



ENVIRONMENTAL
PERFORMANCE REVIEWS

JAPAN

Conclusions and Recommendations

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CONCLUSIONS AND RECOMMENDATIONS*

Population and economic activities are extremely concentrated in dense metropolitan areas and along coastal plains in Japan, while two-thirds of the archipelago is mountainous and covered with forests. In the 1990s, economic growth in Japan was considerably slower than in the 1980s, with contraction of the economy for parts of the period. Agricultural and industrial production decreased. Final energy consumption and the energy intensity of the economy (energy use per unit of GDP) increased substantially, as did total road traffic. The Japanese economy is very dependent on imports of natural resources, such as energy, food and other raw materials.

The most important pressures on Japan's environment today originate from transport, agriculture, industry and, particularly, the growth of energy demand and private final consumption. Priority environmental issues include urban air pollution (NO_x, suspended particulate matter, toxics), waste management, water eutrophication, nature conservation, climate change, chemicals management and international co-operation for environmental conservation. The Ministry of the Environment was established in 2001, 30 years after the Japan Environment Agency (which it replaced), with extended or strengthened environmental responsibilities such as waste management, international environmental co-operation.

This report examines progress made by Japan since the previous OECD environmental performance review (EPR) in 1994, and the extent to which Japan's domestic objectives and international commitments are being met. Below, some 60 recommendations are put forward that could help strengthen the country's environmental performance in a context of sustainable development. It is necessary for Japan to: i) increase the efficiency of its environmental policies; ii) integrate environmental concerns into economic and social decisions; and iii) reinforce its international environmental co-operation.

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

1. Environmental Management

1.1 *Implementing more efficient environmental policies*

In the 1990s, Japan's environmental legislation was further developed. Overall, the mix of instruments used to implement environmental policy is highly effective. Regulations are strict, well enforced and based on strong monitoring capacities. Significant progress has been made in tackling non-conventional air pollutants (e.g. dioxins, benzene), and waste management can be expected to improve further with the recent overhaul of the relevant legislative framework. Strict standard setting and financial support for research and development on new environmental technologies and treatment methods have had a positive technology-forcing effect, which has helped assure timely implementation of stringent regulations. The present system also has some cost-effectiveness advantages: nationwide emission or discharge limits are made more stringent at regional and/or local level when needed, often through agreements negotiated by prefectures and municipalities with industry. Environmental impact assessment (EIA) is systematically applied to major projects, and consultation of the public and of regional and local authorities has improved. Japanese industry has been proactive in establishing environmental management and reporting systems, and several branches have taken initiatives to reduce their environmental “footprint”.

Nevertheless, important gains in cost-effectiveness could be achieved through wider use of economic instruments. In particular, such instruments could help in: i) internalising externalities and generating economic signals that influence producer and consumer choices; and, ii) alleviating national and local government budget deficits. User and pollution charges and environmental taxes are not sufficiently used to internalise environmental costs. Financial assistance programmes are widely used to implement environmental policy, and their cost-effectiveness is not systematically evaluated. Application of the polluter pays and user pays principles is still incomplete, particularly concerning wastewater and waste services. Japan has made encouraging progress with user charges to cover the cost of wastewater services, but for household waste services, there is still a long way to go to achieve full cost recovery. With the exception of agricultural land contamination, management of soil contamination lacks a legal framework and liability is often unclear. In making policy decisions, greater consideration should be given to economic analysis of the options. There is still a need to improve consideration of mitigating measures and alternative options during the EIA process, giving a greater role to the public and NGOs. Voluntary agreements in the industrial sector should be rendered more transparent, with built-in monitoring mechanisms, and quantitative targets.

It is recommended to:

- strengthen and extend the use of economic instruments (e.g. taxes and charges) to implement environmental policy in more environmentally effective and economically efficient ways and to progress towards sustainable production and consumption;
- continue to assure appropriate enforcement of regulatory measures;
- ensure that voluntary agreements become more transparent, effective and efficient;
- extend environmental legislation and policy attention to cover all types of contaminated sites;
- review financial assistance programmes used to implement environmental policy, assessing their environmental and economic effectiveness and their compatibility with the polluter pays principle (as proposed in the 1994 EPR);
- increase economic analysis of environmental policy measures, with the aim of achieving environmental objectives more cost-effectively.

1.2 Air

In the 1990s, urban air quality continued to improve in Japan. The very strong decoupling of emissions of conventional air pollutants from GDP already achieved (-82% for SO_x and -22% for NO_x while GDP rose by 140% over the 1970s and 1980s) was further reinforced in the 1990s (-5% for SO_x, NMVOCs and CO, while GDP rose by 13%). Japan's emission intensities for SO_x and NO_x (kg/unit GDP) are below the OECD average by 85% and 71%, respectively. Among OECD countries, Japan has the third lowest emission intensity for SO_x and the lowest for NO_x. Air pollution from lead has not been an issue for years. Japan has been in the vanguard among OECD countries on regulating toxic chemicals. Significant emission reductions have been achieved for a range of substances (-60% for total dioxin emissions, -45% for benzene, -43% for trichloroethylene and -50% for tetrachloroethylene from 1995 to 1999) by major emitting companies. Motor vehicle emission and fuel quality standards have been further strengthened and are now the strictest in the world (e.g. sulphur in diesel, under 0.05%; benzene in gasoline, under 1%). Automobile fuel efficiency has increased, although the gain has so far been offset by an increase in the volume of traffic. The 1992 law on automobile NO_x emissions requires special measures for sensitive metropolitan areas, and it was amended in 2001 to cover particulate emissions from diesel automobiles. The number of in-use low-emission vehicles (LEVs) increased significantly and now totals 2 400 electric vehicles, 5 300 natural gas vehicles, 200 methanol vehicles and 37 700 hybrid vehicles, though LEVs still account for a very small share of the total fleet.

Japan still faces the challenge of decoupling the use of road transport from GDP growth for both passenger and freight transport. Growth in demand for transport outstripped GDP growth in the 1990s, and demand management measures remain weak. This is Japan's Achilles heel when it comes to urban air quality and CO₂ emissions. The ambitious targets set for areas designated under the automobile NO_x law will be very difficult to meet. No substantial measures have been introduced so far to reduce NMVOC emissions, particularly from large stationary sources. Levels of fine particulate air pollution are an increasing cause of concern in large metropolitan areas. Cost-effectiveness should have received greater emphasis in integrating air quality management and transport decisions (such as the decision to earmark taxes for road building). There is very little use of economic instruments to reduce air emissions.

It is recommended to:

- continue efforts to reduce NO_x and NMVOC emissions, in light of the persistent NO₂ and photochemical oxidant issue in metropolitan areas;
- further develop and implement comprehensive policies to control fine particulate emissions from both mobile and stationary sources and to meet environmental quality standards;
- continue efforts to reduce emissions of toxic chemicals, ensuring in particular that voluntary agreements are efficient and effective;
- use cost-benefit analysis more systematically in integrating major air management and transport decisions, including those for road investment;
- strengthen the management of motor vehicle traffic through a comprehensive package of policies including traffic demand management measures (e.g. land use planning, economic instruments, information technology) and measures promoting the use of more fuel efficient vehicles and of less polluting transport modes.

1.3 Water

Japan continued to make strong efforts in the 1990s to achieve its water management objectives. It also made progress in following up on several recommendations of the 1994 EPR. Human health-related water quality standards for 26 chemical groups are largely respected in freshwater and marine water bodies. Compliance with water quality standards related to the living environment in rivers has continued to improve gradually; it reached 81.5% for BOD in 1999. From 1991 to 1999, the percentage of the population covered by a treatment system of some sort increased from about 50% to 69%. Local stakeholder groups can now be actively involved in the implementation of flood control and river management projects. River control practices have begun to take account of the needs of aquatic species and the growing demand by citizens for river-based amenities. Industry has increased its use of recycled water to as much as 77% of its total water use. The management of groundwater resources has been strengthened. A start has been made towards adapting the management framework to emerging demands and towards better integrating the roles of the various authorities having responsibility for water management.

Such successes notwithstanding, Japan continues to face pressing water management challenges. It has not wholly met the objectives of its sewerage construction programme and remains well behind those OECD countries that are the most advanced in terms of municipal waste water treatment; at the current rate of progress it may be another 15 years before it catches up. The costs of sewerage and wastewater treatment services are not yet fully covered through user charges (cost recovery is 57% nationwide). The water quality status of lakes and enclosed coastal waters has shown no significant improvement for a considerable period. Eutrophication persists as one of the country's most serious water quality problems, and the frequency of red and blue "tides" has not diminished noticeably. Japan has been slow to respond to the need to reduce nutrient loads to receiving waters, particularly in terms of diffuse sources such as agriculture. Wet weather overflows from combined sewer systems cause severe pollution problems. Also, ecosystem aspects of water management are not yet given sufficient weight. The presence of hazardous chemicals (e.g. trichloroethylene) in aquifers poses problems for drinking water supply utilities, and nitrogen-related standards in groundwater are exceeded in 5% of observations. Japanese water legislation needs a more integrated approach. In particular, Japan needs to integrate quantity and quality management better and to move further towards an approach based on entire river basins.

It is recommended to:

- consolidate the body of water-related laws into coherent legislation integrating quantity and quality management and taking a whole river basin approach;
- take additional measures to expedite implementation of sewerage construction programmes (e.g. expanding advanced treatment infrastructure, improving combined sewer overflows); further increase the application of the polluter pays and user pays principles; consider a possible role for public-private partnerships towards this end;
- strengthen implementation of nutrient reduction measures for lakes, bays and inland seas, in particular regarding diffuse sources such as agriculture;
- strengthen the control of substances hazardous to human health and ecosystems, through cleaner production, effluent control, pesticide regulation and groundwater protection;
- streamline the water quality classification system and include ecological water quality criteria;
- continue to actively pursue the restoration of river habitats to near-natural state and extend stakeholder participation in river management to more river basins.

1.4 Waste

Japan is in a very challenging situation concerning waste management. The shortage of landfill capacity due to the very high population density has led to reliance on incineration as the main way to eliminate waste (e.g. 78% of municipal waste, by weight). But public concern over dioxin emissions makes it increasingly difficult to build incineration facilities. Furthermore, the scarcity of natural resources renders Japan very dependent on imported materials. Hence Japan is making a major ongoing policy and societal effort to promote a recycling-based society, fully utilising materials by reducing waste generation and increasing waste recovery. In the 1990s, Japan stabilised its waste generation rates (for both total industrial waste and municipal waste) and decoupled them from GDP growth. The 2000 Basic Law for Establishing a Recycling-Based Society, and related recycling regulations (e.g. for containers and packaging, household appliances, construction and demolition waste, and food waste) have strengthened the regulatory framework for waste management. The principle of extended producer responsibility has been incorporated into national legislation on containers and packaging and on some appliances. Recycling ratios for certain streams of municipal waste further increased in the 1990s. Voluntary initiatives by business have helped reduce generation and landfilling of industrial waste.

However, only 6% of the total cost of municipal waste services is recovered through waste charges nationwide: the use of waste management charges should be extended and increased. Also, municipalities are not yet obliged to join the recycling programme under the packaging and containers law, and quantitative targets are lacking. The current “pay at disposal” scheme for electrical appliances may not be very effective. Voluntary actions by industry should be monitored systematically and effectively. Cases of dumping of industrial waste increased in the 1990s. There is a need to expand capacity for treatment and disposal of industrial waste. Japan must also address its final-disposal needs, as it has very little landfill capacity left.

It is recommended to:

- implement the Basic Law on Establishing a Recycling-Based Society and related recycling regulations, develop quantitative targets, monitor the effectiveness and efficiency of their implementation, and broaden the application of extended producer responsibility (e.g. to automobile producers);
- expand the use of economic instruments for waste management, especially user charges for cost recovery in municipal waste services;
- develop more efficient municipal waste management services and companies, increasing the setting up of intermunicipal treatment and disposal facilities;
- improve the accountability of industry concerning voluntary initiatives on waste reduction and recovery;
- increase capacity for treatment and disposal of industrial waste, with appropriate public access to information and participation.

1.5 *Nature and biodiversity*

Japan has established very comprehensive and regularly updated national inventories (making up the “Green Census”) of nature and biodiversity, with broad support from researchers, experts, and volunteers. The inventories cover topography, geology, distribution of fauna and flora, conditions of ecosystems (including rivers, lakes and coastal habitats) and landscape amenities. Results of the fifth Green Census were treated, analysed and prepared for dissemination by a newly established Biodiversity Centre (1998). Of Japan’s total land area, almost 25% is designated for some form of protection. A national strategy on biological diversity was approved in 1995 and is now under review. Administrative capacities for nature conservation have been improved at national and local levels. Progress has been made in integrating nature conservation and rural amenity considerations into agriculture and forestry policies. In some areas, a river basin approach has been used to promote synergies between nature conservation, habitat rehabilitation, water management, forest management and local development initiatives involving a wide range of public and private actors and citizens.

However, many animal and plant species are threatened by extinction (over 20% of mammal, amphibian, fish, reptile and vascular plant species), with little improvement in the 1990s. Exotic species have affected some ecosystems. Effective and efficient management of protected area is hampered by the multitude of separate legal bases and responsibilities. Less than 3% of the protected areas is explicitly devoted to nature conservation. Enforcement and management capacities are weak, in particular in natural parks facing increasing pressures from visitors and development. The national biodiversity strategy lacks quantified targets and does not adequately address the management of biodiversity outside protected areas (e.g. marine, coastal areas). Despite inspections at customs checkpoints, the illegal entry of products from threatened and endangered species continues. Integrating nature and biodiversity concerns in spatial planning and urban development, as well as in mainstream farming, forestry and fishery policies, is progressing slowly. Economic instruments should be used to provide incentives for compliance with nature conservation regulations and plans, or to provide funds for managing amenities and delivering services beyond legal requirements. Green open space in urban agglomerations is limited and under high pressure.

It is recommended to:

- strengthen measures to prevent the decrease, fragmentation and degradation of habitats in protected areas and extend such areas and their interconnection within a national nature network;
- intensify efforts to integrate nature and biodiversity concerns in agriculture, forestry, fishery and spatial planning policies (e.g. by gradually phasing out environmentally harmful subsidies, making support conditional on compliance with environmental and nature conservation standards, or rewarding efforts to improve biodiversity and amenities);
- review and revise the national biodiversity strategy;
- further strengthen the financial means, human resources and institutional capacities for management of protected areas; explore options for establishing financial mechanisms (e.g. a compensation fund for nature, financed by charges on land conversion and habitat interference);
- continue to promote re-naturalisation projects to rehabilitate degraded ecosystems and to return to nature unused agricultural or industrial land and reclaimed wetlands;
- accelerate progress in preserving and creating urban or peri-urban open green space and in revitalising river banks, with appropriate public participation.

2. Towards Sustainable Development

2.1 *Integrating environmental concerns in economic decisions*

Japan has achieved major decoupling of environmental deterioration from economic growth during the two last decades in terms of SO_x, NO_x, fertilisers and pesticides. Water withdrawal and municipal and industrial waste generation are no longer growing. With the First and Second Basic Environment Plans, Japan established the necessary platform for integrating environmental concerns in sectoral planning; the Central Environment Council reviews progress reports from the various ministries implementing the plans. Environmental concerns are also part of the annual national budgeting process. A comprehensive Greening of Government programme implemented in the late 1990s has reduced the environmental footprint of the public sector. Based on the law on the procurement of eco-friendly goods (2000), a new programme for greening of government was launched in April 2001. Integration of environmental concerns and fiscal policies has begun with the ongoing greening of the automobile tax and automobile acquisition tax. Coal subsidies are decreasing and are scheduled to be phased out entirely in 2002.

Despite quite advanced and sometimes exemplary policies, the decoupling achieved in the 1990s has not been sufficient in some areas. For instance, CO₂ emissions continue to grow at about the same rate as GDP. A number of pollution trends are still on the increase in absolute terms, most notably those related to traffic and energy use. Remaining waste disposal capacity is reaching a critical point. Physical planning is not well co-ordinated with environmental planning. Strategic environmental assessment is not yet systematically applied to environmentally relevant sectoral policies, plans and programmes. Concerning market-based integration, little use is made of economic instruments such as fees, charges, taxes, tradable permits or deposit-refund schemes. Most environment-related taxes are earmarked for road construction and maintenance. The granting of financial assistance to producers and consumers in several sectors may go against both environmental effectiveness and economic efficiency objectives; sectoral subsidies should be systematically reviewed for their environmental implications.

It is recommended to:

- better integrate environmental concerns in physical planning, transport, agriculture, energy and urban policies;
- ensure that co-ordinated and integrated sectoral plans, associated with the Second Basic Environment Plan, are developed through close co-operation among the ministries concerned, and assure accountability for implementation of the plans;
- take the necessary steps to systematically carry out strategic environmental assessment during the development of environmentally relevant policies, plans, and programmes;
- strengthen efforts to buy and use "greener goods" (e.g. via green procurement policies and the green consumer movement) so as to promote more sustainable production and consumption patterns;
- continue to restructure environment-related taxes in a more environmentally friendly way;
- review and further develop the system of road fuel and motor vehicle taxes, with a view to promoting more sustainable modes of transport, to internalising environmental costs, while paying attention to the demand for transport infrastructure and to introducing more flexibility in the allocation of the revenue;
- continue to reduce sectoral subsidies that have negative environmental implications.

2.2 *Integrating environmental and social concerns*

Japan has high-quality environmental information: white papers on the quality of the environment have been presented to the Diet and published annually for more than 30 years. Air and water quality monitoring is highly developed; the regular national surveys of the natural environment that comprise the Green Census provide comprehensive information on nature and biodiversity. A system for integrated environmental and economic accounting has been established and Japan has advanced material flow accounts. Public access to environment-related information is improving; a law on disclosure of information held by public bodies came into force in 2001, and a law on a pollutant release and transfer register (PRTR) was promulgated in 1999. Provisions for stakeholder participation in project evaluation were strengthened in the 1997 law on environmental impact assessment (EIA). Steps towards more integrated, participatory approaches to planning, implementing and evaluating environmentally relevant projects and policies have been initiated, in particular in the context of river basin management. The Second Basic Environment Plan has broadened the scope of environmental policy from production-related pollution control to consumption-driven pollution control and natural resource management, with emphasis on options for mobilising societal forces through participatory and partnership approaches. Campaigns have been launched to encourage environmentally responsible consumption patterns and behaviour (a “recycling-based society”). Environment-related jobs represent about 1.2% of total employment and their number is expected to grow. Environmental management and sustainable development are increasingly considered part of local economic development.

However, environmental education and, in particular, training (e.g. for teachers) should be intensified. Participatory approaches to governance should be better rooted in public administration and civil society. While victims of environmental contamination are well organised, environmental NGOs are still weak in terms of membership, staff and resources. They often focus on individual local subjects, and have limited representation on advisory councils and committees at national and prefectural levels. They have no established legal basis for standing in court for the common good. Local initiatives for sustainable development (Local Agenda 21) are sporadic and would benefit from a national network for co-operation. Environmental implications of major socio-cultural changes (e.g. in lifestyle, work and leisure time, ageing, settlement patterns and mobility) should be further explored. Little information is available on the positive or negative employment impacts of environmental policies.

It is recommended to:

- further develop environmental data, indicators and information as tools facilitating decision making and communication, and review the potential for grouping related institutional capacities together;
- improve public access to environmental information held by the environmental administration, sectoral ministries and the private sector;
- review distributional implications of proposed market-based instruments for environmental management and sustainable development;
- promote the development of environmental NGOs and assure their representation on advisory councils and committees dealing with issues relevant to sustainable development at national and prefectural levels;
- promote environmental education at all levels and forms of education, including training for teachers;
- assess the impact of changes in technology and lifestyle (e.g. the impact of information/communications technology, increased recreation time, retirement) on environment and nature, taking into account related changes in patterns of settlement, transport, production and consumption.

2.3 Chemicals

Japan is an important producer, user and exporter of chemicals, accounting for 12% of world output value in the chemical industry (10% of total Japanese manufacturing value) and with higher demand per capita than any other OECD country. In the 1990s, Japan continued to implement regulations on the introduction of new chemicals to the market and registration of new pesticides. In recent years, Japan has also adopted laws on a PRTR, dioxins and PCBs, and strengthened measures to reduce emissions/discharges of hazardous chemicals. As an example of the results, dioxin emissions from a range of industrial sectors were reduced by 60-65% from 1997 to 1999. Voluntary initiatives by industry concerning air emissions of 12 hazardous chemicals have led to substantial reductions. Safe disposal of PCBs has been put back on track with the development of related legislation and technologies. Japan has begun to address the issue of suspected endocrine disrupters, and has continued to be very active in international programmes concerning chemical management, including that of the OECD (e.g. safety investigation of high production volume chemicals). Environmental monitoring of hazardous chemicals is systematic and thorough.

Progress is still required in several areas. Protection of ecosystems is not generally included alongside health in the objectives of Japanese chemical management policy. Quantitative targets for the reduction of releases of hazardous chemicals have not yet been set, except for dioxins and a few other substances. Japan's efforts towards harmonisation of test procedures (required before the introduction of new chemicals to the market) with those of other OECD countries should be actively continued. Risk assessment has been completed only for a few hazardous chemicals so far. Risk information to consumers concerning hazardous chemicals in products is insufficient. Data on production and consumption of chemicals are not systematically used to assess health risks, nor made public for better risk communication. The great majority of existing chemicals have yet to undergo safety assessment. A code of practice for pesticide application has been in place, and has been promoted through educational programmes for farmers, for many years. It is important to secure the implementation of the code. Following efforts made (e.g. inventory, development of disposal technologies), the environmentally sound disposal of obsolete persistent pesticides should be promoted.

It is recommended to:

- further improve the effectiveness and efficiency of chemical management and further extend the scope of regulation to include ecosystem protection;
- strengthen voluntary initiatives in the chemicals industry and grant a more active role to chemical producers in safety investigations (e.g. of existing chemicals);
- introduce measures to encourage manufacturers to reduce the environmental and health risks posed by chemicals used in consumer products, at all stages of the products' life cycle;
- continue to instruct farmers about and monitor their compliance with regulations and guidelines concerning the application of pesticides;
- continue to develop publicly accessible databases on chemicals (e.g. on toxicity, risk assessment, emissions at all stages of the life cycle) and strengthen risk communication concerning hazardous chemicals;
- continue to co-operate with other OECD countries (e.g. on harmonisation of test procedures for new and existing chemicals) and continue to promote environmentally sound chemical management in East Asia.

3. International Environmental Co-operation

3.1 Climate change

Japan formulated ambitious climate protection targets in the early 1990s and continued to give attention to combating global warming throughout the decade. Japan has a detailed climate protection policy whose implementation is well co-ordinated and regularly reviewed. Japan has consistently supported international climate protection efforts under the UN Framework Convention on Climate Change (UNFCCC). The CO₂ intensity of the economy (kg CO₂/unit GDP) decreased by 2.2% during the 1990s to rank ninth among OECD countries. Japan has pursued fuel switching away from oil and towards gas and nuclear power. It has made extensive and effective use of energy efficiency standards since the 1970s, and significantly strengthened them with the establishment of its “top-runner” programme in 1998. Public transport infrastructure is well developed in major cities, with differentiated tariffs, and public transport continues to account for a large proportion of passenger trips in most metropolitan areas. Voluntary initiatives by Japanese industry have contributed to reductions of greenhouse gas (GHG) emissions from this sector. To influence energy users’ behaviour, public education programmes promote efforts against global warming.

While weak decoupling was achieved in the 1990s between CO₂ emissions and economic growth, Japan’s performance still contrasts rather starkly with its overall goal of reducing GHG emissions by 6% between 1990 and 2008-12. Its GHG emissions increased by nearly 7% between the base year and 1999. Japan has therefore fallen short of the stabilisation targets it declared by ratifying the UNFCCC and by establishing its Action Plan to Halt Global Warming. The energy intensity of the economy (toe/GDP) increased by 5% in the 1990s, a reversal of the trends of the 1970s and 1980s. Although Japan pursued improvements in energy efficiency in all sectors during the 1990s as a means of reducing CO₂ emissions, it has so far largely overlooked the potential contribution of demand management measures and renewable energy sources. Greater effort is needed to harmonise climate protection measures across sectors and among energy sources. Existing environment-related taxes should be reviewed and further developed, where appropriate, from the viewpoint of GHG reduction and other objectives. One example is road transport fuels taxation. Economic instruments such as taxes and charges are used less in Japan than in a number of OECD countries. Japan should continue its efforts to accomplish its targets for limiting HFCs, PFCs and SF₆.

It is recommended to:

- seek the entry into force of the Kyoto Protocol in 2002, with timely ratification processes, and with the widest possible participation;
- further develop the national policy framework to combat climate change, with a balanced mix of policy instruments (including an expanded use of economic instruments such as taxes and charges), to reach domestic and international commitments; review and further develop environment-related taxes where appropriate, from the viewpoint of GHG reduction and other objectives;
- develop and implement co-ordinated demand management measures (e.g. road pricing, parking charges, energy service company) and energy efficiency improvement measures (energy efficiency standards and other measures) in the transport and residential/commercial sectors;
- review and revise voluntary initiatives in industry to improve energy efficiency and reduce GHG emissions (e.g. more explicit targets, expanded public access to relevant information);
- take further measures to encourage the development and use of renewable forms of energy; and to promote fuel switching where appropriate;
- continue to implement policy measures to reduce emissions of HFCs, PFCs and SF₆ with a balanced mix of policy instruments.

3.2 *Other international commitments and co-operation*

Concerning marine issues, Japan has taken major steps to improve its capacity to respond to large-scale oil spills since ratifying the OPRC Convention (International Convention on Oil Pollution Preparedness, Responses and Co-operation) in 1995. The Coast Guard carries out regular surveillance of the exclusive economic zone for illegal dumping or discharging from ships, and port authorities regularly check for MARPOL compliance by ships. Japan has implemented significant measures to reduce its fishing fleet capacity, in line with Food and Agriculture Organisation recommendations. Bilateral and trilateral co-operation with China and South Korea has been strengthened. Japan played a key role in establishing the Acid Deposition Monitoring Network in East Asia, one of the first region-wide co-operative and collaborative monitoring networks in the region, involving eleven countries. This network has become important for the exchange of scientific data and knowledge, which could lead to regional policy responses. Over 30% of Japan's official development assistance is in the environmental field. Japan ceased its production of CFCs in 1995. There has been a gradual substitution of softwood plywood for hardwood plywood in Japan's imports; the former's share increased from 15% in 1993 to 42% in 1999.

Japan has not yet succeeded in developing regional agreements for oil disaster response as the OPRC Convention requires. Although operating the world's second largest shipping fleet, Japan's measures for the management of ballast waters and ship scrapping are now insufficient. Bilateral co-operation with Russia faltered in the late 1990s. Shared fish stocks of several fisheries in the North Pacific need to be restored and properly managed. On transboundary pollution, there is still a long way to go to reach the goal of developing a common understanding and basis for policy responses concerning both air and marine pollution. The rate of recovery of CFCs from consumer products should be improved. Progress towards Objective 2000 of the International Tropical Timber Organisation (to ensure that all imported hardwood comes from sustainably managed forests) is not measurable.

It is recommended to:

- continue to develop institutions for regional responses to oil emergencies, including surveillance, analysis, communication and response (e.g. in the framework of the North-West Pacific Action Plan);
- continue to develop and implement international technical guidelines regarding ballast waters and ship scrapping;
- seek to strengthen regional collaboration to improve the management of shared fish stocks in the North Pacific;
- strengthen bilateral and regional efforts to address shared environmental concerns, particularly regarding transboundary air and marine pollution, and migratory birds;
- implement the new laws on recovery of fluorocarbons from household appliances, automobiles and commercial air conditioning systems;
- co-operate internationally to develop means of ensuring that timber and wood products used in Japan originate from sustainably managed tropical and boreal forests;
- further increase official development assistance (ODA) for environmental purposes, particularly that aimed at facilitating solutions to global environmental problems, as well as total ODA, taking into account the UN target (0.7% of GNP).