

# JAPAN

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## CONCLUSIONS AND RECOMMENDATIONS\*

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

During post-war reconstruction and the 1960s, efforts to stimulate economic growth through public and private investment, but without proper care for the environment, led not only to heavy pollution and irreversible damage to the natural environment but also to serious health problems (Minamata disease, Itai-Itai disease, asthma). Public concern prompted the adoption in 1967 of the Basic Law for Environmental Pollution Control, and the creation in 1971 of the Environment Agency. Both provided the main basis and impetus in the 1970s for major achievements concerning pollution control policies and efforts in nature conservation. Results, acknowledged in the 1977 OECD review of environmental policies in Japan, were consolidated in the 1980s. The early 1990s have witnessed increased attention in Japan to domestic and global environmental issues such as municipal and industrial waste management, NO<sub>x</sub> and conventional water pollution, climate change and environmental aid. The Diet approved a new Basic Law on the Environment in 1993.

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

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

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

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

### 1. Reducing the Pollution Burden

#### *Achievements*

Over the past two decades Japan has had the largest economic growth among G7 countries, while substantially reducing emissions of a number of pollutants in the atmosphere and toxic substances in water, and further containing the growth of other pollutants and of waste production. For instance, while economic growth increased over the period by 122 per cent, SO<sub>x</sub> emissions decreased by 82 per cent and NO<sub>x</sub> emissions by 21 per cent, the best performance among OECD countries. This decoupling was achieved through economic structural changes, increased energy efficiency and effective environmental policies. These successes have proved that environmental policies and economic development can be mutually supportive; the competitiveness of Japanese industry has not suffered overall and has even benefited in some sectors (e.g. the automobile industry and the pollution control equipment sector).

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

Concerning air, Japan has achieved remarkable results in the past two decades, reducing SO<sub>2</sub>, NO<sub>x</sub> and CO emissions through co-operation by all levels of government and industry. It has also contained the increase in CO<sub>2</sub> emissions. This progress, triggered initially by concern in the late 1960s about health risks in industrial and urban areas, is largely due to the combined effect of major structural changes in the economy, energy efficiency measures, changes in the fuel mix and advanced emission control technology. An ambitious regulatory policy to attain national ambient air quality standards was implemented with great effectiveness in co-operation with local authorities and industry. Investment concerning stationary sources was made principally in the 1970s and chiefly by the private sector. Replacement of vehicle fleets was done more gradually, but earlier than in other OECD countries.

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

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

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

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

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

### *Enhancing environmental performance*

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

#### *Air management*

Remaining air pollution issues in Japan concern NO<sub>2</sub>, photochemical oxidants, fine particulates and hazardous substances. Beyond the transport-related proposals identified below, it is recommended that consideration be given to the following:

- As has been done in the case of NO<sub>2</sub>, a strategy should be developed to move towards the attainment of EQS for fine particulate matter and photochemical oxidants.
- Further consideration should be given to monitoring of hazardous air pollutants, especially carcinogens such as benzene, and persistent, bioaccumulative substances such as dioxins and heavy metals.
- Taking into account the potential for transfer of air pollutants to other media such as water and soil, more emphasis should be given to preventive measures.

#### *Waste management*

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

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

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

#### *Water management*

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

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

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

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

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

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

## 2. Quality of Life

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

### *Nature conservation*

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

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

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

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

### *Urban amenities*

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

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

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

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

### *Consumption and time-use patterns*

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

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

## **3. Integrating Environmental and Economic Decision Making**

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

### *Integrating economic and environmental policies*

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

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

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

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

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

### *Integrating environmental concerns in transport policy*

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

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

However, the growth of traffic, particularly of road traffic, tends to offset some of the environmental benefits of past policies, and noise and NO<sub>x</sub> pollution remain major concerns, especially in metropolitan areas. Further, while designing new transport facilities, it is necessary to give full consideration to their environmental impact, including effects on land use and nature conservation. It is recommended that the following proposals be considered:

- A package of incentives and disincentives should be developed to slow or reverse the shift towards more polluting modes of passenger and freight transport. The quality of public transport, while high, should be upgraded. Road construction (e.g. bypasses, inter-sections) should further help reduce local congestion.
- Measures to control NO<sub>x</sub> and particulate matter pollution from diesel vehicles should be strengthened. The target values for noise emissions from trucks should further be reviewed and possibly adjusted to conform to the levels that can be achieved using the best available technology. Japan should also attempt to take the lead in developing emission standards for ships, and in promoting other emission reduction measures, especially for CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>2</sub>. Measures to reduce evaporative emissions from gasoline handling should also be considered.
- A comprehensive transport development plan should be drawn up. It should go beyond existing road infrastructure planning to encompass all transport modes, cover investment as well as management issues, and better integrate environmental concerns. Large transport infrastructure projects should be subject to systematic, early and public environmental impact assessments.

#### 4. International Issues

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

One of the most remarkable features of Japan's performance in the past 20 years has been the decoupling of energy use, CO<sub>2</sub> emissions and economic growth. This has been due largely to changes in the structure of the economy, diversification of the fuel mix and major energy efficiency improvements. Since the late 1980s, however, economic growth, appreciation of the yen and low oil prices have shifted attention away from energy conservation, and energy efficiency programmes have slowed.

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

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

It is recommended that consideration be given to the following:

- The administration should further integrate its actions on climate change issues and continue to follow up on the Action Programme to Arrest Global Warming, notably in transport, buildings and agriculture.
- Care should be taken that actions to address climate change are developed both within the time frame and targets of the Action Programme, and beyond, to cover longer term technological and lifestyle changes.
- Incentives should be provided for the use of more fuel-efficient, lower CO<sub>2</sub> emitting passenger cars, commercial vehicles, public transportation equipment and ships.
- In the industrial sector, efforts should continue to sustain high levels of energy efficiency and to encourage further improvement, notably through technological progress.
- Energy pricing and taxation systems should be examined to ensure that they are not undermining Japan's efforts to address the climate change issue.
- The mix of policy instruments being used or considered should be reviewed, including economic instruments, regulation, voluntary agreements and education. Economic instruments such as taxes and charges are used less in Japan than in a number of OECD countries and, after appropriate analysis and consultation, may have a stronger role to play in helping Japan achieve its goals at least cost.

##### *International co-operation*

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

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

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

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

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

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

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

