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## CONCLUSIONS AND RECOMMENDATIONS\*

This report examines progress made by the United States since the previous OECD Environmental Performance Review in 1996 and the extent to which the country's domestic objectives and international commitments regarding the environment are being met. It also reviews progress in the context of the OECD Environmental Strategy.\*\* Progress has stemmed from environmental and economic decisions and actions by federal, state and local authorities, as well as by enterprises, households and non-governmental organisations (NGOs). Fifty-one recommendations are made that could contribute to further environmental progress in the United States.

Over the review period (1996–2004) the country's GDP grew by close to 30% while the population increased by 10% to 291 million. GDP per capita is very high. The United States has one of the lowest trade-to-GDP ratios in the OECD. Services generate some 75% of the value added in the economy, with natural resource-based sectors contributing less than 5%.

Despite relatively low population density, pollution and natural resource depletion continued to be prominent issues on the country's agenda over the review period. The National Environmental Policy Act, together with other sectoral acts, sets environmental protection as an overarching goal and establishes the framework of environmental federalism, within which specific environmental management responsibilities are shared among federal, state and local authorities. In the review period government institutions evolved, particularly through an improved system of strategic programming. Decoupling of environmental pressure from economic growth has been achieved in some areas, but the US still faces challenges with respect to high energy and water intensities, environmental health risks, marine habitat conservation and maintenance of biodiversity. There remains much potential to integrate environmental concerns through market-based instruments, particularly in the energy, transport and agriculture sectors. To meet these challenges, it will be necessary for the United States to i) thoroughly implement its environmental policies, improving their cost-effectiveness and inter-jurisdictional co-ordination; ii) further integrate environmental concerns into economic and sectoral decisions; and iii) further develop international environmental co-operation. This will require increased effort by all sectors of society.

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\* Conclusions and Recommendations reviewed and approved by the Working Party on Environmental Performance at its meeting on 17 May 2005.

\*\* The objectives of the OECD Environmental Strategy for the First Decade of the 21<sup>st</sup> Century are covered in the following sections of these Conclusions and Recommendations: maintaining the integrity of ecosystems (Section 1), decoupling of environmental pressures from economic growth (Section 2.1), integration of social and environmental concerns (Sections 2.2 and 2.3) and global environmental interdependence (Section 3).

## 1. Environmental Management

### *Implementing more efficient environmental policies*

Traditionally, the US approach to environmental management has been very effective, relying on laws and regulations implemented through enforcement, compliance and funding mechanisms. During the review period, cost-effectiveness concerns became more prominent as regards the choice of policy instruments for environmental management. Increasing priority has been given to using more flexible instruments for implementing environmental policies (e.g. co-operative conservation), in the interest of reducing regulatory and compliance costs and in the interest of achieving a higher level of environmental protection at a more rapid pace. Systems of tradable permits have been pioneered for air emissions (e.g. SO<sub>x</sub>, NO<sub>x</sub>), water resource management and products (e.g. ozone-depleting substances). Ex-ante and ex-post cost-benefit analysis of environmental policies is used probably more than in any other OECD country, and evidence of the net economic benefits of air pollution control efforts has fuelled the recent tightening of emission reduction requirements for a number of pollution sources, including power plants and diesel engines. Efficiency gains and environmental benefits should also result from the delegation of environmental regulatory powers to states, and the increased flexibility negotiated by some states concerning implementation. Public land management and species protection are increasingly undertaken with an ecosystem, integrated approach. Focusing compliance assurance activities on priority sectors or industries with known compliance problems has made enforcement more efficient; even as inspection numbers have decreased, the proportion leading to violations and prosecutions has increased. The rule of law is pervasive in environmental management. “Managing for results”, introduced by the Government Performance and Results Act, has catalysed better environment-related programming and made programmes more performance-oriented. Public-private partnership has proved effective in a number of cases.

The consensus that emerged in the 1970s for a national approach to environmental management remains strong. While states have taken a more active role in initiating policy responses to regional issues, a few have also urged more federal leadership on some far-reaching environmental issues, such as controlling air pollutant emissions from coal-fired power plants and limiting greenhouse gas (GHG) emissions. Command-and-control regulation is still the cornerstone of US environmental protection, accompanied by considerable litigation, which is often costly and time consuming. While implementation of the user pays and polluter pays principles is part of the environmental management culture, some environmental services (e.g. waste water infrastructure, waste collection and treatment) are still too often financed to a significant degree by taxpayers rather than through full cost recovery. The recent emphasis on voluntary initiatives introduces desirable flexibility, but also raises issues regarding transparency, public involvement and efficiency, which will need to be addressed to justify such measures’ prominence in the policy package. The permitting system is still generally single-media in approach, and may result in higher-than-necessary administrative costs to industry. In general, fiscal and sectoral policies sometimes run counter to stated environmental objectives. The importance of these in the overall context of US environmental quality is subject to debate, but may warrant increased scrutiny.

#### Recommendations:

- continue to emphasise coherence and co-operation among federal agencies and between federal and state agencies involved in environmental management;
- place greater emphasis on the elimination of ambiguities in laws and regulations to avoid legal gridlock and protracted litigation; continue compliance assistance activities;
- evaluate the potential benefits of introducing integrated pollution control permits (e.g. multi-media or multi-pollutant permits) for large stationary sources;
- continue to incorporate multi-pollutant and multi-media considerations when assessing the cost-effectiveness of environmental policies, taking into account ancillary benefits for other environmental media and other areas of public policy (e.g. public health, international aspects);
- review government financial assistance (e.g. direct and indirect subsidies, preferential loans, tax incentives) for the provision of environmental services in light of the polluter pays and user pays principles; in particular, examine subsidies related to sewerage, waste water treatment, and grazing on public land;
- expand the role of market-based instruments, in association with other instruments, with a view to increasing cost-effectiveness and economic efficiency in environmental management; consider expanding the use of fees and charges to get prices right, particularly as regards water and energy resources;
- ensure that voluntary environmental initiatives include routine monitoring of performance and cost-effectiveness, and consultation of stakeholders.

#### *Air*

While the US economy grew substantially during the review period, emissions of major air pollutants declined: emissions of CO, lead, NO<sub>x</sub>, SO<sub>2</sub>, particulate matter (PM) and VOCs were strongly decoupled from economic growth in the review period. The SO<sub>2</sub> decoupling is due primarily to the success of the cap-and-trade approach of the Acid Rain Program. For CO, lead, NO<sub>x</sub> and PM, the main factor is increasingly stringent controls on motor vehicle emissions and fuel quality, which have greatly reduced emissions per kilometre travelled. The standards for light-duty trucks (including sport utility vehicles) were raised around 8% in 2003, and will be phased in through the 2007 model year. Programmes for stationary sources have achieved substantial reductions, though many older installations still have relatively high emission rates. Ambient concentrations of criteria air pollutants have decreased significantly in urban areas, and sulphur deposition has been reduced in the East. The United States employs a mix of policy instruments for air quality management, including regulation, market-based instruments and voluntary measures. The recent emphasis on market-based and flexible approaches such as cap-and-trade programmes has increased the cost-effectiveness of pollution control for stationary sources. Though uncertainties remain, assessments of the overall costs and benefits of the Clean Air Act indicate that its implementation has had, and will probably continue to have, substantial net economic benefits. The Department of Transportation implements several programmes that help manage traffic demand and encourage more efficient vehicle use, though their influence is likely undercut by economic signals in the sector. New ambient air quality standards for ground-level ozone and PM<sub>2.5</sub> are expected to lead to significant net benefits, in particular in terms of avoided premature mortality. The recently promulgated Clean Air Interstate Rule, along with a number of other programmes such as engine and fuel improvements in the transport sector, are expected to help most areas in the United States meet the new ozone and fine particulate standards. The promulgation of a large suite of technology-based emission standards to regulate hazardous air pollutants has been completed, albeit considerably behind schedule. In 2005 the United States promulgated pioneering mercury control requirements for coal-fired electric power generators (the Clean Air Mercury Rule).

Despite this overall progress, air pollution intensities (emissions per unit of GDP) for most common pollutants are still quite high compared to those of other OECD countries. Emissions of mercury and particulates from old coal-fired power stations, and of ozone precursors from motor vehicles, pose human health risks and contribute to persistent regional pollution problems (e.g. smog, haze). Ambient concentrations of ozone and fine particulates remain an important public health concern, with some 160 million US residents living in areas classified as in non-attainment for ozone and/or PM<sub>2.5</sub>. Innovative measures and improved inter-regional co-operation will be needed to meet the recently strengthened standards for ozone, PM and regional haze. The State Implementation Plan approach, which focuses on one pollutant at a time and on measures by a single state, is ill adapted to the multi-pollutant or air-shed approaches necessary to control such pollution. Data on ambient concentrations of hazardous air pollutants (HAPs) is patchy, and the recently initiated national HAPs monitoring network will need to be complemented by local-level ambient monitoring to facilitate evaluation of the “residual risk” associated with regulated HAPs. Integration of environmental concerns into decision making in the energy sector remains limited, and energy prices neither fully reflect external environmental costs nor provide adequate incentives for energy conservation. Although efforts are being made to integrate air management concerns into transport planning, little emphasis has been put on the use of price signals or the rationalisation of fiscal policies to support less polluting transport choices. The benefits of technological advances in reducing unitary motor vehicle emissions have been largely outweighed by increases in fleet size and in vehicle-kilometres travelled. Average fuel efficiency of the national motor vehicle fleet remained flat during most of the review period and is one of the lowest in the OECD. The Corporate Average Fuel Economy standards were not raised in the review period for passenger cars. Protection of ecosystems through secondary standards, while provided for in the Clean Air Act, has not been emphasised; some forests and crops are damaged by exposure to regional ozone. Despite an overall trend of improvement, visibility in many national parks and wilderness areas is still regularly impaired by haze; the recently promulgated Clean Air Interstate Rule and other measures are expected to lead to improvements in visibility and benefits for ecosystems.

Recommendations:

- continue to implement measures to achieve the new standards for ground-level ozone and PM<sub>2.5</sub>, striving to take an integrated approach to control ozone precursors at air-shed level; develop and implement secondary ambient air quality standards aimed at ecosystem protection (e.g. for ozone);
- implement a cost-effective national system to achieve targeted reductions of emissions (e.g. of SO<sub>x</sub>, NO<sub>x</sub> and mercury) from existing power stations;
- in implementing future cap-and-trade programmes, ensure that current and projected environmental benefits from existing regulations are not diminished and that geographic disparities in pollution exposure are not increased;
- continue to ensure that federal and state enforcement activities are well co-ordinated and effectively raise the overall level of compliance with environmental regulations;
- strengthen management of hazardous air pollutants by monitoring local ambient concentrations, regularly updating and publishing inventories of toxic releases and cost-effectively assessing residual risk;
- reinforce measures to increase energy efficiency and the contribution of low-emission energy sources to the energy supply;
- continue to revitalise the system of Corporate Average Fuel Economy standards for motor vehicles, improving fuel economy standards for all vehicle classes.

## *Water*

Drinking water quality standards have been strengthened since 1996, and the overall quality of the water supplied by public systems improved during the review period. Of the population served (273 million persons in 2003), the share receiving tap water in full compliance with health-based drinking water standards increased from 86% in 1996 to 90% in 2003. Nevertheless, localised quality problems, such as lead in tap water in Washington, DC, still exist. Due to tightened standards, increased sampling efforts and better detection methods, more health advisories are being issued to protect critical populations. The efficiency of water use in agricultural irrigation has improved. The marginal costs of meeting increasing water demand have spurred efforts to strengthen the conservation signal in water pricing. Almost all water networks now meter consumption and charge in relation to the volume consumed. In some areas, watershed management initiatives have been successfully used to integrate management of water resources and water quality, and thus avoid additional investment in infrastructure (e.g. Catskills watershed, New York). Several initiatives have introduced trading of water pollution permits or water rights associated with selected water bodies, thereby offering more cost-effective means of achieving certain environmental management goals. An additional 15 million people were connected to waste water treatment plants in the review period, maintaining coverage of the population at a high level (71%). The use of sewerage charges became more widespread during the review period, with surcharges in some cases differentiated as a function of suspended solids, oxygen demand or nutrients. Several states have applied innovative economic instruments (e.g. Massachusetts's pesticide tax, Oklahoma's tax credit for manure management) to reduce diffuse water pollution.

However, there is still considerable room to improve the effectiveness and efficiency of the management of water resources and quality, given that several trends are unfavourable and water has become a constraint on development (e.g. urban, agricultural) in part of the West. Some 40% of assessed surface waters are subject to health-related advisories restricting fishing or swimming, many due to elevated levels of mercury and pathogens, and coastal waters in the North-east and in the Gulf of Mexico regularly violate quality standards. Although related public health risks are reduced through the issuance of advisories, additional efforts are needed to fully restore impaired water bodies. In 2003, with a significant increase in monitoring, beach closings or health advisories were issued for more than 18 000 days nationwide, up from 3 000 in the mid-1990s. Many estuaries have high levels of eutrophication, and recent evidence suggests that chronic water quality problems persist in the Chesapeake Bay. Although new mechanisms (Farm Bill, municipal storm water permit programmes) are in place to address agricultural and urban run-off, these diffuse sources of pollution continue to pose significant challenges. Per capita water consumption remains the highest in the OECD, and the intensity of water use (per unit of GDP) is nearly 70% higher than the OECD average. In many noticeable cases the user pays and polluter pays principles are not fully applied. Although there has been a reduction in federal transfers, and greater emphasis on efficiency and cost recovery, federal transfers continued to support the development of public water supply infrastructure over the review period. Capital investment costs for waste water treatment are also still not fully recovered from users, though progress has been made in reducing federal transfers. Municipal water service provision is highly fragmented, and providers too rarely seek to exploit potential economies of scale that could result from inter-municipal co-operation. There are increasing problems with water availability in the Western states as a result of competing demand among increasing populations, agricultural, recreational and environmental needs, and obstacles to more efficient use and conservation of water. This further threatens aquatic ecosystems and strains many Western aquifers. Efforts to address these concerns at local, regional and national levels have recently been initiated, but much more work remains to be done.

### Recommendations:

- improve co-ordination and co-operation in setting federal water objectives and policies, including among the Environmental Protection Agency (quality), Department of the Interior (irrigation, nature protection), Department of Agriculture (agricultural run-off), Department of Commerce (the National Oceanic and Atmospheric Administration's hydrology and water information, supply estimates and predictions) and Department of Defense (flood control);
- reconcile water quality and quantity objectives, in particular by applying an ecosystem approach to flood control; ensure that flood plain management concerns are systematically taken into account in land use and water policy decisions;
- continue to move towards full application of the polluter pays principle and cost recovery in pricing water and waste water services for households and industry; in particular, phase out federal transfers to revolving funds, increase public-private partnerships and promote inter-municipal water utilities to improve efficiency of service delivery;
- give higher priority to reducing diffuse water pollution, in particular from agricultural and urban run-off, by implementing a mix of policies (e.g. water quality trading, storm water run-off control);
- continue to facilitate the development of water markets and, where appropriate, promote the use of prices as a management tool to improve the allocation of water;
- further apply basin-wide management, using existing watershed management initiatives as examples, to improve efficiency, to raise capacity and public awareness and, as appropriate, to extend co-operation between relevant US and neighbour-country authorities;
- foster sustainable water resource management through increased use of economic instruments (e.g. full-cost water pricing, basin-wide water trading, environmental management systems, asset management).

### *Nature and biodiversity*

As a megadiverse country the United States has special responsibilities for biodiversity and nature protection. Efforts by government and NGOs to conserve natural habitats and species have achieved positive results. During the review period, the already extensive system of national conservation areas was further expanded. Many examples exist of effective conservation in protected areas such as wildlife refuges. Strategic objectives have been set concerning the protection, maintenance and restoration of natural habitats and ecosystems, with states, tribes, local governments and landowners playing leading roles. Ecosystem management approaches have been introduced to improve management of many sensitive areas, including the Great Lakes, Chesapeake Bay, the Florida Everglades, the Gulf of Mexico and numerous watersheds. Federal commitment to wetland protection has evolved from a policy objective of "no net loss" to one of "overall gain" in terms of quality and quantity of wetland surface area; efforts have been made to systematically integrate wetland protection and reconstruction objectives into the work of federal agencies. Agri-environmental subsidies have been used to effectively slow the rate of wetland loss on farmland, although they have been substantially reduced in recent years. More sustainable forestry practices have been introduced on public land. Special consideration is given to plant and animal communities on the 30% of US land area owned by the federal government, significant portions of which are managed as national parks, national wildlife refuges, national forests or wilderness. This is supplemented by laws and programmes aimed at individual categories of fish, wildlife and plant species, such as the North American Wetlands Conservation Act and the Endangered Species Act. Co-operation with Canada and Mexico on wildlife and nature protection has progressed. An executive order issued in 2004 reinforced federal commitment to using partnership approaches to engage states, tribes, local governments and private landowners in co-operative conservation initiatives. The Departments of the Interior, Agriculture and Commerce, as well as the US Environmental Protection Agency (EPA), fund partnership programmes to support co-operative conservation measures.

However, as in other countries, biodiversity is still at risk in the United States, with more species declining than improving. Particularly at risk are freshwater and anadromous fish, neotropical migratory birds and some birds of prey. Healthy ecosystems form the basis for sustainable economic growth, particularly in sectors depending directly on renewable natural resources or outdoor recreation or tourism; economic development continues to place heavy pressures on life support systems. While the US has an extensive framework of federal, state and local laws, programmes and institutions for managing its biological resources, it has no comprehensive set of national objectives for managing biodiversity within and outside protected areas, nor a national biodiversity strategy. Among the 1 288 species of plants and animals listed as threatened or endangered, 85% are so categorised primarily because of loss and degradation of their habitats; this trend can be expected to continue unless efforts are made to better integrate nature conservation concerns into land management decisions. The spread of terrestrial and aquatic invasive species is a further challenge, resulting in economic damage estimated at USD 137 billion per year (equivalent to more than 1% of GDP). Some habitats are being degraded in different parts of the country, including coastal, estuarine and aquatic areas, although such areas are also being protected or restored. Some wetlands are degraded by excessive sedimentation, invasive species and inputs of nutrients and pesticides. Nature reserves and parks are subject to increasing pressures (e.g. from motor vehicle use and rising visitor numbers). Programmes such as the Wildlife Habitat Incentives Program, the Conservation Reserve Program and the Wetlands Reserve Program have helped conserve wildlife habitats outside of federal lands, but additional opportunities remain. Fragmentation of responsibility and programmes for biodiversity conservation, fish and wildlife management, parks and forest management among a large number of separate agencies makes overall co-ordination difficult and may reduce the effectiveness of individual programmes. Application of the ecosystem approach is still in the early stages and the use of biodiversity monitoring networks is not yet operational. The US has signed but not ratified the 1992 Convention on Biological Diversity.

Recommendations:

- prioritise habitat and species protection efforts, including rebuilding depleted fisheries and promoting recovery of endangered species, through co-operation among relevant departments and agencies, and public involvement;
- strengthen management of protected areas (e.g. national parks, wildlife refuges, marine sanctuaries); continue newly initiated efforts to strengthen coastal and marine protection, as well as ongoing wetland protection and restoration efforts, using an ecosystem management approach that maximises inter-agency co-ordination and partnerships with landowners, states, tribes and other stakeholders;
- further integrate nature protection concerns in agricultural and forestry practices, promoting practices that provide environmental benefits with respect to habitat conservation or reducing pollution by agrochemicals and nutrients;
- expand use of incentives to promote voluntary wildlife conservation and seek innovative ways to relieve burdens on landowners from restrictions on the use of their land to protect certain species or habitats;
- strengthen co-operation among federal agencies and between federal government and states, universities, industry and the non-profit sector in the management of knowledge and databases concerning pressures on natural ecosystems, the state of ecosystems and species, and the effectiveness of policy responses;
- strengthen and expand the use of co-operative conservation approaches to protect habitats and species through voluntary partnerships.

## 2. Towards Sustainable Development

### *Integrating environmental concerns in economic decisions*

The United States decoupled several environmental pressures from economic growth over the review period. Pesticide use and emissions of some air toxics have been strongly decoupled, though most pressures (e.g. energy consumption, road traffic, water abstraction) have been weakly decoupled. The Government Performance and Results Act has promoted co-ordination among government programmes through planning methods that are result-oriented and accompanied by measurable indicators of performance. Co-operation among various government levels (e.g. in the Brownfields and Land Revitalization Program) has expanded, and this has yielded environmental benefits. Partnerships for environmental protection, involving commitments by businesses, non-profits and landowners to voluntary environmental protection, have led to some innovative and effective approaches, which have produced environmental results. Efforts by the Departments of Energy and Transportation to promote uptake of low-emission fuel by particular end-user groups are encouraging, although these programmes are in general supported by subsidies and have yet to result in widespread fuel switching. The US has an extensive system of environmental regulation at the state and federal levels that generally ensures the integration of environmental concerns in economic decisions. Research programmes support development of new technologies for sustainable development, such as hydrogen vehicles and carbon sequestration. Many federal agencies have points of contact on sustainability, and co-ordination is being provided by the Office of the Federal Executive. Environmentally related tax revenue increased from 6.9% of US tax revenue in 1995 to 9.3% in 2001.

Nevertheless, room remains for further progress in integrating environmental concerns into economic policies and decisions. The pollution, energy, water and material intensities of the US economy remain high in OECD terms, and the fuel supply is still among the most carbon intensive. Neither municipal waste generation nor land conversion has been decoupled from population growth. The lack of full internalisation of environmental costs in transport and energy pricing structures causes market distortions that undermine efforts to encourage energy conservation and enhance energy security through programmes such as Energy Star and incentives for development of low-emission energy sources. Progress in integrating environmental concerns into tax policy has been mixed, with rate differentiation or deductions (e.g. tax deductions for business purchase of sport utility vehicles and for home mortgage interest) sometimes inconsistent with environmental goals. Environmentally harmful subsidies remain. Agri-environmental support has increased as a share of total payments from 5% to 10%. The recommendations of the 1999 report of the President's Council on Sustainable Development have not been fully implemented. At the national level, the periodic publication of national environmental expenditure data was discontinued during the review period.

#### Recommendations:

- review and revise, as appropriate, environmentally related taxes (e.g. in relation to transport, energy, agriculture, forestry, mining) with a view to reinforcing their environmental effectiveness and economic efficiency;
- review and revise, as appropriate, sector policies and subsidies that have environmental effects;
- strengthen the integration of environmental concerns into transport policies and investment plans, and promote consideration of environmental concerns in land use planning;
- continue to make greater use of economic instruments to integrate environmental concerns in the transport sector, especially through road pricing, fuel taxation and incentives to purchase fuel-efficient and low-emission vehicles and fuels;
- continue to apply market-based instruments to internalise the environmental costs of energy use in price signals and to reinforce incentives for energy efficiency in the transport, energy and household sectors;
- continue initiatives to make urban development more sustainable through approaches such as the EPA's Smart Growth programme, brownfield redevelopment and urban environmental initiatives.



### *Integrating environmental and social concerns*

During the review period, the United States continued to address environmental justice issues, with federal agencies taking actions aimed at reducing environmental disparities for all communities, including minority and low-income communities. In addition, more than 30 states sought to address environmental justice through legislation, policies and initiatives during the review period. The Brownfields and Land Revitalization Program is an effective co-operative mechanism to address environmental justice concerns while stimulating urban renewal. Co-operation with tribal authorities concerning environmental conditions has increased substantially at the federal and state levels since the 1990s, with capacity-building programmes leading to tribal self-determination in some environmental matters. US citizens generally have good access to environmental information and to courts, where they may petition or bring suit if they believe a federal environmental statute or state or local environmental law has been breached. The EPA issued a Draft Report on the Environment in 2003, and is scheduled to issue its next report in 2006. The EPA has also created Internet-based training for librarians and others to help the public find and use available environmental information via the free Internet access provided by virtually all public libraries in the US. The federal government has adopted performance-oriented environmental management. The advent of “e-government” and the substantial increase in electronic means of submitting comments on proposed rules has enhanced environmental democracy. Some partnerships involving multiple levels of government (federal, state and local) and stakeholders have resulted in innovative means of achieving conservation and environmental protection goals.

Although a great deal of progress has been made towards integration at the environment-social interface, challenges still remain. Poverty affected 35.9 million people in 2003, and some economically disadvantaged populations near polluting or contaminated sites still suffer greater health risks than other groups. Few tribes have been able to satisfy EPA requirements for implementation of federal environmental management provisions, and some of those that have tried face long administrative delays. For a number of tribes, environmental management services remain inadequate. The production of comprehensive, up-to-date nationwide environmental information, data and indicators, and environmental expenditure data, should be further strengthened. Environmental data quality is mixed, partly as a result of fragmented data collection and information systems. Despite the substantial progress made since 1996 in assuring public access to the Internet, there is a risk that lower access to the Internet among low-income groups may compromise their access to environmental information and consultation processes.

#### Recommendations:

- continue to encourage the systematic integration of environmental justice principles in state government activities and programmes;
- ensure that tribal communities have access to safe drinking water; improve solid waste management on tribal lands and reinforce efforts to help tribes reach self-determination as regards environmental matters;
- continue to produce policy-relevant environmental information and indicators (e.g. national and state reports on the state of the environment, indicators of performance, information on environmental expenditure) and ensure that it is made available in a timely fashion;
- continue to improve data consistency and quality within and among databases and knowledge bases operated by federal and state government agencies, working with NGOs where appropriate;
- continue to promote environmental education and awareness, especially at the state and local levels, in co-operation with NGOs where appropriate.

## *Health and environment*

Protecting human health from damaging levels of pollution has long been the fundamental objective driving US environmental policies, and the EPA's mission is to "protect human health and the environment". The country was proactive in taking measures to reduce pollutant exposure in the 1970s, with an early phase-out of leaded petrol and bans on certain pesticides. Through concerted policy action, the frequency of acute pollution episodes and the incidence of environmentally transmitted infectious disease have been minimised. In particular, enforcement of ambient air quality standards and partial bans on indoor smoking have reduced the frequency of exposure to acutely harmful levels of air pollution, reaping health benefits that greatly exceed the costs of control. During the review period, raised awareness of the vast economic benefits to be derived from reducing children's environmental health risks led to proactive policies, regulations, research, capacity building and international leadership in this area. The US has been among the front-runners in measures to reduce health risks from indoor air pollution, and its efforts have been largely cost-effective. The continued upgrading of municipal water treatment capacity, as well as some municipalities' targeted efforts to replace lead pipes, has considerably reduced health risks associated with public water supply. Although cost-benefit analysis is not required in the earliest stages of environmental health policy development, maximising the cost-effectiveness of implementation has become a high priority since the late 1990s. Federal research programmes continue to improve the scientific basis for policies aimed at reducing environmental health risks, and contribute substantially to international understanding of environmental health issues in the process.

However, with health expenditure at nearly 15% of GDP and a number of economic studies pointing out the cost-effectiveness of preventive environmental actions, the United States could still make significant progress towards improving national environmental health. The environmental burden of disease is relatively heavy, accounting for up to 20-25% of the overall disease burden. The prevalence of chronic conditions (e.g. birth defects, cancer, asthma) with links to environmental exposure is rising, as are related health costs. Some 40% of surface waters are subject to health advisories restricting fishing or swimming, mainly due to elevated mercury and pathogen levels; these advisories lead to a substantial reduction of risk to critical populations. Some 160 million people live in designated "non-attainment areas" for fine particulates and/or ozone. Risks posed by several indoor air pollutants remain elevated for certain groups, particularly schoolchildren. Children bear a disproportionate share of the environmental burden of disease, and this entrains significant economic costs. Promulgation of regulations on hazardous air pollutants has been very slow, and evaluation of residual health risks is nascent. Co-ordination of efforts to improve environmental health should be strengthened, particularly at the federal level, where responsibility is divided among more than ten institutions; the Healthy People 2010 initiative makes a step in this direction. Promoting access to nature and outdoor recreation as a contributor to better public health has historically been a relatively minor but growing objective of US environmental health policy. National tracking of environmental health trends has been piecemeal, although the 2002 launch of the National Environmental Health Tracking Program by the Centers for Disease Control and Prevention is an encouraging step. The promised national children's health study is much needed to improve understanding of significant environmental health risks to children, but design of the study is taking longer than expected.

#### Recommendations:

- develop and implement a national environmental health strategy, defining targets and cost-effective measures for reducing the environmental burden of disease, as well as indicators to monitor progress;
- improve co-ordination among federal agencies responsible for environmental health management, and among federal and state agencies responsible for implementation; better integrate environmental health objectives into general health policy, favouring preventive approaches over technical fixes where the former are shown to be cost-effective;
- launch the planned national study on children's health, giving special attention to monitoring the long-term effects of chronic exposure to pollutants in the environment and in food;
- reinforce efforts to reduce health risks associated with indoor air quality (e.g. radon, tobacco smoke, asbestos); set and enforce minimum ventilation standards in building codes so as to limit exposure to high-risk pollutants;
- continue to implement national programmes to reduce contaminants (e.g. mercury and pathogens) in surface waters, emphasising cost-effective measures to reduce releases at the source, in order to decrease the number of freshwater and beach advisories;
- continue to reinforce measures to ensure that levels of pesticide residues and other contaminants do not exceed allowable levels in the food supply, and that established tolerance levels adequately protect children.

### **3. International Commitments**

During the review period, the United States maintained a broad approach to international environmental affairs, operating through a variety of bilateral, regional and multilateral channels, and successfully met most of its environmental policy objectives and commitments. Included in this broad approach are the US free trade agreements, which have incorporated strong environmental commitments, complemented by environmental co-operation agreements and other arrangements. Reduction targets for SO<sub>2</sub> and NO<sub>x</sub> in the US-Canada Air Quality Agreement are being met. Co-operation with Mexico under the Border XXI Program achieved important advances in pollution monitoring, contingency planning and public participation, which are being extended through the decentralised, result-oriented Border 2012. The US remained the world leader in supporting international environmental science and technology programmes. It supported the design and negotiation of international agreements on invasive species, ship anti-fouling systems, vessel inspection, persistent organic pollutants and environmental guidelines for export credit agencies. It met reduction targets for ozone-depleting substances under the Montreal Protocol. With US support, the Arctic Council and the North American Commission for Environmental Cooperation have matured into important mechanisms for promoting region-wide integrated environmental management, including involvement of indigenous peoples. US public and private institutions have embraced the partnership approach that emerged at the 2002 World Summit on Sustainable Development to support developing and transition economies. The United States has initiated a number of international partnerships focused on climate change, including the Methane to Markets Partnership, the International Partnership for the Hydrogen Economy, the Carbon Sequestration Leadership Forum, the Generation IV International Forum and the Group on Earth Observations System of Systems. Nearly 25 states have launched initiatives to address climate change, either alone or with neighbouring states. In some cases they have adopted policies to reduce or register GHG emissions and to prescribe reductions in power plant emissions.

On the other hand, there has been some fragmentation of efforts, with many bilateral, regional and global programmes not fully funded and targets not met on schedule. In the Great Lakes basin, progress has been slow in cleaning up contaminated sediments, addressing the problem of invasive species and protecting ecologically vital shoreline habitats. Air and water pollution in the US-Mexico border region are still expanding in scope and severity as rapid population growth and urbanisation continue. US estuaries, coastal waters and near-shore habitats remain under heavy pressure from development, agricultural nutrient run-off and transport of air toxics. Although the US has not ratified the Kyoto Protocol, it remains committed to the United Nations Framework Convention on Climate Change (UNFCCC). Like most OECD countries, the US has not met the UNFCCC goal of returning GHG emissions to their 1990 level. As the world's largest economy, the US accounts for nearly 21% of global GHG emissions and has one of the highest per capita levels of GHG emissions in the OECD. Federal climate policy calls for a goal of lowering GHG emission intensity by 18% by 2012, to be met through a range of voluntary, regulatory and incentive-based programmes. While the US remains a major donor to the multilateral development banks, which all operate important environmental programmes, its funding pledges have occasionally been reduced or payments delayed. While the United States has been engaged in domestic legislative efforts necessary to ratify a number of major international agreements, its reputation and influence in multilateral efforts to protect and enhance the global environment are damaged by its failure to ratify major international agreements that it initially advocated and helped design, including the Convention on Biological Diversity and the Stockholm, Basel and Rotterdam conventions.

Recommendations:

- strengthen efforts to improve water and air quality and protect wetlands and natural areas along the northern border (e.g. in the Great Lakes basin), building on the working relationships among relevant authorities in Canada and the US;
- ensure that the goals and quantified targets of the US-Mexico Border 2012 Program are fully met, with effective state-to-state and region-to-region co-operation and broad-based public participation in programme design and implementation;
- strengthen national climate change policy, programmes and implementation, complementing state and industry initiatives and partnerships, and introducing cost-effective voluntary, regulatory and/or market-based instruments, in order to fulfil commitments under the UNFCCC;
- continue to promote the new US vision and strategy to protect the health of the world's oceans and living resources; implement the US Ocean Action Plan; promote ecosystem-based management of US coastal waters and a stronger role at the global level;
- continue to support environmental capacity building in developing countries; provide the funding necessary to meet existing commitments to substantially increase official development assistance;
- assure continuous commitment and funding for the Partnerships for Sustainable Development that the US promoted in the context of the World Summit on Sustainable Development in Johannesburg;
- expedite ratification of international environmental agreements that the US has signed, particularly in cases where the country played a leadership role in their design and negotiation (e.g. Stockholm Convention, Convention on Biological Diversity, Rotterdam Convention).