

OECD

WORKING PARTY ON ENVIRONMENTAL PERFORMANCE

ENVIRONMENTAL PERFORMANCE REVIEW OF CHINA

CONCLUSIONS AND RECOMMENDATIONS (FINAL)

These Conclusions and Recommendations have been approved by all the Delegations of the OECD Working Party on Environmental Performance, including the Chinese Delegation, at its meeting (Beijing, 8-9 November 2006).

CONCLUSIONS AND RECOMMENDATIONS

Since the launch of the “open door” policy in 1978, economic growth has been remarkable. Over the last 15 years, the average rate of economic growth has been 10.1% per year. China now has the fourth largest economy in the world. Large foreign direct investment and the increased role of market forces have facilitated the country’s integration into the global economy. In the process, large numbers of people have escaped extreme poverty. However, while China has about 20% of the world’s population, GDP per capita is still low (USD 6 000 for China compared to USD 25 000 for OECD countries at PPP 2000) and is unevenly distributed across the country, with wealthier coastal provinces and less-developed western provinces. Large migrations have contributed to rapid urbanisation (now 43% of the population), and income disparity between urban and rural areas has increased. Poverty remains a serious challenge in rural China.

This rapid economic growth, industrialisation and urbanisation have generated high pressures on the environment, with consequent damage to health and natural resources. Chinese authorities, aware of the deterioration of the environment, are promoting more balanced patterns of development, using concepts such as “harmonious society” and “scientific development”. Their responses have included planning for national economic and social development (covering environmental management efforts), modern environmental legislation, strengthened environmental institutions, and higher priority to environmental and natural resources management. Nevertheless, air pollution in some Chinese cities reaches levels that are among the worst in the world, energy intensity is about 20% higher than the OECD average, and about a third of the water courses are severely polluted. Challenges with waste management, desertification, and nature and biodiversity protection remain. To achieve a new economic and social development model (a resource saving and environmentally friendly society according to the 11th FYP), China will need to i) strengthen the effectiveness and efficiency of the implementation of its environmental policies; and ii) enhance the integration of environmental concerns into economic decisions (e.g. fiscal, energy, agriculture, transport and land-use decisions).

Environmental issues in China have often a strong international dimension, reflecting regional environmental interdependencies (e.g. transboundary air and water issues, regional seas pollution, desertification) and global economic and environmental interdependencies. The environmental pressures and demand for energy and other resources associated with China’s rapid economic development dramatically underlines questions about the environmental sustainability of current production and consumption patterns globally. Trade as well as financing of development (e.g. official development assistance, foreign direct investment) have important environmental dimensions. China therefore has a shared interest with OECD and other countries to address related challenges, and has significantly enhanced its engagement in international environmental co-operation in recent years.

This report examines progress made by China since 1990 and evaluates the extent to which the country’s domestic objectives and international commitments are being met. Some 51 recommendations are made that could help strengthen China’s environmental performance in the context of sustainable development.

1. Environmental Management

1.1 *Implementing environmental policies more effectively and efficiently*

China's comprehensive and modern set of environmental laws, together with its successive Five-Year Plans for National Economic and Social Development (FYPs) and Five-Year Environmental Plans (FYEPs), provide a high-quality framework for pursuing sustainable development and environmental progress. In December 2005, the State Council issued a decision for better implementing environmental policies. In April 2006, the Chinese Premier announced, in the sixth national environmental protection meeting, three new policy directions, including: integrating environmental protection and economic decision-making on an equal footing, further decoupling pollutant emissions from economic growth, applying a mix of instruments to resolve environmental problems. The proposed directions and measures are being implemented and go a long way towards addressing the environmental policy implementation gap. Within their mandates, departments under the State Council have worked hard to support environmental policy implementation. A range of regulatory and economic instruments (e.g. pollution charges, user charges, emissions trading) and policy approaches that harness markets and public interest in the environment have been developed. Campaigns and award schemes to support implementation at the local level have been organised; work with non-governmental organisations (NGOs) to develop procedures for public participation in environmental impact assessment (EIA) is an important recent example. There is evidence that local leaders in some of the richer provinces are responding to demands from the public for better environmental conditions, and are recognising the benefits to the economy and the society. More than 8 000 companies are registered under ISO 14000. In 2004, pollution abatement and control (PAC) investment expenditure was 1.2% of GDP.

However, these efforts have not been sufficient to keep pace with the environmental pressures and challenges generated by the very rapid growth of China's developing economy nor to capture the potential economic benefits to be obtained from improved pollution abatement and nature protection. Overall, environmental efforts have lacked effectiveness and efficiency, largely as a result of an implementation gap. The weaknesses in the present system are demonstrated by the failure to achieve some of the key objectives of the 10th FYP, and the severity of environmental problems in many parts of China. National environmental legislation and regulations should be compiled in an environmental code, to make them more consistent and user-friendly. Environmental policy priorities should be focused on human health and key natural resources. Consistent nationwide implementation of environmental regulations for products and industrial/energy facilities should be enhanced and given priority. The biggest obstacles to environmental policy implementation are at the local level. The performance objectives of local leaders, the pressures to raise revenues locally to finance un-funded mandates, and the limited accountability to local populations have generally meant that economic priorities have over-ridden environmental concerns. There is a need for much stronger monitoring, inspection and enforcement capabilities to establish a better mix of incentives and sanctions. In addition, environmental expenditure needs to be made more efficiently, and environmental policy instruments need to be made more effective. Implementation of the polluter pays and user pays principles should be strengthened. Special provisions are needed to integrate environment into the development strategies of the less-developed regions and to ensure the affordability of environmental services for the poor. There is an increase in damages associated with disasters of climatic and industrial origin, requiring improved prevention and mitigation measures.

Recommendations:

- implement environmental law and regulations nationwide for products and industrial/energy facilities; strengthen monitoring, inspection and enforcement capabilities throughout the country, including through the independence of the enforcement functions of Environmental Protection Bureaus (EPBs);
- consider establishing SEPA as a ministry; strengthen SEPA's supervisory capacity of EPBs in local government;
- continue efforts to make local leaders more accountable to the higher level government and to local populations for their environmental performance;
- strengthen the integrated permitting system and establish it as a more central instrument for pollution prevention and control; strengthen the integration of environmental protection in land-use planning and regulations, as well as in other relevant plans and regulations;
- extend the use of pollution charges, user charges, emissions trading and other market-based instruments and their incentive functions, taking social factors into account.

1.2 Air

During the review period, China achieved improvements in ambient air quality (e.g. lowering the concentration of SO₂ in urban areas and designated control zones) and in decoupling emissions of SO₂, NO₂ and CO₂ from economic growth. The overall emission reduction targets for SO₂, soot and dust from stationary sources set out in the 9th FYP (1996-2000) were met and surpassed; those for stationary source emissions of soot (-10%) and industrial dust (-20%) stipulated in the 10th FYP (2001-05) are also likely to have been met. The legislative and regulatory framework was updated with the tightening of some emission limits, the introduction of total emission control, and the designation of special control zones (covering 39% of the population). The rate of emission charges was trebled. A start was made with flue gas desulphurisation at large emission sources. A nationwide air quality monitoring network was put in place. Energy policy and institutions (including a renewable energy law) were strengthened, and efforts to diversify energy sources had some success. In the domestic sector, the dependence on coal was reduced from 69% to 30% during 1990-2004. Concerning transport, environment-related efforts included the adoption of fuel-efficiency standards for light-duty passenger vehicles in 2004, the adoption of the various EURO standards for vehicle emissions at set dates, and the development of bus rapid transit systems in some cities.

Despite these efforts, air quality in some Chinese cities remains among the worst in the world. About 60% of cities above county level are likely to have met the grade II ambient air quality standard by 2005. The SO₂ concentration in urban air, after dropping steadily since the early 1990s, began to climb again in 2002. Nationwide SO₂ emissions from stationary sources increased by 13% during 2000-04, and therefore are not likely to have reached the 10% reduction target of the FYP. In the special air pollution control zones, SO₂ emissions fell by 2% instead of the targeted 20%. Likewise, the proportion of cities suffering from highly acid rain (i.e. pH under 4.5) rose again to 10% in 2004, after a low of 2% in 2000. Current emission reduction targets are not sufficient to meet ambient air quality standards. To date, insufficient attention has been paid to VOCs and toxic air pollutants. Air pollution regulations and permit conditions are not well enforced. China's energy intensity per unit of GDP is about 20% higher than the OECD average and, after a decline early in the review period, began to grow again in 2001. Reducing the energy intensity of the Chinese economy is rightly seen as a top priority by national authorities, especially in light of estimates that a doubling of total primary energy supply will be needed to satisfy a quadrupled GDP by 2020 (compared to 2000). But reducing energy intensity by 20% during the 2006-10 period will be a major challenge despite the associated potential multiple benefits (e.g. reducing traditional air pollution, reducing greenhouse gas emissions, increasing energy independence and security, and improving the efficiency of the economy). China did not meet its target of washing 50% of the coal it burns and the

implementation of flue gas desulphurisation has been low to date. Although car ownership is still low, vehicle numbers doubled in the five years up to 2000, and motor vehicle traffic already represents the largest source of urban air pollution; the efficiency of urban transportation is showing a downward trend. Urban mass transit has not received sufficient emphasis and the use of bicycles has been allowed to decline. The quality of vehicle fuels is low (e.g. sulphur content).

Recommendations:

- translate the energy intensity improvement target into more ambitious energy efficiency targets in all sectors; use a mix of instruments to achieve them, including pricing policies, demand management, introduction of cleaner technologies, and energy-efficient buildings, houses and appliances;
- bolster the adoption of cleaner fuels (including cleaner coal technology, coal washing and flue gas desulphurisation) and cleaner fuels for vehicles, as well as cleaner cars;
- implement more ambitious air emission reduction targets capable of achieving ambient quality objectives already adopted; manage a wider range of air pollutants, including VOCs and toxic substances;
- further improve the quality of monitoring data needed for effective air quality management and widen their scope (e.g. sources and pollutants);
- develop and implement a national transportation strategy that recognises the environmental externalities of transport and takes an integrated approach to private and public transport; streamline the institutional framework for developing sustainable transport systems; use a mix of regulation and economic instruments (e.g. taxes) to give citizens incentives for rational transport decisions;
- strengthen mass transport in urban areas, and take measures to encourage the urban use of cleaner transport modes (e.g. bicycles).

1.3 Water

China has a comprehensive legal framework for water resource and pollution management, with clear mechanisms to control abstractions and to set water quality objectives. The 2002 Water Law opens the way for integrated river basin management, stakeholder participation and the use of market mechanisms in water management, in other words for a major reform of the water sector. Water supply and waste water treatment utilities have already undergone considerable reform: in many areas, companies providing water services have been established. Basic institutions for river basin management are in place. A range of economic instruments (user charges for water services, pollution charges for industry, abstraction charges) are used, although often with relatively low rates. Over the period of the 9th and 10th FYPs (1996-2005), total loads discharged to watercourses were reduced in some areas, representing a decoupling of pollution discharge from economic growth. Concerning floods, very large investment has been made in infrastructure to protect against flood damage, flood risks have been reduced in many areas, and communities are more informed about the risks they face. Physical planning laws are being strengthened to prevent further development on flood plains, and there has been some return of reclaimed areas to flood storage functions. In some government departments, the criteria used to assess performance are incorporating water resource use and pollution reduction targets. These are an addition to the economic growth and population control targets commonly set.

However, China's water situation is of high concern. First, many water courses, lakes and coastal waters are severely polluted as a result of agricultural, industrial and domestic discharges. The pollution has severely degraded aquatic ecosystems, is a major threat to human health, and may limit economic growth. The use of untreated water affects development especially in the poorer, more disadvantaged

regions. Large investment in water services will continue to be necessary: i) in urban areas to address the investment backlog and meet the needs of the large influx of rural migrants; ii) in rural areas, taking into account affordability issues; and iii) in the least developed areas in the form of development assistance and transfers. Secondly, China has very low water resources per capita (one quarter of the world average), and they are unevenly distributed (e.g. one tenth in northern and western areas). Among the 600 larger cities, 400 suffer from water shortages. Thirdly, with surface water polluted and scarce, demand for groundwater far exceeds the rate of replenishment in many areas in both rural and urban areas. It will be impossible to maintain the high (and inefficient) levels of urban and agricultural water consumption. The country is undertaking a major project to transfer more than 40 billion m³ a year from the southern Yangtze basin to the North China plain by 2020. However, this will still not meet the needs for economic growth and ecological recovery, without determined demand management and sustainable use by urban, industrial and agricultural users. Finally, around 70% of water withdrawal in China is for agriculture, with 40% of farmland being irrigated. Agriculture and the rural communities (that lack sewer systems) are also major sources of pollution. To make water management more sustainable, the demand for water by agriculture must be reduced and diffuse pollution must be identified and prevented.

Recommendations:

- increase investments and management efforts in urban water supply and sanitation (including in new urban development projects) to meet China's long-term objectives (concerning health and ambient water quality); increase user charges and cost recovery (of operating and investment costs); improve the operational performance of treatment plants; clearly distinguish the responsibilities of water utilities and local authorities;
- continue efforts to improve water pollution control and efficiency in water use by industry; increase the rate of pollution charges and abstraction charges; ensure that treatment plants are efficiently managed; link abstraction and discharge permits to total load planning, while maintaining minimum flows and river quality objectives;
- continue efforts to improve water pollution prevention and water efficiency in agriculture, and to establish water user associations responsible for recovering the cost of providing irrigation water; improve monitoring and collection of groundwater abstraction charges; take measures to halt overexploitation of groundwater aquifers; prevent agricultural run-off into aquifers, rivers and lakes (e.g. buffer zones along rivers and lakes, treatment of intensive livestock effluents, efficient application of agro-chemicals); phase out fertiliser subsidies;
- strengthen and further develop an integrated river basin management approach to improve water resources and water quality management, and to provide environment-related services more efficiently (e.g. flood and drought prevention, soil and water conservation, biodiversity protection, support for recreation and tourism); give greater weight to the protection of aquatic ecosystems (e.g. renaturation of rivers and lakes banks, protection of wetlands); foster stakeholder participation (e.g. representatives of economic sectors, environmental NGOs, experts, administration);
- further encourage sustainable water use through: i) institutional integration of water quality concerns and of water investments (e.g. at national and other relevant levels of government); ii) market-based integration with further progress in the transition towards full cost pricing of water services, while giving attention to the special needs of the poor and of the West; and iii) clarifying and securing the rights to extract, allocate and use water, in the context of water legislation and land tenure reform;
- pursue efforts to provide the rural population with safe water supply and sanitation to meet domestic objectives and international commitments (e.g. Millennium Declaration and WSSD); continue to install meters and collect user charges, taking account of social factor.

1.4 Waste

During the review period, China significantly decoupled the generation of municipal and, to a lesser extent, industrial waste from economic growth. Concerning industrial solid waste, the country met and surpassed the targets set out in the 9th and 10th FYPs with respect to recovery, reuse of waste material and safe disposal in landfills. China also stepped up its efforts to put in place an adequate legal framework for modern waste management by adopting a cleaner production law in 2003 and updating its 1995 waste law in 2004. A series of more specific regulations and standards for various types of waste, such as medical waste, were adopted. A national programme (“Construction Programme of Hazardous Waste and Medical Waste Disposal Facilities”) was put in place in 2003 to significantly increase capacity for treating hazardous and medical waste, and good progress was made consequently with the treatment of medical waste. Considerable amounts of materials are recycled through informal activities (e.g. by freelancers). The opening of the market to foreign waste management technology is a positive signal for further improvement. Chinese authorities wish to curb the generation of all types of waste by fostering a high quality, low material intensity economic growth model. Indeed, given the rapid growth of its economy and of its imports, China’s drive to reduce its material intensity parallels the drive to reduce its energy intensity. The concepts of the “3Rs” (reduce, reuse, recycle) and of the “circular economy” are part of the 11th FYP.

Nevertheless, the amounts of municipal waste, industrial waste and hazardous waste far exceed what can safely be treated and disposed of. Some of those waste are stored waiting for treatment (e.g. close to 50% of municipal waste) or are dumped in an uncontrolled fashion. Human health and the environment are put at risk through a proliferation of uncontrolled dumps surrounding the cities. The 10th FYP target of increasing the capacity of municipal landfills to 150 kt/day was not achieved. Total waste generation increased by as much as 80% during the review period. Waste management is still the “poor cousin”, compared to air and water management, in its share of national government funding of investments. Local bodies have trouble collecting waste charges, which remain too low to cover the operational cost of waste management. Overall, the emphasis remains too heavily on landfilling (the destination of 44% of municipal waste), and few local governments implement separate collection and recycling. Incineration and composting account only for 3% and 5%, respectively of municipal waste treatment. Responsibility for waste management is fragmented across too many agencies. Enforcement is inadequate and does not distinguish sufficiently between large industries and small and medium-sized enterprises.

Recommendations:

- foster the move towards a circular economy by focusing on waste reduction, reuse of waste material and waste recycling, and related targets; require provincial and local governments to adopt and implement comprehensive waste management plans (including accurate verification of volumes of waste – municipal, industrial and hazardous – generated and treated) covering elements of the waste hierarchy;
- accelerate the pace of extending waste treatment capacity by building treatment infrastructure and establishing systems for the collection, reuse and recycling of waste (e.g. separate collection of household waste), including in rural areas;
- formulate enforcement plans for different sectors (e.g. households, large industry, small and medium-sized enterprises) and types of waste;
- streamline the allocation of responsibility for the management of different types of waste; ensure that waste facilities operate efficiently and comply with standards; further develop workable regulations and policy instruments for waste management; improve the collection of waste data and develop tools to evaluate the effectiveness of waste management policies at national and provincial levels;
- establish financing mechanisms with a mix of public and private financing, and move to charging for waste services more progressively in less developed areas; improve the collection rate of waste charges and set them at a level consistent with the government’s aim to achieve a circular economy;
- provide the informal sector (freelancers) with equipment, organisational assistance and training to continue collection and recycling under improved hygienic and environmental conditions, as part of waste management plans;
- raise awareness of waste management and efficient resource use among the public, small and medium-sized enterprises, and industry.

1.5 *Nature*

China has established a comprehensive legal framework for managing nature and biodiversity, which includes wildlife and marine protection as well as terrestrial and marine protected areas. China actively reports on its international commitments and also publishes annual state of the environment reports related to its internal goals and targets. Protected areas at the national, provincial, prefecture and county levels have been dramatically increased over the review period, and China has received international recognition for its wetlands, biosphere reserves, and natural and cultural heritage preservation programmes. Outside of protected areas, ecological considerations have led to afforestation of large areas. New forestry initiatives have been taken to further develop shelter forests in arid, mountainous and coastal areas, to streamline forest management (e.g. more stringent harvest quotas) and to promote farm forestry on land sensitive to soil erosion (e.g. grain for green policy). Various environmental protection programmes within the country have begun to recognise the value of environmental outreach (alien species, endangered wildlife). China has been proactive in developing bilateral and regional co-operation in the area of nature conservation. There has been a regular increase in the number of world heritage sites and Ramsar wetlands.

However, there is a need for more institutional co-ordination and integration of efforts to assess and protect nature and biodiversity inside and outside of protected areas, given the number of agencies and stakeholders involved. There is insufficient monitoring to assess trends and evaluate the protection status of nature reserves. The main targets for species and habitat protection are in terms of percentage of land area. There is a need to ensure that the key natural habitat types and ecosystems are adequately protected and that they support species recovery plans. Although China has a relatively high percentage of total area classified as protected, marine habitats and species are not sufficiently represented and are subject to land-based sources of pollution and habitat alteration, in addition to exploitation pressures. Management level of

reserves needs to be improved and attention should be paid to integrated habitats protection to minimise fragmentation and to enhance habitats continuity through biodiversity corridors. There is a need to integrate nature protection concerns into development plans especially in impoverished central and western regions with abundant biodiversity. Little has been done to promote biodiversity protection on forestland and to tailor payments to forest owners to the provision of forest ecosystem services. China has not yet ratified the Bonn Convention on migratory species, although it is active in regional co-operation on migratory waterbirds.

Recommendations:

- modernise and implement legislation on nature protection, in particular adopt a law on the protection and management of Nature Reserves, notably favouring an increase of marine protected areas and of protected areas with higher protection status; consider ratification of the Bonn Convention;
- enhance the capacity of national, provincial, prefecture and county level agencies to manage biodiversity protection of existing reserves and integrate nature conservation within economic and social development projects outside protected areas;
- increase the financial and human resources for nature and biodiversity protection and further involve local residents in patrolling, monitoring and habitat enhancement, in the context of poverty alleviation; diversify the sources of financing of nature conservation;
- develop the use of economic instruments related to nature and biodiversity protection, not only as income supporting measures, but to reward the provision of environmental services;
- integrate long-term plans for rehabilitating and maintaining species and protected areas (including managing alien species) with land-use and river basin management plans, and any subordinate provincial, prefecture and county plans;
- integrate the economic and social values of protecting habitats and species (e.g. ecological services, tourism development) within development decision-making, in particular as part of EIAs;
- promote sustainable forest management through issuance of forest management plans, certification of foresting practices, and labelling of forest products in China; expand co-operation with supplying countries in the forestry sector, to ensure that imported wood and wood products are sourced from forests that are managed on a sound, sustainable basis.

2. Towards “Harmonious Society” and Environmentally Sustainable Development

2.1 *Integration of environmental concerns in economic decisions*

China’s two digit average economic growth was accompanied by some decoupling of pollution from economic growth in the period 1990-2005. This was the case, in particular, for SO₂ and recently NO_x emissions. Energy intensity has improved by about a half since 1990, though the decrease has levelled off. Water withdrawal and municipal waste have also been significantly decoupled from the economic growth. Successive Five-Year Plans for National Economic and Social Development (FYPs) have provided an important means for identifying and addressing priority environmental problems: they are underpinned by solid analysis, they establish quantitative targets, and they frame investment programming and budgeting. The Chinese leadership has announced its intention to place environmental protection in a more strategic position. In this perspective, the 11th FYP advocates a new economic model in which growth is guided by resource conservation rather than by continued expansion of resource use. Improved energy intensity and the concept of the “circular economy” are recognised as key to help reduce the pollution and resources intensity of the Chinese economy. Various measures have been taken to better integrate environmental and economic decision-making: provision has been made in the 2003 EIA law to assess the potential

environmental impacts of sectoral programmes. Some energy prices have been deregulated (e.g. some coal prices). The use of environment-related taxes has expanded, but accounts only for about 3% of total tax revenues.

However, the pollution, energy and material intensities of the Chinese economy remain high, as well as its water use intensity, and pollution remains very serious in many locations. China generates more pollution and consumes more resources per unit of GDP than OECD averages. There is a high rate of environmentally significant accidents, and resource degradation is constraining economic development. Health costs and ecological damages of present development are high. The target of quadrupling GDP between 2000 and 2020 requires commensurate strengthening of environmental management and finance, so that economic growth is environmentally sustainable. It is not sure that present policies, although going in the right direction, are sufficiently ambitious to meet the strategic environmental objectives identified by Chinese leaders. The under-pricing of energy, water and other resources needs to be addressed. More effective arrangements at the level of the State Council are needed to better integrate environment into economic and sectoral decision-making, including a strengthened role for SEPA.

Recommendations:

- review price levels for energy, water and other natural resources so as to better reflect their scarcity value and internalise externalities; consider mechanisms to compensate or mitigate their impact on poorer sections of the population and regions that would be adversely affected by such price increases;
- consider establishing an inter-ministerial group to examine how environment-related taxes might be restructured to help better achieve environmental policy objectives;
- increase and diversify the sources of environmental finance by fuller implementation of the polluter pays and user pays principles, and increase the effectiveness and efficiency of allocating public environmental expenditure;
- strengthen the institutional mechanisms for better integrating environment into economic and sectoral policies, possibly by establishing a Leading Group on environment or on sustainable development; fully implement the provisions in the EIAs law for assessing the potential environmental impacts of sectoral programmes;
- continue to establish national targets to achieve key environmental objectives, taking into account scientific, economic and social analysis.

2.2 *Integration of environmental and social decisions*

China's economic growth has helped raise living standards and has contributed to significantly reduce poverty. In recent years, government policies have emphasised economic growth with due attention to social and environmental concerns: environmental issues associated with rapid urbanisation and development of coastal regions, with poverty, and with development challenges in less-advanced western parts of the country are being addressed. Considerable progress has been made since the mid-1990s in the development of environmental information, access to this information, and participation on environmental issues. China produces each year comprehensive environmental statistics and environmental reports. The media and the rise of committed and outspoken environmental NGOs reinforce the demand for environmental progress. Progress can also be seen in environmental education and awareness-raising through primary education.

However, the rapid economic growth has led to very wide and increasing disparities between the rich and the poor, urban and rural communities, and coastal and inland provinces. While some aspects of the urban environment have improved in China's mega and large cities, additional demands for environmental services (e.g. water supply, water sanitation, solid waste management) are resulting from the large population migration from western and central China to coastal China. At the same time, the needs for environmental services of the expanding towns and townships and of the rural poor, particularly in the central and western regions, are also growing. To reduce industry relocation and environment-related distortions to competitiveness and trade within China, national environmental standards (i.e. product, emission and quality standards) should be implemented by all provinces effectively and efficiently, minimising transition periods when transitions are necessary. Concerning health, pollution is contributing to an increase in respiratory diseases, cancer and birth defects. Environmental and health information should be strengthened to support priority setting and to generate related economic and health benefits. Concerning environmental information, improvements could be made with respect to indicators of environmental performance, environment-related economic information, environmental and material flows accounts, the coverage of environmental information, and monitoring. Environmental education should be further strengthened (e.g. at university level) and expanded, particularly for young people. Environmental awareness should be increased in Chinese enterprises.

Recommendations:

- further improve health and living standards, particularly in less developed areas, by reducing the share of people without access to sound environmental services (safe water, basic sanitation, electricity); taking account of affordability constraints, give higher priority to water infrastructure in development strategies (e.g. for the poorer central and western China);
- consolidate and strengthen information on health and the environment and develop a national health-environment plan of action; implement the most cost-effective measures; promote pollution release and transfer reporting by enterprises; build capacity to report on exposures of specific population groups to environmental health risks (e.g. occupational health, health impacts near polluting facilities, children's health);
- continue to improve environmental information by developing and using indicators of environmental performance, environment-related economic information and analysis, and environmental accounting tools such as material flows accounts; expand the coverage of environmental information (e.g. to diffuse pollution, toxic substances, hazardous waste); continue to improve consumer protection and public access to environmental information;
- further expand environmental education and awareness, particularly among young people;
- continue efforts to work with NGOs and the public to achieve environmental policy goals; strengthen co-operation and partnerships with enterprises and corporate social responsibility.

3. International Co-operation

The last decade has seen a dramatic increase in China's engagement with other countries in addressing environmental challenges. This reflects a growing recognition across the spectrum of Chinese institutions of the important economic, social and ecological stakes that China has in meeting these challenges, and also of its shared interests with the international community. China is now an active, constructive participant in a broad array of regional and global environmental conventions, institutions and programmes, and is drawing heavily on international financial institutions and special mechanisms (e.g. the Montreal Protocol's Multilateral Fund) to augment its own resources and ensure that China's international commitments are met. Since 1995, It has reduced its production and consumption of ozone-depleting substances more than any other country; established comprehensive and ambitious policies and legal regimes in the areas of marine pollution and fisheries management; provided international leadership in efforts to control transboundary movement of hazardous waste; recognised and taken initial steps to

confront its emissions of greenhouse gases; and undertaken a detailed examination of how its trade and investment policies can work to support environmental management goals.

China, however, remains the second largest contributor of greenhouse gases, and is still the world's largest producer and consumer of ozone-depleting substances. Its largely coal-fired economy is a major source of acid rain and other transboundary air pollutants in Northeast Asia, and is a significant contributor to global-scale air pollution, including mercury. Its coastal waters and regional seas are suffering from an increasing burden of land-based pollution in many areas; and the environmental management and food-sanitation regimes for China's rapidly expanding marine aquaculture industry need strengthening. A lack of strong monitoring, inspection and enforcement capabilities and associated penalties are limiting the effectiveness of otherwise sound policies, laws and regulations established to further China's domestic objectives and international commitments in the areas of marine fisheries, coastal water quality, hazardous waste transport, and the control of illegal trade in endangered species, forest products and ozone-depleting chemicals. Stronger efforts are needed by the government to ensure that Chinese corporations operating overseas, particularly in such environmentally-sensitive industries as forest products and mining, are positive contributors to China's stated goal of building an international reputation for sound environmental management and sustainable development. Funding limitations and inadequate institutional co-ordination are constraining the pace at which China is able to carry out an ambitious international environmental agenda that includes a range of difficult challenges (e.g. desertification control, greenhouse gas reduction, marine management). To achieve success, increased financial efforts from China as well as major technical support and targeted financial assistance to China from OECD countries and international financial institutions will be required.

Recommendations:

- continue China's active engagement in international environmental co-operation, seeking to improve the effective and efficient use of i) domestic resources, and ii) international support mechanisms (e.g. the World Bank's Clean Development Fund, the Multilateral Fund under the Montreal Protocol, and the Global Environment Facility);
- strengthen monitoring, inspection and enforcement capabilities in support of the implementation of international commitments (e.g. on trade in endangered species, in forest products, in hazardous waste and in ozone-depleting substances, as well as on sound chemicals management, ocean dumping and fisheries management);
- improve governmental oversight and environmental performance in the overseas operations of Chinese corporations (such as the OECD guidelines for multinational enterprises);
- develop partnerships with foreign enterprises to contribute to environmental progress through provision of training, technical support and cleaner technology; ensure environmental requirements are not relaxed to attract foreign direct investments;
- continue to assign high priority to domestic and regional anti-desertification efforts;
- intensify domestic and international co-operation to reduce transboundary air pollution in Northeast Asia by, inter alia, introducing cleaner coal technology, improving energy efficiency and fuel switching;
- ensure that the interim and final targets for the phase-out of ozone-depleting substances under the Montreal Protocol continue to be achieved on schedule;
- prepare a coherent national plan on climate change which draws together the array of climate-related activities currently underway and planned to improve their collective efficiency and impact;
- strengthen efforts to protect and improve water quality in coastal waters and adjacent regional seas from land-based pollution sources, and upgrade environmental management regulations and government oversight in the aquaculture industry;
- integrate environmental considerations systematically into China's growing development co-operation programme.