will be necessary to meet the Gothenburg Protocol targets.

There is little or no follow-up on legislative measures taken with a view to promoting international co-operation. Application of the concept of sustainable development has made little headway at either interministerial or local level. Ratification of some conventions has been considerably delayed. In many cases these delays have been due not only to insufficient resources to meet international commitments, but also to the low priority ascribed to the environment.

It is recommended to:

- pursue and step up regional co-operation on the environment (e.g. on waste, tropospheric ozone, natural parks and protected zones);
- take all institutional and financial measures needed to establish and fund the tertiary waste water treatment facilities required under the EU waste water directive;
- adopt and implement strategies and plans to meet the international obligations stemming from the Kyoto and Gothenburg protocols by 2010, and strengthen the measures already in place.

# MEXICO

## CONCLUSIONS AND RECOMMENDATIONS*

Achieving sustainable development is an economic, social and environmental challenge for Mexico. The country's economic development has to be sufficient to support a population that has grown at a higher rate than GDP over the past 15 years and that now numbers 94 million. A sizable population of rural and urban poor, who suffer disproportionally from public health problems partly caused by environmental degradation, coexists with a modern consumer society in a dual economy. Economic activities have generated intense pressures on the environment, including high levels of pollution and, in a number of instances, unsustainable use of natural resources. Environmental considerations until recently have not played a prominent role in development in Mexico and consequently the environment has suffered severely in certain areas.

Since the late 1980s, Mexico has engaged in wide-ranging structural reform of its economy, signed the North American Free Trade Agreement (NAFTA) and joined the OECD. The resulting changes, including the 1995 recession and a recovery with high economic growth in 1996 and 1997, provide the broad context for concurrent profound reforms in environmental policies and environmental management intended to reduce pollution and foster sustainable use of natural resources. A single ministry overseeing the environment and nature protection as well as the management of water, soil, forest and fishery resources was set up in December 1994 and has already taken many positive initiatives. But most of these are too recent to show results as yet.

For the immediate future, the challenge is to: i) thoroughly implement these new environmental policies, achieving realistic objectives and extending environmental infrastructure; ii) further integrate environmental concerns in economic and social decisions; and iii) meet international environmental commitments.

This OECD report establishes a baseline for assessing future environmental progress, and examines Mexico's environmental performance, i.e. the extent to which Mexico's domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in Mexico.

### 1. Implementing Environmental Policies

Overall, Mexico has taken the measure of the challenge that must be met if it is to reverse the severe environmental degradation confronting it. In the last few years, it has undertaken fundamental environmental reforms and launched new policies and programmes that are going in the right direction and in many ways are exemplary.

However, it will take time as well as considerable and sustained effort for these new measures to be firmly embedded in environmental management practice. Ensuring funding and continuity in the implementation of the reforms at national level will be essential. Putting integrated pollution control into effect will require both a cultural shift on the part of managers, who until now have dealt exclusively with water or air pollution, and an increase in the environmental awareness and know-how of small industry. For decentralisation and devolution to be effective, institutional capacity at state and municipal level needs to be built up progressively, and these lower levels of government must acquire greater financial autonomy for managing their environment. Environmental information and education programmes should be expanded to further buttress these changes.

#### *Environmental reforms*

In response to wide-ranging environmental challenges, the Ministry of Environment, Natural Resources and Fisheries (SEMARNAP) has put forward a steady stream of proposals over the past two years to change the way decisions concerning the environment and natural resource management are made in Mexico. There are now many programmes aimed at making development more sustainable. Moreover, the General Law of Ecological Balance and Environmental Protection (LGEEPA) was strengthened in December 1996 with some very significant amendments to encourage major environmental regulatory reform, by: instituting integrated permitting; increasing the economic efficiency of regulation; simplifying administrative procedures; strengthening enforcement procedures; extending

* Conclusions and Recommendations revised and approved by the Group on Environmental Performance at its November 1997 meeting.

mechanisms to improve compliance; furthering decentralisation and devolution; guaranteeing the right to know; and enhancing public participation.

The various environmental plans and programmes are evidence of the serious attempts being made to halt and reverse environmental degradation. Given their great number in many sectors and at all levels of government, however, strengthened evaluation and priority setting may be needed to ensure that they can be implemented effectively and on schedule. In order to promote and assess programme implementation in terms of results, budgets and staffing, it is imperative to put efficient management systems, environmental indicators and monitoring systems into effect.

The historical approach to environmental policy implementation has been one of "command and control"; however, compliance has generally been poor. To remedy that situation, Mexico's environmental enforcement agency (PROFEPA) has promoted voluntary compliance, but also increased efforts to enforce regulations and permits more uniformly and to monitor the major enterprises more closely. While this has resulted in significant progress, there remains a need for the agency to extend its expertise and presence on the ground. Concerning standard setting, regulatory reform has meant turning away from the previous approach of numerous industry-specific effluent and emission limits in favour of a simpler approach, one based on the use and assimilative capacity of the receiving environment. For example, 44 waste water standards were replaced by three standards that set limits based on the downstream use of the receiving water body. PROFEPA has also adopted a new strategy to further improve compliance by strengthening consultation with industry and allowing greater scope for self-regulation. The newly created Pollutant Release and Transfer Register and the System of Indicators of Environmental Law Compliance, which will make emission and compliance data publicly available, can also be expected to improve public awareness and compliance.

Some economic instruments to achieve environmental and resource management objectives have already been adopted. In water management they are well developed, but overall Mexico is trailing other OECD countries. Legal provisions to enable a greater use of economic instruments are in place; there is ample scope to apply such instruments to influence economic choices and provide funding to the central, state and municipal governments for priority tasks. With due regard to equity and poverty issues, appropriate differentiated taxes, air emission charges, deposit-refund systems and/or marketable rights should now be developed. Mexico should use every opportunity to apply the polluter pays and user pays principles, and to finance environment-related public services with the proceeds of fees and charges linked to environmental goods or services. Water resource fees and pollution fees should be collected more consistently.

Mexico makes great use of financial assistance to implement its environmental and natural resource management policies. While this approach mostly conforms with accepted exceptions to the polluter pays principle, it needs to be made clear to enterprises and households that the various forms of financial assistance (e.g. direct subsidies or fiscal incentives) for pollution control are to be eliminated gradually.

Data on public and private environmental expenditure are being collected but will need to be both consolidated and desegregated by level of government and environmental area. In particular, pollution abatement and control expenditure needs to be separated from water supply and natural resource protection expenditure. These weaknesses notwithstanding, pollution abatement and control expenditure can be roughly estimated at 0.8 per cent of GDP.

An increased level of environmental investment will be needed for quite some time to come, together with appropriate mechanisms for priority setting and economic evaluation. Existing water infrastructure must be maintained and rehabilitated; new infrastructure is also needed to support the growing population, particularly for drinking water supply, sewerage and waste water treatment. The collection and treatment of municipal waste and hazardous waste will also require new investment. After years of accumulation and dispersal of contaminants, much clean-up work is needed.

Concerning industry, investments are required to modernise small and medium-sized enterprises and help them deploy cleaner technologies so as to increase the competitiveness and sustainability of the Mexican economy. Meanwhile, however, special programmes have been designed to meet the needs of small and medium-sized firms in environmental protection. In larger firms, voluntary actions to protect the environment are becoming more significant and the use of eco-audits and risk assessments is expanding. A Cleaner Production Centre has been created. R&D on environmental technology is on the rise. Although still small by OECD standards, the environmental sector is

growing and environmental consulting is taking off. Co-operation between government and industry has been weak but has improved lately, partly as a result of the promotion of greater self-regulation of large enterprises.

It is therefore recommended that consideration be given to the following proposals:

- strengthen the capacity of environmental and educational institutions at national, state and local level to improve environmental information and education;
- develop further environmental quality standards with a view to increasing economic efficiency and enforceability; continue to streamline environmental regulations;
- strengthen enforcement and compliance control by public bodies and carry out these tasks in partnership with enterprises and the users of such natural resources as flora and fauna; continue to promote self-regulation and voluntary compliance;
- expand the use of economic instruments to protect the environment more efficiently and to finance environmental activities;
- continue to promote and closely monitor voluntary agreements with stakeholders (e.g. industry, natural resource users);
- improve collection of and access to environmental data, including on environmental expenditure;
- further develop environmental indicators;
- continue to promote greater public participation in decision making related to the environment, including programme preparation and implementation;
- expand and diversify public, private and international sources of funding for environmental protection; enhance the role of banks in supporting environmental investment, including the provision of soft loans by specialised institutions.

***Water***

Mexico's natural and socio-economic conditions present water managers with a difficult task in redressing a severe mismatch between water availability and demand, ranging from superabundance in the humid, thinly populated south-east to great scarcity in the arid or semi-arid areas of the populous centre and the cities in the north. In parts of the country, Mexico's water resources are among the most seriously degraded of all OECD countries, particularly in densely populated zones: surface waters and even groundwaters are often contaminated and/or overexploited and water quality in rivers, lakes and aquifers is commonly not fit for many uses. Despite the efforts already made, the contamination of water resources, which particularly affects the health of poor people who do not have access to drinking water of good quality, still poses grave problems.

In response to this challenge, Mexico is engaged in a fundamental reform of its water sector, aiming at achieving sustainable management of its water resources and satisfying the present and future needs of a fast growing population. Impressive progress has been made with the implementation of irrigation management reforms, and independent state and municipal water utilities are being set up to improve the delivery of water services. The regulatory system has been reshaped and now presents a flexible mix of instruments, including resource and pollution fees and progressive water pricing. Real progress is being made towards the targets of the 1995-2000 Water Programme, for example in terms of extending tap water connections, improving drinking water quality, extending access to sanitation and (albeit not yet sufficiently) building waste water treatment plants.

The rehabilitation of the nation's waters will, however, demand a very large, expanded and sustained effort. The new management policies now being put in place constitute a good approach to solving Mexico's water problems, but will yield results only if thoroughly implemented. Much remains to be done to increase the connection rate for sewerage, and less than 14 per cent of municipal and industrial waste water is treated at present. The need for new and upgraded water infrastructure will stretch investment capability for a considerable time to come and priorities for public investments in this area need to be examined in order to maximise social, economic and environmental benefits. Administrative systems are often inadequate for the effective operation of the concession and permitting regulations, and municipal water utilities do not have the capability to invoice all customers. Despite recent improvements, the enforcement of water regulations and permit conditions is still weak; a significant proportion of resource and pollution fees is not collected. The environmental awareness and know-how of small and medium-sized firms needs to be raised considerably, to enable their adoption of water conservation measures and cleaner production processes.

It is therefore recommended that consideration be given to the following proposals:

- further pursue measures to reduce health risks from contaminated water, particularly in rural areas; extend the existing Agua Limpia programme;
- strengthen the enforcement of water regulations, concessions and permits, as well as the collection of water abstraction and pollution fees;
- complete the management reforms in the areas of irrigation, municipal water services and the devolution of functions to the states;
- strongly pursue measures to improve the efficiency of water use for irrigation and other purposes;
- examine priorities for public investment in water infrastructure and continue setting up public-private partnerships for financing, building and managing municipal water services;
- establish clear performance criteria and accountability mechanisms for all water utilities;
- establish all proposed basin councils and enable them to become strong water resource management agencies (e.g. provide mechanisms to allow them to generate their own financing).

***Air***

Mexico has taken action to address air pollution challenges with measures including: setting standards and emission limits, increasing and improving enforcement of permit conditions, negotiating agreements with industrial subsectors to reduce emissions beyond the requirements of the law, improving fuel quality, adopting environmental audit procedures, strengthening vehicle standards and emission requirements, and integrating transport and environmental policies. The basis is being laid for a system of emission trading. The four largest metropolitan areas (Mexico City, Guadalajara, Monterrey and Toluca) have adopted air quality improvement programmes that include a comprehensive set of measures on vehicles, fuels and traffic management. The introduction of lead-free gasoline in 1990 has resulted in lower levels of lead in the environment and in residents' blood. In Mexico City, the most noticeable results of the policies adopted to date are the lowering of mean daily peak values, and a decline in the number of days that ambient air quality standards are exceeded for ozone, $SO_2$, CO and lead. These have been achieved thanks to cleaner motor fuels, the introduction of catalytic converters and enforcement of strict motor vehicle policies. Shifts in fuel use (e.g. from oil to natural gas for power plants and industry in Mexico City) have been achieved through integration of energy and environmental policies.

Nevertheless, in many large urban areas, especially those of Mexico City, Guadalajara and Monterrey, ambient air conditions still pose serious health problems for much of the year. In Mexico City, concentrations of $NO_2$ continue to rise and the national standard is exceeded nine days out of ten for at least one of the major pollutants. As yet there is no comprehensive nationwide picture of the sources and amounts of pollutant emissions. Many states and municipalities do not have the technical capability and resources to exercise the responsibilities (planning, implementation, enforcement and monitoring) given to them in recent reforms. Most urban centres and industrial corridors need to adopt comprehensive air quality improvement programmes. Despite a welcome move towards self-monitoring and self-reporting, the permitting and inspection system needs to be strengthened and more thoroughly implemented.

It is therefore recommended that consideration be given to the following proposals:

- continue to strengthen implementation and enforcement of the regulatory system;
- pursue efforts to supplement the regulatory regime with self-reporting, audits and voluntary agreements with specific industrial subsectors (particularly the electricity generation, oil, petrochemical and chemical industries); give special attention to the many "micro" industries in urban areas;
- pursue efforts to prevent and control pollution from mobile sources through national and local programmes; tighten emission limits for new gasoline and diesel vehicles;
- further pursue the introduction and application of economic instruments;
- improve the technical capability of states and municipalities to plan and implement air quality programmes under their jurisdiction, and ensure that the implementation of environmental standards is harmonised across the country;
- identify cost-effective implementation strategies for all states; in major urban and industrial centres, develop integrated air quality improvement plans with clearly defined goals and targets;
- develop a national database of air emissions, including toxic emissions; co-ordinate existing local monitoring systems and develop a national air quality monitoring programme capable of producing

timely and policy-relevant information; pay special attention to risk and exposure assessment and epidemiological aspects of air pollution in metropolitan areas;
- raise public awareness of air pollution issues and implement recently legislated provisions for public access to information, for example by putting the new Pollutant Release and Transfer Register and the System of Indicators of Environmental Law Compliance into effect as quickly as possible.

***Biodiversity and natural resource management***

Mexico is one of the few countries in the world with mega-biodiversity. It has about 10 per cent of all species known in the world, has the highest number of reptile species, is second in mammalian diversity and ranks fourth for both amphibians and plant species. Mexico has abundant natural resources: forest, soil, water and fish resources. For decades, pressures from economic activities on natural resources have been mounting and most major ecosystems have suffered serious degradation. As a substantial part of the population lives in relative poverty, especially in rural areas close to the country's living resources, Mexico faces the challenge of implementing nature conservation policies while raising the standard of living.

In response to this challenge, Mexico has adopted a comprehensive approach: it has assembled within one ministry the responsibilities for environment, forestry and soil, and fisheries and aquaculture, and has developed new and far-reaching strategies, policies and programmes that are now in the early stages of implementation. After the doubling in the past decade of natural protected areas (now 5.9 per cent of the territory), a new programme aims to further increase the size and representativeness of natural protected areas and improve their management. Some species protection measures are showing positive results (e.g. monarch butterfly, Berrendo antelope, dolphins, sea turtles) and more are being implemented or prepared. Enforcement of area and species protection measures has improved in recent years. New and innovative instruments are in use to reconcile socio-economic pressures and biodiversity conservation; these include marketing of wildlife products and services under certain safeguards, and community sustainable development projects, being drawn up by local people and government organisations, mainly in economically depressed areas with high biodiversity. An important land certification programme specifies tenancy rights for agricultural land and demarcates natural protected areas, thereby helping avoid the negative environmental effects of ambiguous property rights. Several programmes have been developed to combat deforestation and promote sustainable forestry practices. For fisheries, policies and actual fishing practices have been redirected to focus not only on increasing production and modernisation, but also on quality and sustainability. Mexico has ratified most important international agreements on biodiversity and nature protection; it actively promotes international co-operation, especially on the marine environment.

These recent policies are aimed at redressing some critical problems: habitat loss, forest and soil degradation, and threatened species, many of them endemic. Now that most of the needed policies have been adopted, and their implementation has started, a determined and integrated effort is required to obtain the desired results. This will need to include priority setting, appropriate funding and monitoring of progress, as well as strengthening inspection and surveillance of natural resource use and management. The results of previous policies were disappointing because of a lack of implementation and funding, while forestry and fishery practices too often ignored sustainability. The Programme of Natural Protected Areas, while clear, ambitious and better funded, is not yet fully financed. The national biodiversity strategy has to be completed. Ecological physical planning, introduced in 1988, has not been implemented widely and only a few plans have been approved to date. It is not yet certain that the recent clarifications in land tenure and in agriculture and forestry policies are sufficient to reverse continued degradation, especially in tropical areas. For fisheries, further attention must be given to implementing decrees and regulations. Co-ordination or integration of the various bodies dealing with genetic resources has to be reviewed.

It is therefore recommended that consideration be given to the following proposals:

- pursue the implementation of existing plans and programmes on nature protection, integrated coastal zone management, forestry, soils and fisheries; closely monitor progress achieved; further strengthen institutional capacity for enforcement;
- pursue the implementation of innovative approaches to reconcile biodiversity protection and natural resource use, such as the marketing of specific wildlife products and services and community sustainable development projects;
- ensure more autonomous management of protected areas, involving strengthened relationships with research institutions, NGOs and the public;

- secure sufficient and accessible funding to implement the natural protected area programme and species protection programmes; strengthen priority setting;
- strengthen ecological physical planning; further promote public awareness and participation; continue research on biodiversity and natural resources;
- complete and adopt the national biodiversity strategy;
- implement, with appropriate deadlines, the strategy for sustainable forestry, agriculture and animal husbandry; further strengthen and integrate policies and programmes that combat deforestation (e.g. reforestation programmes), especially in tropical areas; ensure sufficient co-ordination with programmes for rural development and agriculture; integrate biodiversity and forest issues in agriculture policies;
- further pursue the sustainable fisheries approach and continue research into the status and trends of fish stocks.

## 2. Integrating Environmental Concerns in Economic Decisions*

Economic forces and changes in such major sectors as industry, energy, agriculture, transport and tourism strongly influence environmental conditions and trends, and hence either enhance or diminish the benefits of environmental policies and technical progress. Further integration of environmental concerns in economic, sectoral and social policies is needed to achieve cost-effective environmental protection and sustainable development in a rapidly developing country like Mexico.

### *Fostering sustainable development*

In a country facing rapid population growth, migration to cities, and poverty that affects one-third to one-half of the population, pursuing sustainable development raises exceptionally difficult economic, social and environmental challenges. Depletion of groundwater supplies, air pollution in metropolitan areas, continuing deforestation and decreasing biodiversity are all symptoms of the stress being placed on the Mexican resource base.

Mexico has adopted a sound strategy to move towards more sustainable development. The creation of SEMARNAP, the adoption of the 1995-2000 National Development Plan and the 1995-2000 Environment Programme, the creation of broad-based consultative councils on sustainable development, the potential of the current decentralisation and devolution process, the new partnerships established with industry, and the support of NGOs, academics and communities are all positive signs that the new strategy might bring considerable success.

Mexico has created a National Consultative Council for Sustainable Development and four regional councils, with participation by all relevant government entities and all economic sectors. Although Mexico has no truly interministerial body aiming at closer integration of environmental and other policies of the government itself, it has several mechanisms to this effect. Such mechanisms should be strengthened and brought to the minister level to deal with environmental protection and land use issues and ensure that all ministries work towards the goal of sustainable development.

Since the creation of SEMARNAP, interministerial co-operation has improved considerably, now involving the ministries of foreign affairs, finance, trade and industry, energy, agriculture and health. Further integration of environmental concerns in fiscal policies should be sought. The integration of environmental concerns in the transport sector and in coastal area management also needs to be broadened and intensified.

Greater focus should be put on "getting the prices right", with appropriate attention to addressing the special needs of the poor. Internalising externalities, and reducing subsidies and other forms of financial aid that are costly to taxpayers as well as detrimental to the environment, should become important objectives. The use of appropriate pricing (e.g. for water and energy) and economic instruments should help shape more sustainable consumption patterns. Concerning the greening of government operations, the example of SEMARNAP's "green list" for administrative purchases needs to be followed on a larger scale.

* See also the 1997 OECD economic survey of Mexico and the 1997 OECD review of agricultural policies of Mexico.

Quantitative objectives for public policies are gradually being introduced (e.g. for water, with others in preparation for energy and industry). Such objectives are needed in other important policy areas (e.g. waste) so that progress can be monitored more closely. Reviewing the environmental performance of individual states or overall regions should prove useful. Protecting health and improving the level of education, prerequisites for sustainable development, would help reduce the very large inequalities in the distribution of wealth and improve conditions for the large fraction of the population that lives in extreme poverty.

In the industrial sector, a number of large firms in Mexico meet most national and international environmental standards and many are increasingly aware of their environmental responsibilities, including for risk prevention. But most of the country's vast number of small and medium-sized enterprises do not comply with environmental standards. Facing severe economic difficulties, they continue to use old technologies and find it hard to make a strong effort to protect the environment or prevent risks to workers and the neighbourhood. The role of the banking sector in supporting environmental investments should be enhanced.

It is recommended that consideration be given to the following proposals:

- enhance institutional mechanisms to encourage better integration of environmental, economic, sectoral and social policies at the interministerial level, and require environmental authorities to be present at decision-making level in relevant federal commissions, committees and councils;
- set qualitative and quantitative environmental objectives as part of the planning process; identify the corresponding means of financing; establish a mechanism to track environmental performance at national and subnational levels;
- reduce subsidies and cross-subsidies with adverse environmental effects; identify current fiscal measures that have detrimental effects on the environment and seek to avoid such measures in the future, with appropriate attention to the specific needs of the poor;
- adopt an environmental policy specifically focused on small and medium-sized enterprises; develop medium-term contracts with trade groups; offer preferential lending rates and ease access to bank credits for such enterprises; accelerate the transfer of clean technology from larger to smaller firms; encourage environmental partnerships between larger and smaller enterprises;
- promote changes in consumption and production patterns by providing appropriate information (eco-labelling, eco-certification) and environmental education and by ensuring that prices fully reflect environmental costs (e.g. for water and energy) while giving attention to the special needs of the poor;
- accelerate the greening of government operations;
- further develop projects aiming at sustainable management of natural resources and income generation in economically depressed areas.

***Sectoral integration: energy***

Mexico is endowed with considerable reserves of oil and natural gas and significant hydroelectricity resources. These have enabled it to develop very rapidly and to build up a significant industrial sector. In per capita terms, Mexico's energy use and pollutant emissions are much lower than the levels in most other OECD countries. On the other hand, energy intensity (energy use per unit of GDP) is large and growing in Mexico at a time when for the OECD as a whole it is decreasing. $CO_2$ emissions are growing quite rapidly.

Mexico has created a formal body, including representation from several of the relevant public authorities, to deal with energy and environmental issues and has implemented an effective policy to improve fuel mix and quality so as to reduce pollution from $SO_2$, CO, particulates, lead, aromatics, olefins and benzene. To reduce air pollution levels in zones designated as critical, fuel oil is being replaced by natural gas and cleaner transport fuels are being put on the market. Much of the change in fuel use and composition is due to PEMEX and CFE (the state hydrocarbon and electricity monopolies). Electricity savings are being promoted through standards and specifications for certain products. Measures so far have led to reductions in pollution emissions from overall energy use. In urban areas, closer co-operation among public authorities has resulted in better integration of environmental concerns in energy and transport policies. Environmental impact assessments, environmental audits and risk assessments are being carried out in the energy sector, and PROFEPA has been inspecting energy facilities and has established agreements with PEMEX and CFE to carry out environmental audits.

Because energy has been inexpensive for years, energy conservation efforts are not very widespread. An increase in energy prices to internalise energy-related externalities, provided that it took social aspects into account, would increase public awareness in this area and lead to energy saving. Avoidance of accidents and reduction of environmental damage will require a continuing effort from the entire energy sector, in association with environmental administrations. Further efforts will be required to reduce air emissions caused by transport and to integrate more closely environmental considerations in overall urban and transport policies.

It is recommended that consideration be given to the following proposals:

- promote improvements in energy efficiency through energy standards, voluntary programmes and fiscal incentives, giving special attention to measures that are justified economically, regardless of any direct environmental benefits;
- remove subsidies or cross-subsidies on electricity and gas prices, providing instead direct income support if needed for social reasons;
- increase levels and adjust the structure of energy and transport fuel prices by raising energy taxes to internalise energy-related externalities and to provide incentives for energy efficiency, taking into account the specific needs of the poor;
- ensure that PEMEX and CFE act as partners in the development of environmental policies and that their facilities serve as an example to Mexican industry in the area of energy saving;
- increase the use of renewable forms of energy;
- combat air pollution from energy use in urban areas by increasing the penetration of natural gas and reducing emissions from vehicles and filling stations;
- implement the national strategy to progressively reduce the rate of growth in emissions of greenhouse gases, which would strengthen current efforts to improve energy efficiency and conservation.

## 3. International Co-operation

***Achievements***

During the 1990s, Mexico has significantly increased its involvement in international environmental co-operation. It has ratified and implemented numerous international conventions and negotiated many new bilateral and multilateral agreements to help fulfil domestic objectives as well as promote international environmental co-operation. In addition, Mexico has adopted a new approach in its international relations and stresses the need for all countries to increase their role in environmental protection, at both domestic and international levels. As a new OECD Member country that is still facing many of the challenges of a developing country, Mexico must implement policies that foster economic development and also protect the local, regional and global environment, according to its means and obligations. Mexico has undertaken to implement all OECD Decisions and Recommendations concerning the environment.

Mexico has considerably strengthened its environmental protection activities along its northern border, which extends over 3 000 kilometres; it is participating in many activities with the United States to prevent transboundary air and water pollution and to better manage hazardous waste. The new Border XXI programme represents considerable progress from past approaches but is in a very early stage of implementation. Its financing is still an open issue, and external funding will probably be required. As a party to the NAFTA environmental side-agreement (the trilateral North American Agreement on Environmental Cooperation), Mexico is improving its environmental policies and benefiting from the experience of Canada and the US, particularly as concerns toxics and ecosystem monitoring. Funds are being released by the North American Development Bank for projects in border areas, and additional financing is available in a new North American environment fund. Mexico is an active partner in many joint activities concerning forestry and biodiversity.

Mexico has established closer links on environmental issues with countries of Central America, the Caribbean and South America. It is providing these countries with its own expertise and helping raise awareness of environmental issues. It is also actively participating in consultations within the Asia-Pacific Economic Cooperation forum.

Mexico has developed and is now using new fishing methods that avoid incidental deaths of dolphins and marine turtles through the strengthening of regulations, the use of turtle exclusion devices, and inspection and surveillance. It has promoted and supported international agreements on this issue and on responsible fishing. It has

also taken up responsibilities beyond its legal obligations under both the Montreal Protocol and the climate change convention, although it formally has developing country status in these two instruments. It has succeeded in considerably reducing its consumption of CFCs and is expected to ban their use in the foreseeable future. Mexico is making inventories of greenhouse gases and drawing up mitigation measures; in both cases, it acted very much in line with other OECD countries, even though it was not obligated to do so.

Mexico has taken steps to protect its marine environment, in particular by developing domestic oil pollution contingency plans in case of oil spills in domestic waters or through joint emergency plans in waters near the United States. It has been active in follow-up to the UN Conference on Environment and Development, especially with the creation of consultative mechanisms to implement Agenda 21, involving the co-operation of all stakeholders and all ministries.

***Areas for progress***

Given that Mexico's achievements at international level stem mostly from recent decisions, actual results are rather recent or forthcoming. Mexico has only lately adopted quantitative targets and schedules in its international environmental activities. Its funding for international projects has suffered because of financial demands of urgent domestic priorities.

The overall environmental situation along some stretches of the northern border (e.g. as regards water quality, air quality and waste disposal) has continued to deteriorate. In spite of measures taken by Mexican authorities, pressure from rapid economic and demographic growth has led to transboundary pollution. With a more proactive approach in the 1980s, many problems that became particularly acute in the 1990s could have been avoided. Lack of funding and bureaucratic obstacles may delay implementation of the Border XXI programme. The equal financing requirement of new trilateral institutions under NAFTA is likely to put a strain on Mexico.

Concerning climate change, Mexican emissions of $CO_2$, though fairly small, will continue to grow for quite some time. Measures are being taken to increase energy efficiency and reduce the rate of increase of $CO_2$ emissions, but they do not seem very significant. Little use is being made of economic instruments to provide incentives for behavioural change and encourage the use of cleaner technologies. Increasing energy prices would help create greater awareness in all sectors of Mexican society of the need to save energy, but a lack of clear targets hinders the development of appropriate policies and instruments. In the area of marine pollution, additional investment will be needed to meet international undertakings, and particularly to avoid pollution of the sea by oil, garbage and waste. In matters of international trade, close scrutiny should be exercised to avoid illegal trade in CFCs.

It is recommended that consideration be given to the following proposals:

- seek additional resources to make it possible to pursue international co-operation on environmental protection and nature conservation;
- continue to develop a more proactive position, reflecting OECD membership, on global environmental issues;
- further develop institutional capabilities and interministerial co-operation in border areas to solve transboundary environmental problems caused by economic development;
- establish long-term financing plans with state and local authorities to address water management issues arising along the northern border;
- integrate more closely the activities of various ministries concerning marine environmental issues so as to better protect coastal areas and the marine environment while developing economic activities linked to the sea (tourism, fisheries, offshore oil industry, maritime transport);
- invest in port reception facilities so as to be able to ratify the related MARPOL Annex V;
- implement a national strategy to combat climate change, including clear targets, and select effective regulatory and economic measures to reduce growth in $CO_2$ emissions;
- seek additional international funding to protect the country's rich biodiversity.

# NETHERLANDS

## CONCLUSIONS AND RECOMMENDATIONS*

The very high densities of both population and economic activities in the Netherlands have led to very intense pressures on its environment. Environmental protection came to the forefront of the country's agenda in the late 1980s, and the Government began to promote sustainable development nationally and internationally.

Today, planning and consultation on environmental issues have been developed in line with the country's tradition in planning and consensus building. Environmental policies focus on problems of climate change, acidification, eutrophication, dispersion of toxic substances, disposal of waste, disturbance, water depletion, squandering of resources and nature protection. The challenge of implementation of these policies lies in achieving the ambitious targets which the Netherlands has set for itself, by mobilising various levels of government and societal target groups and using a wide array of policy instruments.

Environmental issues in the Netherlands have a strong international dimension because of regional environmental interdependencies (e.g. transfrontier air and water pollution, North Sea pollution), regional economic interdependencies (due to the Netherlands' open economy and role as a "gateway to Europe") and global environmental issues (vulnerability to climate change and sea level rise, importance of trade and environmental aid).

This OECD report sets out the baseline for assessing future environmental progress and examines the environmental performance of the Netherlands in three major areas:

i) integrating environmental and economic decisions;
ii) implementing environmental policies;
iii) international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This assessment includes both domestic objectives and international commitments, and is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in the Netherlands.

### 1. Integrating Environmental and Economic Decision Making

Despite progress made in decoupling the generation of some pollutants from GDP (e.g. $SO_x$ emissions in air, BOD discharges in water bodies), the Netherlands is aware that the intense pressure on its environment and the accumulation of pollution on its territory call not only for traditional environmental policies but also for strong integration of its environmental and general economic and sectoral policies.

#### *Integration and sustainable development*

*The Dutch approach: environmental planning and consultation*

At the end of the 1980s, the Dutch Government strengthened the Ministry in charge of the environment (VROM), increased the human and financial resources dedicated to environmental activities at central, provincial and local levels, and adopted a series of new environmental plans.

Dutch environmental planning identifies eight priority themes, defines general goals and ambitious quantitative targets with deadlines, describes broad measures to reach these targets and estimates the associated costs. It also identifies nine target groups. The National Institute of Public Health and Environmental Protection annually provides advice to the Government on the state of the environment and on progress with the implementation of environmental plans. Dutch environmental planning is indicative, comprehensive, action-oriented and based on some of the most innovative and sophisticated analytical work in the world. There is much to learn from it for other countries. So far it appears successful, but there are delays in reaching a number of targets, and implementation requires sizable human resources as well as strong political support.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its November 1994 meeting.

The general planning approach in use in the Netherlands necessitates a very high degree of co-ordination among national ministries; environmental plans have to be co-ordinated with a number of other national sectoral plans, the more so because VROM covers only some of the fields relating to environmental policy. Integration of environmental policies with other national policies remains in most cases voluntary. Integration among the actions of central, provincial and local government is also critical.

The Dutch Government considers it important to seek consensus on all aspects of its environment policy. Extensive consultation takes place with various social partners and NGOs. Much information is provided on all aspects of environmental problems and their possible solutions. The general approach of full disclosure is a characteristic element of Dutch environmental policy. The quality and quantity of printed material released to the public are among the highest in Member countries.

*Towards sustainable development*

Sustainable development is a key issue in the Netherlands, because the Government has resolved to reach sustainability by 2010, i.e. within one generation. At the same time, growing pressure is being exerted on the environment due to, *inter alia*, the growth in the transport sector and a number of largely unsolved problems in the agriculture sector. Moving towards less pollution and less environmental degradation, while also increasing economic activities in a crowded territory, is a challenge which will be difficult to meet and which will entail large expenditures and a shift towards production and consumption patterns that impose a lighter burden on the environment.

The environmental planning effort that is being carried out to define sustainable development in concrete terms, and the rapid growth in environmental expenditure during the 1990s, are signs that problems are being addressed seriously. However, strong political determination and public support will be needed to allow environmental expenditures to grow as projected.

An equally strong determination will be needed to induce the changes of production and consumption patterns that are being advocated. In particular, economic signals will have to incorporate more fully environmental "externalities". New economic instruments designed to induce appropriate behaviour could be introduced without increasing the overall tax burden. While there is wide support for shifting the tax basis from labour to natural resources and pollution, a significant increase in energy tax to induce more energy saving, as already proposed, has not yet been introduced. However, the Government intends to introduce from 1996 onwards a significant energy tax, either following european decision-making or a tax of its own for smaller energy consumers. Subsidies and other Government financial interventions should be scrutinised from an environmental point of view. A number of environmentally harmful subsidies should be eliminated.

The concept of sustainable development could be further specified in terms of land use goals and targets, which so far, have been relatively absent in environmental plans. As part of the ongoing efforts to better integrate environmental concerns in major economic and sectoral decisions, there is a particular need for extending the use of environmental assessment to projects, programmes and policies which have far reaching effects on land use and infrastructure construction.

*Further progress*

It is therefore recommended that consideration be given to the following proposals:

— implement environmental plans with steadfast determination and along the lines already defined;
— intensify efforts to integrate environmental concerns into policies and budgets formulated in the different administrations and economic sectors; in particular, this integration should be strengthened in the transport and agriculture sectors (see below) and in fiscal policies; specific attention should be given to environmentally harmful subsidies and fiscal deductions;
— integrate environmental assessment earlier in the decision making process to influence choices concerning plans, policies and programmes;
— extend the use of land use planning and regulation to serve pollution abatement, nature conservation and risk prevention.

***Sectoral integration: transport***

Since the beginning of the 1990s, both environment and transport planning have been linked to the concept of a sustainable society. Quantitative targets are established for levels of transport activities, capacity of facilities and pollution levels. Structural features of the transport sector include a relatively high share of public transport and cycling in passenger transport, and a relatively high share of inland shipping in freight transport. Regulations and incentives are used to promote the use of cleaner cars and cleaner fuels. Traffic management is well developed with focus on technical and physical measures and in association with land use planning in cities. Attention is given to the abatement of traffic noise.

However, the growth of traffic, particularly road traffic, tends to offset some of the environmental benefits of this comprehensive policy. Despite some progress for some pollutants (CO, lead, VOCs), the transport sector is a major contributor to $CO_2$ emissions (and climate change), $NO_x$ emissions (and acidification), noise in urbanised areas and fragmentation of natural areas. While formulating growth options and new transport facilities, it is necessary to give full and early consideration to their environmental impact. Today, it is questionable whether the transport sector in the Netherlands is developing in a sustainable way, and this is all the more significant given the importance of this sector within the Netherlands (6.4 per cent of GDP) and within the EC (one-third of international road freight transport, one-half of inland water freight transport).

It is therefore recommended that consideration be given to the following proposals:

— pursue determined efforts to meet the domestic targets adopted in NEPP and the international commitments of the Netherlands ($NO_x$ protocols, convention on climate change), including necessary structural changes in the Dutch transport sector and review of road traffic and freight transport growth options;
— implement a comprehensive set of measures to discourage road transport and promote the cost-effectiveness of alternative modes, including inland shipping and public transport;
— develop the use of economic instruments (including road pricing in urbanised areas and fuel taxation), when and where economically and environmentally effective, and eliminate fiscal deductions for commuting by car;
— expand public involvement and the application of environmental assessment in the definition of transport policies and infrastructure.
— improve accident prevention and preparedness, in connection with the transport of hazardous goods.

***Sectoral integration: agriculture***

Against the backdrop of intense pressures on the environment from agriculture, the concept of sustainable agriculture has been adopted by the Dutch Government. Taking into account the goals, opportunities and constraints of the EC Common Agricultural Policy, the Ministry of Agriculture, Nature Management and Fisheries has reformulated its policy for the sector, and backed this up with environmental targets that are ambitious but also necessary to bring agriculture to a sustainable level. Corrective actions have been taken; co-operation is currently good between the agricultural and environmental administrations, the water boards and farmers' and non-governmental environmental organisations; the enforcement of agricultural regulations is being improved; part of the agricultural research and advisory service efforts have been redirected to address environmental concerns; and programmes to better integrate nature protection concerns in agriculture have been set up. Concerning results, Dutch agricultural production was 39 per cent higher in 1991 than in 1980, whereas agricultural annual emissions of nitrogen, phosphate, ammonia and pesticides to the environment had been reduced between 5 and 12 per cent.

These emissions still remain far in excess of sustainable levels. Also, due to past accumulations and continuing mineral (nitrogen and phosphorus) surpluses, eutrophication will continue to affect water and soil. Further, trends in water depletion (and consequent dessication) and contamination of groundwater by some pesticides and nitrates have not been reversed. While several of the 1994 interim targets have been met, the targets for the year 2000 will be much more difficult to achieve: they are more demanding of farmers and regulations will be harder to enforce. In order to make further progress, decision makers should recognise and accept that the domestic targets and international commitments cannot be achieved without structural changes in Dutch agricultural production.

It is therefore recommended that consideration be given to the following proposals:

- pursue determined efforts to meet both the targets adopted in NEPP and the international commitments of the Netherlands (EC directives concerning nitrates and groundwater, North Sea Conferences), and make the necessary structural changes in Dutch agricultural production;
- identify and remove barriers that may exist within the administrative and legal frameworks to deal with social consequences of the move towards sustainable agriculture;
- ensure that the mix of regulatory, economic, voluntary and other instruments (e.g. sophisticated monitoring and accounting systems) being aimed at farm level is transparent to farmers, remains enforceable in practice and is introduced in a timely fashion;
- continue efforts to reduce ammonia emissions and the high share of agriculture in the emission of acidifying substances;
- strengthen efforts to reduce the use of pesticides, with special emphasis on land-bound agriculture (e.g. arable crops and bulbs);
- ensure that research and development funds continue to be reallocated from traditional agricultural practices to sustainable practices, and that advisory services are used to their full potential.

## 2. Implementing Environmental Policies

### *Cost-effectiveness in pollution abatement policies*

Environmental legislation was consolidated and simplified by the passing of the Environmental Management Act in 1993. The central, provincial and local authorities have become more active in the late 1980s and early 1990s in making sure the activities of enterprises conform to the law and in monitoring enforcement of laws and regulations. Positive results of administrative and judicial action to protect the environment are accumulating and are already substantial. The results concern mainly point sources of pollution and large economic entities. As in other OECD countries, diffuse pollution and dispersed target groups, such as motorists and farmers, have not so far contributed their requisite share of environmental progress. Economic instruments are widely used in the Netherlands and include sizable pollution charges, energy taxes and a waste charge as well as subsidies and grants.

Economic instruments have often been used to support the financing of environmental protection. Overall environmental expenditure has been growing, from 1.1 per cent of GDP in 1980 to 1.9 in 1990, and should reach 2.7 per cent of GDP in 1995. This would place it among the largest in the OECD, reflecting the high level of environmental pressure as well as government commitment to move towards a sustainable development oriented strategy. So far, the implementation of environmental policies has created no substantial problems for the Dutch economy at the macro-level. Most of the costs of environmental protection are met by the polluters and users of environmental services.

Authorities are now expanding the use of social instruments: building consensus and encouraging voluntary agreements (covenants). As a result of a positive dialogue between the Government and the private sector, about 100 covenants were concluded in recent years. Progress has been made in the implementation of such agreements; they are stimulating cost-effective actions, and serve as more or less binding substitutes for regulation in a number of areas. However, should the environment cease to be a major public concern, it is not certain that these instruments would lead to substantial results. They must be used in association with other instruments and with mechanisms of accountability.

To further improve the cost-effectiveness of pollution abatement policies, it is recommended that consideration be given to the following proposals:

- pursue the already well developed efforts at all levels of government to enforce environmental laws and regulations;
- further expand the use of economic instruments (e.g. energy taxes, charges on fertilizers, water pricing, tradable emission permits), when and where economically and environmentally effective, as well as related legal instruments (liability, penalties);
- monitor the effectiveness of voluntary agreements, and ensure they are accompanied by proper accountability mechanisms and used, as necessary, in association with other instruments;
- proceed with the full implementation of the already adopted product policy;
- maintain the current strong efforts in public information and education on the environment;
- maintain investments and efforts in environmental research and development.

***Water***

Almost every water body in the Netherlands is under human control and managed through a sophisticated system. The physical infrastructure is now in place. Apart from the upgrading of sewage reticulation and waste water treatment, there is no need for further large scale works of the type built in recent decades. An appropriate legislative and policy framework for integrated water management is also in place, i.e. for managing water systems in relation to their surroundings and comprising i) the media water, suspended sediments, beds and banks or shores, and ii) their physical, chemical and biological components. Attention has shifted to policy implementation. Remarkable results have been or will likely be achieved: industrial discharges are expected to meet most of the targets set for 1995; municipal discharges already meet targets for oxygen demanding substances and will meet the 1995 target for phosphates; enforcement of the water management laws and regulations has improved.

However, insufficient results must be noted concerning eutrophication, toxic substances and the issue of water depletion (and consequent dessication). Quality standards for receiving water are still exceeded too often in too many places, particularly with respect to nitrogenous compounds, heavy metals and other toxic compounds such as pesticides. This is due partly to accumulated pollution, partly to diffuse domestic loadings, particularly from agriculture, and partly to transfrontier pollution. Water depletion beneath nature areas, caused by agricultural drainage and overextraction of groundwater, affects 10 per cent of the country and seriously compromises nature conservation policy.

It is therefore recommended that consideration be given to the following proposals:

— urgently implement further measures to halt and reverse water depletion under nature areas;
— pursue efforts to implement integrated water management policies in a cost-effective way, taking into account the relative contribution of various sources of pollution;
— ensure that water resources are priced effectively, in line with the user pays principle;
— pursue the renewal of sewerage networks and the installation of dephosphating and denitrification facilities in waste water treatment plants, in as much as need be;
— ensure progress in reducing diffuse emissions (e.g. nitrogen loadings from manure and excessive fertilizer use contributing to eutrophication), in line with international agreements (EC directives, Rhine Action Programme, North Sea Action Programme), through cleaner production techniques and changes in production patterns;
— pursue further cost-effective action concerning contaminated bottom sediments, with due regard to risk to human and ecosystem health.

***Air***

Since the mid-1980s, the Netherlands has improved its air management framework. Targets have been set for emissions reduction and ambient air quality. Nationwide emission control of $SO_2$, $NO_x$ and a number of hazardous pollutants from stationary sources has been introduced by way of regulations, along with effective permitting and enforcement. More recently, voluntary agreements have been added to the regulatory approach. Although they are still in the initial phase of implementation, some success can be recorded. Significant reductions of emissions and/or concentrations of pollutants have been achieved, particularly for $SO_2$ but also for black smoke, CO and lead.

Nevertheless, progress is not on track in a number of areas: acidity remains a major concern related to both domestic pollution and pollution from neighbouring countries; $NO_x$ emissions have not decreased significantly, and concern remains about the feasibility of meeting the Sofia Declaration target; VOC emissions have decreased, but further reduction is required to attain targets; $CO_2$ emissions have increased, up to 1992, declined in 1993 to the 1990 level, so that the interim target of stabilisation at the 1989/90 level in 1994/95 might still be within reach. Relatively low energy prices (e.g. natural gas, steam coal, electricity), high development of the transport sector and particularly road freight transport, and high emissions from the agricultural sector require further efforts from most target groups, including energy, industry, transport and agriculture.

It is therefore recommended that consideration be given to the following proposals:

— step up efforts to increase the effectiveness of the permitting and enforcement procedures at provincial and municipal levels, building on progress already accomplished;

- ensure the monitoring and effectiveness of existing voluntary agreements; encourage industrial branches and individual facilities to draw up their own programmes of emission reduction;
- review the potential of using economic instruments more widely;
- continue efforts to lower the energy intensity of the Dutch economy, through progress in energy efficiency and energy consumption patterns;
- strengthen measures to reduce the emission of priority substances and VOCs from stationary sources;
- strengthen the contribution of the agricultural sector (e.g. by further reducing ammonia emissions) and the transport sector (e.g. $NO_x$, VOCs, $CO_2$).

***Waste***

Waste management policy has been modernised with the adoption of the "waste hierarchy" objectives and related quantitative targets (NEPP) and a new legislative basis (1994). Both prevention of waste generation and recycling rely on voluntary actions, agreements (covenants), regulatory measures, or a combination of them. Thirty priority waste streams have been identified to facilitate action by target groups. Waste disposal is characterised by extended government responsibilities in incineration, controlled landfill sites, enforcement and co-ordination throughout the country. Hazardous waste management has improved through better enforcement and private initiatives; hazardous waste export has decreased. Since clean-up of contaminated sites started early in the 1980s, 1000 sites have already been cleaned; a comprehensive voluntary programme to clean up industrial sites has started.

There is, however, much to be done to bridge the gap between several policy objectives and present realities. Waste trends in the Netherlands are not encouraging so far: volumes of household waste have been increasing and per unit generation of municipal waste is high among OECD countries. Industrial waste also increased in the 1980s; waste prevention needs to be strengthened. In contrast, excellent results have been achieved through recycling: about 55 per cent of all waste is recycled; paper/cardboard and glass recycling rates are among the highest among OECD countries; separation at source of household waste and of biowaste for composting is successful and is expected to improve further. The proposed extensions of incineration and landfill capacities need careful consideration.

It is therefore recommended that consideration be given to the following proposals:

- strengthen efforts, including changes in production and consumption patterns, to reduce amounts of waste produced;
- accelerate the implementation and monitoring of voluntary agreements for priority waste, and complement them with deposit/refund systems and bans on landfilling;
- review planned increases of incineration and landfill capacities; ensure appropriate land use planning and public involvement in the planning of facilities; ensure that there is a market for the compost supply;
- pursue cost-effective recycling efforts, particularly with the improved recycling of commercial waste and a clarification of the roles of municipalities and industry in separate collection;
- monitor voluntary action to clean up contaminated sites and ensure adequate financing of government duties concerning landfill sites and orphan sites, possibly through a landfill charge.

***Conserving nature***

The situation of nature in the Netherlands is a cause for concern. Since the beginning of the century there has been a dramatic decline in the amount of natural area, and what is left has been severely fragmented. The number of plant species has also decreased.

The 1990 Nature Policy Plan presented a fundamental shift in nature policy and is now being implemented to protect what is left of nature and to create "new" nature. It is accompanied by an array of actions concerning rural areas, agriculture, forestry, landscape protection and land development. Progress is being made with the designation and establishment of new national parks. A start has also been made with the acquisition of new areas for inclusion in the National Ecological Network, but at a rate which is still too low to meet targets. The Netherlands has ratified all main international conventions concerning wildlife.

However, this is not sufficient by itself to safeguard the natural resources heritage of the country. The key to the ultimate success of nature policy in the Netherlands will be the reduction of pressures on nature: fragmentation,

desiccation, acidification, eutrophication and contamination. While there are some positive developments on most of these issues, the legacy of past pollution (e.g. accumulation of nutrients in the soil, contaminated bottom sediments) often means that it will be a long time before improvements will become visible. There has been no substantial progress in terms of the desiccation problems. Moreover, in view of some of the development decisions taken over the last few years, or being considered now (e.g. construction of major transport infrastructure, oil exploration under the Wadden Sea), the question arises whether new pressures are not being added at a faster rate than older ones are being reduced.

It is recommended that consideration be given to the following proposals:

— vigorously pursue the programme for protecting areas as national parks and in the National Ecological Network: ensure that targets are met, management plans are adopted and implemented, and rules applying within protected areas are enforced;
— continue action, with appropriate consultation with other North Sea riparian countries, to protect the coastal and marine environment further and to establish a number of marine reserves;
— better protect landscapes through the formulation of regional landscape plans and their effective implementation;
— integrate nature and landscape protection concerns further in agricultural policies and intensify measures to improve the vitality of forests;
— intensify measures to control the lowering of groundwater levels and consequent dessication in nature areas;
— extend measures to control and reduce the fragmentation of habitats, particularly with respect to existing and new transport infrastructure.

## 3. International Co-operation

International issues and international co-operation are of paramount importance in Dutch environmental policy. The Netherlands both imports pollution from a number of countries and exports pollution to its neighbours and the North Sea, and is also quite vulnerable to sea level rise. With its open economy, the Netherlands is very conscious of international competition and of the need to harmonise environmental efforts in Europe and address global environmental issues, in its own interest as well as in the interest of the international community.

*Achievements*

Because of these ecological and economic interdependencies, the Netherlands, over the last 25 years, has played a leading role in the solution of international environmental issues, initially in the area of transfrontier water pollution and later in the whole area of international environmental law. The Dutch Government has played leading roles in many international forums in the preparation and adoption of a range of international agreements aimed at ensuring better protection of the regional or global environment. Rapid progress was achieved concerning pollution of the Rhine, protection of the North Sea and controlling the release of ozone depleting substances, in particular.

Today, Dutch international environmental activities aim at elaborating further a strong European Community framework for environmental protection, enhancing regional co-operation and bringing together developing and developed states to face the global environmental challenges and promote sustainable development.

The level of development aid provided by the Netherlands is very high in relative terms and its environmental component is quite significant. New funding is provided to protect the global environment.

*Future progress*

Through a number of international agreements, the Netherlands is committed to reducing its own pollution in parallel with abatement brought about by other countries. Development options in agriculture and transport are creating very high environmental pressure domestically and internationally. Thus, further efforts will be needed to reduce emissions, especially those from diffuse sources, to match international commitments.

Co-operation with neighbouring countries has been strengthened by recent agreements. However, the shift from general commitments to precise actions presents a major challenge. Implementing international conventions and community directives in frontier regions will require further effort.

Co-operation at global level will require new and innovative procedures to ensure that responsibilities are actually shared and also differentiated. In particular, addressing energy-related problems, such as climate change, will demand expanded and sustained efforts, including further attention to natural gas and electricity prices which are relatively low compared to many EC countries. Similarly, controlling the import of tropical wood, while maintaining good relations with exporting countries, will be a challenging task.

It is recommended that consideration be given to the following proposals:

- ratify and implement recent international environmental agreements, such as those adopted within the framework of UN-ECE and the Council of Europe (Annex III);
- strengthen bilateral co-operation with neighbouring countries, in particular concerning pollution of transboundary rivers and co-operation on local issues (EIA and hazardous facilities);
- work towards solving diffuse source pollution problems, particularly from agriculture and transport, nationally and at EC level;
- strive to reduce energy consumption and emissions of greenhouse gases in the Netherlands by use of an appropriate mix of regulatory, economic and other instruments;
- rigorously pursue measures to implement the Montreal Protocol and related amendments for substances (other than halons and CFCs already banned) such as HCFCs and methylbromide;
- support the preparation of new legal instruments to handle relevant issues described in the Rio Declaration and Agenda 21, such as access to courts and liability;
- contribute to setting up an effective, equitable international system to identify and label wood harvested in a sustainable manner.

# NEW ZEALAND

## CONCLUSIONS AND RECOMMENDATIONS*

New Zealand's economy is highly dependent on its natural resources, which contribute to a large fraction of its exports. In order to ensure sustainable economic growth, these natural resources must be carefully managed for the benefit of present and future generations. The image of a "green and clean" country helps in the export of meat, wool, timber and fish, and attracts foreign tourists. To protect such an image, as well as the environment, New Zealand also needs to take strong measures to curb pollution, to manage the landscape and to protect its national parks and forests. This effort is made easier by the low population density, the absence of transfrontier pollution and the relative lack of old industrial zones with pollution legacies.

In the second half of the 1980s, successive governments introduced radical economic and institutional reforms leading to a more open economy with less involvement of central government, fewer regulations and fewer protectionist measures. The new environmental approach of New Zealand was introduced in 1991 and is still under development. It relies on legislation that establishes general goals to be achieved, along with principles and procedures to be applied, with clearly defined roles for central and local government. Mechanisms exist for central government to further refine the policy framework or to establish national environmental standards where these are justified. Local government has significant policy and implementation responsibilities for environmental management in New Zealand. Subnational authorities and their environmental responsibilities were both dramatically redefined in the early 1990s; these changes were an evolution of previous long-standing responsibilities for environmental management in New Zealand. Overall, environmental policies have undergone major changes and are still in transition.

The challenge of implementation of these policies lies in achieving the goals and targets New Zealand has set for itself, by mobilising the various levels of government and by using a wide array of policy instruments. Concerning international environmental issues, regional environmental interdependencies are limited but global environmental issues are very significant in New Zealand because of the importance of international trade and the strong public concern for global issues.

This OECD report sets out the baseline for assessing future environmental progress and examines the environmental performance of New Zealand in three major areas:

i) integrating environmental and economic decisions;
ii) implementing environmental policies;
iii) international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This assessment includes both domestic objectives and international commitments, and is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in New Zealand.

### 1. Integrating Environmental and Economic Decision Making

The interface between the environment and the economy is dominated by the economic and public sector reforms that took place after a recognition in the early 1980s that the New Zealand economy was grossly over-regulated and inefficient, to the extent that credit from international financial sources was becoming increasingly expensive. The economic reforms focused on encouragement of competition through deregulation and the removal of subsidies and other government intervention on corporatisation and, in some cases, on privatisation as government withdrew from its former commercial activities. The state sector reforms focused on clarification of the roles of agencies to remove conflicting objectives within individual agencies: new agencies were formed to separate policy, regulatory, operational and commercial functions. The reforms also focused on specification of objectives and on accountability of performance.

As a result, sectors such as agriculture, energy and industry underwent major transitions and now operate principally on the basis of lightly regulated market mechanisms. Although environmental concerns had little place in the restructuring process, the resulting changes have had and continue to have both positive and negative environmental effects.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its May 1996 meeting.

***Integration and sustainable development***

New Zealand has developed a coherent approach to safeguarding its natural resources in the Environment 2010 Strategy and the Resource Management Act (RMA), both of which focus on integrating environmental, economic and social concerns in a single process. The RMA's approach of protecting ambient environmental quality rather than regulating specific activities or pollutant discharges is fully consistent with New Zealand's emphasis on lightly regulated markets rather than extensive government control of private sector activities. The RMA places much environmental policy and planning activity with regional and local authorities. This is consistent with the principle of subsidiarity, which suggests that decisions should be made as close to the affected populations as possible. New environmental policies will further benefit from a strong tradition of local planning.

To be effectively implemented, New Zealand's ambitious overall strategy may require additional government effort. While local control is desirable for flexible, responsive environmental management, local authorities have been slow to carry out the many planning tasks that precede full implementation of the RMA. This is partly due to changes in which more than 700 local authorities were replaced by 12 regional councils, 74 territorial councils and four unitary authorities. While the ambient standards and guidelines are powerful in principle, they are also difficult to apply. In particular, they require a large amount of physical and economic data on the environment and a solid understanding of the economy-environment interface, neither of which is yet adequate in New Zealand. Consequently, many local authorities are still issuing resource consents based on technology or discharge standards. Additionally, the realisation of many environmental objectives and the internalisation of externalities depend very much on the RMA resource consent process: not only protection of water and air quality, but also biodiversity, habitat management, groundwater and climate change. In the absence of more detailed policy guidance from the central Government, local authorities may be unable to factor so many different considerations into the issuing of resource consents. The quasi-absence of quantified and dated national objectives and the many gaps in national environmental data make accountability elusive at national level.

It is therefore recommended that consideration be given to the following proposals:

- adopt more concrete goals and quantified targets with deadlines for environmental policy at all levels of government, taking into account pertinent data on the state of the environment;
- strengthen central government support to implementation of the RMA by providing local authorities with further policy guidance in selected areas, moving rapidly to strengthen data on the environment, and carrying out further research on the impact of human activity on the environment and how it can be minimised or mitigated;
- strengthen the effectiveness of the Parliamentary Commissioner for the Environment, for instance by increasing the number of studies carried out each year, as one way to improve implementation of the Environment 2010 Strategy;
- ensure a high degree of co-ordination and collaboration within and among all levels of government, the private sector and communities in order to make the RMA work; make greater use of multi-stakeholder decision-making processes and voluntary agreements so as to encourage constructive conflict resolution and facilitate the work of the Planning Tribunal.

***Sectoral integration: energy***

During the 1980s New Zealand started to take action to reduce the environmental impact of rapidly growing energy production and use. Since the early 1990s, the country has explicitly incorporated environmental protection, energy efficiency and the internalisation of environmental costs into the goals of its energy policy. It has created the Energy Efficiency and Conservation Authority and a substantial fund for encouraging household energy efficiency. For some time it has relied considerably on renewable energy sources (25 per cent); it is committed to increasing their use further by removing regulatory and institutional barriers to the use of renewables. Its air quality is generally good, except in certain areas, such as some urban centres. It has decided to ban the use of leaded gasoline from 1996.

New Zealand must ensure that these policy intentions and related actions are implemented vigorously and provide results. The results will need to be monitored and adjustment actions will need to be taken where justified. The reliance on voluntary compliance and public education may not be sufficient to move the country towards more environmentally sound energy use. Concrete actions are still required to internalise externalities in energy production and use and to eliminate remaining electricity subsidies. The lack of clearly verifiable targets and data by which to measure achievements makes it difficult to monitor progress in implementing the country's objectives. There are no environmentally based controls on vehicle emissions in New Zealand. The growth in energy intensity until recently

(the highest among OECD countries: up 39 per cent in energy supply per unit of GDP and up 26 per cent in energy consumed per unit of GDP, from 1980 to 1992) and relatively low energy prices (including the lowest electricity prices among OECD countries) leave much room for progress without significantly affecting the competitiveness of New Zealand's industry and products. Overall, much work remains on integrating environmental concerns into decisions concerning the energy sector.

It is recommended that consideration be given to the following proposals:

- continue to use and expand the use of ambitious quantitative targets for the country's environmentally related energy objectives, particularly with respect to energy efficiency, car emissions and greenhouse gas emissions; choose dates by which these targets are to be reached, specify who is responsible for achieving them and indicate how the public can verify their accomplishment;
- continue and step up efforts to improve energy efficiency in industry, transport, residences and commerce;
- pursue the wholesale electricity market reform and ensure that electricity pricing reflects all costs, including environmental costs; encourage open access to information about electricity production costs, supply and pricing;
- strengthen measures to internalise external costs of energy activities; this may involve stronger central government direction and technical assistance to regional councils to enable them to implement ambient air quality guidelines and help achieve climate change goals, and strengthened effectiveness and more openness in the use of environmental impact assessment of energy projects and programmes;
- introduce measures to control motor vehicle emissions: as soon as the two transport studies are completed, set firm dates for action to control air pollution and greenhouse gas emissions and to require drivers to assume the full social costs of their choice of transport mode.

***Sectoral integration: agriculture***

The impact of agricultural reform on the environment is generally considered to be positive in the short run. As a result of the elimination of most subsidies, there were reductions in the use of fertiliser, in the number of sheep and in the use of marginal land. Consequently there has been less pressure on water quality in rivers and less emission of greenhouse gases. Change in agricultural practices has led to a more diversified land use pattern through the expansion of forestry plantations and agroforestry onto farm land. The concept of sustainable land use has been promoted and widely adopted. In parallel, there has been widespread acceptance of greater individual responsibility for sustainable land management. The RMA is providing a good framework for the integrated economic and environmental management of land and water resources. Agricultural research resources have been redirected to better address environmental concerns and individuals have accepted greater responsibility for the management of risk associated with natural hazards such as droughts and floods, leading to more rational stocking rates and reduced land degradation. Export of agricultural products has not been affected by environmental concerns.

Because many of the environmental benefits of the agricultural reform process coincided with a short-term fall in agricultural production caused by a decline in prices on world markets, the net environmental effects of the reform in the longer term are less clear. Agricultural production and fertiliser use have started to grow again. The reform has led to a reduction of public intervention to protect land from natural hazards or to manage pests. Because of intensive agriculture on lowlands and the very large livestock population, water pollution is still a serious problem in a number of areas, and half of New Zealand's emissions of greenhouse gases come from agriculture. Given the lack of targets and indicators for environmental improvement, the impact of recent achievements cannot be assessed clearly. While the RMA is not yet being fully implemented, it is essential for regional and local councils to develop interim objectives concerning sustainable land management that are focused and result-oriented. The biodiversity, habitat and conservation values of remnants of indigenous vegetation on farm land, including riparian vegetation, are still threatened and should receive greater attention. Pest control management programmes, especially for possums, are not yet fully co-ordinated in some areas.

It is recommended that consideration be given to the following proposals:

- seek further integration of environmental concerns (soil erosion, water resource management, impact of agrochemical use and animal wastes, emission of greenhouse gases, protection of wildlife habitats) into actions taken by the agricultural sector;
- increase emphasis on mitigating the environmental effects of traditional forms of land use, particularly pastoral agriculture;

- develop the use of economic and other instruments, in order to internalise damages created by polluting activities related to agriculture;
- accelerate development of indicators of land and water quality in order to monitor the results of agricultural management and assess the feasibility of new approaches to environmental management;
- reassess the research and extension process with regard to agriculture and the environment so as to improve the access of land holders and regional and district officers to technical and scientific information;
- maintain efforts in possum and rabbit control and find alternatives to the use of Compound 1080.

## 2. Implementing Environmental Policies

### *Cost-effectiveness in pollution abatement policies*

In the RMA and other environmental policies New Zealand is placing emphasis on using market mechanisms to support its policies, on internalising externalities and on implementing the polluter pays and user pays principles as much as possible. The result-oriented approach has great merit from an economic standpoint and is very reasonable from an environmental standpoint, provided that results are really achieved and goals are met.

In this context, ensuring that prices reflect full environmental costs is essential if resource users are to factor in the full social costs of their resource use and consumption decisions. The reliance on market mechanisms is not likely otherwise to be adequate to manage the environment. Provision of environmental data to the public (and not only to those who buy them) is also an essential element of a democratic debate on ways to manage the environment. While public participation is a strong feature of New Zealand environmental management practice, it may be adversely affected by imposition of costs on the losing party in RMA consent disputes.

Economic instruments are a mechanism for cost internalisation; they could be used on a wider scale in New Zealand. In particular, pollution charges, water charges, energy taxes and waste charges could be strengthened. The major features of overall expenditure for pollution abatement and control in New Zealand are very poorly known, as is the source of the funding; thus it is impossible to assess whether the economic rationality of the new policy is achieved in practice. There is a need to develop concrete targets for environmental policies, with good monitoring of progress achieved as well as detailed examination of the costs involved. The current lack of targets and of economic and physical data is an impediment to pursuing cost-effective environmental policies. This approach ought to be corrected.

To further improve the cost-effectiveness of environmental policies, it is recommended that consideration be given to the following proposals:

- implement further the polluter pays and user pays principles through full application of the RMA and through use of economic instruments and appropriate water, electricity and road pricing;
- tailor environmental monitoring and reporting systems to the implementation needs of the RMA and ensure that they are nationally consistent; extend systems to include information about economic aspects of environmental policies;
- give high priority to completion of the first national state of the environment report and the development of a set of environmental indicators; appropriate Maori-inspired indicators should also be developed to support protection of Maori values;
- take additional measures to ensure that environmental organisations and community groups have opportunities to participate in environmental decision making; in particular, ensure that any costs they bear are not impediments to participation in resource planning and consent legal procedures.

### *Conserving nature*

Among OECD countries, New Zealand has one of the highest proportions of land area (30 per cent) included within a protected area system. It is a leader in the management of parks and protected areas. Public support of and appreciation for protection of the natural environment are high and as a result there is active community participation in issues associated with the natural environment and tourism in protected areas. Logging of indigenous forests outside protected areas has been significantly reduced by reforms in the forestry sector, an amendment to the Forests Act in 1993 that requires the approval of a sustainable management plan for each property where it is intended to cut indigenous forest, and two voluntary agreements between private forestry interests and

environmental groups regarding good environmental practice in plantation forestry. There is a commitment in the Environment 2010 Strategy to prepare a national strategy to maintain indigenous forests. With reform of the agricultural sector, the withdrawal of much marginal land from productive use has reduced pressures on biodiversity. There has been considerable success in controlling some pest species (e.g. rats), and considerable efforts are being made to control other pests (e.g. possums).

Exotic plants and animals endanger indigenous populations, particularly of birds such as the kiwi. Use of the RMA to achieve ecosystem management goals requires better data and skills. More effective ecosystem management would require particular attention to reinforcing the ecological viability of remnant areas, establishing and strengthening links and corridors and managing effects of external activities on protected areas. The programme to survey and identify unprotected natural areas and consequent implementation of protective measures is so slow that areas of biodiversity significance may be lost before it is completed. There has been only limited success in developing a comprehensive system of marine and estuarine protected areas. As a result of budgetary constraints and increased responsibilities, the capacity of the Department of Conservation to undertake effective management of protected areas has been affected, potentially threatening resource protection and visitor services. Recent decisions provide funding to comprehensively address these issues. Effective mechanisms to ensure that some of the economic benefits of tourism are applied to the management of protected areas have not been adequately developed. While the fisheries management programme provides a sound framework for sustainable use of fish stocks, problems still exist with some fish stocks at levels below that which will support the maximum sustainable yield.

It is recommended that consideration be given to the following proposals:

- expedite the programme for survey and assessment of unprotected natural areas and provide for more effective implementation of programmes resulting from the assessments;
- encourage effective ecosystem management irrespective of land tenure and use;
- identify and reserve an adequate and representative sample of marine ecosystems within a system of marine and estuarine protected areas;
- develop opportunities for greater Maori ownership and/or management of protected areas;
- develop a national policy statement on biological diversity;
- ensure that the total allowable commercial catches for fisheries are set to move stocks to scientifically based assessments of maximum long-term sustainable yield.

***Managing water resources***

Thanks to a very low intensity of water use and low overall levels of pollutant discharges from point sources, New Zealand's rivers, lakes and groundwater generally present very high water quality. A long-standing tradition of catchment-based integrated land and water management planning has been integrated with all other environmental management under the RMA. The treatment of municipal and industrial waste water appears to broadly satisfy the goal of the Environment 2010 Strategy to ensure that "aquatic life is not significantly affected" by discharges. The greater accountability resulting from environmental and local government reforms has improved compliance with resource consents. There has been good performance in protecting rivers and lakes of outstanding natural value. Over the last decade, recognition of Maori values in respect of water has increased considerably and the participation of Maori stakeholders in water management decisions has become part of normal practice, even if it is difficult at times to reconcile differing value systems.

However, clean and plentiful water resources cannot be taken for granted. Erosion from steep grazing lands and the effects of intensive agriculture on lowland streams, rivers and aquifers, involving both point and diffuse sources, necessitate an integrated response from water managers and the farming sector as proposed in the Government's recent sustainable land management initiative. Existing monitoring and reporting systems cannot provide adequate information about the results of water management activities and it is not clear whether current conditions are stable, improving or deteriorating. Water planning and management need to provide better focus for managers and stakeholders alike by setting measurable objectives and obtaining good compliance with permits. Concerning public water supplies, insufficient attention has been paid to leakage control and demand management practices (including appropriate pricing mechanisms), even in areas where supply systems are stressed during droughts. Drinking water quality is not always satisfactory, particularly for the smaller supplies.

It is therefore recommended that consideration be given to the following proposals:

- pursue recent initiatives and strengthen measures to deal with point and diffuse sources of livestock waste from intensive agriculture;
- develop receiving water standards and measurable targets (e.g. reduction of pollutant discharges, compliance with water and discharge permits) for use in water management plans;
- continue to pursue good compliance with permit conditions;
- implement demand management practices, including pricing mechanisms that respect the user pays principle, particularly where water resources are scarce;
- strengthen drinking water quality regulatory procedures;
- continue to strengthen consultation with Maori stakeholders;
- encourage greater co-operation among regional councils to enable them to share costs and expertise;
- pursue flood plain management approaches to reduce communities' vulnerability to flood damage.

***Managing waste***

Waste management is mostly the responsibility of regional and local authorities, which have issued policy statements in this area. These bodies are committed to the waste hierarchy. The Ministry for the Environment has produced environmental guidelines for improving waste management. Recycling of post-consumer waste is organised in most cities. Waste minimisation is being sought through voluntary agreements (e.g. in the oil industry and for packaging) and increased composting of green waste. Strong efforts have been made to identify contaminated sites, and initial work is under way to clean up most hazardous sites.

New Zealand lacks comprehensive legislation dealing specifically with both waste and hazardous waste. However, clear responsibilities for this are set down in recent legislation. The whole area of waste management does not seem to be a priority for the Government. As a result, waste issues are poorly analysed and, in many cases, disregarded. Waste disposal relies almost exclusively on landfills and there are no adequate dedicated facilities for the treatment of most hazardous waste. Waste management policies and programmes are hampered by a lack of reliable, comprehensive information on sources of waste and waste generation at national level. Regional efforts need to be co-ordinated and harmonised. Efforts are also needed to assess: i) the environmental costs associated with improper waste disposal, and ii) methods for better monitoring and regulation of landfill disposal practices.

It is recommended that consideration be given to the following proposals:

- develop a national waste information database, including definition and classification of different kinds of waste;
- increase the involvement of the central Government in assisting regional authorities with guidelines on waste management practices, especially regarding assessment of environmental effects;
- implement specific legislation for the control, treatment and disposal of hazardous waste; take steps to facilitate the sitting of dedicated treatment facilities within the country and negotiate disposal agreements with other OECD countries, as need be;
- promote cleaner production and recycling, including waste reduction at source, creation of recycling facilities within the country or promotion of exports to other countries, by securing markets for recycled products;
- improve landfill disposal practices by tightening disposal standards, providing for the collection and treatment of leachate and closing substandard landfills;
- introduce disposal charges, taking account of present real and future landfill costs;
- clean up those contaminated sites that present the highest risks of contamination to waterways and aquifers.

## 3. International Co-operation

New Zealand's international environmental policy has improved considerably in the past ten years. This policy, which takes into account both resources and pollution issues, has been conducted and co-ordinated with the involvement of many ministries and has achieved good results. New Zealand has promoted full protection of Antarctica and of whales and marine mammals in the South Pacific Ocean. It has worked towards bans on drift-net fishing and supports sustainable management of straddling fish stocks. It has taken many domestic measures to protect endemic species, indigenous forests and sites of international significance. Concerning protection of the sea, New Zealand has supported bans on dumping of radioactive waste, as well as further international co-operation on land-based marine pollution. To enforce international safety rules, all relevant ships are now inspected. Imports of

ozone-depleting substances have been banned in line with international commitments. Net emissions of greenhouse gases are declining. Co-operation with South Pacific island states has been strengthened and official development assistance to those states has increased while the environmental component of aid has been reinforced, taking into account differences in cultural and environmental characteristics. Economic instruments have been used to promote phasing out of CFCs, inspection of ships and building up of oil spill response equipment.

These significant achievements have for the most part been accomplished rather recently, and will require further efforts for full implementation and funding. In particular, much work remains to be done on marine resources, marine pollution and maritime transport matters. The policy of setting up a nuclear free zone in the South Pacific has taken time to be entirely effective. Emissions of $CO_2$ are growing at a fairly high rate and there are still many unanswered questions on the actual amount of enhancement of carbon sinks. Projected gains in energy efficiency do not appear very significant. Official development assistance has been declining and as a percentage of GNP is below the OECD average. Despite considerable success in altering production patterns in agriculture by eliminating most subsidies, price distortions remaining in the energy and transport sectors affect, among other things, the effectiveness of climate change policies. As a result of unchanged consumption patterns, pressure on the environment is likely to grow, especially in urbanised areas.

It is recommended that consideration be given to the following proposals:

- ratify and rapidly implement international conventions related to protection of the marine environment (see Annex III);
- fund activities aimed at protecting coastal waters and marine resources and at ensuring oil spill preparedness;
- increase the role of the Ministry for the Environment concerning protection of the marine environment;
- examine more closely the fate of existing CFCs in the domestic context and advance work on methyl bromide;
- introduce the foreseen carbon tax if New Zealand will not achieve its commitments without further policy measures and start preparing additional legal measures to implement its climate change policy, including, as need be, a national policy statement on climate change;
- work out ways and means in New Zealand to promote experimenting with joint implementation in the area of climate change and to monitor closely trends in emissions and sink enhancement;
- develop a national biodiversity action plan;
- increase the level of environmental aid to South Pacific countries;
- give full recognition to the polluter pays principle, the user pays principle and the precautionary principle as basic principles of domestic environmental law.

# NORWAY

## CONCLUSIONS AND RECOMMENDATIONS*

Much of Norway's economic activity rests on the use of its natural resource base. Its abundant energy resources support growing oil and gas exports and a range of energy-intensive industries. Fisheries and related industries form the backbone of coastal settlements, and forestry contributes to rural employment in southern and central Norway.

Norway has an open economy highly dependent on international trade. Following strong economic expansion in the 1970s and the early 1980s, the fall in oil prices in 1986 initiated a recession that has proved the longest in Norway's post-war history, accompanied by growing unemployment. Awareness of domestic and international environmental issues has long been high, and Norway is exposed to air and coastal water pollution arising from emissions from other countries. These factors have resulted in Norway developing a considerable international environmental role.

The challenge to achieve sustainable development largely depends on Norway achieving its economic and environmental objectives through the integration of environmental, sectoral and economic policies, and through an effective combination of economic, regulatory and other policy instruments. Environmental issues under discussion in Norway include: climate change, protection of the ozone layer, biodiversity, acidification, eutrophication, toxic contamination and hazardous waste.

This OECD report sets out the baseline for assessing future environmental progress and examines the environmental performance of Norway in five major areas:

- nature conservation;
- pollution management: the cases of water and waste;
- sectoral development: air, energy and related issues;
- international co-operation;
- integration of environmental and economic decision making.

In each of these areas, the extent to which government policy objectives are being met has been assessed, including both domestic objectives and international commitments, and environmental effectiveness and economic efficiency criteria are taken into consideration. A number of proposals are put forward that could contribute to environmental progress in Norway.

### 1. Nature Conservation

Norway has one of the lowest population densities among OECD Member countries and possesses some of the most extensive tracts of wilderness in Europe. Wilderness areas are, however, under pressure.

#### *Terrestrial natural resources*

Norway has a high level of protection of terrestrial natural resources. Protected areas occupy 6.3 per cent of the mainland's surface area and a network of protected peat marshes, other wetlands and rich deciduous forests throughout all counties covers about 3 per cent of the total surface area of these environments. Fourteen wetlands areas were registered under the Ramsar Convention and ten new areas will probably be listed in 1993. Twenty per cent of the hydroelectric potential in watercourses are protected from hydropower development and strict measures have been taken to reduce pollution of lakes. Populations of wild ungulates are well balanced; however, the situation of large predators, except lynxes, is a source of concern. The amendment by the Parliament of paragraph 11 of the Wildlife Act in June 1993 should avoid abuses.

In the arctic zone, the Svalbard archipelago is recognised as a natural legacy of worldwide importance; continued protection and vigilance are needed because plans to extend tourism and mining operations and to open the northern part of the Barents Sea to oil drilling could seriously damage its wilderness areas.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its July 1993 meeting.

Norway's forest management meets the quantitative criterion of sustainability, though intensive forestry may pose threats to environmental values. The Coniferous Forest Conservation Plan proposes to protect significantly less than the 2 per cent of productive forests that was considered the scientific minimum to be preserved.

In order to conserve terrestrial natural resources for future generations and to maintain a high level of biodiversity, it is recommended that consideration be given to the following proposals:

- Although Norway has a large number of protected zones, it would be worthwhile to extend the protected zones to cover about 12 per cent of the mainland territory, as proposed by the Government in a report adopted by the Parliament in April 1993. The financial resources necessary for this extension should be made available so that the character of the wilderness areas may be preserved.
- The area of protected forest should be enlarged to cover a viable sample of all types of forest environments.
- To achieve sustainable management of the forest heritage, close co-operation would be needed between the Ministry of Agriculture and the Ministry of Environment.
- New measures are needed to protect rivers against damage caused, *inter alia*, by sand and gravel extraction, and to ensure that most of the remaining wild rivers remain intact.
- The survey of the state of Norwegian ecosystems and species should be completed, and research on the biology of indigenous species should be strengthened.

***Marine natural resources***

The key issue in fisheries management is now recognised: if sustainable levels of fish stocks are to be reached, strict adherence to specified total allowable catches (TACs) and quotas is needed. Norwegian fishermen by and large observe technical management requirements, rules for discard, quotas and other regulations. The control of fishing by foreign fleets of stocks under Norwegian management is not sufficient and is a major concern for Norwegian authorities.

The main fish stocks in the Barents Sea have recovered due to better natural conditions and measures taken by Russian and Norwegian authorities. The stock situation in the North Sea needs to be urgently addressed because European Community and Norwegian fishing is far above reasonable levels and for some stocks, notably cod and haddock, the situation could become catastrophic. While the overall aim of Norwegian fishery management policy is to create a sustainable, efficient industry, the specific objectives relating to fisheries and fishermen are sometimes conflicting.

In the area of aquaculture, the escape of salmon constitutes a potential threat that may decrease biodiversity of wild salmon in Norwegian rivers. Stricter measures should be taken to avoid further escapes.

Concerning marine mammals, Norway decided in 1993 to resume limited hunting of minke whales in the north-east Atlantic at a level that would not allow the current stock to be endangered. This decision goes against the views of the International Whaling Commission (IWC). The Norwegian side underlined that the decision of Norway was based on the unanimous recommendation of the Scientific Committee to the IWC to adopt the Revised Management Procedure for baleen whales.

In order to secure conservation and sustainable use of marine natural resources, it is recommended that consideration be given to the following proposals:

- Continued efforts are needed to integrate fishery management policy with other policies and to promote, in a wider context, the preservation of marine ecological balance.
- While multispecies management approaches are gaining importance and research in this area is encouraging, there is a need to accelerate the move towards managing fisheries on a sustainable and multispecies basis and taking stock interactions into account.
- Attention should be paid to the control of fishing by foreign fleets in Norwegian waters in order to secure adherence to TACs and quotas.

## 2. Pollution Management: the Cases of Water and Waste

Norway's approach to pollution control rests on ambient quality guidelines. The multimedia approach used in permit issuance, compliance inspections and audits, and enforcement proceedings ensures integrated environmental

management. This approach incorporates references to critical loads and levels, and to damage avoidance in pollution control regulations, and aims to allow cost-effectiveness to be taken into account in investment decisions.

***Water management***

Though Norway was in the past less equipped with municipal waste water treatment facilities than many other European countries, significant policy and financial commitments have recently been made with a view to improving domestic waste water management in the framework of the North Sea Declarations. Norway has substantially improved its performance in water management over the past decade. Data indicate that industrial discharges of nutrients and hazardous substances are decreasing and that appropriate investments are being made. Discharges from municipal sewage and agriculture have also been considerably reduced. It is recommended that consideration be given to the following proposals:

- In order to meet discharge reduction requirements, including for nitrogen, the programme of investments in waste water treatment should continue to receive high priority and corresponding funding.
- The acidity of southern Norway's watercourses and lakes still does not have a permanent solution, the root of the problem largely lying outside Norway's borders.
- To help reduce eutrophication of inland and coastal waters, the Norwegian agricultural sector should further reduce its nutrient discharges.
- The waste water treatment programme should focus more on contamination. A priority programme should be established for the 12 locations where there is a potential health risk from consumption of fish and shellfish and restrictions on commercial fishing are imposed.
- Since municipal sewage sludge is used in agriculture, treating industrial discharges before they go to municipal collection systems should be considered a priority.
- Though the intensity of use of water resources is relatively low, water for agricultural and industrial uses should be priced.

***Waste management***

Although no environmental problems associated with improper disposal by hazardous waste generators were documented during this review, the fact that an estimated 38 000 tonnes per year is unaccounted for should be cause for concern. The programme to identify and clean up active and inactive hazardous waste sites has started well. However, at present funding levels, it is not realistic to assume that financially viable solutions will be found for most sites. Concerning household waste minimisation and recycling, the combination of economic instruments and technical support used by the central Government and municipalities points to a sustained effort on the part of public authorities. It is recommended that consideration be given to the following proposals:

- First and foremost, a decision needs to be made to implement the national hazardous waste programme, notably with respect to the choice of methods and sites for treating organic hazardous waste. Implementation should then proceed as quickly as possible.
- Knowledge of hazardous waste generation and disposal needs to be improved.
- The assessment of active and inactive hazardous waste sites needs to be accelerated. Where problems are found, short-term measures need to be taken immediately. Long-term measures for soil and groundwater cleanup can be deferred until all the sites have been subject to an initial assessment.
- The costs of municipal refuse disposal should be clearly distinguished in municipal accounts so that refuse disposal charges can better reflect costs.
- The results of the house-by-house collection and recycling pilot projects should be put into wider practice as soon as possible. National programmes to establish markets for recycled material, such as those for glass containers and white paper, could be extended to other materials, such as other paper products, automotive batteries and tyres.
- Promoting waste recycling should continue; however, since several options exist for implementing waste collection, recycling and market creation, it would be advisable to evaluate their relative cost-effectiveness.

## 3. Sectoral Integration: Air, Energy and Related Issues

### *Air management*

Norway has carried out a very successful international policy aimed at solving air pollution problems — such as acid deposition — multilaterally, and has been active within the Nordic Council, the OECD and UN-ECE in creating scientific and political entities to collect the necessary information and draw appropriate Conclusions and Recommendations. It has subscribed to a broad range of percentage reduction or stabilisation targets for emissions in a number of international agreements, even though meeting such targets is often more difficult and costly in Norway than in many other OECD countries.

Norway's atmospheric emissions are largely concentrated in oil use in transport, industry and buildings, and in offshore oil and gas production. This concentration, along with the national emission targets Norway has adopted, presents a challenge for Norway's air management policy.

Satisfactory results have been achieved in some aspects of air management, with the support of a range of economic and regulatory instruments: substantial reductions in emissions of $SO_2$ and toxic substances such as lead, and the achievement of international and national $SO_2$ emission reduction targets. However, acid deposition has not significantly decreased in Norway and there is a need for additional measures to reduce $SO_2$ emissions in Europe. Emissions of $NO_x$, VOCs and $CO_2$ have recently fallen, though probably this is to some extent the result of economic and climatic factors. Norway is taking the lead in technology development, notably on VOC recovery in oil loading and development of clean technology for ship engines. It is recommended that consideration be given to the following proposals:

- The Sofia Declaration target of a 30 per cent $NO_x$ emission reduction by 1998 compared with 1986 levels is ambitious and will be difficult and costly to meet. Nevertheless, there is room for progress through the $NO_x$ Action Plan covering all sectors, including road and ship transport and offshore platforms.
- Norway needs to improve pollution control in its rapidly expanding transport sector. Cost-effective measures to encourage modal transfers, including investment, could play an important part in reducing $NO_x$ emissions. Institutional co-ordination and broad integration should be improved between the Ministry of Environment and other ministries, notably that of Transport.
- Efforts to apply cost-effective technology are likely to help reach much of the VOC emission reduction target, and the VOC Action Plan scheduled for the end of 1993 should ensure that further measures are considered if needed. Regulations on VOC emissions from offshore and onshore facilities could be progressively introduced.
- Norway should support activities aimed at introducing mechanisms of an interim nature for joint implementation of commitments and for financial transfers to facilitate more cost-effective regional reduction strategies for $SO_2$ and $NO_x$ emissions.

### *Integrating environmental concerns in energy policy*

With substantial oil, gas and hydro resources, Norway exports most of the energy it produces. With the production of these resources comes a number of environmental concerns, along with those related to Norway's own energy use. Achieving the objectives of Norway's energy and environmental policies requires a balance between energy resource development contributing to economic growth, and environmental protection. While Norway is active in the international debate on energy-related environmental objectives, the challenge to reduce domestic energy-related emissions is considerable.

Norway's efforts on energy conservation compare favourably with those in other OECD countries in recent years. Significant energy savings have been achieved in the industrial, residential and commercial sectors. Norway has been one of the OECD countries taking the lead on the use of economic instruments to integrate environmental concerns in energy policy.

Norway has adopted a preliminary target to stabilise $CO_2$ emissions at 1989 levels by 2000, and carbon taxation affecting a broad range of energy products and end-use sectors. The potential for further use of regulatory instruments for environmental protection is being explored, and the Climate Change Action Plan being developed will point to further opportunities to improve the integration of environmental and energy policies.

With the possible exception of the hydrocarbons sector, however, the $CO_2$ tax has a limited incentive effect. The Government recognises that $CO_2$ taxes will have to be higher if the stabilisation target is to be reached — indeed, higher than in most other OECD countries. Yet it is clear that Norway cannot be significantly out of line with its competitors without serious consequences for its industry and employment. As a result, Norway may find it difficult to reach its stabilisation target without additional $CO_2$ reduction measures.

In order to make significant progress in the integration of environmental concerns in the energy and transport sectors, it is recommended that consideration be given to the following proposals:

- Encouraging energy conservation and substitution by means other than $CO_2$ taxes should be fully explored.
- Given the limited impact that can be expected from recent tax changes for motor fuels, the transport sector is in need of further action, such as the promotion of fuel efficiency improvements and modal transfers.
- White papers, notably on transport and energy conservation, as well as the action plans on $NO_x$ and climate change, are all relevant to the environmental effects of the energy and transport sectors. Sectoral environmental plans covering energy activities and the transport sector could help integrate these initiatives, with the participation and co-operation of relevant ministries.
- Electricity prices charged to electricity-intensive industries should be continually monitored.
- Any subsidies would jeopardise possibilities for improving end-use electricity efficiency and would ultimately result in increased pressure on hydro resources. The potential for energy efficiency improvements, with respect to electricity demand, should be further evaluated.

## 4. International Co-operation

Although Norway is a small country, its international environmental role is considerable. Norway has fostered and implemented an impressive series of bilateral and multilateral co-operative agreements on environmental protection, supported by high-quality expertise from scientists and engineers in national laboratories and at international meetings. Norway has successfully supported the development of international environmental law and the endorsement of many significant environmental policy declarations. Its role in promoting sustainable development internationally is very significant. The Brundtland Report led to the Bergen Conference and was soon followed by the Rio Conference and the Lucern Ministerial Meeting. Norway's support of these events and their follow-up has buttressed and extended the international dimension of its environmental policies.

Norway is the top-ranking OECD Member country in terms of official development aid per unit of GNP and probably also in terms of environmental aid per unit of GNP. The share spent on environmental aid in Norwegian aid programmes is large and is supplemented by new and additional funds for global issues. Norway is a large contributor to the GEF in relative terms. It has supported environmental assessment of all major aid projects and has made similar assessments of its own projects.

Protection of the North Sea requires heavy investment to reduce discharges of nutrients and toxic substances, and Norwegian authorities, industry and farmers need to act rapidly to meet internationally agreed deadlines. Co-operation with Russia on local transfrontier issues has been successfully started.

Norway, which has no large-scale nuclear activities, is potentially threatened by radioactive pollution from nuclear reactors and waste in other countries. The newly established environmental co-operation with Russia should lead to a better understanding of problems and possible solutions.

Norway is also potentially threatened by oil pollution, not only from its own oil-related activities, but also from foreign oil fields and bulk-carrier and tanker traffic. Thus, it has valid reasons to give precedence to environmental protection requirements over industrial considerations. The risk of a serious oil spill and its effects on fragile ecosystems and fishing activities should not be underestimated.

In order for Norway to continue to take a prominent position in international discussions on sustainable development, it is recommended that consideration be given to the following proposals:

- Co-operation with Russia should be reinforced through training, technology transfer and the preparation of a plan for solving current issues, including appropriate funding.
- Prevention of oil pollution and the protection of the fragile arctic environment should be seen as a priority.
- Environmental expenditure by Norway for global or regional issues should be increased in parallel with progress on joint implementation mechanisms, notably in central and eastern Europe.

– Further development of effects-oriented, cost-effective environmental agreements, such as new $SO_2$ and $NO_x$ protocols, should be supported.

Furthermore, in international forums, Norway should continue to support:

– the further development of international law on the basis of the Rio Declaration, notably in the area of public participation;
– the pursuit of mechanisms for joint implementation of international commitments in order to solve regional or global issues.

## 5. Integrating Environmental and Economic Decision Making

Norway has not only been a pioneer internationally in support of sustainable development, but it has also made efforts nationally to integrate environmental and economic policies. It has progressed towards sustainable development by:

– adopting specific targets related to sustainable development and then seeking the most cost-effective ways to reach them;
– introducing many environmentally motivated taxes and other economic instruments and carrying out a comprehensive review of the potential future role of economic instruments;
– exploring the possibility of introducing fiscal reforms balancing a decrease in labor taxation and an increase in the taxation of natural resource use or pollution;
– updating a number of its regulatory instruments and instigating a comprehensive review of their performance and future role along with planning and economic instruments;
– strengthening land use planning legislation and practice, introducing EIA and including a significant environmental dimension in planning studies and budgetary documents;
– providing a great deal of public information on sustainable development and opportunities for public participation;
– strengthening institutional functioning, within the Ministry of Environment and as far as links between some ministries and county and municipal administrations are concerned.

These achievements represent a substantial contribution to the practice and knowledge of sustainable development. The goal, however, is long-term and much remains to be done. It is recommended that consideration be given to the following proposals:

– An overall national plan for the environment should be developed and adopted by the Government; cost-effective sectoral plans should be extended with involvement of the Ministry of Environment, taking into account the various reports to the Parliament.
– National goals should be translated into sustainable development targets for sectoral ministries. New targets should be set for environmental quality and stocks of key natural resources.
– Overall strategic planning should be reinforced within the Ministry of Environment, and co-ordination between the Ministry of Environment and other ministries should be strengthened through formal and informal mechanisms, including steps to ensure that all ministries assess the likely environmental effects of their policies.
– Detailed economic data should be collected to provide a clearer picture of the economic and financial implications of environmental goals and to help in assessing the cost-effectiveness of options to achieve them. Environmental information and evaluation should be better integrated within long-term programmes and national budget proposals.
– Land use and natural resource planning within the Ministry of Environment should be extended. The links between the EIA process and the decision-making process should be strengthened and studies should be made of the possible extension of some form of EIA to policies, plans and programmes.
– A review should be made of regulations (and economic instruments, for comparative purposes) relating to the conservation and use of natural resources. Studies should be made with a view to introducing natural resource pricing, improving evaluation of economic instruments and reviewing subsidy and tax concession programmes.

# POLAND

## CONCLUSIONS AND RECOMMENDATIONS*

Poland has undergone rapid economic changes since 1989 and has set itself the objective of reconciling economic development with environmental protection. Significant environmental improvements have been achieved, largely as a result of the contraction of economic activity and the restructuring of the industrial and energy sectors, but also as a result of environmental policies adopted and implemented.

With sustainable development as an underlying principle for the formulation of socio-economic policies, the challenge now is to reduce further the pollution and resource intensity of the Polish economy, as recovery and economic growth set in; the second challenge will be to promote convergence of environmental policies and conditions with western European and other OECD countries, in parallel with political and economic convergence.

This OECD report has set out the baseline for assessing future environmental progress and has examined Poland's environmental performance in four key areas:

— integrating environmental and economic decisions;
— reducing the pollution burden;
— conserving nature;
— strengthening international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This assessment includes both domestic objectives and international commitments, and is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in Poland.

### 1. Integrating Environmental and Economic Decisions

***Economic transition, environmental performance and environmental convergence***

In 1990, the environmental situation of Poland was characterised by a relatively wasteful use of resources (e.g. energy, water) and by a heavy pollution burden reflecting a bias towards heavy industry in the national product mix and an ageing, inefficient and highly polluting capital stock. The environmental situation, however, was not all negative: while 11 per cent of Poland was considered to be "severely environmentally threatened", 27 per cent was in a natural or close to natural state; pressures on the environment from transport, agriculture and the consumer goods sector were less, overall, than in OECD countries.

Economic reform and the contraction of economic activity reduced environmental pressures significantly. However, the decreases in pressures have often been greater than the decrease in GDP, pointing to the effectiveness of environmental measures. A National Environmental Policy was successfully launched with sustainable development as an underpinning principle. Economic instruments are used extensively. Poland has been remarkably successful in mobilising financial resources for environmental investment. These investments reached 1.3 per cent of GDP in 1992. Environmental investment in Poland is largely financed from domestic sources (including environmental fees and fines), with foreign assistance providing 4 per cent in 1992. An innovative development is the first debt-for-environment swap involving public (rather than private) debt.

Nevertheless, the pollution, energy and resource intensity of the Polish economy is still considerably higher than in OECD countries: by a factor of two for water and energy intensity; by a factor of three for municipal waste, $NO_x$ and $CO_2$; and by much higher factors for $SO_x$ and particulates. By and large, the major ministries have not internalised a commitment to the environment and existing arrangements have not been effective in holding them accountable for the environmental consequences of their policies: the environment is still seen as an expensive "add-on", which is the responsibility of the Ministry of Environmental Protection, Natural Resources and Forestry. Growth in the transport sector, particularly urban traffic but also motorway construction, as well as waste streams and the burdens they might place on municipalities, will deserve strategic consideration. Poland should reconcile the human and financial efforts and the speed of convergence with environmental conditions in OECD countries. This can be best achieved through the integration of economic and environmental decision making, the implementation of cost-effective environmental policies and the provision of adequate resources.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its November 1994 meeting.

To better integrate environmental and economic decisions, it is recommended that consideration be given to the following proposals:

- co-ordinate different national and international environmental planning activities within an implementation strategy for the 1991 National Environmental Policy. This strategy should include a programming framework, strengthened procedures for priority and target setting, and guidance for implementation and financing;
- strengthen the integration of environmental concerns into policies, budgets and projects formulated in the different administrations and economic sectors (energy, industry, transport, agriculture, forestry); specific attention should be given to environmentally harmful subsidies and fiscal policy;
- ensure that sectoral ministries give account on their efforts to integrate environmental concerns into their budgeting and financing processes;
- include environmental concerns in contractual voluntary agreements with specific stakeholders, such as industrial branches;
- use environmental impact assessments systematically for relevant projects;
- integrate environmental concerns fully into the different forms of privatisation, in particular liquidation and mass privatisation;
- strengthen access to environmental information and public participation;
- develop environmental education through increased use of mass media, the requirement of an environmental component in teacher training and the re-introduction of environment as a subject in the school curriculum.
- strengthen the capacity of the Ministry of Environmental Protection to fulfil its integrative role, which includes: evaluating the economic impact of environmental policies and the impact of economic policies on the environment; maintaining or developing links with sectoral ministries and the Central Office of Planning; providing support of interdepartmental committees; supporting environmental decision making at the local level; and expanding its international responsibilities, such as negotiating agreements, monitoring their implementation and participating in international work, in co-operation with the Ministry of Foreign Affairs.

***Sectoral integration: energy***

The development of the 1992 Energy Policy specifically included an analysis of industrial restructuring, energy efficiency opportunities and environmental policy options. The Energy Policy incorporates the objectives of the National Environmental Policy; as a result, there has been substantial progress in integrating environmental concerns into national energy policy and programmes, at least for the power sector. Poland has made major progress in bringing fuel and energy end-use prices towards market levels, in line with energy efficiency objectives and economic reform. Effective action was taken early in the transition period in lowering air emissions from the power sector through reductions in the use of low quality coal, the construction of plants to reduce coal sulphur content and improved particulate removal from exhaust gases.

Poland's energy intensity, however, remains very high. Although energy efficiency figures prominently in both energy and environmental policies, no major national programmes have been set up to promote energy efficiency, and the National Energy Conservation Agency was established only in 1994. The widespread use of coal, often of low quality, in household stoves and small boilers remains the single most important cause of poor ambient air quality in urban areas; the liberalisation of energy prices has encouraged low income families to use cheaper, lower quality coal. Major environmental problems created by underground mining, the discharge of saline water to the Vistula and Oder and the accumulation of mining waste, have not yet been tackled.

It is therefore recommended that consideration be given to the following proposals:

- pursue improvements in energy efficiency as one of the main mechanisms for reducing air pollution and as one of the country's most important energy "sources" in the near and medium term. A national programme should be launched to overcome barriers to energy efficiency in energy production and distribution, in industry, and in the residential and commercial sectors;
- reduce emissions of air pollutants from small-source combustion of coal, through fuel standards and taxes to favour the use of higher quality coal and through national and local plans to co-ordinate improvement of district heating systems, expansion of natural gas networks and promotion of energy efficiency in residential and commercial buildings;

— carry out a full analysis of the options for the control of environmental costs associated with coal mining, including saline water discharges, accumulated mining waste and land subsidence;
— expand research and development in alternative energy sources, with a focus on coal-bed methane, biomass and possibly wind power.

***Sectoral integration: industry***

Industry is a major sector of the Polish economy and an important source of pressure on the environment, mainly through atmospheric emissions, waste water discharges and waste generation. These pressures are reinforced by outdated technology, wasteful use of raw materials, a specialisation in heavy industry and concentration of industry in a few voivodships and "hot spots". Since 1989, Poland has achieved significant reductions in emissions. This reflects the fall in industrial production and the related industrial restructuring as well as the implementation of environmental measures. Enforcement has been focused effectively on the most polluting enterprises and on targeted areas such as Upper Silesia.

However, the goal of establishing adequate management for industrial and hazardous waste has not been achieved. Major investments to upgrade pollution abatement capacity are needed for both emissions into air and discharges into water bodies. This applies to many enterprises, and not only in "hot spots". Concerning industrial policies, it is not enough to rely almost exclusively on the benefits of industrial restructuring and modernisation for the reduction of industrial pollution. The integration of environmental concerns into industrial policies and practices is therefore now urgently needed.

It is recommended that consideration be given to the following proposals:

— integrate environmental protection measures into the practice of industrial management by fostering "good housekeeping" and environmental audits to identify low-cost solutions for environmental improvements, and by promoting environmental labelling;
— strengthen the institutional integration between the relevant ministries at the stage of industrial policy formulation — for instance, ensure that agreements between government and industry to restructure specific branches address environmental objectives, and assess future environmental pressures from new emerging industries; integration efforts should equally apply at regional level (e.g. Upper Silesia, Lód_);
— stabilise and further clarify the framework of environmental regulations, fees and fines for industrial enterprises, to reduce uncertainty about policy developments and allow for medium-term planning;
— further enforce environmental permits and related fees and penalties concerning air emissions and waste water discharges from industrial enterprises;
— when and where most cost-effective, promote investments in industrial pollution abatement facilities, waste management facilities and technologies that are cleaner and less intensive in water and energy use.

## 2. Reducing the Pollution Burden

***Air***

Poland has placed high priority on controlling air pollution. Air pollution problems have been clearly identified, the relationship between the problems and economic activities has been analysed, and priorities, goals and targets — some of them quantitative — have been defined at the highest government level and have received public support. Beyond these intentions, Poland has achieved considerable reductions in major air emissions over the past five years, notably from the power sector and industry. A mix of regulatory and economic instruments as well as increased financial resources have contributed to this achievement. The monitoring network for air pollution has been improved in recent years through efforts at both the national and voivodship levels and greater co-ordination between environmental and health authorities.

Despite these efforts, Poland's atmospheric emissions of pollutants such as $SO_2$ and particulates, as well as $CO_2$, remain very high compared with European OECD countries. Local air quality remains poor in many urban areas. Although emissions from power plants and industry have decreased, those from district heating plants and residential coal combustion have not fallen significantly. In addition, motor vehicles are creating a growing share of urban air pollution problems. Poland's legal framework for managing air pollution is complex and unwieldy for stationary sources, and is only being introduced and needs further development for mobile sources.

It is recommended that consideration be given to the following proposals:

- formulate implementation plans to improve air quality in local areas, starting with highly polluted urban areas; such plans should include intermediate target levels for air quality and cost-effective measures to reach these levels, including energy efficiency and fuel switching initiatives; mechanisms should be conceived to increase financing for such measures;
- reform the legal and regulatory system for air pollution control to improve its effectiveness and enforcement. This reform could take place in the context of harmonising air pollution regulations with EC directives, and of Poland's international commitments (e.g. UN-ECE protocols). It should focus on regulating a few, key air pollutants;
- renew efforts to contain or reduce environmental damage caused by Poland's growing stock of motor vehicles: extending UN-ECE emission standards to all newly registered automobiles; introducing emission standards for trucks and buses; developing a system of inspection and maintenance for in-use vehicles; considering the use of economic instruments, such as buy-backs, annual charges or customs duties, to ensure that highly polluting and obsolete vehicles are rapidly eliminated from the market;
- integrate transport and environmental policies at the national level, especially for major infrastructure decisions, and at the local level, for policy choices that affect public transport systems, traffic management and urban planning;
- for the longer term, ensure that sectoral air pollution reduction plans are formulated with participation from relevant ministries, enterprises and other interested parties, specifying intermediate and final target levels for emissions by sector and emphasising energy efficiency and the introduction of clean technology.

***Water***

Poland has placed high priority on dealing with problems of water quality and supply. It has channelled significant financial resources into water pollution abatement (0.5 per cent of GDP in 1992) and into the mobilisation of water resources (0.7 per cent of GDP in 1992). Economic instruments (fees and fines) generate the major part of the funds for pollution abatement. A new water law is in preparation and will provide, *inter alia*, for a more integrated and effective river-basin organisation of water management. Pressure on water quality through household, municipal and industrial discharges has started to decrease, partly as a result of environmental policies, partly as a reflection of the contraction of economic activity.

In spite of this progress, the overall quality of surface and coastal waters remains poor, due to significant water pollution at the beginning of the transition period, as well as financial constraints and lead times for the completion of waste water treatment plants in municipalities and industry. Improvements could be accelerated through more cost-effective spending on water pollution abatement. For instance, financing for waste water treatment plants is spread among several hundred communities; given resource constraints, the completion of biological plants is unlikely to occur in the near future.

Poland is relatively poorly endowed with water resources: this creates occasional problems of water supply and adds to the concentration of pollutants. Water prices for households cover only a minimal share of the actual cost of supplying drinking water. The absence of a metering system tends to further increase household consumption and undercuts efforts at demand management. Whereas urban drinking water quality is generally satisfactory, concerns remain with the quality of drinking water in rural areas.

Based on the above assessment, it is recommended that consideration be given to the following proposals:

- continue the successful efforts to reduce the pollution load from municipal and industrial sources;
- give high priority to the rapid adoption of the proposed new water law and continue the rapid implementation of river-basin water management;
- reassess priorities for the completion of unfinished waste water treatment plants — for example, spending limited sums on unfinished plants at strategic sites in order to provide mechanical or chemically enhanced mechanical treatment as soon as possible, deferring plans for more elaborate treatment until these can be assessed in the context of the relevant river basin;
- ensure that new waste water treatment capacity is accompanied by the necessary sewage collection network; examine and improve the efficiency of existing waste water treatment plants;
- continue efforts to improve the quality of drinking water supply in rural areas, and reduce wastage in the transport of drinking water in urban areas;

— consider, over the medium term, a gradual increase in water prices, as well as a rapid introduction of metering systems to link water bills more closely to actual water consumption.

***Waste***

Poland is one of the major producers of industrial waste in Europe: over 120 million tonnes of waste per year. Waste treatment capacity is extremely low in Poland: less than 1 per cent of industrial and municipal waste is treated through incineration or composting, resulting in heavy pressure on landfill capacity and the environment. Significant amounts of hazardous waste have accumulated in factories and landfills (estimated at over 400 million tonnes in 1991). Two-thirds of landfills do not meet the safety criteria or are unclassified.

Work is under way to formulate a comprehensive waste management law and to reduce gaps in legal and administrative regulations that tend to constrain implementation and enforceability. Excellent progress has been made in controlling the import and export of hazardous waste, through rapid co-ordination and effective use of the existing administrative structures. Fees for waste disposal constitute a major policy instrument. Fees are differentiated by toxicity of waste, thus giving an incentive to reduce the generation and disposal of environmentally harmful waste. Problems of enforcement exist, however, where the economic situation of major waste generators (such as coal mines) seriously impairs their capacity to pay fees.

It is recommended that consideration be given to the following proposals:

— give high priority to the rapid finalisation, enactment and implementation of waste management legislation and corresponding regulations to establish a clear framework for federal, regional and local authorities and the private sector; this includes the development of enforceable compliance schedules and efforts to promote low-cost interim solutions that will substantially reduce waste;
— continue monitoring efforts, particularly to assess hazardous waste disposal sites where significant risks to human health are suspected; where problems are found, priorities should be defined and short-term measures taken without delay;
— concerning industrial and hazardous waste, encourage waste reduction, reuse and adequate treatment, and give specific priority to: reusing fly ash and slag from coal combustion and pyrite tailings generated by the desulphurisation of hard coal; recovering and reusing metals from metallurgical waste; reusing phosphorus-gypsum derived from fertilizer production; constructing toxic waste incineration plants, in compliance with internationally recognised standards.
— increase opportunities for public involvement in waste management plans, improve access to information and reinforce the system of accountability for waste generators failing to meet requirements, including responsibility for damage.

***Cost-effectiveness in pollution abatement policies***

By 1991, Poland had already reassessed its environmental problems, and endorsed a National Environmental Policy that distinguished short-, medium- and long-term priorities. Further, environmental expertise and institutions were in place to implement pollution abatement policies using regulatory and economic instruments and specific environmental funds. A number of environmental decisions had already been delegated to voivodships or local levels of government.

Having achieved a number of successes in addressing its short-term environmental priorities, Poland now has to consolidate these results and to deal with its medium-term environmental priorities. This entails increased cost-effectiveness in addressing pollution.

Accordingly, it is recommended that consideration be given to the following proposals:

— reconsider ambient environmental standards so that they are realistically matched with emission standards, permits and the rates of fees and fines;
— complement economic and regulatory instruments by other instruments such as EIA, voluntary agreements and labelling schemes;
— review the cost-effectiveness of public expenditure on the environment in the forms of grants, loans and tax breaks and through environmental funds, with a view to assessing their environmental and economic effectiveness, as well as their compatibility with the polluter pays principle;

— examine pricing policies or tariff structures for such key natural resources as energy and water; aiming at greater environmental and economic efficiency;
— decentralise environmental management in accordance with the principle of subsidiarity and the objective of administrative efficiency.

### 3. Conserving Nature

Poland's efforts to protect plant and animal species have been substantial and, on the whole, quite successful. The system of protected areas has been significantly increased since 1989. The creation of new nature reserves and national parks, covering previously unprotected habitats such as wetlands and grasslands, is a particularly important achievement. The system now protects most habitats of international importance. The Green Lungs of Poland initiative is an innovative new regional programme: its lessons are likely to influence integrated plans for sustainable resource use in other parts of the country and in other central and eastern European countries.

The lack of implementation plans, however, has delayed progress in several policy areas; in particular, there is a lack of management of protected landscapes, which make up over two-thirds of the total protected area. Efforts are also needed for the protection of marine and coastal resources, within the context of regional efforts for the Baltic Sea. Often, responsibilities have been transferred to local authorities which lack the financial and institutional capacities for their new responsibilities. Current proposals to give local authorities a greater role in land use planning might only exacerbate these problems, create co-ordination difficulties and threaten national goals for protected areas.

It is recommended that consideration be given to the following proposals:

— develop management plans for each protected area and landscape park, as well as guidelines for the sustainable management of key ecosystems (forest, wetlands, wet and dry grasslands, rivers and lakes, coastal and marine areas, and mountains);
— make a critical assessment of the staff and funding levels needed to manage Poland's expanded system of protected areas and to implement fully the Bern, Bonn and Biological Diversity Conventions; consider more diversified funding mechanisms, including budgetary and environmental fund sources and both public and private sources; and improve the administrative capacity of the municipalities to undertake new roles for nature conservation;
— integrate environmental and nature protection concerns in agricultural and forestry policies, in order to promote farming and forestry practices that provide environmental benefits, in particular with regard to landscape protection, preserving biodiversity and preventing and controlling pollution from agro-chemicals;
— manage the development of rural and nature tourism to provide both economic development and environmental protection in the relevant areas of the country.

### 4. Strengthening International Co-operation

Poland has succeeded over the last few years in strengthening its international co-operation with industrialised countries and in building a positive image internationally as regards its endeavours to protect the environment. It has taken positive steps to ratify many relevant international conventions and agreed to move towards harmonisation of its environmental law with the laws of OECD Member countries and in particular with EC law. Co-operation with neighbouring countries has been strengthened and Poland has begun to share its environmental management experience with other central and eastern European countries. Poland has attracted more technical and financial assistance for environmental purposes from OECD Member countries than have other central and eastern European countries. To date, Poland has concluded debt-for-environment swaps with four OECD Member countries.

Emissions of $SO_x$ and $CO_2$ have decreased and consumption of CFCs and halons has been reduced. Progress has been achieved in the area of transboundary water pollution and protection of national parks of international significance. Co-operative agreements have been launched with European Member countries to combat transfrontier air pollution and to reduce pollution of the Baltic Sea.

At the same time, many measures required to meet international obligations are not yet implemented. New investment for pollution control has been made but results are not yet visible in many instances. Air pollution in the "black triangle" area is still severe because emissions and transboundary movements have not been sufficiently reduced. Polish emissions in the Baltic are still high. A number of international commitments may not be fulfilled because they

require investment that Poland may not be able to make in the coming years. In some cases, these commitments might even not be economically efficient for Poland.

It is recommended that consideration be given to the following proposals:

- continue and strengthen legal work aimed at introducing into Poland's laws the concepts and approaches developed in other European countries, such as the fundamental principles underpinning EC environmental law and recent international conventions;
- in order to achieve short- and long-term national and international goals, develop action plans and strategies that are implementable and do not exceed reasonably available financial means;
- make full use of opportunities for foreign assistance with the aim of further strengthening Poland's environmental management capacity, introducing cleaner technologies and contributing to the solution of priority international environmental problems;
- continue co-operation with neighbouring countries to solve severe environmental problems arising in Polish frontier regions;
- report regularly to international forums on progress actually achieved and obstacles encountered in the solution of international environmental problems involving Poland (e.g. transboundary air pollution in frontier areas and in Europe; pollution of international rivers and of the Baltic Sea).

# PORTUGAL

## CONCLUSIONS AND RECOMMENDATIONS*

Portugal has experienced a cycle of rapid economic growth -- one of the highest in the OECD -- since joining the European Community in 1986, and has set itself the objective of reconciling economic development with environmental protection. This growth is associated with structural changes --- industrial modernisation, a decline in agriculture, urbanisation of coastal areas, development of tourism --- and with regional disparities, and generates several types of pressure on the environment: natural resource use, pollution and the restructuring of land use.

The European Community plays an important role in Portugal's economic development, participates to a significant extent in funding environmental protection expenditure and influences Portuguese laws and regulations through its Directives on the environment.

Portugal is thus faced with the challenge of achieving economic growth and sustainable development, and ensuring economic and ecological convergence with other European countries.

The OECD's report has set out the baseline for assessing future environmental progress and has examined Portugal's environmental performance in three key areas:

-- integration of environmental and economic decision-making;
-- pollution abatement and natural resource management;
-- international co-operation.

In each area, the degree to which the objectives set by the public authorities have been achieved has been evaluated. National objectives are often of a general nature, but are sometimes more precise and quantified. This is also true of international commitments.

### 1. Integration of Environmental and Economic Decisions

#### Environmental performance, sustainable development and environmental convergence

Portugal's environmental expenditure has generated improvements in areas such as sewage treatment plants or regulated dumps. However, economic growth, industrial development and migration towards the coast and towns have all complicated the search for solutions by sometimes creating new environmental problems, particularly in mainland Portugal. They have affected the quality of life and the tourism industry.

Based on the information currently available, it appears Portugal, at its current level of pollution abatement and control expenditure, will find it very difficult:

(i) to pursue sustainable development and face up to the pressures caused by relatively rapid economic growth, and
(ii) to ensure environmental convergence, i.e. to attain a degree of environmental protection comparable to the European Community average.

The exact scope of the additional efforts needed depends on the transition period which has yet to be defined, the objectives set and economic trends during such period. Financing this effort within Portugal's budget will certainly cause problems. Its funding could thus be provided principally by (i) Community funds (and in particular cohesion funds), (ii) new charges paid by users or polluters, and (iii) new forms of partnership and sponsorship, in particular for natural heritage protection. The financial effort required may be reduced if environmental considerations were better integrated into economic decision-making, whether sectoral or not, and if various instruments (regulatory, economic and land-use planning measures) were used together.

Madeira and the Azores have achieved positive results in integrating environmental protection, tourism and more traditional activities.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its July 1993 meeting.

**Institutional mechanisms and instruments for policy implementation**

Measures taken since 1987 have enabled Portugal to acquire a coherent set of laws and regulations on the environment and associated institutions. The creation in 1990 of the Ministry of the Environment and Natural Resources and progress accomplished in inter-ministerial consultation on the environment should improve the efficiency of the central administration. Information on Portugal's environmental protection expenditure shows that measures have been taken and investment has significantly increased in recent years. The relationship with industry has been developed through voluntary agreements. Environmental impact assessment procedures are beginning to be applied to major projects as well as to activities financed by the European Community. Land-use planning and management are well developed in Portugal, particularly in coastal areas.

The adoption by the Portuguese Government of objectives concerning (i) State efficiency in implementing environment policy ("less of the State, but better") and (ii), the use of economic instruments (pricing and fiscal measures but also environmental investment) is strengthening the progress made. In this regard, it is recommended that consideration be given to the following proposals:

-- The report on the follow-up to the Rio Conference should serve as the basis for the development of a national plan on the environment. This plan should enable essential overall studies to be carried out, mobilise the various ministries and social and economic partners involved, and show the way to sustainable development.
-- The level of environmental expenditure and their funding mechanisms should be examined in depth.
-- Concerning economic instruments, it appears urgent to introduce pollution charges in order that environmental costs be taken into account and new financial resources generated at national and municipal level.
-- Implementation of regulatory instruments should be strengthened, in association with other incentive instruments. Efforts could be undertaken for infringements to be formally recorded, and in order that the courts play a greater role by setting penalties more frequently when serious pollution and other illegal acts occur.
-- Land-use planning and management could be made to play a preventive role in environmental policies. The Ministry of the Environment should strengthen its team of economists in order to better study and integrate costs, subsidies and damages relating to the environment into governmental policy. Economic information should be developed in association with other competent ministries and possibly with social and economic partners.
-- The progressive increase in demands for environmental protection should lead public authorities and industry to encourage the emergence of an eco-industry able to respond to such demands, in particular in the areas of water and waste.

**Environmental training and information**

The training and information efforts which should be made are all the more necessary and sizeable in Portugal, because communication between the administration, companies and the public can still occasionally be insufficient, as a result of habits inherited from the past.

Portugal's policy in this area was defined as early as 1987 and has been progressively implemented by the Ministry of Education and the Ministry of the Environment. The results obtained after only a few years are noteworthy but remain little known and, of course, limited:

-- The inclusion of the environment in educational policy is a good example of successful integration. This success results largely from the existence of an organisation with specific responsibility for these matters under the auspices of the Ministry of the Environment: the Institute for the Promotion of the Environment.
-- Public information policy is very complete and is aimed at the public, decision-makers, laymen and specialists. Collection of environmental data has been completed in a few years, starting from an unsatisfactory situation. The materials collected and distributed have had a positive effect on public awareness of environmental matters.
-- Actions intended to enable the public to take an active part in the decision-making process have been undertaken for some environmental problems. Although the issues submitted to public inquiry are still limited, this type of initiative, only five years after Portugal's framework legislation on the environment, is a highly positive sign of the Government's interest in public participation.

The Portuguese Government considers that continued efforts in environmental training and information are a priority. In view of the task ahead, such a policy requires an extension of the resources available. At the same time, it would be useful to make a detailed evaluation of the efficiency of those measures already taken, in order to avoid dispersal of efforts and to correct on-going strategies where necessary.

The central administration will have an essential role to play, though concertation with local authorities, environmental protection associations, unions and industry will have to be strengthened. The deficit of information and public awareness on environment could be reduced by the use of greater and more decentralised resources. The regionalisation of the public authorities' activities could be expressed through real administrative deconcentration and by involving the public through participation activities. A greater degree of transparency together with an improved communication policy on the part of the administration and industry should also be developed.

**Sectoral integration**: **air pollution, energy and transport**

In comparison to other European OECD member countries, Portugal's performance on air is characterised by a low total volume of atmospheric emissions and generally good air quality. However, emissions are increasing more rapidly and local atmospheric pollution problems occur in some urbanised and industrialised areas. The development of emission levels relative to GDP indicates that the economic growth of the 1980s was not accompanied by a comparable air pollution control effort. Today, legislation relating to the control of atmospheric pollution is progressing. Joint commissions enable concertation with industry and preparation of the introduction of new emission standards, made necessary by the adoption of European Community legislation.

During the past decade, Portugal's energy requirements and intensity increased at a rate which is one of the highest among OECD countries. In contrast to most of these countries, Portugal has become increasingly dependent on energy supply to achieve economic growth. On-going changes in Portugal's energy structure have already had a noticeable effect on $SO_2$ emissions in spite of increased coal use, due to fuel quality improvements. Energy product taxation has recently begun to integrate incentives linked to fuel quality, and in particular to sulphur and lead content, which have had a noticeable effect. The reduction in taxes on LPG is an encouraging example of the extension of this approach to alternative fuel use. However, a sharp drop in real energy and transport prices has been and remains an important factor in stimulating demand for energy and transport services. Electricity prices in particular reflect neither the economic realities of production, nor social costs.

In the future, it is probable that atmospheric pollution problems, and in particular those due to $NO_x$ emissions, will increase. The benefits of energy conservation efforts, the forthcoming introduction of natural gas and the success of co-generation may be more than compensated by very strong growth of the transport sector, particularly in coastal areas. Efforts to modernise and rationalise public transport represent a first step towards wider action in favour of modal transfers to less-polluting forms of transport.

The legislative framework is in place, and the main measures necessary to lessen the growing impact of energy and transport activities on the environment have been taken. The provisions of the framework law on air quality of 1990 which were the subject of a decree adopted in 1993, should be implemented. It is therefore recommended that the following proposals aimed at integrating environmental concerns into sectoral policies on transport and energy be considered:

- The strengthening of energy conservation measures, currently threatened by falling energy prices, and the implementation of an integrated development plan for the transport sector, could be made priority areas.
- Economic instruments should increase awareness of the real costs of energy and transport services, as well as of external environment-related costs. In this respect, it would be desirable to improve balance of taxation between vehicle fuels and other energy products and extend existing fiscal incentives so that they may better reflect environmental protection goals; to continue efforts to rationalise energy pricing, in particular for network energy sources such as electricity; and to extend this rationalisation effort to taxation on vehicle and road use.
- Large pollution abatement investments will be necessary, in particular in refining and electricity production.
- Taxes or charges on atmospheric pollution could encourage the development of less polluting facilities by improving the cost-effectiveness of pollution control techniques and clean technologies, and possibly contribute to financing improved energy efficiency and air pollution control investments.
- Environmental impact assessments should be systematically carried out at an early stage of the decision-making process for major energy and transport infrastructure projects.

## 2. Pollution Abatement and Natural Resource Management

### Water

In order to ensure long-term development of water resources, and to avoid water becoming a limiting factor in the development of dependent activities (industry, agriculture, energy, tourism), Portugal's water management policy is based on an integrated management structure within the Ministry of the Environment, which associates management of surface and underground waters, qualitative and quantitative management measures and management of use by various sectors, whilst relying on direct participation by other ministries. It also relies on the existence of a legislative and regulatory framework, the implementation of a water pricing system in most regions of the country and very positive activities and bilateral relations with Spain concerning common river catchment areas.

However, overall results are mixed. Although Portugal is well endowed with fresh water, regional shortages occur during the dry season. Concerning water pollution, information on trends shows an improvement in the quality of surface waters, but suggests some problems concerning underground waters; it provides a generally satisfactory overall picture for coastal waters, although local problems exist in several estuaries and lagoons. Overall, pollution levels have not increased, and they have even decreased in certain cases (such as the pulp and paper industry). This trend is positive, given Portugal's rapid economic growth and the generally satisfactory state of its environment. It must be noted, however, that Portugal remains under-equipped in sanitation networks and treatment stations for urban and industrial waste water.

It is therefore recommended that consideration be given to the improvements which may be obtained using the following measures:

- -- Strengthening of implementation of anti-pollution measures, with particular attention to local and upstream water needs, as well as to esturial, lagoon and coastal ecosystems.
- -- Development of all economic aspects of water resource management: economic evaluation of major water supply projects, self-financing of water distribution and pollution abatement activities, implementation of the Polluter-Pays Principle and the User-Pays Principle, use of economic instruments, evaluation of the use of subsidies, and increasing the financial resources of the Ministry of the Environment.
- -- Preparation of a special plan for the management of underground waters with a view to protecting their quality and ensuring reliable supply for uses requiring high-quality water.
- -- Acceleration of construction programmes for sanitation networks and treatment stations for municipal and industrial waste water, whilst avoiding pollution being aggravated by discharges from recent and new facilities, and making the best use of innovative technologies;
- -- Conclusion and implementation of "environmental pacts" with the various industrial sectors, associated with efficient monitoring mechanisms and their public access.
- -- A study of the creation of agencies centred on major water catchment areas to carry out integrated management of these areas: management of watercourses and underground water bodies, pollution prevention and control measures, monitoring of navigation, flood protection, and erosion prevention. The core of these agencies could be the existing regional Delegations of the Ministry of the Environment, and benefit from close and active participation on the part of the region's municipalities.

### Waste

Concerning waste management, for a long time the practice was to deposit waste in unregulated dumps, leading to pollution of the atmosphere and of surface and underground waters. Major efforts were undertaken from the mid-1980s: Portugal established an appropriate legislative framework for waste management and surveys and inventories were made to better evaluate existing problems. There was also investment to initiate the country's equipment in regulated dumps and sorting centres for urban waste, and measures were taken with industry to improve the management of industrial waste, for example through voluntary agreements on recycling, with encouraging results.

However, although the situation has improved, no solution has yet been found, and the Portuguese authorities feel that waste causes "major problems", which "must be dealt with urgently", and that the issue of waste and particularly that of hazardous waste, is "one of the most serious national environmental concerns".

From a technical as well as a financial point of view, efforts have already been made towards improving waste management. However, these efforts are probably not sufficient to avoid a worsening of the situation, and, even more so,

to reduce the growing threat to the environment resulting from increased waste generation. It is recommended that the following proposals be considered:

-- Portugal currently lacks appropriate facilities for the elimination of urban, industrial and hospital waste, and should implement the plans which have been adopted and invest in this area.
-- Financial incentives to encourage the appropriate elimination of waste should be implemented, based on the application of the Polluter-Pays Principle regarding investment and operating costs.
-- Mechanisms for inspection and penalty setting are not yet operating efficiently, thus encouraging the continued use of technically outdated and sometimes illegal practices; they should be improved in association with incentive or voluntary measures.
-- In order to increase public and industrial awareness and for future planning purposes, it would be necessary that national plans already adopted for waste management be more rapidly implemented, and in particular those concerning management of urban, industrial and hospital waste, after discussion with the various parties concerned. These plans, which contain targets, an implementation schedule and a description of the financial means needed, should also include a hierarchy for waste management in accordance with Agenda 21, monitoring and implementation measures, and an evaluation of actions which should be taken to clean up old "blackspot" sites.

**Soil and land use**

In the past, soil conservation policy has not been closely integrated with agricultural policy. The considerable changes in the share of land devoted to forestry, cereal cultivation, permanent cropland and pasture were linked to the implementation of a series of financial support programmes in favour of cereals, other crops and afforestation. However, these agricultural and afforestation programmes have limited soil damage. Recent regulatory developments have strengthened the trend towards improved soil conservation.

Nevertheless, serious soil degradation problems exist in large areas of the country, notably vulnerability to erosion. The development of eucalyptus afforestation has been called into question in debates concerning forest fires and soil protection. In recent years, measures have been implemented to take into account the impact on the environment of plantations of such rapid-growth species. Eucalyptus has no longer been given priority in plantation projects by public authorities since 1990. The increase in irrigated land may facilitate soil conservation whilst enabling improved management of cultivated land, but in some cases it can also cause new problems (salinity, erosion, water pollution). Finally, though the level of pollution by agro-chemical products is generally low, there are local problems which need to be solved by technical, informational and training means.

Today, Portugal is at a turning point as regards soil and land use management. The removal of national cereal subsidies and the need to restructure agriculture in favour of profitable crops will coincide with the objective of long-term preservation of the most fertile agricultural land and zones of ecological value. Forests have been recognised as an economic resource and as a soil protection tool. Pressures on high quality soil from urban and industrial development will remain strong in coming years. With current regional and communal planning process on the one hand, and the National Agricultural Reserve and National Ecological Reserve systems, and protected areas network on the other, Portugal has the legal and institutional means to ensure coherent land-use planning whilst taking account of ecological issues.

The next five years will be decisive. It is therefore recommended that the following proposals be considered:

-- Environmental concerns should continue to be integrated into financial support programmes for afforestation and for conversion to permanent cropland and pasture.
-- Development of incentive and information programs aimed at changing agricultural practices such as irrigation, use of chemical fertilizers, holding size, etc., should be pursued.
-- Co-operation efforts between the Ministries of the Environment, of Planning and Territorial Administration, and of Agriculture, in particular regarding measures relating to agriculture, forests, water, land-use planning and tourism, should be strengthened.
-- Priority should be given to the completion of regional land-use planning documents.
-- The National Ecological Reserve should be provided with adequate working means.
-- Strict observance of regulations concerning protected areas should be guaranteed; their size should be increased and an objective of about 10 per cent of the territory could be set for these zones.
-- The public and NGOs should be more closely associated with the management of protected areas and land-use planning processes.

## 3. International Co-operation

Bilateral relations in the environmental field are highly satisfactory and Portugal now participates in a large number of international agreements. The integration of the principles of European Community environmental law into Portuguese legislation is well advanced. Measures have been taken to protect important natural areas and certain threatened species, to reduce transfrontier pollution, and to assist developing countries with respect to environmental issues. The overall result is positive, particularly for a country which itself benefited from development assistance until recently.

Regarding future progress, it is recommended that the following proposals be taken into consideration:

-- The adoption by Portugal of new international commitments, in conformity with models and norms in force abroad, could continue to encourage improvements in national environmental policy. The implementation of domestic legislation and regulations further to European Community decisions, OECD Decisions and Recommendations, and regional or worldwide conventions, will continue to have a very positive effect on Portugal's environmental policy.

-- Concerning bilateral relations, it may be appropriate to strengthen environmental co-operation with Spain, for example through a bilateral agreement giving a firmer and more effective basis to action already undertaken, and which would resolve the difficulties associated with the existence of widely differing institutions on either side of the border.

-- Regarding maritime matters, it would be useful to take additional measures for improved protection of Portuguese waters against the dangers associated with considerable maritime traffic off the Portuguese coast. The competence of various administrations regarding protection of the marine environment have already been clarified but further specification is necessary before a serious accident occurs in the country's territorial waters or economic zone. The necessary resources for monitoring maritime traffic and to deal with pollution caused by vessels should be strengthened, particularly concerning oil tanker de-ballasting. The co-operation set up by the Lisbon Agreement should be more thoroughly tested by combined international exercises to improve the various elements included in the Agreement.

-- Regarding transfrontier atmospheric pollution, the outlook appears to be that Portugal will increasingly be both a producer and a victim of transfrontier air pollution by sulphur and nitrogen oxides. Concerning the protection of the ozone layer, Portugal should reduce its imports of regulated substances in order to conform to the Montreal Protocol.

-- Concerning compensation for transfrontier damage, Portugal is a contracting party to the major conventions, but could consider ratifying other conventions, protocols and amendments to guarantee better compensation of Portuguese victims.

-- In view of its special relationship with certain Portuguese-speaking developing countries, Portugal could play an increased role in the north-south dialogue on the environment. This role would be all the more credible if Portugal increased its development assistance, in particular by increasing the scale of its actions with an environmental component.

# SPAIN

## CONCLUSIONS AND RECOMMENDATIONS*

Spain's rapid economic development over the last two decades has made it the eighth largest economy among OECD countries. In many instances, this growth has been accompanied by an even greater increase in pressures exerted on the environment, in terms both of the use of natural resources (e.g. water, soil) and of pollution. The development of tourism, in particular, has put high pressures on the country's coastal zone.

Since 1978 substantial, though not uniform, devolution of environmental decision making from the central state to the 17 autonomous regions has led to a kind of environmental federalism. Since joining the European Community in 1986, Spain has made much progress with the development of its infrastructure in, for example, transport and water supply. A number of large environmental investment plans have been adopted and are being implemented.

The progress Spain has made towards achieving economic convergence with its European partners needs to be matched with environmental convergence. The challenge ahead is thus: i) to effectively and efficiently implement environmental policies, which includes carefully balancing environmental investment priorities while taking account of both national needs and international commitments, and ensuring that all autonomous regions make harmonised environmental progress; ii) to more fully incorporate environmental considerations into sectoral policies; and iii) to enhance Spain's role in international co-operation to protect the environment.

This OECD report sets out the baseline for assessing future environmental progress, and it examines the environmental performance of Spain: the extent to which government domestic objectives and international commitments are being met. A number of recommendations are put forward that could contribute to further environmental progress in Spain.

### 1. Implementing Environmental Policies

#### *Achievements and further progress*

Spain has made very significant efforts since the 1980s to develop and implement a coherent environmental policy. It has adopted specific environmental plans and developed a modern set of basic environmental laws and regulations in line with EU directives. It has progressively strengthened its environmental administration, and in 1996 it created a Ministry of the Environment (MMA) with wide responsibilities for inland and coastal waters, pollution, waste management, nature protection and biodiversity. Spain has adopted basic minimum standards applying to the whole country. It has given wide responsibilities to autonomous regions and municipalities to implement its environmental policies. Broad decentralisation of environmental activities, when supported by strong regional governments, should facilitate implementation of environmental policies and help build public support. It should also increase cost-effectiveness by allowing differentiation in standards to reflect differences in ecosystems and use of natural resources. Nonetheless, there is also a need to ensure that all parts of the country make comparable environmental progress. For example, streamlining and codifying the very large body of environmental laws and regulations would facilitate enforcement and implementation by lower levels of government.

During the 1980s, Spain increased its public environmental expenditure at a rate higher than that of GDP growth. During the 1990s, public investment for environmental activities has remained approximately constant. Pollution abatement and control expenditure has reached only about 0.8 per cent of GDP. The environmental policy of Spain is hampered by a heavy reliance on subsidies, government transfers and other forms of aid to finance environmental activities. The availability of environmental funding for specific types of projects from the European Union and the central Government can distort regional and local investment priorities. A more systematic use of the polluter pays principle and the user pays principle would be a key part of ensuring that future development will be sustainable. Spain has introduced several economic instruments to support its environmental policies. Thus far these instruments are used on too limited a scale and there are problems to be overcome to ensure that municipalities collect and pay all environmental charges.

Spain publishes yearly reports on the state of the environment and has created a series of measurement networks. High-quality environmental information is provided for the public at the central and some regional levels.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its November 1996 meeting.

The public now has access to environmental data held by the administration, though this access is sometimes limited by bureaucratic difficulties. Not enough is known to allow a comparison of the environmental performance of the autonomous regions, to evaluate enforcement by municipalities or to assess the environmental achievements of enterprises. Also, more economic analysis should be made to assess cost-effectiveness and help internalise external costs.

It is therefore recommended that consideration be given to the following proposals:

- streamline environmental legislation and adopt a framework law on the environment;
- make greater use of user fees and earmarked environmental charges to internalise external costs and change behaviour;
- eliminate environmentally harmful subsidies, especially in water management;
- encourage greater access to environmental information and provide environment performance indicators at national and regional levels;
- perform ex ante and ex post evaluations of cost-effectiveness of policies and mixes of instruments.

***Water management***

Water issues have always been of pre-eminent importance in Spain. The uneven seasonal and geographical distribution of supply and demand makes the availability of water a constraint on sustainable development in some regions. For much of this century, large-scale hydraulic engineering works for hydropower, irrigation and water supply have been the dominant feature in water management. The Drainage Basin Authorities have long played an essential role and the 1985 Water Act provides a solid framework for water quantity and quality management in a country where water transfer among basins is considered a means of providing equal access to this most valuable resource. Municipal sewerage networks have been extended and the treatment of municipal waste water has made great strides in the last 15 years: the installed capacity of municipal sewage treatment plants grew from 13.4 million population equivalent in 1980 to almost 47 million in the early 1990s. The quality of coastal bathing waters generally is good. With major investment plans for municipal waste water management and irrigation approved in 1995 and 1996, Spain has provided itself with a set of concrete water management objectives. These need to be complemented by the proposed National Hydrological Plan, which should give prominence to ambient water quality and the ecological needs of watercourses.

Despite the progress to date, a balance between the use of water for economic development and the protection of aquatic environments has yet to be achieved. Overpumping is depleting aquifers, and distorted consumption patterns caused by a rigid water allocation system prevent rational use of water. Considering that the average efficiency of agricultural water use (which accounts for 80 per cent of total consumptive use) is less than 47 per cent, irrigation water should be viewed as underpriced; furthermore, water prices to households are among the lowest in the OECD. A lack of transparent and rigorous economic analysis for new water development projects is a potential threat to aquatic ecosystems. The system for permitting and water pollution fees under the Water Act has failed to achieve sufficient progress in the clean-up of municipal and industrial waste water. Sewerage connection rates and treatment levels vary widely among autonomous regions, and several large cities (e.g. Valladolid, La Coruña) are still without any form of treatment. Implementation of the National Sewerage and Waste Water Treatment Plan will depend greatly on increasing the commitment and environmental expertise at the municipal level. Large industrial facilities generally have sufficient treatment capability, but small industry lags behind, particularly in the animal husbandry and foodstuffs branches. The Drainage Basin Authorities should give greater emphasis to their role in erosion control in headwater areas.

It is therefore recommended that consideration be given to the following proposals:

- place greater emphasis on water demand management approaches, including improved flexibility of water allocation procedures, strict application of the user pays principle along with establishment of a water pricing regime that encourages water conservation and optimum use, installation of flow meters in irrigation channels and, where needed, establishment of infrastructure for local water transfers;
- institute rigorous and transparent cost/benefit analyses, taking account of all costs, for all public investment in water development infrastructure;
- upgrade drinking water treatment facilities and reduce water losses in pipe networks;
- simplify permitting procedures for waste water discharges and improve the implementation of the system of water pollution fees under the 1985 Water Act while also raising environmental awareness and know-how at the local level to persuade municipalities to take greater responsibility for waste

water issues, and applying the polluter pays principle to industrial discharges into municipal sewer systems;
- adopt the proposed plan for the control of industrial discharges;
- implement further measures to reduce pollution from diffuse sources, particularly fertiliser and pesticide leaching from agricultural land;
- make the proposed National Hydrological Plan an instrument for integrated water management, through broad stakeholder consultation and by giving due weight to receiving water conditions and aquatic ecosystems, implementing planned programmes to enhance the natural functions of watercourses and devoting part of water use efficiency gains to the replenishment of rivers.

***Air management***

Spain has made progress in developing a policy framework for air management in the last two decades. The Atmosphere Protection Act has been implemented since the mid-1970s, and more recently Spain has actively been incorporating EU rules and other international requirements in its legal framework; among these are fuel quality regulations and emission standards, including those for motor vehicles. Recent national efforts have focused on, inter alia, improving the air quality monitoring system and emission controls for large combustion plants. $SO_2$ emissions show a decreasing trend in the 1990s, and concentrations of $SO_2$ and particulates have decreased through sulphur reduction in fuel and a shift away from coal, as well as emission regulations. Acidifying substances emitted in Spain cause acidification only in limited areas, as critical loads are generally high and acid deposition low. Spain has taken the first step towards integrating environmental concerns in energy policy with its 1991 National Energy Plan. The plan has many quantitative targets related to the environment and many of its measures are designed to achieve both energy targets (such as reduction of reliance on oil and increases in energy saving) and environmental targets (e.g. emission reductions). Progress has been made in areas such as natural gas use and co-generation. The 1995 Strategy for Energy and Environment provides updated and reinforced targets concerning, for instance, $CO_2$ and $SO_x$ emissions.

Further efforts are necessary, not only to meet current targets and solve current problems but also to deal with future concerns. $NO_x$ and VOC emissions are still increasing, though Spain has adopted stabilisation or reduction targets. More attention should be paid to improving local air quality; various kinds of local pollution exist, caused by heating installations and industrial plants, and also by vehicles, which are of increasing concern. Target levels and emission standards are generally modest in Spain, and it is necessary to establish a long-term strategy to upgrade them. Some autonomous regions do not have sufficient capacity to implement regulations and in certain cases their environmental authorities do not enforce regulations because of social and employment concerns. Although $CO_2$ emission levels are lower than the OECD Europe average, current policy related to $CO_2$ reduction is expected to limit the growth only to 10 per cent for total emissions and 15 per cent for energy-related emissions between 1990 and 2000; implementation of programmes is lagging, especially those involving energy saving. More integration of environmental concerns is necessary in transport policy to improve local air conditions and restrict $CO_2$ emissions.

It is therefore recommended that consideration be given to the following proposals:

- strengthen air pollution management at regional and local levels to deal effectively with local air pollution problems, notably in specially designated air pollution zones;
- use air monitoring systems for evaluation of progress and policy development;
- review levels and implementation of emission standards for stationary sources other than large combustion plants, and develop a strategy to upgrade pollution control at such facilities;
- implement as soon as possible measures in the 1995 Strategy for Energy and Environment to reduce air emissions, and seek ways of further limiting the increase in $CO_2$ emissions;
- review the structure of energy taxation to better take into account environmental damage by, for instance, reducing the tax differential in favour of diesel fuel and introducing a tax differential based on sulphur levels for heavy fuel oil;
- strengthen measures on vehicle traffic to improve local air conditions and to reduce $CO_2$ emissions; fully implement the revised energy saving policy for the transport sector;
- develop coherent atmospheric emission data for the 1980s to allow assessment of achievements regarding emission reduction targets.

***Waste management***

Spain adopted national legislation aiming at safe disposal and waste minimisation for municipal waste in the late 1970s and for hazardous waste in the late 1980s. Progress has been made on ensuring safe disposal of waste. The amount of urban solid waste subject to uncontrolled landfilling has decreased from 60 per cent to 25 per cent in the last 15 years. Regulation of hazardous waste management started in 1986; the number of reports on hazardous waste generation has significantly increased. To deal with contaminated soil, Spain has been developing an inventory of contaminated sites since 1991. Recent efforts at central level have focused on establishing national plans; plans for hazardous waste and for remediation of contaminated soil have been approved, and MMA is developing a plan for urban solid waste. Improvement is also seen at regional level; the autonomous region of Catalonia, for instance, has adopted a comprehensive law for waste management.

Concrete achievement has been limited so far to some progress in proper waste disposal and recycling; little progress has been made on waste prevention. Improvement of hazardous waste management is an urgent issue: treatment and disposal capacity is insufficient, leading to export and uncontrolled disposal. Little attention is paid to minimisation (reduction and/or reuse) of construction/demolition waste and non-hazardous industrial waste. For the remainder of the 1990s, Spain faces a challenge to make progress at every step of the waste hierarchy. Another important task is to upgrade waste management in the autonomous regions; some regions do not have sufficient capacity for hazardous waste control, and in a few regions uncontrolled landfill accounts for more than half of solid waste disposal.

It is therefore recommended that consideration be given to the following proposals;

- establish a national strategy to deal with urban solid waste, with a clear priority of reducing generation of waste and further promoting recycling;
- extend separate collection of recyclable materials and hazardous household waste and ensure sufficient treatment capacity for them;
- adopt national legislation for packaging waste and implement it as soon as possible;
- strengthen controls on hazardous waste and invest in new capacity for treatment and disposal while putting stress on the user pays principle;
- improve management of non-hazardous industrial waste and construction/demolition waste, with clear assignment of responsibility to generators;
- use a range of policy instruments to encourage waste minimisation (e.g. waste collection fees, landfill fees, product charges, deposit-refund system, voluntary agreements, information and education);
- develop clean-up standards and remediation methods for contaminated sites while paying attention to the cost-effectiveness of clean-up.

***Nature conservation***

Spain encompasses a large part of Europe's biological diversity in terms of habitats and species. At the national level, it has adopted both general aims and modern nature conservation legislation. The proportion of its territory benefiting from protection has grown significantly over the last decade; in terms of the IUCN classification (Categories I to V) it now amounts to 8.4 per cent. The management of parks and protected areas today on the whole receives significant resources to protect nature and promote the recreational use of parks. Spain has made considerable investments in sophisticated planning and decision-making tools, and is developing a state-of-the-art database for natural resource management and monitoring. Some species recovery plans are being carried out successfully at both the national and regional levels. The autonomous regions have been given a greater role in recent years. Much of the work on protected areas is driven by the requirements of the EU habitat directive. Public participation in nature conservation has expanded considerably, as have negotiations and agreements with local communities and landowners. Environmental NGOs are active throughout the country. Increasingly effective fire services manage to contain forest losses despite the steadily growing number of fires.

Yet, development pressures and the use of natural resources have long caused degradation of ecosystems and a loss of biodiversity, and it is not clear whether past trends have been halted. Much remains to be done in terms of setting quantitative objectives, extending the area protected and making it more representative of the wide diversity of Spanish nature. A significant proportion of areas identified for protection under international agreements still awaits follow-up action. Visitor pressure is becoming a concern in some parks. The management framework for nature conservation needs to be simplified, for example in respect of the multitude of categories of protected area. In the management of natural resources (soil, water, forests, fisheries) there is still little integration with biodiversity and

nature conservation considerations. The rate of implementation of the National Plan of Hydrological Forest Restoration so far has been too slow to reverse erosion trends, and efforts to push back desertification should be stepped up.

It is therefore recommended that consideration be given to the following proposals:

- approve the National Strategy for the Conservation and Sustainable Use of Biological Diversity;
- transcribe the EU bird and habitat directives into national law and set quantitative targets and deadlines for extending the number and total size of protected areas in all autonomous regions, and ensure that they are representative of the main habitat types; continue to improve stakeholder participation in the planning and management of protected areas;
- step up habitat rehabilitation projects, particularly in ecological corridors such as the traditional drovers' roads and along rivers and streams;
- complete and adopt the National Plan against Desertification and expand efforts to control erosion and other soil degradation by developing and implementing policy instruments to encourage private landowners to adopt erosion control measures and practices, by giving higher priority to erosion control in the allocation of funding for afforestation activities and by fully exploiting the provisions of the 1985 Water Act to promote soil conservation plans and protective zoning along rivers and streams in basin hydrological plans;
- pursue further integration at national and regional levels of nature conservation and biodiversity considerations in sectoral laws, plans and management practices for fishing, agriculture and forestry;
- extend public awareness campaigns to include issues such as desertification, soil degradation, fisheries and water use.

## 2. Integrating Environmental and Economic Decisions

### *Integration of environmental concerns in economic policies*

Integration of environmental concerns in other policies has been progressing, but slowly. Environmental considerations have now been introduced in some sectoral plans. In spite of the success achieved, the mechanisms of integration among sectors are not yet fully efficient and effective. Spain does not have a government approved national environmental plan or strategy with quantitative targets and commitments by other ministries.

Environmental impact assessments (EIAs) have been used to integrate environmental considerations in major public investment projects. Further efforts would be required to ensure the use of EIAs for wider categories of projects. There would also be merit in using EIAs to assess strategies or programmes, especially transport, tourism and irrigation programmes.

The price mechanism can play a very positive role in limiting waste of scarce natural resources and integrating environmental considerations in other policies. In particular there is a need to examine the extent to which water prices, especially for irrigation water, and other forms of agricultural subsidies may lead to water overuse and inefficiencies in land use.

Co-ordination of environmental efforts among various levels of government needs to be strengthened. In particular, existing mechanisms for consultation with the autonomous regions should be used more extensively in relation to draft EU directives. Lower levels of government could better carry out their environmental responsibilities if they had adequate funding for this purpose: the issue of fiscal revenues and earmarked taxes and charges may therefore require further examination to strengthen the role of lower levels of government.

The central Government is very supportive of consultative procedures involving representatives from industry, employer and labour groups and NGOs. It has created a number of bodies to discuss environmental matters. Voluntary plans in partnership with industry are being used with success.

It is therefore recommended that consideration be given to the following proposals:

- develop a comprehensive national environmental strategy, building on national and regional plans;
- seek greater integration of environmental policies with other policies and ensure that development in agriculture, transport and tourism is fully sustainable;
- widen the use of EIAs at the project level and develop EIA at strategic level;

– clarify the respective roles of central and regional authorities to avoid conflicts and enhance cost-effectiveness in environmental policy; ensure that environmental responsibilities transferred to regional authorities can be adequately funded.

***Sectoral integration: transport***

Environmental concerns in the transport sector have only recently been taken into account in Spain, with related measures on urban and interurban infrastructure dating from the beginning of the 1990s. EU directives for reducing air emissions and noise at source are being implemented. EIAs are being improved as regards their use in transport infrastructure projects and their extension into some of the autonomous regions. Environmental and energy-saving concerns are being introduced in transport planning. Intermodal public transport programmes have been elaborated in some large cities through a financial partnership by all relevant levels of government. Promising efforts are being made in some cities with local traffic management programmes, which promote environmentally friendly transport modes.

However, the transport sector is growing faster than GDP (with increases of 50 per cent in passenger traffic, 60 per cent in freight traffic and 70 per cent in car ownership over the last 15 years, compared with GDP growth of 40 per cent); and the pattern of growth, with its emphasis on road building and diesel-fuelled vehicles, further intensifies environmental pressures. Of most concern are pollution and energy consumption, and deteriorating air and noise quality in urban areas. Because the country is at the periphery of the core European markets, Spain's economic integration in the EU particularly contributes to growth in freight transport. Cost-effective measures now will mean less need to redress pressures later at higher costs. In this respect, much better integration of environmental concerns in transport policies and plans is needed at both national and regional levels. Setting environmental targets for pollution levels would provide a frame of reference for the formation of transport policy; the targets already set for energy saving provide an example. Rigorous and expanded use of environmental assessment of proposed transport infrastructure is needed. The increase in the diesel car fleet, which is mainly due to fuel taxation policy, is of particular environmental concern in urban areas. Since surveys clearly show that the Spanish population is exposed to relatively high noise levels, especially in urban areas, more attention needs to be given to noise from road and air traffic.

It is therefore recommended that consideration be given to the following proposals:

– develop a comprehensive strategy for the transport sector, including quantified targets for noise and pollutants (notably particulates, $NO_x$, VOCs and $CO_2$), integration with the National Energy Plan and a monitoring process to aid in adjusting freight and passenger transport policies; fully implement the revised energy saving policy for the sector;
– extend the range of EIAs to the formulation of infrastructure plans and programmes, with improved public consultation and participation;
– adjust fuel taxation policy with a view to giving consumers price signals that take environmental damage into account;
– further stimulate and develop programmes to improve the urban environment through the implementation of a comprehensive set of measures limiting the use of cars and promoting other modes;
– set legal standards for acceptable levels of ambient noise and develop a policy to both redress current pressures and avoid future ones.

## 3. International Co-operation

Spain has long had good relations with its neighbours concerning environmental activities. It is party to numerous bilateral and trilateral agreements aiming at managing common problems, notably in the area of surface and marine waters. Spain rapidly incorporated EU law into its own law, and has given direct responsibilities to the autonomous regions to implement environmental law. Many autonomous regions are implementing Agenda 21 at their level, and some have started co-operation with developing countries, including financial aid. Concerning air pollution, $SO_x$ emissions have decreased but $NO_x$ has not been stabilised. Growth in $CO_2$ emissions has been reduced, but continues. Many steps have been taken to reduce water pollution emanating from Spain. Aid to developing countries has been increased very significantly since 1988; Spain, which was a recipient country 20 years ago, is now insistent on increasing its level of official development assistance (ODA) beyond the OECD-DAC average.

While the overall record is positive, there are areas where further progress could be made, particularly to ensure that Spain's economic convergence within Europe is accompanied by environmental convergence and that its environmentally dependent activities (e.g. agriculture and tourism) benefit from a solid natural resource base and a positive environmental image. The co-ordinating or overseeing role of the central Government concerning matters within the jurisdiction of regional governments could be strengthened in areas where Spain has international commitments. Great care should be exercised to avoid international difficulties linked to growing demand for water. In this context, it may be appropriate to deepen bilateral co-operation based on the latest international agreements in this field, as well as EU directives. Concerning $NO_x$ and $CO_2$, Spain should take measures to stabilise its emissions as soon as possible. Given the existing severity of desertification and water shortages in Spain, more advanced measures to prevent climate change should be of great interest. Protection of the marine environment has progressed but could receive higher visibility and be more closely co-ordinated with activities concerning environmental protection in coastal areas.

It is recommended that consideration be given to the following proposals:

- seek to enhance Spain's role in international forums dealing with environmental protection by increasing funding devoted to international activities and by taking more action-oriented positions;
- ratify and rapidly implement several international agreements related to protection of the environment (Annex III), particularly those on oil pollution of the sea;
- strengthen existing mechanisms to ensure meaningful consultation with regional governments on international issues, to oversee the degree to which regional governments reflect Spain's international commitments in their own legislation and to assess whether implementation of environmental laws and regulations in the regions is sufficiently uniform as not to create distortions in competitiveness among regions;
- implement more consistently the principles in the Rio Declaration, notably those concerning full payment for use of natural resources, liability and compensation, and the precautionary approach;
- strengthen and co-ordinate activities in the area of marine environment, in particular better integration of activities to protect the terrestrial and marine environments;
- work closely with other European countries and African countries to protect threatened migratory species;
- increase the aid budget to enable Spain to reach its 0.7 per cent of GNP target for ODA by 2000, and devote more ODA to enhancing environmental protection, notably in Mediterranean countries.

# SWEDEN

## CONCLUSIONS AND RECOMMENDATIONS*

In the 1970s and 1980s, environmental issues were at the forefront of Sweden's agenda despite the country's relatively low population density and the moderate economic growth of the period. In addition to the national dimension, environmental issues in Sweden have a strong international aspect. This is due to regional economic and environmental interdependencies (Nordic co-operation, transfrontier air pollution, North Sea and Baltic Sea pollution). Sweden took the initiative for the first UN Conference on the Environment in Stockholm in 1972 with the aims of identifying the most urgent environmental problems and obtaining agreement on actions to deal with them. In the latter part of the 1980s, Sweden also became strongly involved in global environmental issues (climate change, ozone layer, environmental aid).

More recently, an economic recession and entry into the European Union have provided the context for economic and environmental decision making in Sweden. The overall objectives of Sweden's environmental policy are to: protect human health, conserve biological diversity, manage natural resources so as to ensure their sustainable use, and protect natural and cultural landscapes. Environmental policies today focus on the following themes: climate change, ozone layer depletion, acidification and ground-level ozone, urban environmental quality, eutrophication, metals and persistent organic compounds, management of land and water resources, protection of nature, ecocycle and waste management, chemical safety and nuclear safety.

The challenge of implementation of these policies lies in:
- achieving, in the most cost-effective way, the ambitious targets Sweden has set for itself;
- strengthening the integration of environmental concerns in sectoral and economic decision making;
- continuing to foster effective international co-operation.

This OECD report sets out the baseline for assessing future environmental progress, and it examines the environmental performance of Sweden: the extent to which government domestic objectives and international commitments are being met. A number of recommendations are put forward that could contribute to further environmental progress in Sweden.

### 1. Implementing Environmental Policies

In the past 25 years, Sweden has developed effective and often very innovative environmental policies. Major achievements have included: developing appropriate legal and administrative instruments; introducing a wide range of economic instruments; broadening the scope of physical planning to include environmental protection and sustainable management of natural resources; extending to environmental matters the principles of Swedish democratic functioning, notably abundant and accessible information, separation of powers, extended role of NGOs and special roles for women and youth; decentralising the implementation of environmental policies; and basing policies on high-quality monitoring and environmental research and development. Sweden has developed strategies founded on precise quantified objectives and periodic follow-up on environmental performance. Its Parliament, the Riksdag, closely monitors the various measures taken and provides policy orientation.

Over the last ten years, economic instruments have been used to supplement the case-by-case regulatory approach to licensing of polluting installations. They have also been used to support the financing of environmental protection. Overall, pollution abatement and control expenditure in Sweden amounts to 1.1 per cent of GDP. So far the implementation of environmental policies has created no substantial problems for the Swedish economy at the macro level. Most of the costs of environmental protection are met by polluters and by users of environmental services. Sweden is implementing the polluter pays and user pays principles strictly. There is little subsidisation to enhance pollution prevention. Municipalities charge citizens the cost of the services they receive to protect the environment.

Nevertheless, there is a need in Sweden to further strengthen the cost-effectiveness of environmental policies while addressing a number of remaining problems, such as ensuring that environmental regulations stemming from the case-by-case approach are harmonised with EU laws based on quality or emission standards, harmonising the integrated pollution control system (applied to emissions into water and air) with industrial waste management,

* Conclusions and Recommendations approved by the Group on Environmental Performance at its May 1996 meeting.

and ensuring a complementary use of regulations, economic instruments and other instruments (voluntary agreements, physical planning, environmental impact assessment, environmental information).

***Air***

Prompted by serious acidification problems, Sweden has made strong efforts to reduce its own $SO_X$ emissions, and has achieved significant results: an 80 per cent reduction between 1980 and 1993 and a level of $SO_X$ emissions per unit of GDP that is among the lowest for OECD countries. $NO_X$ and VOC emissions are also decreasing. Substantial progress has been made in reducing emissions of hazardous air pollutants, including ozone-depleting substances, heavy metals and organic substances. $CO_2$ emissions have decreased by 40 per cent since 1970 and are now among the lowest for OECD countries. Swedish cities do not experience very serious local pollution, though there are some significant problems in larger cities with $NO_2$ and particulates. Ground-level ozone concentrations exceed World Health Organisation levels in many places in southern Sweden.

A range of measures has contributed to these remarkable achievements. Regulations on fuel quality and a case-by-case licensing system for stationary sources have formed the basis of air pollution control; continual efforts have been made to strengthen licence conditions through monitoring of available technology. Vehicle emission standards that in practice require the use of three-way catalytic converters on cars have been in effect since 1989. Energy policy promoting a shift from oil to electricity and biofuels, as well as higher energy efficiency along with an expansion of the use of district heating, contributed to the decrease of atmospheric emissions. Several economic instruments were introduced recently; they include a $CO_2$ tax, a sulphur tax on fuel, a $NO_x$ charge/refund system for larger power/heat plants, an emission charge on domestic aircraft and environmental classification of fuels and vehicles, with differentiated taxation.

Although national emissions have largely decreased, deposition of acidifying substances in Sweden has not lessened accordingly. It is estimated that a large reduction of $SO_x$, $NO_x$ and volatile organic pollutants in Europe will be necessary to reduce deposition below critical loads in Sweden, in the context of wider air pollution concerns including pollution from VOCs and ground-level ozone. Additional domestic efforts are required to meet national targets for $NO_x$ and VOC reductions; increasing vehicle traffic is cause for concern about future $NO_x$ and $CO_2$ emissions. Sweden is using carbon taxes, as well as other, multiple-purpose policies and measures, to limit $CO_2$ emissions. Existing measures are not expected to fully stabilise $CO_2$ emissions at 1990 levels by 2000. Beyond 2000, $CO_2$ emissions are likely to increase, even if Sweden retains nuclear plants. In summary, Sweden needs to strengthen further its air quality management and its integration of environmental concerns in sectoral policies, especially transport and energy policies.

It is therefore recommended that consideration be given to the following proposals:

- promote work to control $NO_x$ and VOC emissions from non-road equipment and ships;
- promote stricter requirements for $NO_x$, VOC and particulate emissions from vehicles;
- further promote energy efficiency improvements and the use of renewable energy sources;
- expand the use of economic instruments to include road pricing in urban areas and promote more environmentally sensitive fuel taxation; ensure that tax deductions for commuting by car continue to be in effect limited to rural areas, and eliminate incentives for private driving in the taxation of company cars;
- develop and implement a nationwide strategy to contain the increase in road traffic and strengthen vehicle traffic management and the use of public transport in urban areas.

***Chemical products, waste and ecocycle policy***

Since the 1980s, Sweden has followed key principles for the management of products and waste: the precautionary principle, the substitution principle, the waste hierarchy and producer responsibility. Sweden has been especially active in eliminating hazardous substances from products and waste, an area of growing significance as products have become a major source of hazardous pollution. Sweden stresses the role of producers in chemicals management and, more recently, in the ecocycle policy, an approach that gives producers general responsibility and broad flexibility in implementing measures.

Sweden has been a front runner among OECD countries in the field of chemical products management. The industry has considerable responsibility for assessing and classifying substances, and for removing harmful

substances when less harmful ones are available. Sweden has also established many substance-specific risk reduction programmes, some of which aim at complete phase-out. Within this framework, major changes in the market have reduced exposure to hazardous substances; most of the ambitious targets in these risk reduction programmes have been met or are expected to be met. Sweden has reached its target concerning agricultural pesticides (50 per cent reduction by 1990 from early 1980s levels, as measured by active ingredient) through a combination of regulations, information measures and voluntary measures supported by active participation of farmers; this reduction was achieved without net economic cost. Continued efforts should be made to ensure that policies to remove hazardous chemical substances from the market are the most cost-effective.

Waste management policy has focused on municipal waste rather than industrial waste. Recycling rates for some waste streams, such as paper/cardboard and aluminium cans, are very high in Sweden. Municipalities have implemented separate collection systems for household waste, including separation of hazardous waste, to promote recycling and ensure proper disposal. Energy from waste, in the form of landfill gas and heat from waste incineration, is highly utilised and constitutes a substantial part of the energy supply. Sweden has improved waste disposal practice since the 1980s; for example, air toxic emissions from incinerators have been reduced. Further effort is necessary, however, to improve smaller landfill sites and landfill practice. Legal frameworks for hazardous waste management and waste export and import have been improved. Sweden banned the export of hazardous waste to non-OECD countries in 1988. To progress further, Sweden should promote waste prevention, and strengthen proper management of industrial waste and of construction and demolition waste.

The 1993 ecocycle policy aims at establishing a broad framework for the management of products and waste, in order to minimise the use of natural resources and the resulting environmental impact. In practice, the policy focuses on promoting reuse and recycling, and reducing the amount and hazardousness of waste. The development of a policy framework is just beginning. Out of ten candidate product streams, ordinances have recently been implemented for packaging, paper and tyres. Ongoing work includes the preparation of regulations for other priority waste streams, the development of criteria for priority setting among various products and the surveillance of flows of material used in large quantities or containing hazardous substances.

As programmes related to products and waste have emerged separately in each policy area, their level of development varies from one area to another. Drawing from its experience so far, Sweden could proceed towards more comprehensive and balanced management of the whole spectrum of product streams. The framework of the ecocycle policy is a good basis for such work. Various policy instruments should be considered, including greater use of economic and information instruments.

It is therefore recommended that consideration be given to the following proposals:

- develop a systematic procedure for priority setting in risk reduction;
- evaluate the procedures for reporting to the product register to maintain its usefulness for overview and enforcement;
- improve landfill management with, inter alia, leachate treatment and prevention of hazardous waste contamination, especially at smaller sites;
- develop a strategy including a legislative framework and the provision of basic statistics, to improve industrial and construction/demolition waste management;
- initiate producer responsibility for other prioritised waste streams;
- for the management of products, identify priority areas and formulate medium- to long-term strategies with clear targets, based on current work on priority setting and survey of material flows;
- in the long term, continue efforts to co-ordinate policies related to products and waste in developing and implementing a cost-effective framework in line with the ecocycle principle; integrate chemicals policies further into the ecocycle principle as a means of detoxifying ecocycles.

***Water***

Its dense network of rivers, lakes and wetlands makes Sweden rich in water resources from both ecological and economic points of view. The quality of most inland waters is suitable for most uses. Sweden's performance in terms of municipal sewage treatment is among the best in the OECD: close to all urban households are provided with both biological and chemical waste water treatment, achieving removal rates of 90 to 95 per cent for biochemical oxygen demand, suspended matter and phosphorus, and 20 to 50 per cent for nitrogen. In response to the EU directive on urban waste water, all North Sea and Baltic Sea coastal communities with more than 10 000 inhabitants

are expected to be equipped for denitrification by 1998. Industry has significantly reduced its pollutant discharges (e.g. AOX), but remains the major source of oxygen-demanding substances. Emissions of some heavy metals to water (e.g. arsenic, chromium) have been strongly reduced. Water polluters and users pay for the treatment services, though no resource charges have been instituted for withdrawing water or discharging pollutants into natural waters.

However, mercury levels in pike still exceed international health standards in more than 40 per cent of Sweden's lakes. National emission objectives for cadmium remain to be met and elevated concentrations of toxic substances from industry, agriculture, contaminated sediments and mine tailings are still found in fish, birds and mammals. Acidification, mainly from transfrontier air pollution, remains a concern; liming programmes cannot provide a permanent solution. Nitrogen leaching from agricultural land has not yet been reduced sufficiently. The appropriate use and disposal of sewage sludge poses problems. The case-by-case approach to licensing discharges should be complemented by a greater emphasis on receiving water quality objectives. EU membership and the changing emphasis in Sweden's water problems may be reason to rethink some current approaches, and to move towards a river basin perspective and provide greater transparency as to the outcomes of water management activities.

It is therefore recommended that consideration be given to the following proposals:

- formulate a strategy for dealing with the environmental effects of intensive agriculture; expand the range of measures to reduce nitrogen leaching from agricultural land in the most cost-effective manner;
- give further attention to the appropriate use and disposal of sewage sludge;
- set risk-based priorities for cleaning up old mine tailings and other contaminated sites and draw up a long-term plan for the financing of remediation measures;
- step up efforts to reduce discharges of cadmium in order to meet North and Baltic Sea objectives;
- place greater emphasis on receiving water and ecosystem conditions (in relation to relevant EU water directives) and move towards a river basin perspective in water management;
- improve the transparency of water management enforcement activities through clear reporting of enforcement procedures and management outcomes.

***Nature conservation***

Sweden has an integrated body of laws promoting the conservation of nature, and the Riksdag has adopted a series of explicit policy objectives. A good knowledge base concerning biodiversity is continually updated through a joint effort of government, voluntary organisations and individuals. Protected areas receive a relatively high level of protection; elsewhere, policy instruments such as land use planning have been widely used to include nature conservation considerations in decision making. The new forest policy places equal priority on production and conservation, and a shift towards more sustainable forestry practices is under way, in part also due to market pressures. NGOs play an active role in managing and funding species recovery plans and extending knowledge about nature conservation. On the whole, the hunting management system adequately regulates management of the country's main game species.

Nevertheless, the state of Sweden's nature is still highly vulnerable. Biological and landscape diversity and the distinctiveness of Swedish flora and fauna have diminished. Pressures from forestry and agriculture have been the main sources of threats to biodiversity; changing practices in both sectors have been introduced only recently and have yet to prove their effectiveness. The proportion of land area set aside for nature protection is smaller and less representative of the major biomes than in many OECD countries. While 6.6 per cent of Sweden's total territory is legally protected, only 0.5 per cent of productive forest outside the mountain region is protected and relatively little attention has been paid to the protection of freshwater and marine habitats. More could be done to meet the parliamentary goal of preserving native species. Considering the task ahead, overall spending on nature conservation appears low, especially since a large part of present funding goes for compensation payments.

It is therefore recommended that consideration be given to the following proposals:

- accord higher priority to nature conservation;
- set quantitative targets in goals for protected areas, in terms of total area, representativeness and minimum size of individual parks and reserves, and step up the effort to reach these goals;
- create marine protected areas in the Swedish part of the Baltic Sea;
- implement the biodiversity action plan and make protection of biodiversity a basic principle of the proposed Environmental Code;

– further integrate environmental concerns in forestry policies and ensure that forestry practices evolve further towards a sustainable and environmentally conscious approach, with appropriate goal setting and monitoring of performance.

## 2. Integrating Environmental Concerns and Economic Decisions

Despite much progress in decoupling the generation of some environmental pressures from GDP (e.g. $SO_2$, $NO_x$, VOC and $CO_2$ emissions, water abstraction and pesticide use), Sweden's national objectives and international commitments call for not only cost-effective environmental policy but also a significant strengthening of the integration of environmental concerns in economic and sectoral decision making. Such integration is seen as a key to improving environmental performance and moving towards sustainable development. This is because economic forces and changes in major economic sectors, such as transport, energy, manufacturing, forestry and agriculture, strongly influence environmental conditions and trends, and thus can enhance or counteract the benefits of environmental policies and technical progress.

### *Integration and sustainable development*

Sweden is supportive of the concept of sustainable development and is developing strategies to integrate environmental policy and other policies. Sweden's official view is that "growth must take place without additional damage or depletion of the national environment". Long-term strategies for environment and physical planning, with quantified objectives, have been developed. The ecocycle concept has been introduced to facilitate holistic approaches concerning hazardous substances. Sectoral policies now take environmental objectives into account. Long-term strategies have been developed for forestry, biodiversity protection and transport. Steps have been taken to reduce city traffic.

Economic instruments are being used to modify the use of natural resources and to decrease pollution. Energy taxation has been changed to increase taxation on $CO_2$ emissions through a carbon tax with a rate that is among the highest in Member countries, while the overall level of energy taxes was essentially unchanged. A $NO_x$ charge has been introduced to reduce $NO_x$ emissions, and is redistributed among emitters so as to remain revenue neutral. A number of environmentally differentiated taxes have been introduced to reorient use of polluting substances and products. Domestic airlines must pay a pollution charge (soon to be replaced by a different environmental charge) and users of fertilisers and pesticides pay a special tax on these products. After a few years of experience, it has been found that these taxes have helped in achieving targets without undue administrative cost.

In spite of considerable progress in institutional integration and the use of economic instruments, some difficulties continue to arise. While very constructive "internal" dialogue exists between the Ministry of the Environment, its boards and the regional and municipal authorities, the "external" dialogue between the environmental agencies and those in other sectors is developing. As a result of economic difficulties in the first part of the 1990s, priority was given to considerations of economic competition and the restructuring of industrial and social policies. In the future, the integration of environmental consideration into sectoral policies should be strengthened. Attention should be paid to the role of environmental expenditure as a potential moving force in policies concerning economic development and employment. If outstanding efforts have been made to give a role to local governments in the implementation of Agenda 21, it remains to be seen how local proposals will be integrated at the national level. Strong measures will likely be needed to modify consumption patterns. More precise objectives and targets for sustainable development will be required and greater efforts will be needed to reach the goals announced in 1993.

Environmental considerations are taken into account in development strategies for the transport and energy sectors. Emissions of hazardous air pollutants and $CO_2$ have been significantly reduced. However, trends in energy consumption and transportation use do not yet appear to have been reversed. Further steps could be taken to reduce and eliminate subsidies that are detrimental to environmental protection, particularly those that encourage use of private vehicles, facilitate rapid depletion of natural resources (e.g. topsoil) or impede conservation of natural resources.

As the legal system relies to a large extent on government institutions at the central, regional and municipal levels to take care of environmental concerns, the rights of the public and NGOs in monitoring application of laws are

very limited. While the role of citizens is very active within hearing and consultation processes, it is almost impossible for them to use the courts to force full implementation of the law.

It is therefore recommended that consideration be given to the following proposals:

- continue working towards greater use of economic instruments in order to promote better environmental and cost-effective policies; consider the possibilities to increase the rates of certain taxes in order to promote better consumption patterns, and introduce new taxes and charges without raising the overall tax ratio; promote international co-ordination of energy/$CO_2$ taxes;
- integrate environmental issues into all preparatory and decision making processes of the Government, including use of environmental impact assessments in strategic planning, especially as concerns energy and transport policies, and use voluntary agreements as appropriate;
- in connection with the proposals expected from the commissions on energy, transport and taxation, set precise objectives in these areas and deadlines for implementation;
- develop the environmental expertise and strategic capacity of the county administrative boards;
- complete the codification of environmental law and use this opportunity to: widen the scope of application of EIAs, increase the alternatives considered, and better define what EIAs must contain and monitor their quality; consider the option of litigation for individuals and NGOs concerning licensing decisions or non-enforcement of laws and regulations; give greater importance to ambient quality standards; continue integrating EU law into Swedish law;
- orient research activity towards multidisciplinary programmes emphasising more sustainable development and better controlled consumption patterns.

***Sectoral integration: agriculture***

In the mid-1980s, Sweden introduced a wide array of policies to contain the detrimental effects of modern agriculture on the environment, human health and animal welfare, and to safeguard the agricultural landscape. Its environmental goals for agriculture are generally ambitious and, thanks to high environmental awareness among farmers, well supported by the sector. A 1992 goal for a 10 per cent reduction in the total use of commercial fertiliser has been met, and one relating to pesticides (75 per cent reduction from early 1980s levels) will likely be met in 1996. Progress has been made towards the target of converting 10 per cent of the arable area to organic farming; and the programme of preserving 600 000 hectares of farm land of significant habitat value appears to be on track to meet its 1998 objective, as 70 per cent of the area is already covered by management agreements. Since the mid-1980s, Sweden has made effective use of charges and taxes on agricultural inputs as part of a broad mix of policy instruments; in the early 1990s it significantly increased environmental expenditure in agriculture.

However, implementation of habitat and landscape conservation agreements is hampered by a lack of clarity about what is to be achieved, and participating farmers do not always fully appreciate what is expected of them. Better follow-up and enforcement of individual agreements need to be built into the programme. Progress towards the objective of halving nitrogen leaching from agricultural land is lagging, and implementation and enforcement have not been strong enough; serious local eutrophication problems, and many less serious ones, remain. There is no evidence that ammonia emissions have been reduced since the objective was set in 1990, while measures taken in July 1995 have yet to prove their effectiveness. Policy makers need to take care that a switch to new, more biologically active, low-volume pesticides does not introduce new risks. While policies have been comprehensive, not enough attention has been given to optimising the cost-effectiveness of implementation. Also, integration of the various policy goals and related measures is only now beginning to be pursued to the point of developing a genuine strategy for sustainable agriculture with objectives for 2005 and 2021.

It is therefore recommended that consideration be given to the following proposals:

- strengthen follow-up and enforcement of measures concerning nature conservation and landscape in agricultural policies and practices;
- strengthen implementation and enforcement of regulations on nitrogen leaching;
- continue efforts to reduce ammonia emissions;
- continue monitoring the effects of pesticide risk reduction policies;
- improve integration of policy goals;
- give greater attention to cost-effectiveness aspects in policy design;
- develop a national strategy for sustainable agriculture, together with local implementation criteria.

## 3. International Co-operation

Sweden has very effectively promoted international co-operation on environmental protection issues and has supported its international programme with significant levels of human and financial resources. It initiated the concept of effect-related reduction protocols within the framework of the Convention on Long-range Transboundary Air Pollution and has been a driving force in the EU work towards a strategy on acidification. It has proposed realistic commitments and achieved concrete results. It has been a strong promoter of new approaches to transfrontier pollution prevention and control and, with other like-minded countries, has built an effective pressure group at the international level. Swedish diplomats and environmentalists have played a strong role in international negotiations. The Riksdag has given much attention to international environmental issues and has ratified international agreements rapidly. Sweden has promoted the adoption of overall goals at international level, concerning, for instance, restoration of the Baltic Sea area, and related targets (e.g. reduction of emissions of certain heavy metals by as much as 70 per cent); this approach has been fruitful, as considerable progress has been achieved by Sweden and other countries in the Baltic region.

For its part, Sweden has met its commitments concerning emissions of $SO_2$ into air and those concerning discharges into water of a number of pollutants, such as phosphorus and lead. It has taken expensive measures to reduce inputs of nitrogen in coastal waters (e.g. from waste water treatment plants). It has banned the production and consumption of a number of ozone-depleting substances ahead of internationally agreed deadlines and has taken vigorous steps to reduce its $CO_2$ emissions. Concerning aid to developing countries, Sweden is a large donor country in relative terms. Its aid budget is well above the Rio target of 0.7 per cent of GDP. Environmental co-operation with central and eastern European countries is progressing effectively.

In spite of these overall achievements, Sweden suffers from acid precipitation, resulting largely from transfrontier air pollution, and transfrontier water pollution in the Baltic Sea. Although international co-operation has made great progress, transfrontier pollution affecting Sweden has not been reduced as much as was hoped. Concerning emissions of mercury, cadmium and nickel, international targets for 1985-95 will not be reached by Sweden in relation to the North Sea and the Baltic Sea. Sweden was not able to halve its nitrate discharges to water by 1995, but will probably achieve the target by the end of the century. Emissions of $NO_x$ to air will not be decreased by 30 per cent by 1998. $CO_2$ emissions will not be stabilised by 2000 without further measures. Environmental aid is probably growing, but this growth is at the expense of other aid. Pollution of the Baltic Sea is not decreasing as fast as expected because much of the problem has its source in central and eastern European countries. In particular, heavy metal concentrations in the Baltic Sea are still growing.

It is therefore recommended that considerations be given to the following proposals:

- ratify those agreements that Sweden has recently signed (Annex III);
- adopt measures to decrease transfrontier pollution of Swedish origin from farming, sewage treatment, transport, etc., and continue active work in international forums to reduce transfrontier air pollution, in particular the emission of acidifying pollutants, and to promote strict vehicle emission control measures;
- promote action to decrease air emissions of pollutants from ships in the Baltic Sea;
- strengthen co-operation in the framework of the Helsinki Convention in order to reduce pollution loading of the Baltic Sea;
- contribute to strengthening the prevention of maritime accidents in the Baltic area;
- promote measures to reduce $CO_2$ emissions from transport and manufacturing industries and review the effect of energy taxation; continue to seek the most cost-effective instruments to promote energy conservation and use of renewable energy sources;
- within the aid budget, increase the share of environmental aid and seek to restore the overall aid budget to reach the national goal of 1 per cent of GDP;

continue environmental aid and technology transfer to central and eastern European countries.

# SWITZERLAND

## CONCLUSIONS AND RECOMMENDATIONS*

Switzerland's environment is under intense pressure (pollution, natural resource use, spatial restructuring) notably from industry, agriculture, transport and tourism. These pressures reflect very high densities of population and activity as well as a location in the heart of Europe. Switzerland nevertheless still has remarkable natural scenery and wilderness areas.

During the 1970s and 1980s ambitious environmental policies promoted by the Confederation were implemented by the cantons and municipalities. Fundamental to these polices were a regulatory approach, substantial government funding and an actively involved public demonstrating great environmental awareness (following several industrial accidents and the debate on forest decline). Remarkable results to pollution abatement were achieved in consequence.

Since the beginning of the 1990s environmental policies have focused on prevention of damage to the environment, application of the polluter pays principle and collaboration with the business community. The Federal Council recently confirmed its intention to consider the requirements of sustainable development in all sectoral policies, notably those affecting energy, transport and agriculture. However, Switzerland must overcome two major obstacles: the difficulty of translating the concept of sustainable development into actual changes in consumption and production patterns, and the tendency for concerns about economic stagnation, employment and competitiveness to lower the priority given to environmental issues.

This OECD report establishes a baseline for assessing future environmental progress and reviews Switzerland's environmental performance in three areas:

- implementation of environmental policies;
- integration of environmental concerns in economic decision-making; and
- international co-operation in environmental protection.

### 1. Implementation of Environmental Policies

#### *Environmental effectiveness and economic efficiency*

*Ambitious policies and very good results in pollution control*

Switzerland has designed and implemented pollution abatement policies with ambitious objectives. Most of these objectives have been met with remarkable success: air pollution emission rates among the lowest in the OECD area, very high levels of waste water infrastructure and in waste management facilities. This success was achieved by means of an ambitious regulatory approach combined with rigorous enforcement, strong support from the public and a considerable financial effort.

The prescriptive environmental policy applied in Switzerland rests on a very comprehensive body of federal and cantonal laws and regulations. Their enactment is preceded by lengthy and intensive consultations between the different authorities and economic actors, which facilitates their implementation and observance.

Public involvement is very developed. Citizens may intervene in the preparation of legislation, propose subjects for referendums and vote directly on major policy issues. A number of referendums have been decisive in strengthening environmental action. As regards right of redress, the prominent NGOs have extensive possibilities which it is important that they retain.

Expenditure on environmental protection is equivalent to about 1.7 per cent of a GDP which is high compared with that of other OECD countries. The Confederation, cantons and municipalities finance roughly one-third of this expenditure, businesses and households roughly two-thirds.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its June 1998 meeting.

Although Switzerland is one of the OECD countries that has invested most in environmental protection, much remains to be done. Concerning "grey" environmental issues, it is necessary to meet air management targets for $NO_x$, VOCs and ozone, maintain and renovate waste water infrastructure, supplement municipal and industrial waste management infrastructure, clean up contaminated sites, treat non-point source pollution, regulate genetic engineering, and so on. As regards "green" environmental issues, despite some successes such as the stabilisation of forested area, measures to protect, nature, landscapes and biodiversity have been insufficient to counteract the pressures of economic activity in a country notable for its population density and its highly-developed tourism industry. These measures therefore need to be reinforced, particularly at cantonal level.

*Improving the economic efficiency of environmental policies*

Switzerland's environmental policies are now at a critical juncture characterised by rapidly rising marginal costs of pollution abatement, sluggish economic activity, public budget restrictions, concerns about competitiveness in Europe, and globalisation. As a result, Switzerland is seeking and should continue to seek greater economic efficiency in its environmental policies and consistency of its environmental law with European law.

Switzerland has accordingly revised and modernised its Constitution and its various laws concerning the environment. It is moving towards a more balanced use of sets of regulatory, economic and voluntary measures. The principle of causality has been adopted with the aim of internalising external costs, and several economic instruments have been introduced. The new charges on VOCs and on the sulphur content of heating fuel are very promising in that they are fiscally neutral and highly incentive. Nevertheless, the number of economic instruments used in environmental policies in Switzerland is comparatively modest. In accordance with the principle of collaboration, several voluntary agreements with industry have been adopted, thus permitting flexible progress towards environmental objectives.

Economic analysis and evaluation of environmental policies is still relatively little developed in Switzerland, despite a recent expansion of research capabilities in this area. There is a shortage of data on the results and implementation of environmental protection measures in the cantons and municipalities, expenditure incurred, checks and sanctions applied, and the effects of eco-taxes and of "green" payments to farmers. The Confederation therefore must not confine itself to promoting policies, but must also monitor them.

It is recommended that consideration be given to the following proposals:

- continue efforts to apply the principle of causality (polluter pays and user pays principles) and reduce subsidies for pollution abatement;
- raise the rates of existing charges and taxes progressively so as to internalise externalities that are insufficiently taken into account; introduce new economic instruments without increasing fiscal pressure;
- encourage monitoring of results and assessment of the economic efficiency of environmental policies on the basis of more comprehensive and comparable data concerning individual cantons and municipalities, for example on pollutant emissions, expenditure on environmental protection, and degrees of target attainment;
- continue efforts to apply the principle of collaboration with the parties concerned, in particular by developing voluntary agreements with the business community together with involvement and information of the public;
- develop preventive action and land use planning, especially as regards non-point source pollution and the protection of nature, landscapes and biodiversity.

***Water***

Switzerland took measures very early on to prevent and control water pollution, notably from industrial and urban sources. There has been considerable investment in waste water infrastructure (over SF 40 billion in the past 30 years), partly financed by federal and cantonal subsidies. As a result, many watercourses are now of good physical-chemical quality (content of organic contaminants, heavy metals and micro-pollutants). With the ban on phosphates in detergents, and phosphate removal at many treatment plants, phosphate loads from these sources have decreased very significantly. Switzerland is also very active in the management of lakes and river basins of European importance.

A new generation of water management policies has been developed to solve remaining problems. First, the new water pricing system will enable the implementation of the principle of causality and will provide economic incentives for better management of water resources. Maintenance and renewal of the sewerage network will require considerable and sustained financial efforts. Second, control of non-point source pollution has fallen behind. The overall phosphate load has remained the same due to the increasing load from agricultural sources, and eutrophication is still a major concern for most lakes. Nitrate concentrations in groundwater continue to increase. Many drinking water catchment points need to be better protected from pollution by nitrates and pesticides. Third, flood control, power generation and urban development have in many cases disrupted the morphology and biological life of watercourses. The recent introduction of minimum flows downstream from water withdrawal points is only a partial solution. Fourth, integrated, partnership-based management could be encouraged so as to ensure sustainable development of water resources.

It is recommended that consideration be given to the following proposals:

- continue to implement the new water pricing system; envisage the application of new economic instruments such as effluent charges and taxes on polluting agricultural inputs;
- ensure funding for the maintenance and renewal of waste water treatment facilities;
- accelerate the application of measures to control non-point source pollution, notably from agriculture;
- improve the protection of withdrawal points for drinking water supply, for example against harmful or persistent substances (nitrates, pesticides);
- give higher priority to the restoration of watercourses; improve target definition in this area and seek a broad consensus in regard to such programmes;
- speed up improvement of the federal network for monitoring groundwater quality so as to obtain a better understanding of trends in this area, as well as of the influence of measures taken in other sectors such as agriculture;
- with a view to sustainable development of water resources, develop a system of integrated, partnership-based management for all water users; this should include inter-sectoral interests and policies such as nature and biodiversity.

***Air***

Swiss performance as regards air quality is among the best. Switzerland has met or will shortly meet all its international commitments for atmospheric emissions reduction. Since the early 1980s it has achieved remarkable declines in emissions of the main air pollutants ($SO_x$, $NO_x$, VOCs, CO, particulates, heavy metals) and substantial improvements in air quality. These results are largely attributable to a consistent and ambitious federal strategy for air pollution abatement and to efficient implementation of regulatory measures by the cantons. Associated with the country's economic characteristics (low energy intensity, economic stagnation in the 1990s) and energy structure (almost entirely hydro and nuclear power, relatively high energy prices), this environmental policy has ensured that Switzerland's emissions per unit of GDP are the lowest or among the lowest in the OECD area. In addition, considerable progress has been made with the Energy 2000 action programme, which is contributing to a decline in emissions of $CO_2$ and conventional pollutants.

However, the very ambitious targets set at national level for 1995 with respect to $NO_x$ and VOC emissions have not been achieved. Despite remarkable reductions of 26 per cent in $NO_x$ emissions and 37 per cent in VOC emissions since 1985, ozone concentrations over the country as a whole are still too high. A 70-80 per cent reduction of such emissions would be necessary to solve the problem of summer smog more or less permanently; this now seems possible for VOCs by the end of the decade, but difficult in the case of $NO_x$. The essentially regulatory approach to air management is now being reinforced by economic incentive measures (redistributed charges on VOCs and on high-sulphur heating fuel). It would be advisable to facilitate this development by securing a broader consensus on air management policy both within the administration and among the public.

It is recommended that consideration be given to the following proposals:

- pursue the use of economic instruments for air management by implementing the redistributed charges on VOCs and the sulphur content of heating fuel and by increasing taxes on gasoline in order, inter alia, to reduce $NO_x$ emissions;
- define a strategy to control fine particulates, especially from mobile sources, and improve data on their emission and concentration;

- reinforce co-operation at all levels of government so as to better integrate air quality concerns in transport, energy, regional planning and taxation policies;
- better explain the objectives of air protection (both health and environmental) and secure greater involvement of NGOs in issues relating to the environment, tourism and cars;
- pursue the implementation of the Energy 2000 action programme, and increase efforts concerning renewable energy sources.

***Waste***

Over the past ten years Switzerland has developed the legislative and regulatory framework, institutions and infrastructure needed to ensure efficient waste management. Expenditure in this area now amounts to 0.6 per cent of GDP. Collection of unsorted municipal waste is available to almost the entire population. Eighty per cent of this waste is now incinerated in appropriate facilities. Landfilling of incinerable waste will be totally prohibited from 2000. Subsidies for municipal waste disposal facilities will shortly be abolished. Enforcement of the Order on environmentally hazardous substances has brought about a marked decline in the quantities of certain pollutants present in waste, such as mercury and PCBs. The level of selective collection of municipal waste for purposes of recovery and recycling is one of the highest among OECD countries; the recycling is done essentially by the private sector and is financed chiefly by an advance disposal charge. Incineration capacities for special waste are now sufficient to meet the country's needs; exports of special waste for incineration or open landfilling have been prohibited.

With regard to municipal waste, it will be necessary to complete the implementation of the policy already adopted, in particular by expanding incineration capacities, resolving the problems of recycling management, and providing financing in accordance with the principle of causality. For example, the introduction of the charge per bag to finance collection and disposal of unsorted municipal waste has reduced quantities to be treated and increased sorted waste collection, but has also led to unsuitable methods of disposal, more uncontrolled landfilling and depositing of inappropriate materials in sorted waste containers. The costs of recycling wastepaper, glass and organic waste, which are not covered by the bag charge, also present increasing problems. Differences in incineration capacity suggest a need for more intercantonal co-operation in this area. Exports of special waste for physical-chemical treatment or for underground landfilling have increased greatly since 1992, in contrast to the amount sent for other types of treatment. Consequently the total quantities of special waste exported have remained fairly constant since 1988 despite the self-sufficiency target set in 1992. The existence of contaminated sites is of growing concern to the public, although no major case of related pollution has been recorded. The inventory of these sites (about 5 000) should be completed in 1998 in most cantons; it will cost about SF 5 billion to resolve the problem.

It is recommended that consideration be given to the following proposals:

- improve intercantonal co-operation in the matter of waste inventory and treatment, so as to promote optimal use of available national treatment capacity;
- make a particular effort at cantonal and municipal levels to accelerate the closure of irregular landfills and meet the target for 2000 of total elimination of landfilling of incinerable waste;
- intensify public consultation and information efforts to gain acceptance of the principle of causality in respect of waste management and, in particular, re-establish the quality of selective waste collection, improve the rate of recovery of certain materials and ensure financing of the system over the long term;
- accelerate the inventory and clean-up programme for disused landfills and other contaminated sites; undertake the necessary work and ensure financing.

***Nature, landscape and forests***

The Swiss public and NGOs have been and continue to be a moving force behind policies for protected areas. The success of the 1987 Rothenthurm initiative (whereby wetlands protection was written into the Federal Constitution following a referendum) and the amendments to the law on nature and landscape protection have given the Confederation an important role in this area. Federal inventories have recently been completed or undertaken to identify biotopes and landscapes in need of protection. In order to influence economic activities outside protected areas, instruments such as environmental impact assessments (EIAs) and regional planning are being used. Fundamental changes have been made in agricultural policies with a view to encouraging more sustainable

agriculture; direct ecological payments to farmers are beginning to have a positive effect on landscapes. Forest management has shifted from a quantitative approach related to timber output, which helped stabilise and even increase woodland area, to a more balanced approach that gives equal importance to forests' ecological, social and economic functions. Switzerland has ratified the main international agreements on biodiversity and nature conservation and takes an active part in international debates, notably on wetlands protection.

The percentages of rare, endangered or extinct animal and plant species in Switzerland are nevertheless among the highest in the OECD for mammals, fish, reptiles, amphibians and vascular plants, and the highest for birdlife (56 per cent) — and these percentages are rising. Destruction or physical transformation of biotopes and landscape features continues, chiefly due to continuous urbanisation, agricultural modernisation and the development of transport and tourism infrastructure; loss of biodiversity and damage to landscapes has not been halted. Arbitration by the cantons and municipalities often do not favour the protection of nature, landscapes and biodiversity. The area of protected biotopes covers only 3.5 per cent of Swiss territory. On going inventory activities lead to often quite small areas being protected; management plans for these areas are often still being prepared. The means allocated to nature and landscape protection have not been sufficient to overcome the problems created by economic pressures. The Swiss Landscape Concept strategy, approved by the Federal Council in December 1997, aims to turn this deteriorating situation around by extending efforts to the whole country and to all relevant public policies. Extensive participation by citizens' groups and public bodies in the design of this strategy has secured its widespread acceptance and improved awareness of the ecological problems involved. To implement the strategy successfully, it will be necessary on the one hand to define precise quantified targets and performance monitoring arrangements, and on the other to ensure that regional and land use planning take more account of nature and landscape protection. The parties involved at the federal, cantonal and municipal levels will need to redouble their efforts and act more concertedly, notably to: develop cantonal plans and programmes related to nature and landscapes; implement the Swiss Landscape Concept strategy in all its aspects; create a network of protected landscapes linked by ecological corridors; and incorporate environmental concerns in tourism policies. These initiatives should also further stimulate the movement towards more sustainable policies and practices in regard to agriculture and forestry.

It is recommended that consideration be given to the following proposals:

- increase funding for a more vigorous policy in regard to protected areas and intensify efforts to establish inventories and to manage designated areas effectively;
- increase the surface area devoted to biotope protection; establish an ecological network;
- set realistic quantitative targets for biotope and species preservation;
- improve monitoring and assessment of results achieved in the area of biodiversity and nature conservation;
- strengthen the partnership between the authorities and scientific and economic actors concerning the development and implementation of biological diversity policy;
- ensure progress towards the implementation of the Swiss Landscape Concept strategy by setting precise or numerical targets together with time schedules and by making sure sufficient funding will be available;
- pursue the implementation of sustainable agricultural practices; in particular, assess the effects of direct ecological payments on nature and landscapes and promote the creation of "green" corridors in rural areas;
- continue to apply sustainable forestry practices, giving high priority to biodiversity in forest biotopes;
- integrate environmental concerns more systematically in tourism policies and practices.

## 2. Towards Sustainable Development

### *Environment and the economy*

*Decoupling and sustainable development strategy*

Switzerland has clearly decoupled economic growth from air pollutant emissions. Where water and waste management is concerned, the decoupling is less marked. In the 1990s most objectives have been achieved in a context of very low economic growth. The considerable advances in environmental protection do not appear to have had any negative effects on either competitiveness or employment.

Switzerland has not only recognised the need to review its government policy in light of sustainable development concerns, but has also created structures that facilitate dialogue; the sustainable development strategy adopted in 1997 identifies the efforts that need to be made. Switzerland has introduced policies to bring about the internalisation of externalities and the removal or reorganisation of subsidies. Related measures have been taken in the energy, transport and agricultural sectors and results have been achieved.

*Greater integration of environmental concerns in sectoral and economic policies*

The new Committee on Sustainable Development has an important role to play and will need to seek a satisfactory balance between economic, environmental and social goals. It would be advisable for quantitative targets and deadlines to be established. It will also doubtless be necessary to use the political processes in order to reach trade-offs.

The Federal Council has come out in favour of a green tax reform which would be part of a general tax reform as from 2001, taking into account the need to reduce labour taxation and concerns about fiscal neutrality. Elements of this reform might be: to continue to reduce existing taxes and subsidies that generate distortions and negative environmental effects; to promote environmental taxation in close consultation with the cantons and municipalities, and to create new eco-taxes, for example in the areas of agriculture, natural resources, transport and energy. Separately, a significant increase in gasoline taxes might be considered.

Greater weight should be given to the integration of environmental concerns notably in economic and social policies and in policies related to employment and technological innovation. Problems also persist in regard to balancing nature conservation, tourism and land use objectives.

The efforts made to promote more environmentally-friendly consumption patterns have had a positive effect on consumers. The environmental performance of national and cantonal administrations can be improved by using instruments such as public procurement policies and environmental management systems.

*Reinforced environmental protection in the cantons and municipalities*

The implementation of environmental protection programmes and strategies is far from uniform across cantons. In many cases arbitration in the cantons and municipalities favour short-term development, infrastructure creation and scattered urbanisation over preservation of nature, landscapes and biodiversity.

Preparation of cantonal plans for sustainable development and local implementation of Agenda 21 should go ahead. In a very compact country like Switzerland, regional and land use planning should be made to play a key role in the coming years to channel urban growth and development of transport infrastructure and ensure effective protection of nature and landscapes. In some cases it will be necessary to strengthen environmental aspects of cantonal administrative structures and to define more precise plans of action in order to give effect to federal strategies.

Pollutant emission, pollution abatement and control expenditure and environmental performance are not adequately monitored in some cantons. An intercantonal or federal-cantonal mechanism might be useful for reviewing environmental performance: for example, a body that would systematically assess the implementation of national policies and the environmental performance of cantons, identifying those areas where targets have or have not been met.

It is recommended that consideration be given to the following proposals:

- develop sustainable development strategies with quantified targets;
- increase the integration of environmental and sectoral policies, notably with regard to transport, energy, agriculture, tourism and land use;
- promote green tax reform in such way that the environment, natural resources and employment are protected;
- pursue the development of action plans to promote sustainable development at cantonal level;
- undertake the assessment of cantons' environmental performance by intercantonal co-operative mechanisms;

- give more weight to environmental considerations in regional planning at the federal, cantonal and municipal levels, and take the necessary steps to integrate environmental considerations in urban development schemes and transport-related construction projects;
- pursue federal and cantonal action to promote more sustainable private and public patterns of consumption.

***Sectoral integration: transport***

Switzerland was for a long time a European front-runner in developing regulations designed to limit motor vehicle pollution by enforcing strict emission standards. Now such regulations are harmonised throughout Europe. Partial use of the revenues from excise taxes on motor fuels for environmental purposes was approved in a 1993 referendum. The integration of environmental considerations in transport infrastructure projects has improved over the past ten years with the increased use of environmental impact assessments. Federal and cantonal authorities have launched ambitious traffic noise abatement programmes. Thus, in many respects, the integration of environmental and transport policies in Switzerland can serve as an example to other OECD countries.

For more than fifteen years now, there has been a broad consensus of public opinion on the harmful consequences of road traffic growth for the environment, regional planning and energy balances, and this has paved the way for an improvement in public transport supply through support measures, together with restricted use of private transport (notably in cities, as a result of traffic management measures) and transport of goods by road (on transalpine routes in particular). As a result, Switzerland now has one of the world's densest rail networks along with urban and intercity modal distributions that give pride of place to public transport.

Owing to public finance constraints and increased competition from private road transport, maintaining dense and cohesive public transport and freight rail networks is more difficult today than in the past. Development of these networks, with the construction of new transalpine rail link and other projects concerning railways, poses a major funding problem which Switzerland plans to solve through a special fund. Generally speaking, pursuit of environmental objectives regarding transport is being subjected to new requirements concerning financing, profitability and the internalisation of external costs. These concerns have to be placed in the European context of free trade and non-discrimination.

It is recommended that consideration be given to the following proposals:

- promote co-operation between the actors involved in transport and environmental policies at federal, cantonal and municipal levels;
- implement measures adopted in the transport sector and strengthen the national transport strategy towards sustainable development;
- introduce environmental impact assessments of transport and land use strategies, plans and programmes;
- review the road/rail balance of the investment funding system, so as permit the maintenance and development of rail transport;
- continue to improve the internalisation of external costs in transport pricing and taxation, notably as regards road freight transport;
- be certain to reduce the gasoline price differential between Switzerland and neighbouring countries so as to encourage savings in motor fuel consumption and reduce emissions due to "gasoline tourism";
- define priorities and sources of financing investment in transport noise abatement in order to meet the noise exposure targets set for 2002.

***Sectoral integration: agriculture***

Over the past ten years Swiss agriculture has undergone a major structural adjustment leading to a contraction of agricultural activity. While value-added and farmland have not decreased much, agriculture's share in GDP has declined by one-half, the number of farms by one-quarter, agricultural employment by 30 per cent, and stocking density by 10 per cent for cattle and 25 per cent for pigs. Swiss agriculture continues to show a very large livestock share in value-added (70 per cent), a high proportion of grassland (60 per cent) and a marked food trade deficit. In the short term structural adjustment has had mixed effects on the environment: reduction of pressures due to the use of chemical fertilisers and pesticides, and reduction in greenhouse gas emissions ($CH_4$, $NH_4$, $N_2O$), but

continuing concerns about water quality, soil erosion and pollution; positive effects on biodiversity and landscape (maintenance of Alpine pastures by means of summer grazing) and negative ones (fragmentation of biotopes due to growing farm size).

A process of major reforms towards sustainable agriculture to address economic, environmental and social concerns is under way. It is intended to respond in particular to the growing imbalances in farm product markets, the high rate of transfers under recent farm policies, the environment consciousness of the Swiss public, and the new international challenges following the agricultural agreement of the GATT Uruguay Round. Reduction of agriculture's negative environmental effects and due recognition of its positive externalities are central to this reform, which is replacing farm price support with direct payments to farmers meeting ecological requirements defined according to very precise criteria. Switzerland has set itself the very ambitious target of getting almost all farms to change over to integrated production by 2002 through the introduction of environmental criteria to determine eligibility for virtually all direct payments. Nearly two-thirds of farmers have already agreed to operate their farms according to the stringent rules of integrated production. Positive environmental effects are already apparent. The forthcoming implementation of a further stage of reform (Agricultural Policy 2002) should lead to a significant reduction of pollutant emissions from agriculture.

To date, the measures taken by the authorities have been based for the most part on a regulatory approach and payments in exchange for ecological services. The aim is to reduce agriculture's harmful environmental effects and increase its beneficial ones. Organic farming, however, is still limited: 6 per cent of farmers and of useful farmland are now involved. Agriculture continues to create serious pollution problems, especially as regards phosphate and nitrate loads. In so far as the steep increase in federal spending on direct ecological payments is matched by a decline in price supports, it is likely to encourage more efficient use of natural resources by reducing distortions in the supply of agricultural products.

It is recommended that consideration be given to the following proposals:

- establish environmental objectives, within the framework of environmental protection programmes, on the basis of close co-ordination between the federal departments concerned with agriculture and the environment;
- develop further incentives and voluntary approaches;
- apply the polluter pays principle whenever possible;
- adopt a more place-based approach to the design of agri-environmental measures so as to associate environmental offset areas with an ecological network and with the improvement of natural species habitats and biodiversity;
- pursue efforts to prevent pollution from agricultural sources, for example through measures to reduce livestock numbers, in the context of strict application of the Water Protection Act, or through ensuring that one-quarter of farms practise organic farming;
- increase attention given to monitoring and assessing periodically the effects of agriculture on the environment.

## 3. International Co-operation

Switzerland has co-operated actively with its neighbours in environmental matters at the European level and worldwide for many years now. This international openness can be explained by Switzerland's size and location, its heavy dependence on foreign trade, and the tourist and vehicle flows to and across the country. In 1993, the Federal Council chose the conservation of the natural environment as one of the main objectives of Switzerland's foreign policy.

Switzerland co-operates closely with the European Union in many areas related to environmental protection, including transit of goods. Although it has not joined the European Economic Area, Swiss environmental law is being progressively adjusted in order to achieve closer alignment with EU directives and thus limit the distortions of competition which differences might generate. As regards international trade, Switzerland supports compliance with environmental and social objectives by way of binding rules.

Switzerland maintains good neighbour relations with all adjacent countries and, for more than a 100 years, has engaged in effective joint action to protect the environment (water and fishery management). Co-operation in managing international lakes (Constance, Geneva) has made it possible to stabilise and subsequently reduce phosphate releases and to reduce eutrophication.

Co-operation with the countries and organisations concerned has made possible considerable reductions in pollutant discharges to catchment areas of the major European rivers and to the North Sea. With regard to acid rain, Switzerland has already met or will shortly meet the internationally agreed targets for reduction of $SO_x$ and $NO_x$ emissions. Acid deposition on Swiss territory has already been greatly reduced, but efforts still need to be made at the international level to ensure that critical loads are not exceeded. Unlike many other countries, Switzerland will probably succeed in reducing its $NO_x$ emissions by 30 per cent, in line with the Sofia declaration.

At world level, Switzerland has embarked determinedly on the control of ozone-depleting substances, achieving its targets and the reduced use of replacement HCFCs. It has agreed to stabilise $CO_2$ emissions at their 1990 level by 2000 and proposes to reduce them by 10 per cent by 2010. Switzerland seems likely to meet the target of stabilisation by 2000. In 1997 it was the first country to adopt a law for reduction of $CO_2$ emissions incorporating mandatory quantified targets and even providing for the introduction of a $CO_2$ tax as a subsidiary measure. In regard to co-operation with developing countries, Switzerland adopted North-South guidelines for promoting sustainable development as early as 1994 and has not reduced development aid significantly.

Despite these exceptional achievements in international co-operation, environmental problems persist. At some of the international lakes, in particular Lake Lugano, there is still too high an intake of phosphates and continuing eutrophication. The Rhine receives discharges of nitrogenous substances in excess of the targets set. Although the cantons are very autonomous in their relations with neighbouring countries, they are not always fully associated in negotiations on major international conventions; this can cause delays detrimental to the implementation of international environmental co-operation. It is important to adopt and put into effect a national strategy concerning biodiversity. The policy for sustainable development as applied to the Swiss Alpine area must address difficult problems regarding regional planning and transport (creation of new international transport routes). These problems are difficult to separate from the energy policy problems associated with the reduction of $CO_2$ emissions. Concerning the control of chemical substances, Swiss legislation should be coordinated with international recommendations. Where development aid is concerned, Switzerland has not yet met its targets and the proportion of its environmental aid is relatively low.

It is recommended that consideration be given to the following proposals:

- ratify and implement the recent international agreements on environmental protection (Annex III);
- develop action to associate the cantons more closely in the preparation of international conventions;
- continue and reinforce environmental co-operation with the European Union;
- encourage the development of a plan of action for the preservation of Lake Lugano through harmonised actions;
- pursue the development of Alpine co-operation with a view to reinforcing the Convention on the Protection of the Alps, notably with regard to transport, energy and tourism;
- introduce charges and taxes that will positively affect $CO_2$ emission reduction and make precise arrangements for future imposition of a $CO_2$ tax, in the event that this should prove necessary;
- strengthen co-operation between federal offices that deal with development aid, foreign economic affairs and environment;
- increase development aid so as meet to the national target of 0.4 per cent of GNP, move towards the international aid objective of 0.7 per cent, and increase environmental aid.

# TURKEY

## CONCLUSIONS AND RECOMMENDATIONS*

Turkey has been undergoing major economic changes in the 1990s, marked by rapid overall economic growth and structural changes (privatisation of State enterprises, price liberalisation, integration in the European and global economy). However, the share of the informal sector in the Turkish economy remains high. Turkey's population has reached 65 million and remains one of the fastest growing in the OECD. Major migrations from rural areas to urban, industrial and tourist areas continue.

Turkey now confronts the challenge of ensuring that economic growth is associated with environmental and social progress, namely sustainable development. During the 1990s, it has experienced increasing environmental pressures, reflecting rapid sectoral growth in energy, industry, transport and tourism. A number of institutional and legislative elements of environmental reform have been put in place. A national environmental plan, remarkable in many ways, was adopted in 1998 as part of the national development planning effort. Although current emissions and discharges per capita remain low compared to OECD per capita averages, much of the necessary environmental infrastructure must still be created in urban and industrial areas. The road towards environmental convergence with other OECD countries will be a long one, and will require strengthened environmental efforts from central government, municipalities and the private sector, as environment has had a relatively low priority in Turkey.

The challenge is therefore to: i) implement environmental policies and strengthen environmental infrastructure; ii) better integrate environmental concerns in economic decisions; and iii) meet the country's international environmental commitments.

This OECD report establishes a baseline for assessing future environmental progress and examines Turkey's environmental performance, i.e. the extent to which its domestic objectives and international commitments are being met, based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

### 1. Implementing Environmental Policies

Overall, the 1998 National Environmental Action Plan (NEAP) has taken the measure of the challenge to be met by Turkey in reversing the environmental degradation experienced by a number of urban and industrial areas and by its natural resource base (e.g. erosion, coastal damage). With environmental protection part of its Constitution, Turkey has made significant advances in the 1990s (creating the Ministry of Environment, reforming its environmental legislation and instruments for environmental protection, establishing EIA, adopting the 1998 NEAP). Turkey has also benefited from some positive structural changes (change in energy mix, privatisation of heavily polluting State-owned enterprises, industrial restructuring). Other areas where progress is apparent include a significant increase in the powers of provincial and local governments in regard to environmental matters, and environmental protection efforts made by export-oriented parts of industry (e.g. tourism, textiles).

Yet these advances are not commensurate with increased pressures from economic activities and urban growth. Overall, enforcement, economic analysis, information and institutional capacity should be improved to strengthen environmental policies. Given the backlog in regard to environmental investment needs and general lack of enforcement, it will take time and considerable effort to transform environmental management practices and mobilise appropriate financial resources.

#### *Fostering environmental policy implementation*

Environmental policy relies on a command and control approach. Regulations have evolved significantly and tend to approach those of the EU. However, there is a lack of adequate enforcement capability. Fines and penalties for non-compliance with environmental regulations would need to be revised in order to have some effectiveness; the Ministry of Environment would also need to develop an inspection and enforcement branch and strengthen its territorial capability. Given the gap between regulations and enforcement, a transition period would be needed, notably for those industrial sectors which are not export-oriented, to gradually improve their performance

* Conclusions and Recommendations approved by the Working Party on Environmental Performance at its June 1999 meeting.

without their ability to invest being hindered. Enforcement of environmental laws and regulations would also benefit from a reduction of the informal sector's share in the Turkish economy.

Turkey should gradually begin to use a wider variety of policy instruments to improve cost-effectiveness in managing the environment, in particular through greater reliance on economic instruments for environmental protection. Efforts towards partnership approaches should be pursued and the terms of existing voluntary agreements should be reviewed in light of OECD practice. Capacity to carry out economic analysis of environmental issues and to integrate environmental concerns in sectoral policies should be greatly enhanced within the national environmental administration. Land use cadastres and inventories, and land use control, need to be upgraded, as half the urban population lives in illegal settlements with inadequate and unreliable environmental services.

The EIA procedure has been established, but further improvement of the EIA regulation is needed to make it fully effective. There is a significant need for personnel qualified to conduct EIAs, both in the public and the private sectors. Managers and consultants from a growing number of companies are being trained for this purpose.

Although participation mechanisms such as local environment committees, the EIA procedure, and Councils for the Environment and Forestry exist, public participation is a relatively new process in many instances. The absence of environmental reporting by industry has in a number of cases tended to exacerbate conflicts with NGOs and the public. Environmental NGOs will need to address a range of issues in order to establish themselves as stimulating and constructive partners for environmental progress.

Despite significant advances in environmental monitoring and the provision of environmental information by many environmental and non-environmental institutions (e.g. the SIS and SPO), there are no regular, comprehensive environmental publications (e.g. environmental data, environmental indicators, state of the environment reports). Creation of an environmental observatory and of a nationwide environmental information strategy and action plan (METAP) are still under consideration. Turkey has not yet signed the Aarhus Convention on improving access to environmental information and is considering follow-up to OECD Recommendations (e.g. PRTRs, environmental information). There are no clear estimates of public and private environmental expenditure.

It is therefore recommended to:

- strengthen, empower and improve the national environmental administration's performance, and its co-ordination with other ministries and the provincial and municipal authorities;
- strengthen the enforcement system considerably, through clarification of institutional responsibilities, adequate co-ordination at all levels of government, and an increase in resources available for inspection and enforcement;
- make the regulatory system more flexible, integrated and cost-effective, seeking an adequate mix of instruments and assessing each in terms of its ability to attain policy objectives and their cost;
- strengthen the permitting system, and move towards a procedure that takes an integrated pollution prevention and control approach;
- improve access to environmental information and increase public participation in decision-making relating to the environment;
- improve environmental information systems (periodic reporting on the state of the environment, environmental indicators and environmental expenditure) so that they can provide for the needs of policy design and raise environmental awareness in all sectors of society;
- expand the use of economic instruments to contribute to more cost-effective management of the environment and ensure appropriate pricing of natural resources (e.g. water, energy), with due regard to social conditions;
- expand and diversify public, private and international sources of funding for environmental protection; enhance the role of banks in supporting environmental investment.

***Water***

Rapid economic and population growth has implied rapidly increasing demand for water for both industrial and domestic use. However, the greatest pressure on water resources in Turkey has been due to increased irrigation, undertaken in order to provide agricultural commodities for growing domestic and export markets. Pollution affects water quality. The diminishing availability of easily exploitable new water supplies means higher water development expenditure, which will be required at a time when financial resources are needed for waste water treatment.

In response to these challenges, a number of important principles have now become part of national legislation. For instance, the 1988 Regulation on Water Pollution Control refers to the establishment of an action plan for water quality improvement and to long-term water basin quality management plans. Positive actions have been taken: large enterprises have started to treat their sewage before discharge; associations of water users have been created, which should improve irrigation water management; monitoring of water pollution has been extended. In parallel with tourism development, efforts have been made to improve the quality of coastal water, in particular in the Mediterranean region.

Much still remains to be done in order to progress towards sustainable management of water resources. Large-scale hydraulic engineering works for irrigation, hydropower and water supply remain the dominant features of water management, while water quality is deteriorating in many areas. A balance has yet to be achieved between water use for economic development and population growth and environmental protection. Particular efforts should be made to increase the share of the population connected to sewage treatment (currently about 12 per cent). The need to provide new and upgraded sewerage and sewage treatment infrastructure will stretch investment capability for a considerable time to come. Public investment priorities need to be examined, in order to maximise social, economic and environmental benefits. Pricing of water services should be developed so as to achieve rational use of water resources and improve investment recovery, as well as recovery of operational and maintenance costs. There should be a more systematic approach to harmonising national and international legislation (e.g. quality standards, emission limit values, waste water treatment). Dispersed responsibility for water management is confusing for users, and sometimes also for authorities. The information flow and co-operation among institutions and users required would benefit from a river basin approach, which would facilitate the establishment of investment priorities as well as harmonisation. Municipalities lack qualified personnel to operate water facilities, and farmers will not be able to implement modern irrigation methods without appropriate training and services.

It is therefore recommended to:

- set quantitative objectives for domestic sewage treatment and speed up connection of the population;
- examine priorities for public investment in water infrastructure and encourage adequate pricing of water services, e.g. through combined water bills, as well as public-private partnerships for financing, building and managing municipal water services;
- continue the transfer to users of irrigation facilities, and establish mechanisms to enable the introduction or strengthening of cost recovery;
- integrate environmental concerns in water withdrawal plans and cost-benefit analysis of water projects;
- develop an overall water resource management strategy by river basin, addressing both quantity and quality issues; establish basin councils to reinforce co-operation and partnership among authorities and water users (municipalities, industries, farmers);
- revise water legislation in line with international developments;
- pursue efforts to monitor water quality and strengthen enforcement of legislation.

***Air***

In urban areas, there has been a decrease in concentrations of $SO_2$ and particulates in the 1990s. This is largely due to major changes in the fuel mix used in these areas: high sulphur content domestic coal has been prohibited for heating and replaced by imported coal with a lower sulphur content; natural gas has been substituted for coal in several cities. Today gas consumption accounts for about 10 per cent of Turkey's energy supply. Lead emissions are beginning to decline as a result of introduction of unleaded gasoline. Since 1997, the Ministry of Environment has been consulted on and involved in major decisions concerning energy sector investments. Subway lines have opened in Ankara, and are being built in both Ankara and Istanbul. The National Environmental Action Plan provides a comprehensive and realistic assessment of air issues.

However, as a result of economic growth and despite environmental protection efforts and significant shifts in energy supply (e.g. from coal to gas), emissions of $SO_x$, $NO_x$ and $CO_2$ are growing at a very high rate. In particular, the transport and electricity supply sectors are growing more rapidly than GDP, generating significant air pollution pressures. Nevertheless, Turkish energy use per capita and emissions per capita are low compared to OECD and OECD Europe averages. Comprehensive information on air emissions and air quality is limited. There is scope for improving air quality by upgrading fuel quality standards, phasing out leaded gasoline, and reducing sulphur content of liquid and solid fuels. Enforcement of air quality regulations should be strengthened, particularly in industrial areas. The use of economic instruments should be developed (e.g. fuel tax differentiation according to sulphur or lead content) to increase the cost-effectiveness of air management. Progress is to be achieved through energy efficiency and use of cleaner fuels and alternative energy sources. Urban transport investments should focus on public transport, and on its integration with land use and development options.

It is therefore recommended to:

- establish and improve procedures to calculate and publish periodic emission inventories at national level for a range of pollutants, including $SO_x$, $NO_x$, VOCs and particulates;
- extend the national air quality monitoring system in industrial as well as urban areas, and increase the number of pollutants monitored to include, in particular, $NO_x$, ozone, and lead and other heavy metals;
- link air management policy measures to quantitative targets for emission reductions and for improvement of air quality in regard to all major air pollutants, with an implementation schedule;
- review and upgrade standards relating to air pollution, notably those for ambient air quality, fuel quality and emissions from stationary sources, with due regard to the impact of air pollution on human health and the environment and associated damages;
- improve enforcement of all air quality regulations by ensuring that appropriate human and financial resources are made available for this task, and by applying penalties for non-compliance;
- clarify institutional responsibilities at all levels of government for air pollution licensing, regulation inspection and enforcement; encourage use of cleaner technologies and develop voluntary agreements with selected industrial sectors;
- continue efforts to improve energy efficiency and to encourage use of cleaner fuels and alternative energy sources;
- develop a master plan for transport which would take account of the development of all transport modes and of interactions between transport and other economic activities, along with environmental objectives.

***Nature***

Turkey's concern for nature conservation is not new; its first national park was created in 1958. A wide range of protected areas have been established: national parks, nature parks, Ramsar sites, etc. The number of protected areas has increased steadily over the last few years. The area of forest cover has remained constant, and forests are sustainably managed. Efforts have been made regarding on-site conservation of the country's genetic resources, and studies on native species have been conducted. Turkey has ratified most international agreements on biodiversity and nature conservation.

The proportion of endangered or vulnerable species is nevertheless quite high, particularly in the case of mammals (22 per cent). The destruction or transformation of biotopes is continuing, largely as a result of the very rapid development of tourism, urbanisation, and major construction projects in rural areas. Protected areas themselves are subject to many pressures (siting of tourism projects, irrigation, overgrazing, pollution of wetlands, forest fires, illegal hunting, etc.); management plans are sorely lacking. Protected areas cover only 3.9 per cent of the country's total land area. The main impact of rural communities living in forests (forest villages) is soil depletion due to overgrazing. Local communities and environmental NGOs have not been closely enough involved in planning nature conservation programmes. Lack of co-operation among the various government bodies responsible for nature conservation has also been noted. Turkey has still not ratified the Bonn Convention on migratory wildlife species.

It is therefore recommended to:

- strengthen the network of specialists, scientists and NGOs dealing with information on flora and fauna, finalise the inventory of endangered species and publish a Red List;

- increase the total surface of protected areas, linking them to form a network, and ensure that they are effectively protected, particularly through management plans;
- set as an objective, and implement, strict protection of part of the coastline;
- strengthen co-operation and partnership among ministries and agencies responsible for nature conservation at the planning and implementation stages;
- ensure that environmental impact assessments are carried out for activities that put pressure on biodiversity;
- increase public awareness, and reinforce information and education programmes on nature conservation problems;
- put in place a national biodiversity conservation strategy and action plan, and a national action plan to combat desertification and to control soil erosion and drought, in association with scientists and environmental NGOs;
- pursue efforts to classify forest stands for the purpose of conserving genetic resources.

## 2. Integrating Environmental Policies

### *Fostering sustainable development*

Based on a number of strategic development options and the goal of bringing its living standards closer to those of other OECD countries, Turkey benefits from extended analytic, integration and planning efforts by the State Planning Organisation and by much of the national administration. Environmental planning has been part of Five Year Development Plans since the mid-1970s. Sustainable development was adopted as a central concept for the period 1991 to 1996 (sixth Plan), and protection and improvement of the environment is a major objective for the period 1996 to 2000 (seventh Plan). The 1998 National Environmental Action Plan is a leading example of national environmental planning, given its high quality and comprehensive analysis, setting of orientations and objectives, and action-oriented proposals. Further, programming of public investment by the SPO in direct relation to the Five Year Development Plans, and the more recent use of EIA for projects, are major tools serving institutional integration.

There is, however, limited co-ordination between sectoral ministries and different levels of government on environmental matters. The Ministry of Environment is in practice relatively new, with limited resources and limited competence; several administrative functions are carried out by other ministries or government agencies. Its contribution to integration of environmental concerns in other national policies, and to supporting environmental management by local authorities, is also restricted. Closer co-ordination with government departments responsible for treasury and fiscal policies would encourage the development of a system of economic instruments for environmental protection. The SPO should carry out environmental assessments of sectoral programmes and policies more systematically, as part of its internal procedures.

Several regional development projects, such as GAP and water development projects, attempt to bring together the economic, social and environmental dimensions of sustainable development. Local Agenda 21 Committees (e.g. in Antalya) are a major step forward in terms of local attention to environmental concerns. A number of local development projects, some largely driven by NGOs (e.g. TEMA) or international organisations (e.g. UNDP), are having positive results, particularly for rural populations in depressed areas. The National Assembly is considering legislation that would establish a Sustainable Development Council.

Particular attention needs to be given to integrating environmental concerns in energy, transport, tourism, industrial and agricultural policies. The objective of producing food for a rapidly growing and richer population has had higher priority than maintenance of a sustainable agricultural resource base. Many opportunities to further sustainable agriculture and food production exist which would be more cost-effective than current policy measures. In the industrial sector, most of Turkey's large exporting firms try to meet most national and international environmental standards, and many are becoming increasingly aware of their environmental responsibilities. Nevertheless, most of the country's vast number of small and medium-sized enterprises do not comply with environmental standards. Facing severe economic difficulties, they continue to use old technologies and find it difficult to make a strong effort to protect the environment or prevent risks to employees and the surrounding area. This suggests opportunities for investment in cleaner technologies and enhanced productivity consistent with sustainable development objectives. Banking's role in supporting environmental investment should be enhanced.

Greater focus should be put on "getting the prices right", with appropriate attention to addressing special needs of the poor. Internalising externalities, and reducing subsidies and other forms of financial aid that are both costly to taxpayers and environmentally damaging, should be important objectives. The use of appropriate pricing (e.g. for water and energy) and economic instruments should help shape more sustainable consumption patterns. Environmental concerns should be integrated within fiscal policies and reforms.

It is therefore recommended to:

- implement the 1998 National Environmental Action Plan, and contribute to its international diffusion as a reference model;
- reduce subsidies and cross-subsidies (e.g. for industry, agriculture, energy) with adverse environmental effects; identify current fiscal measures that have detrimental effects on the environment and seek to avoid such measures in the future, with appropriate attention given to the specific needs of the poor;
- promote changes in consumption and production patterns by providing appropriate information and environmental education, by measures to ensure waste minimisation, recycling and control of landfills, and by ensuring that prices fully reflect environmental costs (e.g. for water and energy), while giving attention to the needs of the poor;
- review the environmental impact of small and medium-sized enterprises; develop medium-term contracts with trade groups; ease access to bank credits for such enterprises; accelerate the transfer of clean technology from larger to smaller firms; encourage environmental partnerships between larger and smaller enterprises;
- further develop projects aiming at sustainable management of natural resources and income generation in rural depressed areas; ensure the environmental impact assessment of sub-projects of the GAP, and minimise their adverse environmental impacts (e.g. erosion);
- strengthen the institutional capacity to analyse the economic and social consequences of proposed policies, programmes and projects having significant environmental impacts.

***Tourism and environment***

Tourism has developed very rapidly in Turkey, based on the country's great natural and cultural riches, with both positive and negative environmental effects. Income from international tourism (9 million visitors) accounts for approximately 15 per cent of total export income and 4 per cent of GDP. However, tourism is concentrated along the Aegean and Mediterranean coasts between May and September and generates strong environmental pressures.

In order to better integrate environmental considerations in tourism policies, Turkey has progressively put in place a legislative and regulatory framework aimed at better organising tourism development and protecting certain sensitive areas. Concrete progress has been made in regard to drinking water supply, waste water treatment in tourist areas, bathing water quality, development of regional action plans, environmental impact studies for tourism projects, and diversification of tourism products.

Nevertheless, Turkey is seriously behind in providing sanitary infrastructure. Operators need to be able to use tourism and environment indicators to evaluate their performance in carrying out action plans, and to keep up with the integration of environmental concerns in tourism development strategies. Greater efforts should be made to assist sustainable development of SMEs in the tourist industry and to use economic instruments to protect the environment. Mechanisms for permanent dialogue among tourism authorities, local public authorities and the tourist industry should reinforce the integration of environmental concerns in tourism policies and practices.

It is therefore recommended to:

- put in place a national strategic action plan for sustainable tourism development, containing quantified environmental protection objectives, investment priorities and land use planning for tourism activities;
- develop tourism and environment indicators to evaluate the success of programmes, keep track of progress in integrating environmental concerns in tourism and assist decision-making in tourism development strategies;
- put in place tools for permanent dialogue among tourism authorities, local public authorities and the tourist industry;

- improve the evaluation and control of the environmental impact of small and medium-sized enterprises in the tourist industry;
- expand the use of economic instruments to better internalise tourism's environmental costs and increase its financial contribution to environmental protection.

## 3. International Co-operation

In the 1990s, Turkey has strengthened bilateral environmental co-operation with a large number of countries, mainly in its region, and has signed, ratified and implemented many international environmental agreements. Numerous initiatives have been taken to increase co-operation with other Black Sea and Turkish-speaking countries. Limited official development aid has been received; at the same time, technical assistance has been provided to other developing countries. Problems associated with pollution of coastal waters in the Mediterranean area have been reduced, and new waste water treatment facilities are being installed. In this regard, more efficient progress has been made when it involved action by the private sector than when State or municipal funding was involved. Transfrontier movement of hazardous waste has been halted. Turkey has been very successful in improving maritime safety in the Turkish Straits, and in reducing use of ozone-depleting substances ahead of schedule. In these two cases, positive results have been achieved in co-operation with social partners and with the support of NGOs. With regard to conventional air pollutants (e.g. $SO_x$, $NO_x$, VOCs), Turkey is taking into account technological capacities and the relevant UN-ECE protocols (e.g. Helsinki, Sofia, Oslo, Geneva) when revising its air quality regulations, although it is not a party to these agreements.

Despite progress at the end of the 1990s, compared with the early part of the decade, serious international environmental problems remain to be solved. This is mainly due to the large accumulated backlog in regard to various international environmental issues, along with the low priorities given them in governmental policies. First, there are many environmental agreements which Turkey intends to ratify, although it has not yet done so, and other agreements which it could reasonably envisage ratifying along with other European countries. Among these, particular attention should be given to a number of UN-ECE agreements which are pertinent to a rapidly industrialising country. Second, a few ministries have not yet acted on several measures needed to cope with maritime and terrestrial emergencies. Greater attention should be given to preventing maritime and industrial accidents. Third, construction of sewerage and treatment plants for municipal waste water has not progressed at a rate sufficient to abate pollution of coastal waters to a satisfactory extent. Energy conservation efforts have also been limited, despite the economic and environmental gains to be expected. Serious gaps in environmental monitoring and data collection in recent years have prevented preparation of a state of the environment report or a precise assessment of progress made in carrying out environmental policies in an international context, notably in the framework of Mediterranean and Black Sea co-operation programmes. Finally, the institutional capacity of both the Ministry of Environment and the Ministry of Foreign Affairs should be significantly enhanced.

It is therefore recommended to:

- examine the international agreements signed by most European OECD countries, in order to take steps towards ratifying those which meet the needs of a rapidly industrialising country in a European context;
- pay particular attention to recent developments in international environmental law, as a basis for solving transfrontier issues in a bilateral or regional context;
- improve availability and access to environmental information, facilitate public participation with a view to implementing relevant OECD Recommendations, and prepare for possible accession to the Aarhus Convention;
- take measures to promote greater energy conservation and energy efficiency, with a view to supporting world efforts to reduce emissions of greenhouse gases;
- develop an integrated strategy to prevent maritime and industrial accidents and to cope with their consequences, with a view to becoming a party to relevant international agreements and practices in this regard.

# UNITED KINGDOM

## CONCLUSIONS AND RECOMMENDATIONS*

Early industrialisation, an intensive use of natural resources and urbanisation have transformed the United Kingdom's environment, which is characterised by a high density of population and largely man-made landscapes. Its mature economy has experienced considerable fluctuation over the last two decades and is no longer based on heavy industry. The expansion of the service sector and of high technology and light manufacturing, along with an increasingly mobile lifestyle, are reshaping the United Kingdom's consumption and production patterns and posing new challenges for the achievement of environmental progress.

As awareness of environmental issues grew as early as the 1950s, the United Kingdom was often in the forefront internationally in identifying environmental threats and in devising policies and institutions to restore air and water quality, to reclaim derelict land and to better plan towns and countryside. These efforts, driven by domestic conditions and needs, were valuable and, in their own terms, successful. They often focused, however, on the most apparent problems rather than the underlying causes.

UK environmental policy has undergone a revival since the late 1980s. The United Kingdom has adopted a higher international profile on environmental matters and its environmental legislation has been strengthened. The United Kingdom is also now committed at the highest levels of government to environmental protection and sustainable development.

This OECD report sets out the baseline for assessing future environmental progress and examines the environmental performance of the United Kingdom in four major areas:

i) reduction of the pollution burden;
ii) nature conservation and landscape preservation;
iii) integration of environmental and economic decision making;
iv) international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This assessment includes both domestic objectives and international commitments, and is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in the United Kingdom.

### 1. Reducing the Pollution Burden

#### *Strengthening the effectiveness of pollution prevention and control*

The United Kingdom has made particularly good use of its many assets in its environmental efforts. Its strong scientific establishment has contributed significantly to the understanding of environmental problems. The Government has linked acting on the basis of good science with use of the precautionary principle. The land planning system is a well established and valuable instrument which offers a strong basis for further environmental progress, though there could be opportunities to increase the use of environmental impact assessments. The economic structural reforms of the last 15 years have displayed increased cost transparency, notably for environmental costs; and the privatisation of regional water services, through controversial at the time, is now regarded by many to have been a positive step from an environmental viewpoint.

The recent move in the United Kingdom towards integrated pollution control (IPC) is a major component of environmental management, though it is only half completed and its scope is still limited to large point sources of pollution. The system holds much promise of providing valuable experience far beyond the United Kingdom. The Government has stated that it is committed to the use of market forces, although it has yet to make extensive use of economic instruments as part of its environmental policy.

It is therefore recommended that consideration be given to the following proposals:

- Supplementing the regulatory framework with a variety of economic instruments would improve the cost-effectiveness of UK environmental policy. There are many opportunities to extend the use of economic

* Conclusions and Recommendations approved by the Group on Environmental Performance at its June 1994 meeting.

instruments, such as incentive charges for water pollution and abstraction, deposit-refund systems and levies on landfill as well as on minerals extraction and pesticide use.

- The full implementation of IPC requires a system of consistent environmental and economic criteria that give meaning to IPC's basic principles ("best available techniques not entailing excessive cost", and "best practicable environmental option"). It also requires that the establishment of environmental quality standards, especially for air and water, be accelerated.
- An integrated approach to pollution prevention and control should be applied to more than just discharges from large point sources of pollution. Planning should also extend the integrated approach to the use of chemicals and the life cycle of products.
- The establishment of the Environment Agency, announced in 1991, would clearly facilitate the development of IPC, notably with respect to waste, and should be completed without delay. Its remit could also take account of the effect of all major sources of pollution, including transport and agriculture. These proposals also apply for the separate but parallel plan to create a Scottish Environment Protection Agency.
- Government procurement, contracts and standards, both for products and for services such as construction, should systematically incorporate environmental factors.
- Research and development on clean technology should be further promoted and care should be taken not to weaken environmental research.
- Sufficient funding should be provided for environmental efforts as well as a medium- and long-term assessment of the public and private financial implications of existing national and international commitments.

***Water***

High rainfall and low abstraction levels in the United Kingdom provide favourable conditions in most areas for water quantity and quality management. Water supply and low-flow problems are limited. Water quality in most rivers and lakes is good according to conventional criteria. Drinking water generally meets quality standards. Efforts have long been made to protect water quality. Today, 74 per cent of the population is connected to secondary or tertiary treatment, a relatively high level among OECD countries. For direct discharges of industrial effluent, the discharge consent system and IPC cover a wide range of plants and processes. The privatisation of water companies has improved the transparency of pricing and brought efficiency gains in the provision of water services.

Nevertheless, the environmental performance of the United Kingdom concerning water could be improved, notably with respect to coastal water and bathing water quality, the quality of tap water, eutrophication of lakes and reservoirs, and diffuse pollution. The lack of statutory environmental quality objectives and frequent institutional changes may impede consistent and effective policy implementation. In addition, rising public expectation concerning environmental quality and international commitments, such as EC directives and the North Sea Declarations, are leading to a higher level of ambition for water quality management, and will require significant financing over the next ten years.

It is recommended that consideration be given to the following proposals:

- Statutory environmental quality objectives should be adopted for individual rivers, in line with the 1991 Water Resources Act, and for groundwater. They should be based on both human health criteria and ecological considerations.
- Sewage treatment should be further improved, notably to deal with discharges to coastal waters, capacity problems and storm water overflows. Water supply facilities should also be improved, aiming at removal of nitrate and pesticides, reduction of leakage and replacement of old piping (especially lead and tar-coated pipes). Charges for these services should be designed with such investment needs in mind.
- Measures should be developed to deal with increasing quantities of sewage sludge, such as proper composting, incineration and landfilling. Further efforts to reduce contamination of sludge are required. Control of land application of sludge, based on adequate monitoring, is necessary to assure sustainable land use.
- Economic instruments (e.g. effluent and abstraction charges) should be used to provide increased incentives for reducing pollution and water abstraction, and water metering should be extended to encourage customers to reduce water consumption.
- The control of diffuse sources of water pollution should be strengthened through integrated measures, including land use planning, protection zones, agricultural practices and better use of fertilizers and pesticides.

***Waste***

Waste management in the United Kingdom in the past two decades has been carried out at relatively low cost. It has principally relied on landfilling and little on recycling, and has been helped by stable trends in waste quantities. Since the late 1980s, the United Kingdom has taken significant steps to improve waste management, mainly in response to EC directives and other international agreements. The Government has set up a hierarchy of policy options and is committed to implementing it. More stringent regulations on landfills and incinerators have been introduced and will be strengthened within five to ten years. The United Kingdom no longer exports hazardous waste for disposal, and waste dumping at sea has been reduced to dredged material and sewage sludge, with the latter being phased out by 1998.

Tougher regulations on air and water pollution, and elimination of sea disposal, will increase the quantity of waste requiring treatment and disposal. Introduction of stringent regulations and responsibilities will raise disposal costs significantly and force many landfill sites and incinerators to close. Contaminated land poses a long-term environmental threat. Overall, the United Kingdom will undoubtedly have to confront major challenges in waste management over the next ten years.

It is recommended that consideration be given to the following proposals:

- Quantitative targets for waste reduction and recycling should be developed to aid in designing concrete measures and provide guidelines for the private sector.
- The Government should encourage proper coverage of waste generation in IPC and draw up a long-term schedule of regulation reflecting expected technological progress.
- Economic instruments should be used to encourage waste reduction and recycling, including landfill levies, deposit-refund systems and higher recycling credits.
- An inventory of the most seriously contaminated sites and an expansion of public funding to tackle the most acute problems are urgently needed. A comprehensive system for land clean-up, including cost allocation measures, should be established.

***Air***

The past 20 years have seen significant improvements in the United Kingdom with respect to emission levels and atmospheric concentrations of $SO_2$, particulates and lead. These improvements are largely due to the structural changes in the economy, clean air legislation, energy efficiency improvements, a decline in coal use coupled with the availability of cleaner fuels, and compliance with EC directives. The United Kingdom is increasingly setting clear goals and targets for air management policy. It has played a leading role in developing and applying the concept of critical load in international agreements on acid deposition. The comprehensive regulatory system under development since 1990, using a combination of authorisations, emission standards and air quality standards, provides a framework that can accommodate the development of innovative technologies and the flexibility for plant operators to choose the most economic options, while allowing for further emission reductions within the framework of IPC.

No significant achievements can be seen with respect to $NO_x$, CO, VOCs and ground-level ozone. $NO_x$ concentrations and emissions in particular have increased in recent years. The transport sector, especially road transport, is largely responsible for this increase. While significant reductions in emissions of $NO_x$, VOCs and CO are expected from the implementation of EC directives on emissions from new vehicles, other emission reduction efforts will have to be developed. Most of the emission reductions to which the United Kingdom is committed, and therefore the largest part of the necessary investments in air pollution control, are to take place over the next five to ten years.

It is therefore recommended that consideration be given to the following proposals:

- Ongoing work on the establishment of ambient air quality standards should be accelerated and extended to pollutants such as particulate matter and air toxics.
- A wider use of economic instruments would improve the environmental and economic efficiency of the United Kingdom's air management policy. Road pricing systems should be further explored. More use could also be made of regulatory measures such as product standards, energy efficiency standards and life cycle analysis of products.

- Strategies to achieve emission reductions concerning SOx, VOCs and $NO_x$ and related targets, and to limit acid deposition on UK soil and in neighbouring countries, should be implemented efficiently.
- There should be further integration of transport and environmental policies. In particular, comprehensive national transport development programmes should take into account the short- and long-term need to reduce air pollution from transport.

## 2. Nature Conservation and Landscape Preservation

The United Kingdom has made good progress in this area, and has a solid basis for further achievements given its strong tradition in the study of natural history; active and competent voluntary organisations; and well-established legal and institutional arrangements for land use planning, nature conservation and landscape management. In particular, key species have shown a number of positive trends over the last two decades. There is also a commitment to positive action concerning protected areas, and encouraging and innovative policy changes in sectors such as agriculture and forestry. At international level, the Government has taken a number of initiatives to protect important natural assets and rare species.

Policy changes need to go further, however: there are still a number of negative trends for representative and important habitats and species, notably due to pressures from agriculture and forestry.

It is recommended that consideration be given to the following proposals:

- Co-operation and integration between government bodies dealing with nature protection and landscapes and with other sectors should be strengthened. The UK Government should continue to press for environmental objectives and management principles to be integrated into agricultural support policies under the Common Agricultural Policy.
- Following up on the Biodiversity Action Plan, and as announced by the Government, precise targets for species and habitats should be set. They should be monitored using performance indicators, and broken down by type of measure and by management responsibility.
- Stricter protection measures or the extension of special areas, such as the Sites of Special Scientific Interest, will probably be necessary to achieve targets for species and habitats.
- Protected areas should be more effectively safeguarded against developments that are detrimental to nature conservation.
- The protection of the UK coastal and marine environment should be strengthened and accelerated, particularly in view of the international importance of these habitats. Priority should be given to ensuring a level of protection comparable to that of terrestrial habitats. The number of Marine Nature Reserves should be increased.
- Financial means should be considered to strengthen the policy of nature conservation.

## 3. Integrating Environmental and Economic Decision Making

### *Environmental and economic policies*

As the cradle of the industrial revolution, the United Kingdom has had a long experience of the problems that economic development can bring for the environment, including resource depletion, pollution, and degradation of the urban and rural landscape. Environmental issues have, however, changed in scope and nature to the extent of being recognised in the late 1980s by the UK Government as global and closely tied in with economic development issues. The UK Strategy for Sustainable Development, released in January 1994, clearly recognises that demand for energy, water, minerals and transport must be managed with environmental objectives taken into account. Some of the economic structural changes of the 1980s and early 1990s (deregulation, privatisation) also have implications for environmental management.

Much remains to be done to integrate environmental, economic and sectoral policies in the United Kingdom, as in other OECD countries. Fortunately, good opportunities exist for substantial improvements in policy integration. These include the wider use of economic instruments, in combination with regulatory and other policy instruments (Section 2), to achieve increasingly stringent environmental goals at least cost.

It is recommended that consideration also be given to the following proposals:

- Existing mechanisms for economic and sectoral policy integration need to be used more fully, and a stronger environmental capability should be created within non-environmental government departments, with the collective action of Green Ministers broadened. An environmental appraisal should be an explicit part of every stage of policy making.
- More use should be made of quantitative targets, especially to make the concept of sustainability more concrete and to improve public accountability.
- Reporting on the state of the environment and its changes should be done regularly, and public access to environmental information and data should be facilitated (e.g. information on voluntary agreements and on emission registers).
- More work should be done on the economic costs and benefits of environmental programmes, the environmental implications of economic and sectoral policies and the economic, social and environmental consequences of changes in consumption and production patterns. Understanding of these matters would be improved if the environmental policy analyses carried out for legislative proposals were provided to Parliament.
- The use of land use planning and regulation should be continued and reinforced to serve pollution abatement, nature conservation and risk prevention.

***Sectoral integration: energy***

The United Kingdom has developed a coherent climate change programme for the period up to 2000, within the framework of a longer-term sustainable development strategy. Its $CO_2$ reduction programme rests on a set of quantitative targets broken down by sector and by measure. The Government has recognised the necessity of using a mix of mutually supportive regulatory, information and economic instruments within a well-defined energy efficiency programme. This programme is notable in several respects: the importance given to information efforts; the introduction of a staged increase in road fuel duties; the use of targeted financial support programmes; and the creation of the Energy Saving Trust, which aims to actively involve energy industries in efforts to reduce energy consumption and $CO_2$ emissions. The United Kingdom's $CO_2$ target appears feasible, providing the Climate Change Programme is kept under review and adjusted as necessary. In particular, the adequacy of the energy efficiency incentives provided through the programme remains a central issue.

As a significant energy producer providing much of its own energy needs from abundant domestic resources, the United Kingdom is familiar with the environmental problems of energy production and use. The increasingly apparent legacy of its early industrialisation, and the emergence of environmental concerns related to energy activities (notably international concerns such as acid deposition and climate change), are causing a fundamental shift in energy policy. In view of the Government's $CO_2$ target, it is becoming apparent that stricter duties than those initially introduced in the privatisation acts of energy utilities are needed to encourage improved energy efficiency. Privatisation has increased the need for cost transparency and brought to the forefront issues relating to environmental liabilities in the nuclear and coal industries.

Opportunities to further integrate environmental concerns into energy policy should be geared to reaching the objective of more sustainable energy consumption and production patterns. In this context, it is recommended that consideration be given to the following proposals:

- In the area of improved energy efficiency, the Government should take a more active role in identifying how the resource needs of the Energy Saving Trust can be met, and in ensuring that regulators, utilities, other fuel suppliers and agencies substantially increase their contributions. For the medium term, arrangements for extending the trust's work to sectors such as transport should be examined.
- The Climate Change Programme for the period up to 2000 should be implemented, kept under close review and adjusted as necessary; greenhouse gas emission targets should be considered for the years beyond 2000, in the context of the global response under the Framework Convention on Climate Change, and strategies outlined for achieving them.
- All offshore petroleum developments should be subject to environmental impact assessments, and stricter controls should be considered on allowable oil discharges from offshore platforms, as well as from refineries, which should rely more on pollution abatement technology.
- The legacy of coal mining operations, and in particular the full extent of costs of mine drainage control and site restoration, needs to be clearly established. The Water Resources Act should be amended so that the coal industry has a continuing obligation to prevent mine drainage pollution. The dereliction of former mining areas should be tackled in a coherent national programme.

- Greater transparency is needed in the internalisation of environmental costs in the nuclear industry. This would include assessing the cost of disassembling and eliminating the legacy of the past nuclear programme. The economics of new nuclear developments should be separated from the liabilities of existing plants.

***Sectoral integration: the chemical industry***

The United Kingdom established specific institutions to deal with chemical risks at a very early stage of industrialisation. Improvements have been introduced over the last 20 years, including industry adoption of legislation to cope with growing risks from the rapid expansion of the chemical industry, now one of the largest UK manufacturing sectors. The recent adoption of IPC and the obligation to use "best available techniques not entailing excessive cost" and the "best practical environmental option" represent major changes in the pollution management of the chemical industry. The integration of environmental regulators into a single agency will be another important step towards achieving greater cost-effectiveness in regulating pollution from the chemical sector. The chemical industry took the initiative to develop very early the Responsible Care programme; and major chemical companies have acted with great diligence to reduce their pollutant releases to the environment and their consumption of energy and other natural resources, and to improve their overall record as "good neighbours".

The IPC approach was introduced with the full support of the UK chemical industry. The technical complexity and heterogeneous nature of the industry has made dialogue and consultation a central issue in the implementation of IPC. There were initial difficulties in this respect, and some problems remain.

It is thus recommended that consideration be given to the following proposals:

- Care should be taken to ensure that IPC is adapted to the needs of smaller companies in the chemical industry.
- The integration of environmental regulatory bodies dealing with the chemical industry should be further promoted.
- The wider use of the Responsible Care programme should be promoted.
- Quantified risk assessment for chemicals and major hazards should be more widely used, and cost-benefit approaches applied to decision making in cases of major uncertainty.
- More environmental data should be published on pollutant emissions and toxic inventories, as well as on achievements towards a safer chemical industry.
- Research and testing on both new and existing chemicals should be increased, and strong UK support for international co-operation in this area should be maintained.

## 4. International Co-operation

Since the late 1980s, the United Kingdom has been among the leading countries in promoting and supporting international environmental co-operation. It has taken numerous initiatives to promote better environmental protection, supported the development of new international agreements, helped devise effective rules and practices, and sought effective enforcement of international environmental law. It has supported scientifically based measures that are justified from a cost-benefit perspective. The United Kingdom has agreed to a wide range of quantified targets at international level, mostly concerning air, water and marine pollution. All the international commitments of the United Kingdom have been met, or are on the way to being met, in time. Transfrontier pollution of air and marine waters has been considerably reduced. Dumping and incineration of hazardous waste at sea have been banned. Steps have been taken to effectively follow up on commitments made at UNCED. The United Kingdom has been active in providing aid to developing countries and in helping them better protect their environment.

While the overall picture is very positive, there is still room for progress. Neither the subsidiarity principle nor the weakness of cost-benefit calculations should be used as a reason for slowing environmental convergence in the European Community. The significance, both environmental and political, of transfrontier pollution still originating from UK land-based or offshore installations should not be underestimated. In particular, additional measures are needed to prevent an upturn in $NO_x$ and $CO_2$ emissions at the end of the century, and to reduce acid deposition. New efforts will be needed to reduce pollution of the sea by oil and chemicals. Concerning aid to developing countries and to Central and Eastern Europe, the level of financial resources being made available does not seem commensurate with the United Kingdom's international role and GDP. This applies, in particular, to the

environment component of bilateral development aid and to the level of resources provided to various environmental funds.

In this context, it is recommended that consideration be given to the following proposals:

- A number of recent international agreements still need to be ratified (Annexes III. A and III. B).
- The United Kingdom should continue to support innovative action within the European Community.
- Cost-benefit approaches should be applied to the implementation of the precautionary principle.
- The UK authorities should ensure that the financial means and human resources necessary to achieve the targets set in international agreements are available.
- The progress of the United Kingdom in implementing action plans under Agenda 21 should be monitored; NGOs should be associated with the monitoring process.
- Legal instruments for the protection of the marine environment should be strengthened, and new international agreements to reduce sea pollution and cope with liability should be prepared.
- The implementation of the Montreal Protocol should be continued, and existing CFCs should be recovered more efficiently.
- The environmental component of aid should be more clearly defined and increased.

# UNITED STATES

## CONCLUSIONS AND RECOMMENDATIONS*

The United States responded at an early stage to pressures on the environment from economic activities and to public awareness of environmental problems by creating institutions with specific environmental responsibilities. Its size and the attendant diversity of environmental conditions, its federal structure and the varying institutional arrangements among the 50 states constituted a challenge when it came to creating a "level playing field" across the country with respect to environmental regulations. The response has been a set of federal rules, specific to various issues (*e.g.* nature protection, air quality, water quality, waste and contaminated sites), to be implemented by the states under federal oversight.

There has been comparatively less emphasis on issues of natural resource use; the United States remains among the world's largest users of energy and water on a per capita basis. Many of today's pollution sources and effects are less visible to the public, yet no less hazardous for public health and ecosystems. The challenge for the United States is to: *i)* implement more cost-effective environmental policies to address remaining issues; *ii)* better integrate environmental concerns in economic decision making; and *iii)* continue to actively support international co-operation to protect the environment. The task must include strategies that can encourage a transformation of existing production and consumption patterns to make them contribute to the nation's sustainable development objective. This will require an increased effort from all sectors of society.

This OECD report sets out the baseline for assessing future environmental progress, and it examines the environmental performance of the United States: the extent to which government policy objectives are being met. This assessment includes both domestic objectives and international commitments, and is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in the United States.

### 1. Implementing Environmental Policies

#### *Achievements and cost-effectiveness of environmental policies*

Laws and regulations of a "command and control" type were used over the 1970s and 1980s as the main instrument to implement US environmental policies, on an issue-by-issue basis. They proved very effective and led to a number of achievements, in a context of high public environmental awareness and varied environmental NGO initiatives. They contributed to the decoupling of economic growth and emissions of important pollutants, such as atmospheric emissions of $SO_2$ and lead. In a number of cases, the country as a whole and some states have been world leaders in standard setting (*e.g.* cleaner cars in California). Overall, compliance is high and enforcement is strong; public participation and access to environmental information can be seen as models in many respects; more than in any other country, the environmental agenda has benefited from strong environmental science and research. Although significant expenditure has been devoted to environmental protection (over $120 billion in 1992), there is no evidence that the economy has been adversely affected as a whole by strong environmental protection policies. The private sector is showing an increasingly proactive attitude towards environmental protection and sustainable development and is seizing opportunities offered by new and fast growing markets for environmental goods and services.

Still, urban, industrial and agricultural activities continue to exert pressure on the environment: a significant proportion of rivers and lakes remain unsuitable for swimming and fishing, a sizable fraction of the US population is still exposed to air of unsatisfactory quality, the decline in the area of wetlands has not yet been halted and the number of threatened and endangered species is still growing. These pressures are partly caused by consumption patterns based on low-density housing, extensive use of the motor vehicle, high resource use (energy, water) and high generation of waste. As long as they are not reduced, conditions will not be favourable for sustainable development. Reversal of current trends will require an increased effort from all sectors of society. A change to more environmentally and economically cost-effective and integrative sectoral policies will be necessary to moderate the increase in environmental expenditure.

Environmental policies themselves are now therefore at a crossroads in the United States, not because there is less or more environmental concern than ten years ago, but because new and alternative approaches to policy development and implementation appear desirable. In fact, new environmental policies are already under way. They promote: i*)* licensing procedures for major polluting installations based on pollution prevention approaches; *ii)* partnership with stakeholders (*e.g.* industrial branches, environmental NGOs); iii) place-based and ecosystem

* Conclusions and Recommendations approved by the Group on Environmental Performance at its November 1995 meeting.

management; and iv) goal setting and performance-oriented accountability. These policies continue to emphasise cost-benefit and risk analysis, probably more than in any other OECD country. Special attention is given to environmental justice, the idea that a disproportionate environmental burden is often placed on minorities, low-income people and Native American communities.

These changes in environmental policies are expected to bring significant gains in environmental effectiveness and economic efficiency to address the environmental issues of the 1990s. This will be even more the case if they are supported by more extensive use of economic instruments and voluntary agreements, in conjunction with regulation. Some of these instruments are already in use (*e.g.* trading mechanisms for emission permits or allowances, a CFC tax, voluntary programmes and agreements). However, expanded use of fees and charges to get the prices right for natural resources such as water and energy, and a review of financial assistance schemes, should receive higher priority.

It is recommended that consideration be given to the following proposals:

- streamline the environmental regulatory system and promote a performance-based approach while maintaining health and environmental standards;
- continue the introduction of strategies based on ecosystems;
- implement environmental policies at least cost for the government and society as a whole and call upon inputs from all stakeholders;
- set new health and environmental standards in a consistent way, bearing in mind the costs and benefits of achieving them;
- in laws and regulations, avoid approaches that easily generate costly litigation, court actions or reviews;
- strengthen co-operation between government institutions and the private sector, building upon such approaches as the Common Sense Initiative;
- continue using market-based instruments in association with regulatory instruments and others, such as voluntary agreements; expand the use of pollution charges to improve economic and environmental effectiveness;
- review government financial assistance for the provision of environmental services (*e.g.* direct and indirect subsidies, preferential loans, tax incentives) in the light of the polluter pays principle and the user pays principle; in particular, examine subsidies on sewerage, waste water treatment and irrigation, and grazing on public lands;
- examine pricing policies or tariff structures for such key natural resources as energy, water and grazing lands, to ensure that they take environmental considerations into full account; to this end, a review of any financial assistance schemes that might lead to overuse of resources would be useful.

***Ecosystems***

Long-standing and effective efforts by governmental and non-governmental organisations to conserve both natural habitats and species have achieved very positive results. The United States possesses an extensive system of national parks that is well managed and still being expanded; many terrestrial and marine protected areas at state and local levels have also been established. As a result, about 10 per cent of the total area is covered by some degree of protection. Several hundred recovery plans have been adopted for threatened and endangered species, as well as for other important wildlife species; the measures taken have allowed some depleted populations to recover and sometimes to widen their geographical range. The integration of environmental considerations into farm policies has slowed soil erosion and habitat loss caused by conversion to agricultural uses. More sustainable forestry practices have been introduced, mostly on federal land, as in the Pacific Northwest. Habitat restoration efforts (*e.g.* for wetlands and prairies) have also had some success. The United States has been active in international co-operation; for instance, on North American waterfowl and North American wetlands, and under the Ramsar and Washington conventions. The ecosystem management approach increasingly being adopted, for example in Chesapeake Bay and the Everglades, will also help better protect US biodiversity.

Despite these achievements, however, the effects of economic development continue to place heavy pressures on the natural environment. Habitats are still being reduced or degraded in many parts of the country and in coastal areas. Even for wetlands, which have been given special attention over the last decade, the "no net loss" policy goal is not yet being achieved. Concerns remain on the sustainable use of public lands. A consistent system to provide information on the many categories of protected areas is also lacking, particularly for areas outside federal management: state, tribal, local and private protected areas. Many more species are declining than are improving, particularly freshwater species, migratory birds and some birds of prey. Protection measures in place are increasingly questioned on grounds that they interfere too much with certain types of development. A number of stocks of marine fish species have

been declining. Knowledge of less visible species is lacking in a number of areas. The large number of separate programmes for sometimes highly specific purposes makes overall co-ordination difficult; on the whole, the efforts of the different agencies appear fragmented. While there are some individual policy goals for wetlands and for endangered species, there is no overall set of national objectives for biodiversity.

It is therefore recommended that consideration be given to the following proposals:

— develop and adopt a co-ordinated set of biodiversity objectives for habitat and species;
— strengthen co-operation on the part of federal agencies, state, tribal and local governments, private landowners, business, voluntary organisations and the general public to promote biodiversity;
— further strengthen habitat restoration efforts;
— pursue and develop the ecosystem management approach, including on public lands;
— use compensatory economic instruments to improve protection of species and habitats in certain areas, while allowing further land development in others;
— integrate further environmental and nature protection concerns in agricultural and forestry policies to promote farming and forestry practices that provide environmental benefits, in particular with respect to preserving biodiversity and preventing and controlling pollution from agrochemicals;
— strengthen co-ordination among federal agencies with responsibility for improving knowledge concerning land use, coastal areas and biodiversity trends.

***Water***

The 1972 Clean Water Act has been used very effectively in reducing point discharges: from 1972 to 1994, the number of people served by secondary or better levels of sewage treatment nearly doubled, to 163.7 million or 64 per cent of the population. A rigorous, nationwide compliance assurance system enforces permit conditions. Municipal and industrial waste water treatment plants are mostly large, well-managed units with permit compliance rates of over 90 per cent. Good performance can also be seen in the management of municipal sewage sludge: about 90 per cent of composted sludge is suitable for spreading onto agricultural land, proof of the effectiveness of the pre-treatment of industrial effluent discharged into municipal sewers. Attention is being given to environmental justice (*e.g.* provision of basic water services to colonias in Texas and New Mexico). A comprehensive range of nationwide programmes by all federal water management agencies supports and brings consistency to state and local activities.

In spite of progress in improving water quality, 40 per cent of assessed rivers, 45 per cent of assessed lakes and 33 per cent of assessed estuaries are not supporting their designated uses and the goal to make all waters "fishable and swimmable", originally set for 1983, has still not been achieved. The main pollution sources requiring further action are diffuse sources such as agriculture, overflows from combined sewer and storm water outfalls. In the next few decades much of the ageing water supply and waste water treatment infrastructure will need to be replaced or upgraded, implying significant investment expenditure.

The United States has the highest per capita water withdrawal in the OECD. Agriculture accounts for 85 per cent of total consumptive use; in arid and semi-arid regions the figure is even higher. The availability of water is a constraint on sustainable development in some regions. Protection of in-stream flows has generally been weak and has allowed many rivers to become overallocated, leading to harm to aquatic ecosystems. The price of water is low, often leading to inefficient use.

The widespread use of financial assistance and the absence of consistent policies on charging for water resource use (either for taking water or for discharging pollutants) show that to date the application of the user and polluter pays principles has been limited, in most areas. The permitting system has become very labour-intensive and unwieldy, and in all parts of the country there is a substantial backlog in renewing permits; recent moves to "reinvent environmental regulation" respond to these concerns.

It is therefore recommended that consideration be given to the following proposals:

— strengthen the application of the user pays principle to promote more efficient use of water for agricultural and other uses; include all Safe Drinking Water Act compliance costs in water prices;
— increase prices of irrigation water to better reflect long-term marginal costs of providing further water supplies in areas facing water shortages;

— strengthen the application of the polluter pays principle to achieve further reductions in point and non-point pollution discharges; examine the use of economic instruments to reduce non-point agricultural pollution;
— move towards a greater use of public-private partnerships in water supply and waste water treatment services as part of the renewal of ageing water infrastructure; consolidate smaller water supply utilities to achieve economies of scale in meeting safe drinking water standards;
— use the whole-watershed approach to:
  • integrate measures to reduce non-point pollution of both urban and agricultural origin;
  • protect in-stream flows from excessive withdrawals;
  • identify aquatic habitat requiring protection from the effects of hydraulic engineering works;
  • protect, in partnership with landowners, high-value wetlands and estuaries identified in wetland conservation plans;
  • integrate flood plain management, land use and water policies.

***Waste***

The waste management approach has achieved significant results, principally through implementation of the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Due to waste reduction, reuse and recycling, quantities of municipal solid waste being incinerated and landfilled have been reduced: the proportion of waste recovered tripled between 1970 and 1993 and now stands at about 22 per cent, a figure that nonetheless is low among OECD countries. The goal of ensuring cradle-to-grave management of waste so that humans and the environment are protected is broadly being met. Municipal waste is now mostly disposed of in lined landfills, incinerated or composted; unsound disposal operations have been shut down. Strong enforcement of rules and regulations has been the basis for waste management successes to date. Reductions in hazardous waste generation appear to be substantial. Disposal is now carried out in an environmentally sound fashion. Many contaminated sites have been identified and clean-up is proceeding. Underground storage tanks are being converted to prevent future threats, and problems of the past concerning such tanks are being dealt with fairly expeditiously. Environmental justice issues are now being taken into account in all waste management activities.

Nevertheless, the United States still records the largest per capita generation of municipal waste in the OECD, and since 1980 growth in per capita generation has been almost exactly in line with growth in per capita GDP. Considering that only a small fraction of the funds spent on waste management at all levels of government is devoted to waste reduction, and in view of the benefits achievable, present efforts in waste reduction still appear too small. Enforcement of waste management regulations has become very procedural in nature; the Common Sense Initiative, with its emphasis on a more performance-based approach, could aid greatly in this regard. Much effort and expense is devoted to pursuing the goals of identifying and cleaning up abandoned and uncontrolled sites: it is estimated that current policies will lead to an overall clean-up cost of over $4 billion per year for the next several decades. Progress has been slow, and transaction costs are high. Hence, while the United States seems to be meeting its objectives for waste management, it may be paying too much for the benefits arising from clean-up.

It is therefore recommended that consideration be given to the following proposals:

— simplify RCRA regulations and promote a more performance-based approach while maintaining health and environmental standards; amend the legislation to reduce ambiguity in the definitions of "waste" and "hazardous waste";
— increase waste reduction efforts through, *inter alia*, voluntary agreements for priority waste streams, promotion of cleaner technology, adoption of producer responsibility rules and an increase in technical assistance and training to small businesses;
— make greater use of economic instruments to influence consumer behaviour;
— accelerate CERCLA clean-up processes and reduce the associated transaction costs;
— accelerate clean-up activities at federal facilities;
— expand the currently limited RCRA management on tribal lands;
— control import and export of hazardous waste to give effect to principles included in the Basel Convention.

***Air***

Since the 1970s, significant progress has been made in reducing emissions of most conventional air pollutants. Lead emissions have dropped by 88 per cent since 1984. $SO_2$ emissions decreased by 18 per cent between 1980 and 1993, VOC emissions also decreased and $NO_x$ emissions have stabilised. Reflecting the decrease of emissions, ambient air quality shows general improvement for conventional pollutants. Under the Clean Air Act, the United States has adopted national ambient air quality standards and implemented regulatory measures on stationary and mobile sources that have proved effective. The United States has been a front runner in the fields of hazardous air pollutants and indoor air pollution. The Acid Rain Program's $SO_2$ allowance trading system and the regional (multistate) $NO_x$ trading system are examples of the pioneering work being done in the United States on the development and practical implementation of emission trading. The experience will prove instructive to many other countries.

Nevertheless, the United States has today some of the highest emission rates per capita and per unit of GDP among OECD countries for $CO_2$, $SO_2$ and $NO_x$, and one of the most energy-intensive economies. While it has decoupled economic growth and air pollution to a certain degree over the past 25 years, the overall trend has not been as strong as in many other OECD countries. Problems remain with ground-level ozone and with deposition of airborne pollution such as acid precipitation and fine particulates, and related health and welfare damage. Ambient air quality standards are not always met in many metropolitan areas and about 60 million people lived in non-attainment areas for one or more criteria pollutants in 1993. Because of the complexity of federal-state-local government relationships, and of procedures regulating pollutant emissions, the process of implementing regulatory policies has involved high transaction costs to both regulatory agencies and regulated industries.

It is therefore recommended that consideration be given to the following proposals:

- complete the formulation of State Implementation Plans, and fully implement them;
- monitor the results of various forms of emission trading systems and explore the possibilities for expanding their use, including for pollutants from mobile sources, and examine reductions in transaction costs incurred by regulators and regulated industries;
- consider the use of other economic instruments, particularly energy taxation and road pricing;
- remove environmentally unsound subsidies, such as direct and indirect subsidies to coal-fired power plants and to road construction;
- accelerate the development of standards for air toxics;
- promote the integration of air pollution concerns in relevant sectoral policies, especially energy and transport policies;
- promote activities to improve energy efficiency and clean energy technology.

## 2. Integrating Environmental Concerns and Economic Decisions

The integration of environmental concerns into economic and sectoral decision making is key to improving environmental performance and moving towards sustainable development. Policy integration is also essential to achieve cost-effectiveness in responses to environmental challenges. This is because economic forces and changes in such major economic sectors as transport, energy, manufacturing, agriculture and forestry strongly influence environmental conditions and trends, and thus can either enhance or counteract the benefits of environmental policies and technical progress.

***Strengthening institutional integration***

In most cases, the focus of US environmental policies is still on separate issues rather than on comprehensive policies, and on remedying environmental deterioration rather than on preventing such deterioration through actions addressing its underlying causes: urban sprawl, energy use, consumption patterns, etc. Integration should receive increased attention in the United States.

The President's Council on Sustainable Development is exploring this area. EPA's first Five-Year Strategic Plan and its work on environmental goal setting are important new initiatives. Co-operation among various federal departments and agencies in the environmental field is growing, despite the scattered structure of environmental law. In some cases, as for trade and environment, special interagency co-ordination bodies have been set up. Further efforts will be needed to promote government-wide environmental action, involving all relevant federal agencies.

The May 1995 accord between EPA and the states on a National Environmental Performance Partnership System and the March 1995 act concerning "unfunded mandates" will contribute to a new balance between a uniform federally defined, level playing field with respect to environmental regulations and more decentralised and varied environmental policies.

It is recommended that consideration be given to the following proposals:

— design a process for discussion of the findings of the President's Council on Sustainable Development and invite all citizens to share in responsibility for adopting more sustainable patterns of production and consumption; in particular, assess the consequences on the environment and sustainable development of current patterns of transport, energy use, housing and urban sprawl;
— consider making the national environmental goal-setting programme an interagency responsibility, with appropriate consultation and support of major stakeholders about these goals; continue to ensure co-operation with state governments on the review of their environmental performance;
— develop a complete and reliable environmental information structure to produce more policy- relevant environmental information and indicators (national reports on the state of the environment; national and state environmental indicators relative to selected environmental goals) and to ensure centralised access to environmental data;
— develop more environmentally sensitive local land use planning, taking into account effects of transportation and energy consumption, in order to support sustainable development strategies and the protection of landscape and nature;
— promote environmental management in private companies (through, for instance, independent auditing) and within government operations.

***Sectoral integration: transport***

Transport plays a key role in the United States, linking social and economic activities in urban areas and over the country's vast territory. The use of cars and trucks, in particular, causes significant air pollution and other environmental problems. Initially, the response focused on the technical regulation of individual vehicles: stringent emission standards requiring cars to use three-way catalytic converters went into effect as early as 1981; fuel efficiency standards on new cars were strengthened by 50 per cent between 1978 and 1985. These measures proved successful in reducing vehicle-related emissions of CO, VOCs and $NO_x$ against a trend of increasing vehicle traffic. Lead emissions were drastically decreased by the growing use of unleaded gasoline and the reduction of the lead content in leaded gasoline. Trains and ships carry a large share of freight transport, particularly large volumes of bulky materials over long distances; investment by rail companies in intermodal transport has been effective in sustaining rail's share of freight transport. In the early 1990s, further measures to reduce emissions of individual vehicles were taken. Emission standards for passenger cars have been tightened since 1994. Inspection/maintenance programmes will reduce emissions from older vehicles. The formulation of gasoline is being changed. A programme to introduce lower-emission vehicles using alternative fuels has been started, but has yet to show results. Greater flexibility in the use of federal funding for public transport planning and projects enables the inclusion of air pollution concerns in funding decisions.

However, the United States has not succeeded in controlling the growth of vehicle traffic. In the absence of more stringent emission standards and/or growth in the clean fuel fleet, total mobile source emissions, now fairly stable, are likely to rise again after 2005 with further increases in vehicle traffic volume. The total number of passengers using mass transit is very limited. Traffic measures such as high-occupancy vehicle lanes and car pooling did not prevent the increase of motor vehicle use. The heavy reliance on the car is encouraged and supported by the very low cost of vehicle use, which does not reflect true costs, including environmental costs; fuel prices in the United States are among the lowest in the OECD and many employees are provided with free parking. The use of off-road vehicles is still largely unchecked and control of their emissions is only beginning to be required. If the United States wishes to avoid incurring ever higher costs of vehicle use, such as pollution and congestion, measures to contain or reduce private vehicle use should be an essential element of long-term environmental and transport strategies.

It is therefore recommended that consideration be given to the following proposals:

— fully implement measures provided by the Clean Air Act to reduce vehicle emissions, including emission standards, fuel improvement and inspection/maintenance programmes;
— consider economic instruments to reduce vehicle traffic, such as increased fuel taxation and the elimination of free parking for employees;

— strengthen measures to reduce truck emissions and to promote more efficient and less polluting freight transport;
— strengthen efforts to sustain and improve public transport;
— strengthen federal-state-local co-ordination and provide stronger support to metropolitan planning organisations and cities;
— pursue integration of transport policy and land use policy to encourage higher-density development in suburban areas and to link public transport and activities requiring mobility;
— strengthen education and information to increase public understanding of the environmental problems inherent in vehicle use and the necessity of reducing it;
— continue R&D to develop lower-emission and more energy-efficient vehicles.

***Sectoral integration: chemical industry***

The United States has developed comprehensive approaches to the management of chemicals, comprising regulations for the control of pesticides and new chemicals, broad policies to manage existing chemicals in general and measures to reduce risks from specific chemicals and activities of the chemical industry. It has developed an advanced system to analyse and assess structure-activity relationships, allowing the assessment of new chemicals in the absence of test data. The United States was also one of the first OECD Member countries to develop a significant programme for testing and assessing existing chemicals. The Toxic Release Inventory has proved a useful tool in stimulating the abatement of releases of chemicals to the environment. It is expected that the chemical industry will meet the targets of the 33/50 Program. Concerning specific substances such as asbestos and lead, the United States took vigorous measures to prevent health damage. Thanks to a variety of environmental regulations and the increased responsibility of management for environmental issues, the chemical industry has made major environmental progress.

Despite these achievements, a number of problems remain. The broad definition of new chemicals requiring notification and the absence of test data in most cases have placed a significant burden on EPA for assessment activities. Most chemicals in commerce are existing chemicals, yet the extent of EPA efforts dealing with the testing and assessment of these chemicals pales beside the workload for new chemicals. There are no clear time targets for the existing chemicals programme. The procedures for risk management for such substances as lead and asbestos under the Toxic Substances Control Act are complicated and time consuming. Safety measures for pesticide application are not yet sufficiently accessible to agricultural workers and their application needs to be assured. Co-ordination and integration of the existing chemicals programme with other government programmes, such as those dealing with water and air pollution, need further improvement. The same holds for co-ordination among federal, state and local activities. Industry feels that further improvement of environmental performance can be achieved at reasonable cost only if regulations become more flexible.

It is therefore recommended that consideration be given to the following proposals:

— simplify the pre-manufacturing notification system for new chemicals by further limiting the number of chemicals involved, and should be further improved by the addition of some test requirements;
— improve the effectiveness of the review programme for existing chemicals by strengthening co-ordination with other environmental programmes and further defining goals to be reached within certain time frames;
— continue federal and state authorities' efforts to ensure that pesticide safety information is fully accessible to, and fully used by, workers in agriculture;
— further improve co-ordination of chemical management activities at the federal, state and local levels;
— develop procedures that give more flexibility in taking action towards environmental goals for certain types of industry.

## 3. International Co-operation

Since the early 1970s, the United States has been in the forefront of international co-operation to protect the environment. It initiated negotiations on, and has entered into, a very large number of bilateral and trilateral agreements in North America. It also initiated broader multilateral agreements to deal with pressing regional or global issues. US leadership over the years has been demonstrated by, *inter alia*, its promotion of: environmental issues in international forums, the use of EIA in international financial institutions, recognition of environmental and trade issues, and the use of tradable emission rights. The United States has promoted new approaches in international environmental diplomacy based on scientific research and technological innovations, openness in information, public participation and accountability of governments to present and future generations. It has been very active in promoting sound

environmental practices in many countries and in providing technical assistance and aid to developing countries and to central and eastern European countries. Overall the US performance in the area of international environmental co-operation over the past 25 years has been outstanding.

The United States has helped in the adoption at international level of many innovative policies and measures already accepted at domestic level. This approach would become less fruitful to solve new international environmental issues if the measures implemented in the United States were to be less strict than those proposed or already implemented in other countries. If the United States successfully promotes international environmental agreements but does not subsequently ratify them, the United States will have a less influential role in promoting better protection of the global and regional environment through multilateral action. This would also diminish US credibility in future negotiations and could lead other countries to refrain from completing action on mutually agreed conventions.

***Achievements in North America***

Co-operation between the United States and Canada has a long history. Concerning boundary waters, the US-Canada relationship has been for decades a striking example used by many other countries. Significant progress has been achieved in pollution abatement in the Great Lakes and more progress is expected. A strong programme was recently launched to reduce transboundary air pollution and acid precipitation, with targets to be reached by 2000.

Great progress in co-operation with Mexico has lately been achieved. Many working groups have been established to harmonise approaches and solve co-operatively the acute problems in border areas. An Integrated Border Environmental Plan has been launched and its first phase implemented. The United States has made major investments for water sanitation. Improvements in environmental quality in border areas will take several years to be visible.

In the framework of the North American Free Trade Agreement, the United States, Mexico and Canada have entered into a trilateral agreement on environmental co-operation that should help better protect the environment of all three countries. The new institutions under this agreement have the potential to play a very significant role.

***Other international achievements***

The United States has been very active in promoting protection of the ozone layer and has introduced domestically innovative instruments to meet internationally agreed targets. It adopted a commitment to return emissions of greenhouse gases to their 1990 level by 2000 and a major action plan to cope with climate change issues and improve energy savings.

The country has been very active in promoting protection of the marine environment in the framework of IMO and UNEP. It directly inspired a number of international conventions in this area. New initiatives are being launched concerning the Gulf of Mexico and the Caribbean.

The United States was the first country to promote environmental impact assessment to evaluate the effects that federal activities carried out on its territory had on the global commons and on the environment in countries not participating in the activities. It has promoted a similar approach in multilateral financial institutions and in assessing the effects of trade agreements on the US environment.

Its leading position in the area of international environmental co-operation should have important consequences for its financial involvement to solve international environmental issues. The principle of common but differentiated responsibility means the United States has to maintain a significant level of efforts both at home and internationally to protect the environment. As the United States is the source of a large amount of transboundary or global pollution, costly activities have to be financed to reduce these. The concept of joint responsibility of all OECD countries concerning the solution of global environmental problems cannot be taken seriously if disparities among the burdens supported by the OECD countries are too great.

***Areas for progress***

Despite the considerable progress so far in co-operative activities with Canada and Mexico on issues arising in border regions, many tasks remain uncompleted, *e.g.* virtual elimination of discharges of persistent toxic substances in the Great Lakes, further reduction of acid precipitation in north-eastern states and better air and water pollution control

in regions bordering Mexico. It is not clear whether economic development in the Mexican border area similar to what has taken place in the last ten years can be sustained into the future. Further federal and state funding may be required; increased use of economic instruments should help shift more of the financial burden to polluters; the polluter pays principle, endorsed by all three countries, should be further developed and applied in border areas, bearing in mind, where necessary, differences in national ambient standards and levels of development.

The United States has a very important international role to play by reducing its own emissions of greenhouse gases, especially $CO_2$: its progress or lack of progress in this area is likely to have a strong influence on progress in other OECD countries. Reliance on voluntary measures may not be sufficient to significantly modify long-established production and consumption patterns, based on abundant and cheap energy, and to stabilise $CO_2$ emissions at the 1990 level.

The United States has used a series of trade measures to foster greater environmental protection in other countries. More caution may be needed in the future to ensure that such measures are not inconsistent with international trade agreements and are in line with decisions taken in the context of international agreements.

In many areas, such as environmental aid, US expenditure is higher than that of most OECD countries for environmental protection in developing countries; but in relative terms the US effort may be seen as much less significant. This is not always the case, however; along the Mexican border, the US financial effort has been particularly large. The United States should consider whether a further reduction in its financial commitments for aid to developing countries as well as for environmental activities, as currently discussed, would not undermine its position as a leader on environmental issues in these countries.

Many reports have been prepared to describe the United States's international activities, but few analyse actual results and there are few indicators of achievements or measures of success. Financial support for international environmental activities might be enhanced if there were better indications that the funds spent so far have led to significant results.

***Recommendations on international co-operation***

It is recommended that consideration be given to the following proposals:

— ratify and implement recent international agreements on environmental protection that have been adopted by most Member countries (Annex III) and, in some cases, have been signed or promoted by the United States, particularly the UN Convention on Biological Diversity and the UN-ECE conventions on environmental impact assessment and industrial accidents;

*Regional issues*

— give more attention to achieving the goal of virtual elimination of persistent toxic substances in the Great Lakes, taking into account releases in air and water;
— assess whether a further reduction of acid precipitation in north-eastern states is needed, bearing in mind health effects linked to small particulate matter;
— review the achievements of the two-year Integrated Border Environmental Plan for the US-Mexican border area and identify remaining needs to help in the move towards sustainable development; prepare a five-year plan for this area with goals and targets, an outline of project costs, an analysis of expected benefits and an indication of financing sources;
— give particular attention to activities aimed at protecting the Gulf of Mexico and the Caribbean;

*Other international issues*

— promote new international agreements for protection of the marine environment, including control of pollution from land-based sources and ships, and protection of coral reefs;
— closely monitor activities aimed at reducing domestic emissions of greenhouse gases, show leadership in reducing energy wastage and take further steps, as need be, to reach domestically and internationally agreed targets on greenhouse gas emissions;

- contribute to the further development of conditions under which trade measures can be used to protect the environment in the framework of international agreements or organisations;
- strengthen bilateral and multilateral aid programmes for solving global environmental issues;
- promote wider public support in the United States for activities aimed at solving regional or global environmental issues.

# BELARUS*



* In co-operation with UN/ECE.

## CONCLUSIONS AND RECOMMENDATIONS*

In the 1990s, Belarus has had to adapt to new circumstances and has faced serious economic difficulties: a 37 per cent decline in GDP, a major fall in trade with countries formerly in the USSR, low foreign investment and inflation that reached four digits before declining. These new circumstances forced major changes in its economic structure, formerly characterised by highly developed industrial and agricultural sectors and extensive trade with other republics of the USSR.

Environmental policies were initiated in the 1960s and focused on nature and drinking water protection. With the 1986 accident at the Chernobyl nuclear power plant, near Belarus's southern border in neighbouring Ukraine, measures were taken to protect the population and the environment from the severe effects of this event. In the first half of the 1990s, important steps were taken to establish comprehensive environmental policies. The present environmental priorities of the Belarussian Government are: i) promotion of less polluting production processes; ii) protection of human health through adequate water supply and control of water and air pollution; iii) preservation of biodiversity; and iv) development of legislation and standards.

This report sets out the baseline for assessing future environmental progress, and examines Belarus's environmental performance in three key areas:

- integrating environmental and other policies;
- implementing environmental policies;
- strengthening international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This assessment includes both domestic objectives and international commitments, and is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in Belarus.

### 1. Integrating Environmental and Other Policies

#### *Economic transition and environmental performance*

Since 1990, environmental pressures and major emissions have decreased considerably. This decrease reflects not only reduced economic output, but also energy supply changes and environmental action. The pollution and resource intensities of the economy, however, remain relatively high. For sustainable economic development to be achieved, the country will have to continue strengthening and financing pollution prevention and control, and improving management of natural resources such as water, forests and wildlife. It will also have to integrate environmental concerns in policies for industry (e.g. the chemical industry), agriculture and energy. Fostering sustainable development could also be supported by a deepening of economic reform, which would increase the incentives for industrial enterprises and other economic actors to raise the efficiency of their natural resource and energy use. In the medium to long term, economic reform would contribute both to renewed growth and to a shift towards a less resource- and pollution-intensive economy. The new national strategy on sustainable development should support such orientations.

Environmental programmes formulated thus far constitute an important asset for environmental policy making in Belarus. The country has achieved a number of important goals from its 1990 Ecologia programme for 1991-95: the transformation in 1993 of the State Committee on Ecology into the Ministry of Natural Resources and Environmental Protection (MINNAT); the adoption of key environmental legislation; the introduction of pollution and natural resource charges; the establishment of state ecological examinations (a form of environmental impact assessment); the strengthening of environmental education and monitoring; and the maintenance of total allocated environmental expenditure at over 2 per cent of GDP in recent years. Within this total, pollution abatement and control expenditure is probably in the range of 0.8 to 1 per cent of GDP, a large part of it being financed by the

* Conclusions and Recommendations approved by the OECD Working Party on Environmental Performance at its June 1997 meeting. Report prepared by the OECD in co-operation with UN/ECE.

country's system of Environmental Funds and by enterprises. In addition, about 3 per cent of GDP represents expenditure related to the Chernobyl accident.

Belarus has made little progress towards meeting environmental policy goals that involve major investment, partly because environmental expenditures, although stable as a share of GDP, have declined significantly. Some ambitious objectives, such as establishing hazardous waste disposal sites in each region, ensuring that all towns over 8 000 inhabitants have water supply, sewerage and waste water treatment systems, and considerably increasing the number of cars equipped with catalytic converters, have yet to be tackled. MINNAT's new environmental programme for 1996-2000 addresses some of the problems raised in the implementation of the Ecologia programme by setting priorities more clearly. Similarly, greater attention should be given to reviewing environmental performance and the effectiveness of programme implementation through adequate reporting to policy makers and the public on results achieved with respect to quantitative and qualitative policy objectives.

In reducing industrial pollution, Belarus has relied on "end of pipe" solutions and new pollution abatement investment. To better integrate environmental concerns in industrial policies and practices, however, low-cost environmental management and cleaner production techniques should be seen as important supplementary solutions that are likely to be more cost-effective. Improving environmental management in industry would also help focus managers' attention on low-waste production technology once resources for large new investments become available. The system of charges on pollution and resource use could be used to provide incentives for change as well.

Belarus has introduced a form of environmental impact assessment, the state ecological examinations, both for new projects and for modifications to existing facilities. These examinations are a good tool for integrating environmental concerns into project-level economic decisions. The number of projects treated is very large, however; this affects the quality of the individual examinations, especially at local levels, and creates a heavy administrative burden. Public participation is too often missing or given little weight during the examinations. The methodology of the examinations is based on the 1991 Convention on Environmental Impact Assessment in a Transboundary Context (Espoo), which Belarus has not yet ratified. MINNAT's current review of the regulations for the state ecological examinations should take the above aspects into account.

It is therefore recommended that consideration be given to the following proposals:

- pursue changes in economic structures and develop economic reforms both to renew economic growth and to foster a less resource- and pollution-intensive economy;
- reinforce the integration of environmental concerns within economic sectors, with particular emphasis on industry, agriculture and energy;
- promote low-cost cleaner production techniques in industry and improve industrial environmental management;
- focus state ecological examinations (environmental impact assessments) on projects with potential for major impact on the environment, and increase related public involvement;
- orient environmental planning and programming more towards priority setting and measurable results; review the achievement of environmental objectives and commitments more systematically.

***Dealing with effects of the Chernobyl accident***

The effects of the Chernobyl accident necessitated an integrated response in Belarus, and such a response was initiated immediately after the accident and developed further later. Since 1991, a State Committee has had primary responsibility in this area; in 1994, the Ministry on Emergency Measures and Protection of the Population from the Consequences of the Accident at Chernobyl was created. Additional efforts from several other ministries were mobilised, along with a broad range of high-quality scientific capabilities within the country. In the days after the accident, countermeasures (e.g. evacuations and provision of uncontaminated food and stable iodine) were taken on a massive scale and overall were timely and effective. Later measures such as resettlement, health care programmes and efforts to reduce exposure have also been effective. Decontamination efforts such as removal of topsoil and contaminated biomass have generated waste, which is in well-monitored sites. Expenditure related to Chernobyl, more than ten years after the accident, is still at over 7 per cent of total government expenditure and around 3 per cent of GDP.

Radioactive contamination affected 23 per cent of the territory of Belarus. Today most remaining radionuclides are within the first 20 cm of the soil, whereas their concentrations in air and surface waters are significantly lower than the allowed values. The accumulation of americium-241 in flora and fauna close to

Chernobyl has been observed; its influence on the health of the exposed local population has not yet been fully studied. The fact that at present 100 000 people receive doses of only 1 to 5 mSv per year, and that very few people exceed doses of 5 mSv per year, confirms the effectiveness of the efforts made by Belarus. The total exposure of the population is being assessed to further target health monitoring programmes and efforts continue to monitor the health of affected populations. Certain adverse health effects have been observed, such as increases of thyroid cancers in children. Besides health effects on the population, psychological and social effects are of significance.

The intervention levels that determine countermeasures in this chronic exposure situation in Belarus are much stricter than levels recommended internationally. Since Belarus is one of the few countries to have been subject to such widespread contamination, it would be useful for Belarus and the international community to re-examine in an international context the appropriate intervention levels for chronic exposure situations.

Most countermeasures are based on 1991 laws establishing contamination zone classification and ensuing compensation; since 1991, more and better radiological data have been collected. Some of the 3 per cent of Belarussian agricultural land taken out of production could now be returned to agricultural use. Social compensation has been important as a response to the situation in Belarus; a fresh review of the compensation regime (goals of compensation, results) would be useful, and the planned revision of the 1991 social protection law could take such a review into account. Research programmes on public health received only a small fraction of the Chernobyl funds in 1995; continued and possibly expanded research into population doses and health effects, and epidemiological study of affected populations, are important to assure that those at risk can be effectively identified, medically followed and treated.

Keeping in mind health, environmental, social and economic concerns, it is recommended that consideration be given to the following proposals:

- continue and strengthen monitoring and research programmes to help guide public health and safety policy actions;
- continue and expand public information and education programmes;
- give increased attention to cost-effectiveness in designing, implementing and monitoring countermeasures;
- consider re-examination of intervention levels in an international context;
- continue and finalise the review of the 1991 laws that classify contamination zones and define countermeasures.

***Biodiversity and agriculture***

The priority that the authorities give to preserving biodiversity is being translated into policies: a legal framework has been established and plans are under way for a considerable increase in protected areas (which now cover 7.4 per cent of the territory). Despite severe financing problems, expenditure for the management of protected areas, although relatively low, appears to be stable. The decision to increase the area of national parks, rather than areas under more strictly protected regimes, will have positive effects with regard to public environmental awareness. The promotion of nature tourism is positive as well, though it should be developed in a controlled way. Preservation of biodiversity in Belarus can be strengthened by streamlining the management and control of protected areas, which are now shared by several authorities. Belarus has ratified CITES and the biodiversity convention; good scientific work is being conducted on species inventories. Authorities are preparing a national strategy for the protection of biodiversity.

Biodiversity policies focus on protected areas; outside these areas, environmental concerns need to be integrated in agricultural policies and practices. Concrete measures taken, along with declines in agrochemical use (by about 75 per cent for commercial fertilisers and pesticides) and generation of manure, are among the reasons that pollution pressures from agriculture have decreased markedly; but pollution remains high in some areas and will probably increase when agricultural production starts increasing again. Farm extension services with training in good agricultural practices do not now exist but could be an important step forward. Such services could promote both agricultural productivity and environmental protection. More systematic conversion of marginal lands to non-agricultural uses might be considered. The country's remaining wetlands, which are of great significance for Belarus's biodiversity, should be protected.

It is therefore recommended that consideration be given to the following proposals:

- continue the efforts to extend protected areas;
- establish sufficient legal protection for remaining wetlands;
- strengthen management and control of protected areas by establishing clearer responsibilities;
- encourage the development of nature tourism while examining such questions as the activities to be allowed in protected areas and formulating a code of good practice;
- finalise work on the national strategy on biodiversity;
- integrate environmental concerns in agricultural policies and practices; establish farm extension services providing training in good agricultural practices;
- consider a more systematic approach to converting marginal agricultural lands to non-agricultural use.

## 2. Implementing Environmental Policies

The institutional and legal framework for environmental protection that has been developed over the last few years provides Belarus with solid foundations and added impetus for environmental progress. However, present circumstances require both further strengthening of the environmental policy framework and improved cost-effectiveness and priority setting.

***Strengthening the environmental policy framework***

A new environmental programme (for 1996-2000) has recently been approved; it follows the 1990 Ecologia programme (for 1991-95). Together with draft laws concerning water and air, it should help in strengthening the planning and legal framework for environmental protection and in clarifying priorities. Under the current financial constraints, which are very tight and growing more so, priority setting is of utmost importance and necessitates reinforced economic analysis.

The basic environmental policy approach now relies almost exclusively on standard setting at central level and subsequent control and enforcement. To improve the environmental and economic effectiveness of policy implementation, partnerships on environmental matters between government and other sectors in society should be introduced, for instance through quantified environmental target setting by theme or sector within the framework of environmental programmes.

Information is well developed as regards the consequences of the Chernobyl accident. Environmental information and access to it could build on this example. MINNAT should also consider information to be a policy tool that strengthens the basis for environmental management, and should seek ways and means to improve and strengthen non-governmental associations' involvement in decision making processes.

Monitoring of pollution emissions has been strengthened in recent years. New monitoring and laboratory equipment has been installed and co-ordination among institutions has been improved. Nevertheless, important work remains to be done, as recommended in the OECD's 1994 environmental information systems assessment: e.g. improving integration of the information collected and orienting the output to support policy making. A 1993 decision to link the different monitoring systems together into a unified system has not yet been fully carried out.

The authorities rightly consider environmental training and education as important, and have developed programmes at the various levels of education. The number of students graduating in environmental or environment-related studies is large. However, limited financial means affect the quality of environmental education.

It is therefore recommended that consideration be given to the following proposals:

- reinforce priority setting, on the basis of economic analyses;
- continue improving environmental legislation; in particular, proceed with the adoption of prepared revisions to laws, such as those on water and air;
- further develop environmental information and its availability for the public and various sectors in society, and encourage the participation of environmental NGOs in environmental policy making;
- complete the introduction of a unified environmental monitoring system and ensure that it supports policy making;
- continue to support environmental education and training programmes.

***Improving the cost-effectiveness of environmental policies***

Belarus has developed an important range of policy instruments for managing pollution and natural resource use. It has an extensive set of ambient environmental standards. However, these standards are too numerous, and much stricter than comparable standards in other European countries; in practice, measurements can be taken only for a limited number of them. With the present permitting system, MINNAT and its inspectorates closely oversee the activities of industrial enterprises and other polluters. This command and control system forms the core of environmental management and provides authorities with a classical regulatory instrument. The system is, however, relatively complicated and burdensome from an administrative point of view. Maximum emission levels for industrial facilities are set by complicated calculations, and permits have to be renewed too often. Therefore, the cost-effectiveness of this system should be examined, with integrated pollution prevention and control in mind.

The introduction of environmental charges and fines has been positive as a way of promoting environmental awareness in enterprises and as a source of financing for environmental expenditure in accordance with the polluter pays and user pays principles. The levels of these charges and fines have been revised regularly to reflect inflation. However, they are too low to serve as significant incentives for improvements in production processes and technologies. They should continue to be indexed to keep pace with inflation and their progressive increase should be considered.

Belarus's Environmental Funds provide over 20 per cent of the financing for environmental investment expenditure, and play an important role in supplementing budgetary allocations for monitoring equipment and other environmental expenditure. The management of these funds should emphasise priority setting and cost-effectiveness in project selection. Grants should aim at mobilising a maximum of other resources. It is also important for each individual fund to have sufficient resources to finance necessary investments.

It is therefore recommended that consideration be given to the following proposals:

- analyse the number and level of ambient environmental standards on the basis of the specific context of Belarus and the experience of other countries, and introduce a more realistic set;
- consider streamlining the permitting system and extending the validity of permits;
- continue to index environmental charges and fines to keep pace with inflation and consider progressively strengthening them to introduce incentives for technological change;
- strengthen the system of Environmental Funds by developing a training programme for funds' staff members and streamlining operating procedures.

***Air***

Overall atmospheric emissions of conventional pollutants such as $SO_x$ and $NO_x$, as well as of $CO_2$, have decreased considerably since 1991, respectively by about 50, 30 and 50 per cent. This is due largely to economic decline, but also to the increased share of natural gas in energy supply (now reaching 45 per cent) and to environmental action. High priority has been given to reducing air pollution, with a range of instruments, including permitting, charges and fines, enforcement and monitoring. Charges and fines generate revenue for the Environmental Funds and promote environmental awareness in enterprises. Air quality monitoring is of good quality and technical expertise is in general well developed. Energy policy in Belarus has helped reduce emissions of air pollutants: efforts are being made to improve energy efficiency; a major shift from oil and coal to natural gas in electricity and heat production has taken place; progress has been made in producing unleaded gasoline.

Air quality remains low in many cities, however, largely because of uncontrolled emissions of air toxics. Energy and air emission intensities per unit of GDP are still very high. When economic growth resumes, this will be of great concern. The air quality standards are ambitious, but too numerous and too strict. A revision of these standards should be considered, together with other regulatory standards and other economic instruments, aiming, inter alia, at cost-effectiveness. For the short term, the main industrial sources of air pollution affecting human health should be identified and cost-effective short-term measures taken to reduce this pollution. The increased share of road transport in total transport and the ageing vehicle fleet deserve special attention; the exhaust emission standards need to be updated and enforcement strengthened; the availability of unleaded gasoline at filling stations is very limited and needs to be increased; fuel quality should be improved. To increase energy efficiency, low-cost process changes in industry and improved environmental management should be promoted, and attention should be paid to energy prices. For the residential sector a number of obstacles to progress with energy efficiency need to be overcome, particularly the lack of control by residents over the heating of their own apartments.

It is therefore recommended that consideration be given to the following proposals:

- introduce domestic standards conforming more closely to international standards for ambient air quality, emission limits and deposition levels;
- improve the cost-effectiveness of permitting for stationary sources;
- update vehicle exhaust emission limits; reinforce controls on in-use vehicles; adhere to relevant UN/ECE agreements; and ensure increased availability of unleaded gasoline in major cities and along main national roads;
- strengthen the emphasis on energy efficiency, with greater stress on: i) energy price setting for households and other users, and ii) energy savings programmes for the residential sector; the decree of September 1996 to increase heating tariffs for households should be implemented;
- improve fuel quality, notably the sulphur context of oil products such as diesel.

***Water***

In spite of severe economic problems, Belarus has made progress with water management: a permitting system associated with charges on water pollution and withdrawal has been established, and substantial financial resources are being allocated to water management. Water supply systems and waste water treatment plants have been improved in many places; such infrastructure is being built or renovated in 45 towns. The overall quality of surface waters and groundwater has also improved.

Locally, however, serious water quality problems persist. Industrial waste water is mostly treated together with municipal waste water, without sufficient pre-treatment by enterprises. Many municipal waste water treatment plants are overloaded and do not have the technical means to treat toxic pollutants. Diffuse pollution, especially nitrates from agriculture, is seriously affecting shallow wells in rural areas, an important part of drinking water supply. The emphasis in water management is not sufficiently focused on prevention at source. To improve the cost-effectiveness of water management, incentives for industry and agriculture to change their production processes should be considered. The present charges on pollution and withdrawal should continue to be indexed for inflation and possibly be increased gradually to induce enterprises to adopt cleaner technologies. The fee paid by households for drinking water should be raised to a level closer to meeting the production costs. The introduction of a river-basin approach could enhance the effectiveness of policies and expenditures. Large investments remain to be made to reach the water supply and waste water treatment objectives of the Ecologia programme for 2000.

It is recommended that consideration be given to the following proposals:

- review water management priorities with the aim of increasing efforts to prevent pollution at source;
- continue putting priority on drinking water quality, but give more attention to rural areas; in this respect, increase the emphasis on reducing diffuse pollution by agriculture;
- apply minimum pre-treatment standards for main industrial polluters and consider gradually increasing charges to induce technological change;
- continue efforts to build or renovate waste water treatment plants, taking into account low-cost treatment methods;
- progressively bring the price of drinking water for households towards the total production costs of water supply;
- consider introducing a river-basin approach in water management policies to improve cost-effectiveness of measures and expenditures.

***Waste***

Over the last few years, the Government has established the basis for comprehensive waste management. The 1993 Industrial and Consumer Waste Act was enacted, a permitting system with associated waste charges is being applied and data collection and monitoring have improved. Investments, albeit limited, have been made as well, for controlled landfills and plants to treat and process waste. An important government objective is to minimise generation of industrial waste. Under present economic circumstances, controlled landfilling is considered the main method for disposal. Efforts are being made to improve control over existing landfills and to build new ones.

Despite the decline in industrial output per unit of production, industrial waste generation continues to be high (19 million tonnes in 1995). Much industrial waste has accumulated at industrial sites awaiting further handling (619 million tonnes by the end of 1995), or is disposed of at insufficiently controlled landfills. Municipal waste generation has been stable for the last few years at 2.5 million tonnes per year. Most municipal and all medical waste is disposed of at landfills; the capacity of many landfills is nearing saturation. Although a start has been made with waste management, more efforts are needed to prevent waste generation by introducing low-waste technologies and reuse of waste. Increased efforts are needed to reduce the considerable quantities of accumulated waste at industrial sites. Special attention should be paid to hazardous waste (1.3 million tonnes generated in 1995): more efforts are needed to improve the reuse rate and storage conditions for such waste. The present rather low level of investment for waste management needs to be raised as part of the implementation of Belarus's comprehensive waste management policy.

It is recommended that consideration be given to the following proposals:
- introduce incentives for enterprises to gear production towards low-waste technologies and develop waste reuse and recycling;
- strengthen monitoring, treatment and disposal of hazardous waste;
- devote special attention to the treatment and proper disposal of accumulated waste on enterprise premises;
- improve landfilling conditions and strengthen related controls; improve treatment of medical waste;
- consider devoting more financial resources to waste management, through various means, including an increase of waste charge levels.

## 3. Strengthening International Co-operation

After independence in 1991, Belarus had to create and develop new policies for international environmental co-operation. It concluded bilateral agreements with all its neighbouring countries and some other countries, laying the framework for co-operation on environmental issues. Belarus promotes regional environmental co-operation within the Inter-State Ecological Council of the New Independent States and takes part in the Environment for Europe process and in environmental co-operative activities of the UN Economic Commission for Europe. Its commitments under the UN/ECE agreements on transboundary air pollution have been fulfilled, though the declines in $SO_x$ and $NO_x$ emissions have mainly been due to reduced economic activity. Belarus is making some efforts to meet its global international commitments, such as those concerning protection of the ozone layer and biodiversity. A special programme to reduce use of CFCs led to significant progress. As a follow-up to the 1992 UN Conference on Environment and Development, a national sustainable development strategy is being prepared. In April 1997, Belarus hosted a conference on sustainable development in transition countries. An inventory of greenhouse gas emissions is being made.

At this stage in its international environmental co-operation, Belarus should gear its bilateral co-operation towards specific issues and concrete results, for instance regarding transboundary water and air pollution and nature protection. Concerning regional co-operation, policies should be developed or reinforced to guarantee that Belarus's international obligations will continue to be met in the future, after economic growth resumes. MINNAT's international capacity needs to be strengthened, co-ordination on international environmental co-operation with other ministries reinforced, and a strategy for international co-operation on environmental matters developed, consistent with domestic environmental priorities and the planned national sustainable development strategy. International conventions to which Belarus is not a party, but that could be of benefit to its environment, should be examined for signature and/or ratification: e.g. the UN/ECE conventions on international watercourses (Helsinki), prevention of industrial accidents (Helsinki) and environmental impact assessment (Espoo), and the Basel Convention on hazardous waste. Ratification of the Framework Convention on Climate Change is on the agenda.

It is therefore recommended that consideration be given to the following proposals:
- translate bilateral and regional agreements into concrete programmes and projects;
- become a party to international conventions, such as the UN/ECE conventions on international watercourses, prevention of industrial accidents, environmental impact assessment, and the Geneva and Oslo Protocols under the Long-range Transboundary Air Pollution Convention, as well as the Basel, Ramsar and Bonn Conventions;
- ratify the Framework Convention on Climate Change;
- strengthen international environmental co-operation by increasing MINNAT's international capacity, by establishing priorities for action and by reviewing systematically the implementation of environmental obligations.

# BULGARIA*



* In co-operation with UN/ECE.

## CONCLUSIONS AND RECOMMENDATIONS*

Before 1989, the economic development of Bulgaria was already characterised by reliance on heavy industry, low efficiency in use of energy and raw materials, and outdated and highly polluting technology. All this presented difficult challenges for environmental management in Bulgaria after 1989. Severe economic decline and frequent changes of government impeded development and implementation of environmental measures. Yet a few important steps have been taken towards environmental improvement: the establishment of basic legislation, development of a national environmental strategy, enhancement of institutional capacity and mobilisation of international assistance.

However, implementation of environmental policy and investments for environmental improvement have not followed. Development of the regulatory framework has been delayed by a slow legislative process. Mobilising resources from enterprises, government and households is proving difficult in view of economic constraints. Pollution loads to air and water have been reduced, but mainly because of declines in production; a resumption of economic growth could increase pressures on the environment. At this stage, the challenge for Bulgaria is to progress with the enactment of draft legislation and concentrate its effort on cost-effective and urgent actions. Integration of environmental concerns into the economic reform process is another challenge in enhancing environmental performance cost-effectively.

This OECD report has set out the baseline for assessing future environmental progress and has examined Bulgaria's environmental performance in four key areas:

- reducing the pollution burden;
- conserving nature;
- integrating environmental and economic decisions;
- strengthening international co-operation.

In each of these areas, the extent to which government policy objectives are being met has been assessed. This assessment includes both domestic objectives and international commitments, and is based on environmental effectiveness and economic efficiency criteria. A number of recommendations are put forward that could contribute to further environmental progress in Bulgaria.

### 1. Reducing the Pollution Burden

#### *Focusing on urgent tasks*

Bulgaria has made progress in dealing with pollution problems in the past few years: the 1991 Environmental Protection Law was adopted and the institutional capacity of the Ministry of Environment, including the Regional Environmental Inspectorates, was strengthened; environmental monitoring systems were also improved, largely through international assistance. Environmental impact assessments (EIAs) are used on a large number of new projects and programmes. The 1994 Environmental Strategy Update clearly identified tackling hot spots as first priority, since hazardous pollution from large industrial plants threatens human health and the environment in surrounding areas.

Further efforts are required, however, to establish a sufficient framework to control pollution. Several pollution control laws have been drafted but not yet enacted. A key challenge is to reform a system of very strict but unenforced standards, dating from previous decades, into realistic standards; this should involve analysis of the technical and economic feasibility of proposed regulations. Enforcement mechanisms are weak, largely limited to low fines on air, water and soil pollution. Other policy instruments could be used more extensively. Major concerns include hazardous emissions from industrial plants, $SO_x$ from thermal plants and lead and other emissions from motor vehicles.

Given the serious pollution conditions in hot spots and strict constraints on public and private funding resources, Bulgaria should focus in the short term on reducing acute pollution risks to human health and the environment. Temporary measures to reduce acute risk can be carried out before sophisticated high-cost measures are introduced. The convergence of Bulgaria's environmental performance with that of European OECD countries should be realistically planned for the medium to long term.

* Conclusions and Recommendations approved by the Group on Environmental Performance at its November 1995 meeting.

It is therefore recommended that consideration be given to the following proposals;

— accelerate enactment of draft environmental laws, such as the draft water, air and waste laws;
— develop a cost-effective system of policy instruments (regulatory, economic, EIAs, others) that complement each other;
— develop realistic regulatory standards and a system of clear compliance schedules, with interim standards, when necessary, for plants that cannot meet standards;
— strengthen enforcement mechanisms, introducing permit requirements and a more effective fine system;
— promote the application of low-cost, "win-win" solutions for industry, such as good housekeeping and cleaner production;
— consider cost-effective pollution control measures in the energy and transport sectors.

***Air***

Overall atmospheric emissions of substances such as $SO_x$, $NO_x$, particulates, $CO_2$ and methane have decreased by more than 20 per cent since 1990, mainly as a result of the decline in economic output. The 1992 Environmental Strategy and its 1994 update identified air pollution as the country's most important environmental problem and an area for priority measures. These are only beginning to be implemented. The air quality monitoring system has significantly improved. A few highly polluting industrial plants, most notably in non-ferrous metallurgy, have made investments to control air pollution, and low-lead-content gasoline and lead-free gasoline have been introduced. A draft air law has been prepared.

Air quality remains low in many cities and hot spots, continuing to present a significant threat to human health. Overall, national emissions are still very high compared with those of either western European countries or other central and eastern European countries. Emissions from large industrial facilities remain major problems, as do those from residential/commercial sector use of low-quality solid fuels. Motor vehicle emissions are a concern in cities, especially in Sofia, and are likely to increase, unless counteracting measures are taken. Further work is needed to develop realistic emission requirements for large polluting plants, and the Regional Environmental Inspectorates will have an important role to play in their effective enforcement. Determined action is needed to implement the Environmental Strategy concerning air pollution. The integration of air pollution concerns in industry, energy and transport policies is essential if results are to be achieved in the most cost-effective way.

It is therefore recommended that consideration be given to the following proposals:

— concerning large polluting facilities, improve enforcement through better monitoring and reporting systems, higher fines, the introduction of permits and the development of compliance schedules;
— review the cost-effectiveness of emission standards for large stationary sources, particularly the uniform standards for power plants;
— improve the integration of environmental concerns in energy policies: reduce power sector emissions, develop and implement strategies to improve energy efficiency, and promote the substitution of cleaner fuels by households;
— continue efforts to promote the use of lead-free gasoline and strengthen measures to control motor vehicle pollution through: i) more comprehensive emission requirements and effective enforcement; ii) greater restrictions on the import of old, highly polluting vehicles; and iii) measures to reduce unnecessary traffic in cities and promote public transport, particularly in Sofia;
— encourage development of local air pollution plans, especially in hot spots, through wide consultation among local and national authorities, the public and major polluters.

***Water***

Bulgaria has strengthened water management efforts in recent years. It has assigned increasing financial resources to these efforts. Monitoring and information systems for ambient water quality are well-developed and provide a good basis for policy development. Some improvements in the water quality of polluted rivers have resulted from declines in agricultural and industrial production. Early progress has been made in increasing water conservation and pollution prevention approaches in industry and livestock production.

Much work has been done to improve the legislative framework: a comprehensive draft water law, which is awaiting approval by the Parliament, is expected to establish an integrated national water policy stressing sustainability.

A set of regulations, ready for implementation when the law is enacted, will provide clearer targets and effluent standards.

However, overall problems of water quantity and quality remain severe. Availability and distribution of water present serious difficulties. While current water shortages relate mainly to a prolonged drought, major problems exist with antiquated and leaky distribution systems and with wasteful agricultural and industrial use. Concerning drinking water, nitrate and heavy metal contents pose localised health concerns. Many municipal waste water treatment plants are incomplete, funding for them is slow and clear priorities have not been established. Industrial waste water treatment has increased, but should expand, including in newly emerging industries such as food processing. At current levels of funding, it will take several decades to address the overall water infrastructure problem. The systems of user charges and pollution fees can be improved to better reflect service cost and environmental damage; this would produce funds for investment in water supply and sewerage networks and waste water treatment plants, and give proper incentives for water conservation and pollution reduction. An effluent charge, which has been proposed, would be useful to this effect.

It is therefore recommended that consideration be given to the following proposals:

— continue and expand efforts in river basin management, with involvement of all interested parties and agencies;
— continue and strengthen efforts to encourage water conservation and pollution prevention by industry and agriculture, through regulatory and pricing approaches as well as by fostering best management practices;
— continue to develop and implement a permit system for industrial and municipal discharges, using a phased approach with interim limits and enforceable compliance schedules;
— continue price reform for water supply, with attention to metering and collection practices, and implement the proposed water effluent charge;
— fund the completion of unfinished waste water treatment plants, giving priority to areas where maximum benefit will occur, including attention to important tourist areas; and establish clear priorities for each river basin concerning water supply infrastructure projects.

***Waste and contaminated soil***

In the last few years, progress has been achieved in preparing a legal framework and in increasing institutional capacity for waste management. A draft waste management law will provide a comprehensive framework for municipal, industrial and hazardous waste management, including the waste hierarchy principle and regulatory systems. Decrees on hazardous waste management and on waste import have been adopted and standards for landfills are under development. Reporting of hazardous waste generation and management, which began in 1993, will provide a basis for sufficient control. Enactment of the waste management law will enable Bulgaria to fully implement and enforce these regulations and to ratify the Basel Convention.

However, waste management practice is still rudimentary, and the bulk of the work needed to achieve a good performance is still to be done. There are numerous uncontrolled municipal landfills, and larger municipalities face a shortage of landfill capacity. Hazardous waste is not separated from other waste. Industrial waste is disposed of on site or mixed with municipal waste. The lack of pollution control measures for landfills has led to significant contamination of soil and groundwater. Waste minimisation in industry is not proceeding. Soil contamination poses threats to human health and crop production in some parts of Bulgaria and is a barrier in the restitution process for agricultural land.

It is therefore recommended that consideration be given to the following proposals:

— strengthen hazardous waste management; fully implement and enforce a tracking system and permits for management; improve hazardous waste disposal, initially by better monitoring; further promote demonstration projects for treatment and disposal facilities;
— encourage recycling of household and industrial waste, such as ash and slag from coal combustion, phospho-gypsum, paper, plastic and glass, particularly those items for which recycling facilities and infrastructure still exist;
— raise awareness of industry concerning waste management to encourage efficient implementation of regulations and good housekeeping practices through better information and training programmes;
— identify major risks posed by soil contamination and develop cost-effective programmes to reduce them.

## 2. Conserving Nature

Bulgaria is blessed with rich biodiversity and large natural areas, thanks to its geographic and climatic conditions. These assets were retained under central planning. The recent economic decline worked, on balance, to the advantage of nature conservation because pollution and other pressures decreased. Despite strictly limited human and financial resources, Bulgaria has taken some impressive steps since 1989. Protected areas have been extended to cover 4.5 per cent of the land, with representative samples of all ecosystems included. Species recovery plans have been prepared; the number of species and their populations have been maintained or increased. Restoration of a few important wetlands has started under the National Wetland Plan. The National Biological Diversity Conservation Strategy has been adopted.

Among environmental issues, however, nature conservation receives low priority. Institutional capacity and co-ordination among organisations are lacking. Some 90 per cent of the funds for nature conservation come from international sources. Laws on protected areas and other topics have been drafted but not yet adopted. Development of sustainable practices in forestry and agriculture is still in an early stage. As economic activity increases, the natural environment will face stronger pressures from pollution, development and tourism. New issues such as illegal hunting and results of the privatisation of farm land and the devolution of forest lands are also of concern. Bulgaria should accelerate the development of the necessary legal, institutional and planning mechanisms and move towards their implementation urgently.

It is therefore recommended that consideration be given to the following proposals:

- accelerate enactment of draft laws, especially that concerning protected areas;
- proceed with ratification of the Convention on Biological Diversity and develop legislation for its implementation;
- strengthen institutional capacity and improve intragovernmental co-ordination;
- develop an action plan for the Biological Diversity Conservation Strategy, addressing co-operation with NGOs and public awareness as well as habitat and species management;
- secure proper management of protected areas by promoting technical capacity;
- monitor and evaluate damage to the natural environment from acidifying substances and other pollutants;
- complete pilot projects to develop sustainable management practices for agricultural land, forests and rural tourism and establish sustainable development strategies for these areas;
- investigate options for increasing domestic financial resources for nature conservation, such as a nature protection fund with revenue from an earmarked nature tax;
- enhance public awareness through information campaigns and education programmes, especially in rural communities.

## 3. Integrating Environmental and Economic Decisions

### *Economic transition and environmental performance*

Bulgaria suffered difficult economic conditions in the transition period; GDP fell by more than 24 per cent between 1989 and 1994, industrial output by 40 per cent and agricultural output by 33 per cent. Economic reform has been slow. Privatisation of large state-owned enterprises has been delayed; most highly polluting industrial facilities are still in operation; little large-scale investment for pollution control equipment has been made. As a result, the pollution and resource intensity of the economy remains very high. Reduction of discharges of pollutants into air and water was principally due to the decline of industrial and agricultural production rather than to more efficient production or cleaner industrial processes. Pollution loads may increase once economic growth resumes, unless environmental policy is strengthened.

Despite these difficult conditions, Bulgaria has made significant progress since 1989 in improving the policy framework and strengthening its institutions for protecting the environment. The 1991 Environmental Protection Law and its 1992 amendments provide a strong legislative framework for environmental policy. The development of the Environmental Strategy and its 1994 update has defined priorities. The Ministry of Environment, including the Regional Environmental Inspectorates, has been able to enhance its institutional capacity. Public information and participation have constituted a major success, with active involvement of environmental NGOs and preparation of a legal framework to guarantee public access to information. The introduction of EIAs has been the most important step in the development of policy instruments; more than 1 000 projects went through the process in three years. Recent legislative amendments, however, could weaken EIAs.

Environmental policy instruments need to be further developed and their effectiveness improved; better consideration of and coherence among different instruments are needed. More realistic standards are needed with improved enforcement. Permitting systems for polluting facilities should be introduced. Fines do not provide sufficient incentives for compliance and need to be upgraded. EIAs are, to some extent, used to compensate for the weakness of these instruments. The use of economic instruments is limited and most existing ones need revision to provide stronger incentives.

Total environmental expenditure in Bulgaria is estimated at 1.3 per cent of GDP for 1993; expenditure for pollution abatement and control amounts to about 1 per cent of GDP. The tight constraints on financial resources for the environment will not change in the near future. The Government should set clearer priorities and goals so as to use limited public resources in the most cost-effective way. Better funding mechanisms should be developed, such as higher user charges to pay for environmental infrastructure investments, including municipal waste water treatment, solid waste management and nature protection. The establishment of the National Environmental Protection Fund provides a good basis for increasing finance for environmental projects, but its revenue base has been small and its management weak. The Eco-Trust Fund, to be created to implement a debt-for-environment swap and to manage other sources of external financing for environmental projects, should help strengthen financing for the environment.

The vertical organisation of the administration has hampered institutional integration. The major sectoral ministries have given little attention to environmental issues; the Environmental Strategy and update were approved by the Ministry of Environment, but not endorsed by the Council of Ministers. The Ministry of Environment needs more capacity to deal with increasing work, including stronger economic and legal analysis of sectoral programmes. Integration at local level is also of importance. Steps are needed to deepen the integration of environmental and economic policies; sectoral policies, including those on energy, agriculture and transport, must include environmental concerns in their objectives and their operational components. Removing energy subsidies and establishing appropriate charges for raw materials and other natural resources should help encourage resource efficiency and thus reduce pollution.

It is therefore recommended that consideration be given to the following proposals;

— establish government-wide environmental policy objectives based on the 1992 Environmental Strategy and 1994 update;
— increase efforts to disseminate the Environmental Strategy and to promote public participation in the development of local environmental action plans;
— develop and put in place procedures for incorporating environmental concerns in the privatisation process before privatisation of large industrial enterprises gets under way;
— consider further use of economic instruments, such as increased user charges and the introduction of air and water pollution charges;
— examine pricing policies or tariff structures for such key natural resources as energy and water, to ensure that they take environmental considerations into full account; to this end, a review of financial assistance schemes that might lead to overuse of resources would be timely and useful;
— continue to use EIAs and give high priority to the preparation of new regulations for EIAs and environmental audits;
— strengthen the National Environmental Protection Fund by enlarging its revenue base and improving its management.

***Sectoral integration: industry***

Pollution from industry has fallen significantly since 1989; particulate emissions from industrial processes in particular have decreased. As a result, environmental conditions in most hot spots appear to have improved somewhat. While the decline in industrial output has played the largest role in reducing pollution levels, some highly polluting plants have invested in pollution control equipment. The 1994 Environmental Strategy Update identified good housekeeping and low-cost investments as the most practical and cost-effective means of reducing industrial pollution levels, considering the severe financial problems that many enterprises face. Pilot programmes have demonstrated the effectiveness of, and potential economic returns from, a cleaner production approach.

Despite this progress, pollution from industry remains high, and the energy intensity of industrial production has increased. Delays in economic reform have slowed industrial restructuring, while some branches of heavy industry have demonstrated renewed viability. It has been difficult to integrate environmental and industrial policies: as a result,

industrial policies largely ignore environmental considerations. Integration could start promoting environmental audits and cleaner production initiatives in industry.

In the medium to long term, the overall environmental policy framework will play a key role in promoting better environmental performance by industry. The polluter pays principle should be the basis for a system of regulations and incentives on which investments, technical assistance and other measures must rest.

In the short term, it is recommended that consideration be given to the following proposals:

- integrate environmental protection measures into the practice of industrial management by fostering good housekeeping and environmental audit programmes to identify low-cost solutions for environmental improvement;
- promote training to improve capacity on the part of both government and enterprises for environmental auditing and environmental management;
- strengthen institutional integration between the relevant ministries at the stage of industrial policy formation, including those governing privatisation and economic development programmes, starting with "win-win" strategies such as the promotion of cleaner production;
- develop local programmes, with participation by enterprises, local government and the public, to improve environmental conditions in hot spots;
- further enforce existing penalties concerning air emissions and waste water discharges from industrial enterprises and implement environmental permit systems.

## 4. Strengthening International Co-operation

Since 1989, Bulgaria has greatly increased the importance it puts on international environmental co-operation. The Government has given greater attention to the requirements for implementation of international commitments. Internationally recognised principles and procedures have been introduced into national law, and draft laws have been prepared along these lines, including harmonisation of Bulgarian environmental requirements with EU standards. Within the context of the Environmental Action Programme for Central and Eastern Europe, Bulgaria has prepared its national programme (i.e. the 1994 Environmental Strategy Update). Bulgaria has been attracting international assistance for both environmental policy development and environmental investment projects. In October 1995, Bulgaria hosted the third "Environment for Europe" Conference in Sofia.

Nevertheless, Bulgaria still needs to develop an overall strategy for its international environmental co-operation. It should ensure that its international environmental commitments and the international assistance it receives are consistent with its domestic environmental priorities. In particular, the costs of implementing international environmental commitments should be considered closely, in light of economic constraints and domestic priorities. In many areas where Bulgaria has already made commitments, implementation programmes need to be developed.

Specific international issues deserving further attention include: i) the likelihood that domestic emissions of transboundary air pollutants will increase with a return to economic growth; ii) safety at the Kozloduy nuclear power plant; and iii) the depletion of fish stocks in the Black Sea.

It is therefore recommended that consideration be given to the following proposals:

- strengthen domestic capacity for analysis of the economic and institutional implications of international commitments and identify priority areas for action where both national and international benefits are maximised;
- continue to introduce internationally recognised concepts and approaches into domestic legislation;
- continue and strengthen efforts to identify and prepare priority environmental projects for international financing;
- continue co-operative efforts under the Danube and Black Sea conventions and programmes, and promote discussions on measures to protect fish stocks in the Black Sea;
- continue and strengthen bilateral co-operation with Romania and strengthen bilateral discussions with Turkey and Greece, in particular on water issues;

- accelerate enactment of the environmental legislation pending in the Parliament, to support implementation of international commitments.
- ratify regional conventions and related protocols such as the UN-ECE convention on transboundary watercourses, the protocol on further reduction of $SO_x$ emissions and the VOC protocol, taking into account the need to apply a step-by-step approach.

# RUSSIAN FEDERATION*



* In co-operation with UN/ECE.

## EXECUTIVE SUMMARY AND RECOMMENDATIONS*

In the 1990s, the Russian Federation has undertaken wide-ranging reforms including privatisation and market and trade liberalisation. This period has been characterised by deep contraction of output (decline of over 40 per cent in GDP and over 50 per cent in industrial output), decreasing investment, intervals of high inflation, growing unemployment and social hardship. By 1996 and 1997, Russia had achieved a certain degree of economic stability. However, the Asian financial crisis and worsening terms of trade for major Russian export commodities (e.g. oil) contributed to the financial and economic shocks of 1998 and a further decline in output.

Russia has carried out major environmental policy reforms to accompany the transition to a market economy and the devolution of powers to regional governments. It has continued to use its very large natural resource assets (e.g. oil, gas and other mineral resources, timber) as a basis for economic development. Given the previous emphasis on heavy industry and the underpricing of energy and raw materials, and despite the decline in output during the 1990s, Russia still has a very pollution and resource intensive economy. What has been achieved over the past several years is now being made fragile, if not jeopardised, by lack of investment in the economy, particularly the industrial sector, and, more broadly, by difficulties in implementing institutional and structural changes.

It will be a major challenge for Russia in the coming years i) to better prioritise and focus efforts in implementing environmental policies and developing environmental infrastructure, ii) to capture opportunities for simultaneously increasing environmental and economic efficiencies, and iii) to meet its international environmental responsibilities as a major international partner.

This report establishes a baseline for assessing future environmental progress and examines Russia's environmental performance; environmental performance being defined as the extent to which environmental domestic objectives and international commitments are being met effectively and efficiently. A number of recommendations are put forward that could contribute to strengthening the country's environmental performance.

### 1. Implementation of Environmental Policy

#### *Policy reforms and policy instruments*

During the 1990s, Russia initiated a number of environmental policy reforms through a series of new federal laws and policy initiatives, including extending the use of economic instruments, decentralising and devolving policy implementation, and expanding public information and participation. Environmental offices of regional governments have taken up more extensive duties in implementing federal policies, as well as in establishing and implementing regional policies. These new policies (e.g. on waste management, water and air pollution abatement) have begun to be implemented. Federal projects in priority areas have been launched, and new regional initiatives have been implemented. Nature conservation has been enhanced. Environmental funds at federal and regional levels have provided financing for environmental protection. With improved management and a clearer legal status, environmental funds could play a more meaningful role in the years ahead and provide a significant and stable mechanism for financing priority environmental investments. Activities and expenditure to protect the environment at the level of enterprises have continued, in part through the use of financial offsets associated with the system of environmental charges. Implementation of environmental education programmes, wider mass media coverage and greater availability of environmental information have increased public awareness of environmental issues. Public participation in environmental matters has been institutionalised in new legislation and is slowly expanding. The 1995 Federal Law on Ecological Examination has established a basis for environmental impact assessment. Environmental non-governmental organisations have grown in number and are progressively playing a more meaningful role in the environmental decision-making process.

However, the implementation of these environmental policy reforms is meeting a number of severe problems, largely due to the general socio-economic decline, inflation, budgetary shortages and cuts in civil service staff. The low priority given to environment by the federal government, particularly after 1996, has also been a serious impediment. Federal administrations dealing with natural resources and the environment have undergone a series of reorganisational moves but are still very fragmented. Since 1996, Russia no longer has a Minister of the

* Conclusions and Recommendations approved by the Working Party on Environmental Performance at its June 1999 meeting.

Environment in its government. The environmental regulatory framework, which is often very complex and difficult to implement, leaves considerable room for discretionary decisions by regional and local environmental administrations. Economic instruments have lost much of their effectiveness because of inflation. Social considerations have prevented some natural resource prices from keeping pace with inflation. Implementation of the polluter pays principle and the user pays principle is weak. Polluters and consumers still believe public authorities should subsidise environmental goods and pollution control, although budgetary constraints are very severe and tax evasion is widespread. Public investment to protect the environment has fallen. Federal budget funding of environmental activities has declined to a point (0.5 per cent of total environmental expenditure) that arouses legitimate concerns.

As a result, Russia is facing a number of serious environmental problems which ought to be solved urgently. In major urban centres, air pollution levels exceed internationally recognised health-based standards. Infrastructure for drinking water is deteriorating, leading to increased water-borne diseases and mortality. The effectiveness of arrangements to safeguard the growing stock of hazardous waste, including radioactive waste, is compromised, presenting an imminent health risk in some localities. The Russian economy is several times more pollution and resource intensive than those of OECD countries. The costs associated with these current conditions are likely to be substantial.

It is therefore recommended to:

- strengthen enforcement of environmental laws and regulations, including making them more transparent, allowing less administrative discretion and expanding the network of environmental inspectors and prosecutors;
- streamline the environmental regulatory framework (standards, permitting, charges) by concentrating on a limited group of substances, in particular those harmful to human health or the environment, revising standards in line with internationally established standards, and reviewing legislation to eliminate inconsistencies and fill gaps;
- develop and gain inter-agency consensus on a methodology for economic valuation of environmental damage and remedies;
- continue efforts already underway to introduce human health and ecologically-based risk assessment methodology as a priority-setting instrument in the environmental and public health sectors;
- as economic conditions permit, gradually raise pollution and resource charges to a level where they have a meaningful effect on the economic decisions of enterprises and utilities;
- strengthen environmental funds, clarify their legal status and institute improved financial management training for environmental fund managers;
- strengthen and unify the environmental monitoring system, in order to establish an objective information base for policy development and implementation; develop a core set of environmental indicators and promote their use at federal and regional levels;
- continue efforts to improve public access to environmental information and participation in decision-making; strengthen efforts to increase public environmental awareness;
- review present institutional arrangements in order to greatly strengthen the capacity for nationally co-ordinated environmental policy development and implementation, notably by increasing the status and responsibilities of the federal environmental authorities;
- continue to develop effective systems of interaction in environmental protection and related topics between federal executive bodies and administrations of the Subjects of the Federation.

***Air management***

Air management in Russia makes use of ambitious air quality standards, detailed emission permits, air pollution charges (including cash payments, in-kind payments and offsets) and special air protection zones. Leaded petrol is progressively being phased out, as in Moscow, Nizhniy Novgorod and Rostov-on-Don. In regard to energy efficiency, the 1994 Federal Energy Strategy, the 1996 Federal Law on Energy Conservation and the 1998 Federal Programme on Energy Conservation define a set of objectives and actions whose purpose is to set the Russian economy on an energy-efficient development path using market mechanisms and regulations, reduced subsidies and appropriate energy pricing. Progress in implementation varies considerably among the regions, some of which have their own energy efficiency laws and funds. Many projects have been initiated (e.g. audits, consumer information, metering, reduction of heating system losses, energy efficiency investment). Some major energy price reforms have been carried out. A new federal law on air protection of May 1999 specifies emission standards for stationary and

mobile emission sources, technological processes and equipment; it introduces certification of compliance, fuel standards and, for the first time, the requirement that account be taken of the critical load on ecosystems and of transboundary pollution. Emissions of conventional air pollutants have decreased significantly in the 1990s: 37 per cent for $SO_x$ , 34 per cent for particulate matter, 29 per cent for $NO_x$, 25 per cent for VOCs, 24 per cent for CO and 37 per cent for $CO_2$. Russia has met or is in line to meet its international commitments concerning $SO_x$ , $NO_x$ and $CO_2$ emissions.

However, decoupling these emissions from GDP has not been achieved. On the contrary, the decrease in emissions has been smaller than decline in GDP over the same period: the effects of GDP decline, fuel switching to natural gas (reaching 54 per cent of consumption) and air management efforts (investment in air pollution abatement and control equivalent to 0.1 per cent of GDP) have been more than compensated by countervailing factors. These include the increased relative importance of heavy and energy intensive industries in the Russian economy, lack of investment in and ageing of capital stock, and systemic inefficiencies in energy provision (e.g. low energy prices for households, lack of metering and controls, lack of markets and of market discipline, a continuing orientation by industry to meeting production goals). The Russian economy's energy intensity grew in the 1990s and is three times the OECD Europe average. Emissions per unit of GDP of $SO_x$, particulates, $NO_x$, VOCs, CO and $CO_2$ have all increased in the 1990s and are much higher than the OECD average. Overall, air quality is still very poor in many Russian cities. Air pollution has significant health impacts on the general population (e.g. respiratory diseases, exposure of children to lead) and contributes to highly reduced life expectancy in black spot areas. Much remains to be done to make air management more effective, including concentrating on the main pollutants and large polluters, increasing the incentive effect of pollution charges, adopting foreseen tax credits for air pollution abatement efforts and adopting the revised air law in preparation. A major effort is needed to overcome the lack of investment in energy efficiency and thereby obtain related economic and environmental benefits; this implies reducing barriers to investment through mechanisms such as regional energy efficiency funds, separate budget line items to guarantee financing of energy servicing companies, and extending the use of mechanisms such as production sharing agreements to provide the stable and predictable legal and fiscal basis necessary to attract investment. Further energy price reforms to more fully reflect costs, combined with steps to resolve non-payment problems, should support more efficient energy use.

It is therefore recommended to:

- improve air management systems by i) aligning air quality standards with international ones and ii) simplifying permitting and focusing on large pollution sources;
- continue using air pollution charges to finance environmental investments; foster their incentive effect through gradual increases;
- exchange experience among regions on innovative air pollution abatement and energy efficiency measures;
- implement federal and regional energy efficiency programmes; in particular, create conditions that promote investment in energy efficiency;
- continue economic and energy reforms leading to market-based energy price signals in support of more efficient energy use, in combination with steps to resolve non-payment problems;
- promote sustainable transport strategies, including the phase-out of leaded petrol, the introduction of alternative fuel, energy savings and $CO_2$ emission reductions, the promotion of public transport, and the use of physical planning instruments and clean air plans at the municipal level;
- improve air quality monitoring (e.g. urban ozone), warning and reporting to the public, and introduce concrete measures to reduce the severity of episodes of low air quality.

***Water management***

In the 1990s, important progress has been made in water management at the federal, regional and local levels. Legislation such as the 1995 Water Code and 1998 Law on Fees for Water Bodies' Use have supported and extended the use of economic instruments (charges for water use and wastewater discharges, fines and compensation for damage to water bodies) to complement regulatory instruments (quality standards and permits for water abstraction and discharges). Implementation of the polluter pays principle and increasing use of metering have contributed to the development of water pricing. Partly as a result of pricing, and partly due to economic decline, total water use has decreased since 1991. The amount used for irrigation has fallen considerably. Consumption of water by industry has diminished, although less rapidly than production; in some regions there has been a considerable decrease in water consumption by households. Industrial and municipal wastewater discharges have

fallen significantly. Important federal water management programmes have been prepared, for instance on drinking water and flood prevention. Integrated programmes have been adopted for river basins (e.g. the Volga, Tom, Ob). Devolution of powers to regional and local levels has led to initiatives at these levels, especially concerning water supply and wastewater treatment.

Despite the progress made, the general quality of water resources remains worrying. Drinking water supply is a priority concern: the quality is low, with significant health impacts. There are water shortages in many areas. Lack of funds has hampered implementation of the new water policy. Much needs to be done to upgrade and extend infrastructure for water supply and wastewater collection and treatment. Most cities have a joint industrial-municipal water supply, which results in some drinking water being wasted. Industrial pre-treatment installations are too rare and are deteriorating, so that the effectiveness and efficiency of municipal wastewater treatment has been reduced. Reduction in the effectiveness of the sanitary infrastructure leads to irregular supply and important water losses. Relatively low tariffs for water services, and widespread non-payment of water bills, result in revenues which cannot cover operational and maintenance costs. Institutional arrangements do not assign clear responsibilities and powers. Overall, water management is still too orientated towards management of supply rather than of demand.

It is therefore recommended to:

- implement the 1995 Water Code, adopt the Concept of the State Policy on Integrated Water Management and Protection of Water Resources, and implement integrated water basin management;
- gradually increase water pricing to cover real costs, taking account of affordability constraints; continue to strengthen mechanisms to improve the collection of charges and fines; expand the use of metering;
- review standards concerning the quality of water bodies, drinking water and wastewater discharges, in light of international health and water bioresources conservation-based standards relating to health and ecosystem protection;
- adopt and implement relevant bills and programmes relating to drinking water;
- continue to give high priority to providing drinking water of good quality and in sufficient quantities, with special attention to rural areas; increase the use of groundwater resources for drinking water supply; strengthen the protection of water abstraction areas;
- improve the effectiveness of existing wastewater treatment facilities; put new ones into operation in areas experiencing water scarcity and serious health effects; ensure that industrial enterprises progress in regard to pre-treatment of wastewater;
- improve data used in water management through, for instance, harmonisation and co-ordination of monitoring, improvement of data quality and analysis, and extension of regular reporting.

***Waste management***

Russia recently adopted a modern waste management policy approach. This includes the Federal Law on Production and Consumption of Waste and the development of basic regulations, among which are those necessary to meet international obligations under the Basel Convention. The implementation of a national industrial waste management data system is progressing well. Detailed regulatory measures to control waste generation and management are being developed on regional and inter-regional levels. Local and regional initiatives directed at waste reduction and resource recovery are being carried out on a modest scale.

Nevertheless, large accumulations of waste exist and continue to grow; the rate of industrial hazardous waste generation has not fallen in proportion to the decrease in industrial production; municipal waste generation is increasing; waste management in general is largely dependent on land disposal facilities; rates of reuse, recycling and resource recovery are low; the capacity to collect and safely store radioactive waste is deteriorating, accompanied by increasing public health risks; and there has been no response to the need to manage contaminated sites. Overall, the main policy objectives set out for waste management are not being met. The prospects of realising a comprehensive and consistent regulatory framework, as called for in the Federal Waste Programme, are uncertain and implementation of legislative and regulatory instruments is lagging. Reduced financial capacity threatens co-operative institutional development, erodes the existing basic management capacity and massively reduces the amount of investment available to upgrade waste disposal facilities, let alone to create new ones or promote cleaner production. The Federal Waste Programme appears unrealistic in this respect. Existing waste management facilities and practices can only provide declining environmental performance. One constraining factor is the low level of charges borne by waste generators.

It is therefore recommended to:

- ensure co-operative development of regulatory initiatives by federal and regional administrations, recognising the need for detailed regulatory controls which are decentralised and tailored to local conditions;
- further implement the waste management information system as a support tool for decision-making;
- review the present Federal Waste Programme and establish priorities in accordance with available financial means;
- develop and implement realistic strategies for incremental progress in regional industrial waste management, based on secure landfill and storage facilities, recycling and resource recovery initiatives, and waste prevention through cleaner production;
- rehabilitate municipal waste collection and disposal facilities through ensuring adequate funding of service providers and upgrading and/or development of new landfills;
- build upon positive attitudes concerning waste reduction, recycling and resource recovery through expanded provision of information to the public and NGO involvement;
- progressively increase charges for waste management services to waste generators, in line with the polluter pays principle;
- establish uniform land disposal facility standards for municipal solid waste and various types of industrial waste (including hazardous waste, as appropriate), in order to provide a basic level of environmental protection in the near term;
- speed up the approval and implementation of the unified targeted federal programme "Nuclear and Radiation Safety of Russia", including public sector funding commitments, in order to prioritise needs, and to maintain, upgrade and expand existing storage and disposal infrastructure as necessary.

***Nature conservation***

Russia has the responsibility for managing and conserving a large share of the world's wilderness and biodiversity. It has made significant strides in addressing some of its nature conservation challenges. The legislative and regulatory base of nature conservation has evolved quickly and comprehensively and is being refined to facilitate implementation. The process has benefited from the knowledge and expertise of internationally recognised Russian scientists and managers. A number of natural resource inventories have been compiled, and the Russian Red Book of Endangered Species has been published. There has been a continuing expansion of the system of protected areas, which now cover 5.5 per cent of the country (or close to 1 million square kilometres). At the same time, there has been increasing success in controlling trade in endangered species and protecting selected threatened species. Russia ratified the Convention on Biological Diversity in 1995, and has been active in pursuing the fulfilment of its obligations under this convention and several other international agreements relating to nature conservation. It has been able to mobilise significant international assistance for nature protection. Growing environmental awareness and concern in the country has been catalysed by environmental education and the dedication of numerous non-governmental organisations.

However, without an infusion of additional financial support, either through budgetary re-allocation or other means, protected areas will not be able to fulfil their main functions. Such a setback would be of both national and global significance. Outside protected areas, Russia's immense forests and related wilderness have a major role in regard to biodiversity and the global carbon cycle. The 70 per cent decline in timber harvesting in the 1990s has partly relieved forest resources from pressures associated with often unsustainable forestry practices. Nevertheless, in some instances unsustainable and sometimes illegal forestry practices continue to affect highly valuable old growth forest and protected areas. The degradation of aquatic ecosystems (rivers, lakes, coastal waters) threatens aquatic life (e.g. sturgeon). Poaching has increased with poverty. The complexity and uncertainty surrounding land ownership and property rights undermine natural resource management.

It is therefore recommended to:

- allocate appropriate resources to support the system of protected areas, which is of regional, national and global importance;
- improve the legislative and regulatory base relating to biodiversity protection and strengthen implementation in this area;
- ensure that nature conservation and natural resource management are supported by predictable property rights for land and natural resources;

- support and develop programmes addressing the degradation, contamination and loss of habitat in sensitive and remnant terrestrial ecosystems, such as the tundra and steppes;
- reverse the deteriorating ecological conditions of, and trends in, sensitive aquatic ecosystems including rivers, lakes, estuaries and coastal waters;
- ensure the prevention of soil degradation by implementing anti-erosion measures, desertification prevention, environmentally safe use of chemicals and other measures directly and indirectly affecting biological diversity;
- integrate concerns about biodiversity protection and sustainable use of natural resources in forestry policies and operations.

## 2. Integration of Environmental and Economic Decisions

***Economic transition and environmental progress***

During the first phase of transition, significant economic reforms were carried out, notably privatising and liberalising economic activities. However, this progress was not matched by institutional reform. The growth in poverty and inequality has led to disillusion with reform.

Despite difficult economic circumstances, there have been important environmental achievements. The Constitution of the Russian Federation states that "every citizen has the right to enjoy a safe environment and to be compensated for damage to health or property caused by environmental violations." In 1991, the Federal Law on Environmental Protection entered into force. A Concept of the Transition to Sustainable Development was approved in 1996, and a related State Strategy has been developed but not yet approved. A National Environmental Action Plan and several Regional Environmental Action Plans have been developed. Environmental authorities have played a leading role in supporting the development of civil society through a more open, participatory approach to policy development. They have implemented planning mechanisms, set priorities, co-ordinated actions at regional level, and contributed to decentralisation and devolution of environmental policy implementation.

During the 1990s, pollutant emissions to air and discharges to water have declined (by 25 to 35 per cent), though not as much as output. Little decoupling has been achieved. On the contrary, the pollution intensity of the overall economy has increased, partly due to a growth in pollution intensive activities relative to other activities. Environmental expenditure (including both monetary expenditure and that through offset payments) represents 2.2 per cent of GDP and includes pollution abatement and control expenditure of about 1.7 per cent of GDP. Despite a sharp fall in industrial investment, the level of overall environmental investment has not declined much in recent years.

Russia benefits from very large natural resource assets (e.g. oil, gas and other mineral resources as well as forest, fishery, water and biodiversity resources). Until 1997, some of them (e.g. oil and gas) contributed a great deal to maintaining a positive current account balance. The pricing of resources has undergone major changes (e.g. liberalisation of some energy prices), but the price of water and other natural resources remains below cost recovery levels and deserves further attention. Overall, in the 1990s use of natural resources (e.g. energy, water, fishery resources) has decreased by 30 per cent, less than the decline in GDP. The Russian economy's intensities of energy and resource use (with the exception of forest resources) have therefore increased during the transition period. Clarification of property rights, including land rights, is needed to ensure that the country's vast natural resource base is managed in a way that supports sustainable development.

The priority attached to environment within public policy has declined in recent years, and public funding has thus decreased as well. Since 1996, the role and influence of environmental institutions at the federal level have been substantially reduced. This shift has made it all the harder to integrate environmental concerns in other policy sectors and to implement environmental policy. Much public expenditure on environmental protection is being postponed because of budget cuts. In general, federal targeted programmes in the environmental sector are ambitious but severely under-funded, and thus fall short of their stated objectives.

Economic, political and institutional reforms are essential to address current and emerging problems of sustainable development. There is a need to promote more efficient use of resources, to encourage a shift to a less environmentally damaging economic structure and to generate the means needed to support environmental improvement. However, the uncertain progress in the broader process of reform has acted as a constraint on environmental improvement mainly through the lack of incentives to use natural resources efficiently and distortions in fiscal policies. Price distortions and the very low level of investment are major obstacles to achieving a less

pollution and resource intensive economy. The financial and economic shocks of 1998 have created new uncertainties about the pace and direction of policy reform. There appears to be less integration of environmental and economic decision-making now than several years ago.

It is therefore recommended to:

- develop more effective arrangements at the federal level to integrate environmental, economic and social objectives with a view to promoting sustainable development, for instance by creating or strengthening environmental policy units in relevant federal bodies and promoting integration of environmental concerns in effective industrial, energy, transport, economic and fiscal policies;
- support economic and institutional reforms which increase the overall efficiency of the economy and promote "win-win" strategies;
- support policies which remove impediments to investment and promote modernisation of the capital stock;
- focus public environmental programmes, particularly the National Environmental Action Plan, on a smaller number of priorities (e.g. on-going pollution causing serious health risks, urgent problems of accumulated pollution), in accordance with available financial means;
- gradually reduce public subsidies of pollution control activities by enterprises and allow water and energy prices to rise to cost-recovery levels; restructure the responsibilities of utilities that deliver water and domestic heating; promote better resource conservation through public awareness activities;
- clarify land ownership and property rights to natural resources to ensure that they are managed in a way that does not compromise economic, environmental and social policy goals;
- ensure that provisions of the tax code do not provide perverse incentives to damage the environment or undermine economic instruments used for environmental protection; identify opportunities to integrate environmental concerns in fiscal policies.

***Sectoral integration: industry***

Russia inherited from the USSR a large industrial sector with low energy and resource efficiencies. Industrial areas in several parts of the country now suffer from severe air, water and soil pollution as well as serious health effects. In the 1990s, Russian industry underwent major transformation. Industrial production fell sharply (by over 50 per cent) although it continued to represent a significant share of GDP. The share of energy-producing and other raw materials sectors has grown, while that of manufacturing has diminished. Output of small and medium-sized enterprises has increased in relative terms. A considerable part of industry has been privatised. The average age of industrial plants and equipment is now over 16 years; the share of loss-making enterprises has grown to approximately 45 per cent, and the share of barter in sales has reached about 60 per cent.

The drop in industrial production has been translated partially into reduced industrial pressures on the environment. A well-developed permitting system for regulating industrial pollution is based on more stringent standards than those in effect in most OECD countries. Economic instruments, such as fines and charges for pollution and natural resource use, were introduced in 1992 to finance environmental measures and to provide incentives for companies to reduce their environmental impacts. Some large companies producing for export markets have adopted environmental management systems; some industrial associations are promoting environmental awareness in industry. A legislative framework has been developed for prevention of and response to industrial accidents. Environmental programmes are being drawn up for some key industrial sectors. In general, while Russia is being integrated in the world economy, enterprises ought to become more interested in complying with environmental requirements, as non-compliance may result in reduced competitiveness or may lead to fines and the obligatory expense of eliminating the consequences of ecological accidents and disasters.

A variety of market, institutional and financial failures have brought industrial investment to a low point, including investment in pollution abatement and natural resource saving. The complexity of fiscal and budgetary transfers between the federal and regional governments further hinders competition and investment. As a result, most industrial capital stock is comparatively old and obsolete. The health of many people is still affected by industrial pollution; serious industrial accidents are frequent. The fact that the decrease in environmental pressures has been less rapid than the contraction of production indicates that the benefits of environmental policies and energy switching have not been commensurate with the factors leading to worse environmental performance in industry. Uncertainties concerning liability for past environmental damage, and lack of information on enterprises' environmental performance, are additional obstacles to investment. It is of utmost importance that a climate

favouring efficiency and investment be fostered, together with effective industrial and energy policies, to provide a basis for environmental and industrial authorities to pursue "win-win" policies. In addition, institutional, economic and legal stability is a precondition for attracting investment from both domestic and foreign sources.

It is therefore recommended to:

- elaborate an environmental strategy within an effective industrial policy, including objectives and priorities for short-, medium- and long-term actions; give priority to industrial pollution hot spots, low-cost solutions and "win-win" opportunities;
- continue to promote the use by enterprises of environmental management systems in line with ISO 14000 or EMAS;
- promote co-operation among authorities responsible for industrial and environmental policies, at all administrative levels, at the time environmental and industrial policies are formulated;
- foster improvements in regard to energy efficiency, raw material use and local and general pollution in Russian industry;
- develop a long-term contaminated sites management programme, including an inventory, risk prioritisation, clarification of liability, and related regulatory and economic instruments;
- consider improvements in and strengthening of industrial accident prevention, preparedness and control;
- collect and publish emission data on polluting enterprises; encourage environmental performance reporting by companies.

## 3. International Co-operation

As a very large country and a major international partner, Russia has considerable responsibilities for international environmental co-operation. It has strengthened its relations with OECD countries, and benefits from many joint activities with these and other countries.

### *Achievements*

At the end of the 1990s, international co-operation on environmental issues has progressed considerably following the new openness of Russian society. Information exchange between Russian and foreign experts has increased rapidly. For example, international experts participated in an assessment of radioactive pollution resulting from Soviet military activities.

In recent years, Russia has adopted a large number of multilateral environmental agreements and negotiated many bilateral agreements, with its 14 neighbouring countries and with other important trading partners. International co-operation is particularly advanced in north-western Russia. Russia has met all its commitments concerning $SO_2$ and $NO_x$ emissions; while this is mostly a result of economic decline, it also reflects a shift in fuel supply. Efforts have been made to reduce emissions of VOCs. Russia has greatly reduced its production, consumption and export of ODS, and in doing so has been able to benefit fully from the financial support of the GEF and of OECD countries.

In the area of technical assistance, Russia has established institutional arrangements for obtaining financial and technical support from bilateral and multilateral donors to help protect its environment and meet its international obligations. The State Committee on Environmental Protection (SCEP) should strengthen its co-ordination of foreign support relating to environmental issues. As its domestic financial resources have become increasingly scarce, Russia's contributions to international co-operative activities have often been in kind (e.g. carrying out studies and organising meetings).

### *Climate change*

Despite sharp reductions in $CO_2$ emissions, Russia remains the world's third largest emitter of $CO_2$ from energy. There is considerable potential for GHG reduction, as energy efficiency is fairly low and cost savings could be achieved through its improvement. Large energy savings would also save fuel for export and help provide an opportunity to trade emission quotas.

In line with the UN Framework Convention on Climate Change and the Kyoto Protocol, it is likely that emissions in 2000 and 2010 will be below those in 1990. Thus, a GHG emission quota could be available for trading. In the meantime, there are significant opportunities for joint implementation activities to reduce $CO_2$ emissions further. As the Russian economy's carbon intensity is particularly high, there is great potential for energy efficiency improvements, but they will require eliminating economic barriers which currently discourage investors.

***Strengthening international co-operation***

Despite its objective of promoting international co-operation, Russia has had difficulties in meeting some of its international commitments. It has not always been able to pay its annual contributions to international environmental organisations and initiatives and has accumulated various arrears. Its reporting on dumping activities has been incomplete, and a number of cases of dumping of radioactive waste have been considered not to be in conformity with the London Convention. Concerning marine pollution from land-based sources, results achieved in the Baltic Sea fall short of commitments. Some of these problems are the consequence of the difficult transition period and recent economic crisis, but some are also due to lack of rapid institutional change.

To strengthen co-operation with industrialised countries, it would be desirable for Russia to become a party to all those international conventions and related protocols concerning the environment with which it is in agreement. Such a move would require that environmental issues be given higher priority in the ratification processes by the Government and the State Duma. It would also require greater availability of governmental resources for international environmental co-operation, greater willingness to sign international agreements to which many OECD countries are also a party, and a decision to play an international role corresponding to Russia's global environmental responsibilities and potential. In particular, it would be desirable for domestic funds to be available to finance an adequate level of Russian participation in international meetings.

International technical and financial assistance to Russia, although not very large so far, has played a useful role. Efforts should be made on the Russian side to create more favourable conditions for attracting assistance in priority areas, and on OECD countries' side to improve the quality of this assistance. In particular, there should be an emphasis on promoting investment, on capacity building, on more effective institutional reforms and on increasing mutual technology transfer. Providing equipment at no cost is not a substitute for helping to create conditions under which Russia could produce that equipment itself. At a time of economic crisis, there is scope for increased technical and financial assistance from OECD countries to address urgent environmental problems. Russia would need to maintain a positive climate for provision of such assistance.

It is therefore recommended to:

- ratify and implement international environmental conventions already signed, and examine the advantages of joining other international agreements, notably concerning liability (Annex III);
- provide adequate budgetary allocations to pay the Russian contribution in the framework of international conventions concerning protection of the environment;
- strengthen the capacity for international environmental protection within the Russian administrations by reinforcing the co-ordinating role and associated capacity of the State Committee on Environmental Protection, by promoting participation of Russian experts in international meetings and co-operative activities, and by strengthening environmental expertise in the Ministry of Foreign Affairs;
- combat transfrontier pollution, reduce marine pollution from land-based sources and ban release of radioactive material to the sea;
- provide reliable mechanisms to secure investment in energy efficiency projects and progress in greenhouse gas emission trading;
- remove obstacles to expeditious transfer of official technical assistance relating to environmental protection and, in particular, clarify applicable customs and fiscal regimes;
- facilitate international co-operation on innovative and high priority environmental management issues at the regional level;
- encourage donors to enhance and focus their assistance so as to resolve priority problems;
- incorporate the recommendations of this review, as feasible and appropriate, in future international programmes of environmental technical assistance to Russia.