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PERFORMANCE REVIEWS**

JAPAN

Assessment and Recommendations



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This report presents the **Assessment and Recommendations** of the
OECD Environmental Performance Review of Japan.

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ASSESSMENT AND RECOMMENDATIONS*

1. Towards Sustainable Development

1.1 *Developments since the 2002 review*

Prior to the 2008-09 global economic downturn, Japan's economy had grown steadily, albeit at a much lower rate than in other Asia Pacific region and OECD countries. The economic expansion phase was characterised by a reduction in both energy and resource intensities. Progress was made in reducing some *pressures on the environment*, notably air emissions, water abstractions and municipal waste generation. However, further efforts are needed to reduce the generation of non-municipal waste, manage the risks associated with chemicals, and tackle air and water pollution in some areas. Greenhouse gas emissions have grown and are above the Kyoto target. Pressures on nature and biodiversity have also intensified.

In recent years, there has been a move from a strictly environmental *interpretation of sustainable development* to a more integrated approach, recognising the linkages between environmental protection, economic growth and social change. These linkages are given much emphasis in the 2006 Third Basic Environment Plan and the 2009 New Growth Strategy. The 2007 Strategy for a Sustainable Society outlines the pillars of Japan's sustainable society model: low-carbon economy, sound material-cycle and harmony with nature. However, there is no specific institution that co-ordinates governmental policy on sustainable development. While mechanisms are in place to ensure policy co-ordination, *integrated policy-making remains difficult*, with ministries and local authorities focussing on the implementation of their respective sectoral and local plans.

As recommended by the 2002 OECD Environmental Performance Review, Japan reinforced its evaluation procedures to *ensure accountability for the implementation of environmental plans*. The Ministry of the Environment and its major advisory body, the Central Environment Council, annually conduct progress reviews and disclose the results to the public. However, these reviews do not sufficiently assess the *cost-effectiveness of the policy mix*. In many cases, considerations other than effectiveness and efficiency guide policy choices, which are often selected from a limited set of options. Japan's environmental administration would also benefit from further strengthening the independence of its advisory bodies.

* Assessment and Recommendations reviewed and approved by the OECD Working Party on Environmental Performance at its meeting on 4 May 2010.

Recommendations:

- clarify linkages and priorities among different *sectoral plans and the basic environment plans*;
- strengthen *inter-institutional co-operation*, so as to ensure more effective and coherent integration of sectoral and environmental policies at all levels of government;
- improve the *evaluation of environmental policy* by strengthening *ex ante* and *ex post* economic analysis and enhancing the independence of advisory bodies.

1.2 Greening growth

Japan's export-driven economy slowed significantly in 2009 as a consequence of the *global economic downturn*. The government responded with a large-scale fiscal stimulus and a long-term growth strategy. *Environment-related measures accounted for some 16% of the overall anti-crisis package*. Support to energy efficiency, renewable energy technologies and related research and development (R&D) constituted the core of the "green" stimulus measures, reflecting emphasis on the transition to a low-carbon society. However, as in many other countries, Japan's stimulus package included *measures that can have negative environmental impacts and distort competition*, such as support to the car industry and agricultural production, and discounts on highway tolls. "Green innovation" is one of the six pillars of the 2009 *New Growth Strategy to 2020*. Although still at an initial stage of definition, the Strategy appears to include the main elements of the 2009 OECD Declaration on Green Growth.

The private sector has a growing role in providing environmental infrastructure and services. *Pollution abatement and control expenditure in the business sector* increased during the review period, partially offsetting the decline in public expenditure. According to some studies, Japan holds the third largest share of the global market of environmental goods and services. *Employment in environment-related enterprises* has doubled since the previous review and accounts for 95% of total (public and private) environmental employment. The eco-business is expected to expand further, providing for additional job opportunities in the sector. Some Japanese financial institutions have also started to provide environment-related financial services.

Eco-innovation is a core element of Japan's environmental policy and part of the government's strategy to contribute to economic growth and social progress. Japan is a world leader in environment- and climate-related technological innovation, and is a pioneer in some new green technologies, such as green information and communication technologies. *Government expenditure for environment- and climate-related R&D* increased considerably during the review period. However, it still represents a relatively low share of the public R&D budget; by expanding direct public investment in basic R&D, the government would share the risk of developing new technologies with the private sector and further accelerate innovation. The private sector, especially the manufacturing industry, is considered a driver of eco-innovation. *Performance targets*, such as the Top

Runner Programme, have contributed to technological improvement. Nonetheless, these performance targets should be assessed in terms of their level of ambition, capability of inducing breakthrough innovations and cost-effectiveness.

Japan has promoted the diffusion of cleaner goods in both the public and private sector. *Green public procurement* has been mandatory since 2001, although only for central government institutions, which has helped to enlarge the market of some eco-products. Japan should consider the financial implications of its green purchasing policy and make sure that it targets goods and services with the highest potential environmental returns. Information on environmental performance of products is made available through a variety of *eco-labels*. Japan provides *fiscal support to businesses and households* to invest in energy saving and pollution control equipment. Incentive schemes are in place to encourage purchases of energy efficient household appliances (*e.g.* the Eco-Point Programme) and vehicles. However, rewarding energy-efficient or environmentally friendly products strains the public budget and is less cost-effective than internalising environmental impacts in the price of goods and services.

Revenue from *environmentally related taxes* increased by 6% during the review period, although its share in total tax revenue decreased. The taxation system has been “greened” to some extent, for example with the introduction of a coal tax and tax breaks for fuel-efficient vehicles. These tax incentives have contributed to renew the vehicle fleet with more efficient and smaller vehicles. The earmarking of vehicle and road fuel taxes for road construction and maintenance was removed in 2009. However, the tax rates on energy products, including transport fuels, have not changed since the previous review and remain among the lowest in OECD. There is no evidence that fuel taxes have substantially contributed to reduce energy consumption from transport in Japan. There is scope to broaden the use of environmentally related taxes, given the relatively low tax-to-GDP ratio and the low share of indirect taxes in total receipts. In general, environmentally related taxes can generate revenue that, depending on the economic circumstances, can help fiscal consolidation through deficit reduction and/or be used to reduce other taxes or to finance government expenditure, including environmental expenditure. The tax reform foreseen in 2011 is set to include environmentally related tax measures.

Phasing out *environmentally harmful subsidies* should be a central part of a comprehensive environmental fiscal reform, with a view to increasing cost-effectiveness of policy measures and to reducing pressure on the public budget. Japan removed subsidies to domestic coal production and reduced support to agricultural producers. Nonetheless, support to agriculture remains high and mostly linked to production. Japan continues to subsidise business activities related to fossil fuels for securing a stable energy supply, such as exploration and refining, and to exempt fuels used in several sectors from excise duties. As emphasised in the previous two OECD Environmental Performance Reviews, businesses often benefit from government financial assistance to meet environmental targets, thereby deviating from a consistent application of the polluter-pays-principle.

Income inequality and relative poverty have slightly decreased since 2000, although they remain higher than in the mid-1990s. The impacts of environmentally related taxes and charges on low-income households are an emerging issue and should be further explored. The *decline and ageing of Japan's population* create new challenges for the design of environmental policies and the planning of environmental, energy and transport infrastructure. *Regional inequality* in Japan is relatively low in comparison with other OECD countries, and the majority of the population enjoys good quality environmental services. However, disparities remain between large metropolitan areas and small and medium-sized cities, for instance concerning accessibility of public transport services, domestic gas supply and wastewater treatment plants.

Recommendations:

- evaluate the impact of the *New Growth Strategy to 2020* on the environment, as well as the net contribution of environment-related sectors to growth and employment;
- review *transport-related taxation and pricing*, with a view to directly linking taxes on the purchase and ownership of vehicles to their fuel efficiency, and to better targeting pollution related to vehicle use through fuel taxes and road pricing;
- *mainstream environmental considerations in the 2011 tax reform*, with a view to broadening the use of environmentally related taxes and reducing incentives and subsidies that have perverse environmental effects, or that contravene the polluter-pays-principle;
- speed up the implementation of *green public procurement* in local governments, while ensuring its environmental effectiveness, economic efficiency and compliance with competition rules;
- further expand public direct investment in basic *R&D in environment- and climate-related technologies*; analyse the effectiveness and dynamic efficiency of current *performance targets* (e.g. the Top Runner Programme) in inducing eco-innovation;
- strengthen the analysis of the *social-environment interface* as a support for decision-making, including the distributional impacts of environmental policies and the impacts of demographic and other social trends on the environment.

1.3 Implementation of environmental policies

A number of the objectives of Japan's Second (2000) and Third (2006) Basic Environmental Plans were met by implementing a *comprehensive set of policy instruments*. National efforts were supplemented by regulatory and enforcement actions by prefectures and municipalities, and the implementation of negotiated agreements and voluntary initiatives by the business sector. However, the management of key environmental domains, including waste, water and air management, is still based on the legal framework developed in the 1970s and 1980s and the Basic Environmental Law adopted in 1993. A *number of amendments promulgated over the review period* introduced new measures but also made the legal framework more complex.

Despite some progress with the use of market-based instruments, especially in water management, *regulatory instruments and negotiated agreements with industry* remain the most common policy choice. The effectiveness and transparency of negotiated agreements could be improved. Damage compensation mechanisms played an important role in addressing the legacy of past pollution. Non-compliance, even though infrequent, was followed by swift and firm enforcement and innovative non-compliance measures. However, efficiency gains could be achieved by integrating environmental notification of industrial operations and inspections. The application of *environmental impact assessment (EIA) procedures* is limited by relatively high eligibility thresholds and inadequate public consultation by project proponents.

Policy implementation is accompanied by extensive *environmental information disclosure*, including regular state of the environment reports, self-monitoring and corporate reporting by industry. In spite of the recent adoption of the Environmental Information Strategy (2009), environmental information and data systems remain fragmented. They also lack economic and financial information to support policy and decision-making in an integrated way. In spite of a number of public consultative mechanisms, including the Central Environmental Council and its manifold working groups, *greater participation of the public* could provide further support for environmental decision-making. Lack of support for grassroots NGOs leaves much of the bargaining power with industry and economic decision-makers.

In the area of *air management*, Japan is still one of the least pollution-intensive OECD countries. Further progress was made in reducing emissions of carbon monoxide (CO), non-methane volatile organic compounds (NMVOCs), dioxins and particulate matter. Emissions of sulphur and nitrogen oxides and heavy metals were further reduced and low ambient concentrations of these pollutants were maintained. Progress was made in reducing NMVOCs and CO emissions from mobile sources (-48% and -56%, respectively) and dioxin emissions from waste incineration (-90%) despite increases in transport and incineration activities. However, *problems persist with air quality in urban areas*, in particular with high levels of photochemical oxidants due to emissions from small- and medium-sized installations (as well as from sources outside the country), and with cumulative effects of emissions from mobile sources. Japan is not on track to meet its emission targets for NMVOCs and small particulate emissions are not systematically monitored.

Progress was made in improving the *quality of Japanese rivers* with important decreases of biological oxygen demand (BOD), nitrogen, phosphorus and heavy metals discharges. This was due to: *i)* the extension of municipal sewerage and wastewater treatment coverage in large cities (reaching the level of close to 100% of the population in cities with more than one million inhabitants); *ii)* the expansion of wastewater systems in rural areas (including individual sanitation units); and *iii)* reduced nutrient loads from agriculture. However, *lakes and coastal waters* continue to suffer from algae blooms due to continued high nutrient load from agriculture, low and insufficient *sewerage and*

wastewater treatment capacity in smaller cities, and discharges from unregulated small sources. Better co-ordination of various water management objectives, and the redirection of funding towards better water quality management within integrated river basin management, would help to broaden the historical emphasis on water quantity management (flood control and water supply for agriculture) to include water quality and nature conservation objectives.

Japan has gradually developed a comprehensive, risk-based approach to *chemicals management*. Nevertheless, the private sector could shoulder a greater part of the burden of investigating the potential health and environmental risks of chemicals that have not been subject to systematic assessment (existing chemicals). The Japanese *pollutant release and transfer register (PRTR) system* is well developed. The substances and sectors it covers, and its communication methods, should be subject to regular review.

Recommendations:

- *review and update the 1993 Basic Environmental Law* in order to consolidate, streamline, and make the existing body of laws more coherent;
- expand the use of *economic instruments*, for example trading schemes and user charges, to increase the economic efficiency of environmental policies; review the cost-effectiveness of *regulatory instruments and agreements negotiated with industry*;
- implement vigorously the *2009 Environmental Information Strategy*, strengthen the collection of relevant information, particularly regarding economic aspects of environmental policies, and ensure that this information systematically responds to the demands of relevant decision makers;
- broaden the range of *mechanisms for public participation in environmental decision-making*; increase public support for grassroots NGOs and more public participation in EIA procedures;
- strengthen efforts to *reduce NO_x and NMVOC emissions* in order to effectively tackle photochemical smog in urban areas; establish a monitoring system for *small particulates*;
- further integrate the management of water quantity and quality; reinvigorate efforts to reduce pressures on the *quality of inland lakes and coastal waters* by reducing pollution from agriculture and small- and medium-sized sources (e.g. by strictly applying minimum environmental quality standards for heavy metals);
- speed up the *expansion of water supply and sanitation infrastructure in medium and small cities* carefully assessing costs and benefits of existing collective and individual systems;
- accelerate the *programme for testing and assessing the potential health and environmental effects of existing chemicals*, particularly through the greater involvement of the private sector, with a view to establishing a comprehensive chemicals management system, including the management of potential risks to children's health.

1.4 International co-operation

Japan has played a *proactive and constructive role in international environmental co-operation*, particularly in the areas of climate change, waste management and resource productivity, chemicals management, water and, more recently, biodiversity. It has a good record of meeting international commitments in multilateral and other environmental agreements, and actively supports international initiatives and institutions. In a changing international economic and political context, Japan will need to reinforce its efforts in order to maintain its leadership.

Japan's absolute level of *official development assistance* (ODA) to developing countries is among the highest in the world. However, Japanese ODA decreased to 0.19% of gross national income (GNI) in 2008, which is far below the 0.7% UN goal and among the lowest in OECD. *Environment is a prominent component of the country's aid policy*, accounting for about 30% of its ODA in 2008. Over 90% of Japanese bilateral environmental co-operation is in the form of loans that must be repaid, albeit on concessional terms. More concessional terms apply to loans for environmental projects that are tied to the purchase of Japanese goods, services and technologies. All *ODA projects are systematically assessed for their economic and socio-environmental feasibility* before approval. The results of these reviews are publicly disclosed, although how opportunities and risks identified are followed up is not always clear. A revision of the environmental guidelines is addressing the effectiveness of the environmental impact assessment and the application of strategic environmental assessment.

Japanese *bilateral environmental co-operation programmes* with China, Indonesia and other countries have contributed to real environmental improvements in those countries. Japan has attached increasing importance to promoting *regional environmental co-operation* in various areas, notably: transboundary air pollution, fisheries management, and co-operation on oil spills. The Tripartite Environment Ministerial Meetings between Japan, China and Korea have become more action-oriented in recent years. However, further efforts are needed on the implementation side, for instance to tackle *transboundary transport of photochemical oxidants and dust and sand storms*, which continue to cause problems in Japan.

Japan has co-operated actively with its partners to integrate trade and environment policies and to tackle *illegal trade in environmental sensitive products*. For instance, Japan is the second largest contributor to the Multilateral Fund for the Implementation of the Montreal Protocol on ozone depleting substances (ODS). *Recovery and safe disposal of ODS* has considerably increased. Japan has been at the forefront of *international co-operative efforts to manage chemicals*, most recently in relation to manufactured nanomaterials. Japan established an *ad hoc* enforcement unit to ensure continuous monitoring of *trade in species* identified under the Convention on International Trade in Endangered and Threatened Species of Wild Fauna and Flora (CITES). On the other

hand, *imports of wood products* still include a significant share of uncertified or unlabeled products, despite good progress with green procurement.

Japan has developed a new framework to promote a sustainable model for managing the *marine environment*. Nonetheless, further efforts are needed to implement some marine conventions, including the London Dumping Convention and the Ballast Water Convention. Monitoring of off-shore marine areas has revealed high concentrations of heavy metals and persistent organic pollutants. Illegal discharge of waste oil by ships is a continuing problem. *Overfishing* of some fish stocks (*e.g.* in the Northwest Pacific region, tuna fish stocks) is still a concern and requires more sustainable management of fish stocks, as well as improved preservation of marine ecosystems through regional and bilateral co-operation. Japan's policy on whaling continues to generate widespread international criticism. As the home to one of the largest shipping fleets in the world, Japan has contributed actively to international initiatives to improve the *health, safety and environmental performance of the shipping industry*.

Recommendations:

- maintain a strong commitment to environment within an expanded volume of *official development assistance* in line with international commitments; promote a more systematic application of strategic environmental assessment in development co-operation; and maximise the benefits of environmental development aid by providing it under untied conditions;
- promote *sustainable management of fisheries and the marine ecosystems* through a region-wide agreement for the Northwest Pacific Ocean and bilateral co-operation with developing countries providing fish resources to Japan;
- strengthen the enforcement of laws and regulations to prevent illegal trafficking *in wildlife and wildlife products*;
- strengthen *tripartite cooperation with China and Korea on chemicals management*, and extend it to other countries in the Asian region where chemicals production and use are increasing;
- strengthen *regional co-operation to monitor transboundary air pollution*, especially the precursors of photochemical oxidants and dust and sand storms, and to reduce emissions at source.

2. Selected Issues

2.1 Climate change

Japan has shown *strong commitment to the global effort against climate change*. Within the framework of the 2009 Copenhagen Accord, Japan submitted its target of reducing greenhouse gas (GHG) emissions by 25% by 2020 compared to the 1990 level. This target is “premised on the establishment of a fair and effective international framework in which all major economies participate and on agreement by those economies on ambitious

targets”. *Co-operation with developing countries* is given strong emphasis; in 2009 Japan launched the “Hatoyama Initiative”, which builds on the 2008 Cool Earth Partnership Financial Mechanism, to provide funding for climate change mitigation and adaptation in developing countries. When the Kyoto Protocol entered into force, Japan launched the *Kyoto Protocol Target Achievement Plan*, which consists of a wide range of regulatory, voluntary and economic measures. The government is implementing the Plan in close co-operation with the business sector. Local authorities are also very active and have sometimes taken the lead in introducing innovative policy measures. Japan has established a research programme to guide its climate adaptation policy.

Under the Kyoto Protocol, Japan committed to a 6% reduction in its GHG emissions on average over the 2008-12 period compared with the 1990 level. However, *national net emissions increased*, and in 2007 they were 9% above the base-year level. This was largely driven by rising emissions from electricity generation, due to the increased share of fossil fuels, especially coal, in the energy mix. Consumption of coal has increased in part to compensate for an unexpected fall in nuclear power. Consequently, progress in reducing *CO₂ intensities* has been slow compared to other OECD countries. The economic recession had a downward effect on energy demand and GHG emissions in 2008, which were 6.4% below the 2007 emissions. However, this effect is likely to be temporary and achieving the ambitious 2020 targets will require the use of significantly more cost-effective policy instruments.

Unlike many OECD countries, Japan made remarkable *progress in the transport sector*; CO₂ emissions have decreased by nearly 12% since 2000. Technological advancement and favourable tax treatment have helped to considerably improve the average fuel efficiency of the road vehicle fleet. Efficiency of freight transport has also improved. Distance travelled by car has decreased since 2003 with the rise in oil prices; passengers have increasingly used the well developed public transport system. However, passenger transport in minor cities and rural areas largely relies on private vehicles. Tackling traffic congestion remains a challenge, especially in major metropolitan areas and on motorways.

Japan has effectively *integrated energy and climate policies*, with a strong focus on energy efficiency, R&D and, more recently, renewable energy sources. Japan is a world leader in *climate-related R&D*, which benefits from growing public spending. The Renewable Portfolio Standard has created a market for renewable electricity and has contributed to developing wind, solar and biomass capacities. Japan has one of the largest solar photovoltaic installed capacities in the world, although the contribution of solar power to energy supply is negligible. Overall, the share of renewables in energy supply has remained fairly stable at a much lower level than in many other OECD countries. The current *policy approach to renewables* is based on technology-specific support and short-term targets, which limit investor flexibility, thus potentially increasing overall costs. A fragmented electricity grid is also an obstacle to a more extensive use of some renewable energy sources, such as wind and solar photovoltaic. Further diversifying the energy mix,

including by developing renewable energy sources, would contribute to improving Japan's energy security and reducing its GHG emissions.

Energy intensity has been steadily declining, although not as much as in other countries. Energy efficiency of manufacturing has further improved; Japan's major industrial sectors are among the most energy efficient in OECD. However, *electricity consumption in the residential and commercial sectors has been steadily growing*, largely due to the increased use of electric appliances, which has more than offset their efficiency improvements promoted by initiatives such as the *Top Runner Programme*. Energy performance standards apply to a wide range of buildings and factories, although they remain mostly voluntary. Overall, Japan's energy conservation policy is largely based on promoting technological progress and pays insufficient attention to demand-side management. There is further scope to reduce domestic and commercial energy consumption and GHG emissions.

Tax rates on energy products, including transport fuels, are among the lowest in OECD and do not convey a strong price signal. *Putting a consistent price on carbon, e.g.* through emissions trading in combination with a carbon tax, would drive investment in renewables and energy conservation more cost-effectively than current policies. The government has postponed the introduction of a carbon tax for several years. The trial *emissions trading system (ETS)* is a novel initiative, but it remains voluntary and marginal. Participants benefit from governmental subsidies. In March 2010 the Cabinet approved and submitted to the Diet the bill of the Basic Act on Global Warming Countermeasures, which foresees the introduction of emissions trading and taxation measures. Japan has made extensive use of the *Kyoto market mechanisms* to reduce the costs of achieving its target.

Negotiated agreements, such as the Voluntary Action Plan in the manufacturing sector, dominate Japan's policy mix to achieve its climate objectives. Negotiated and voluntary targets should be made more transparent and take into account what would be achieved by business-as-usual technological progress. Japan should consider complementing the voluntary approach with mandatory measures, including standards (*e.g.* for buildings) and market-based instruments. The systems in place to evaluate the effectiveness of policy measures seldom include quantitative analyses of their economic efficiency compared to possible alternative options.

Recommendations:

- examine the *cost-effectiveness of the climate policy mix*, particularly of negotiated agreements, looking across a range of alternative measures;
- put a *consistent price on carbon* through emissions trading in combination with climate-related taxes; transform the trial *emissions trading system* (ETS) into a mandatory cap-and-trade scheme that is compatible as far as possible with trading schemes in other countries; gradually introduce auctioning of permits;
- establish a consistent and long-term framework to develop *renewable energy sources* and reduce reliance on fossil fuels, avoiding technology-specific targets;
- further expand integrated *public transport* systems in smaller cities and rural areas, and improve *traffic demand management* to tackle congestion in large metropolitan areas and on motorways;
- develop a comprehensive *climate change adaptation strategy*, mainstream adaptation into land-use and sectoral plans; as part of broader international efforts, provide additional finance to further integrate climate change mitigation and adaptation into development co-operation.

2.2 Waste management and the 3Rs (reduce, reuse, recycle)

The 2000 Basic Law for Establishing a Sound Material-Cycle Society has integrated the environmentally sound management of waste with the 3Rs (reduce, reuse and recycle) approach. This represents a *shift from waste management to sound materials management*. The Fundamental Plan, which implements the law, was approved by the Japanese Cabinet in 2003 and revised in 2008. Quantitative targets for resource efficiency, recycling, and final disposal of waste have been achieved and strengthened. Overall resource productivity of the Japanese economy increased by 37% between 2000 and 2007, mainly due to declining inputs of construction materials. Inputs of imported resources (fossil fuels, metals) continue to grow and the environmental impacts related to these trade flows have not yet been assessed.

About 60% of municipalities are charging for waste collection, but *cost recovery for waste services* is still low (about 13% nationwide). During the review period, recycling of selected waste streams has improved. The 3Rs concept has been successfully implemented by local authorities, Japanese businesses and citizens in Eco-Towns. The *Eco-Town Programme* has created synergies between industrial and urban areas to maximise resource use, recycling and local development. Final *disposal amounts* of non-municipal and municipal waste have been reduced by 55% and 40% respectively. However, waste generation from the manufacturing industry has increased faster than GDP. Overall, the 3Rs policy has focused on recycling and reducing final disposal, mainly to respond to landfill shortage. Further efforts are needed in waste prevention (reduction and reuse).

Treatment and disposal of waste have been streamlined with the installation of bigger facilities serving larger areas. Incineration capacity for non-municipal waste has

increased significantly, yet dioxin emissions from waste incineration have been cut drastically. A polychlorinated biphenyl (PCB) waste treatment system has been established. However, compared to 2000, non-municipal landfill capacity has decreased, and securing disposal sites in major cities continues to be a challenge.

The *principle of extended producer responsibility* (already applied to containers and packaging, electric and electronic equipment, construction materials, and food) has been broadened to include end-of-life vehicles. However, this principle has been only partially implemented (e.g. electric and electronic equipment, end-of-life vehicles). The current situation, where final owners are charged for returning their end-of-life electric and electronic products, continues to encourage illegal dumping, unregulated collection activities and uncontrolled exports of secondary, potentially hazardous, materials. Although regulatory measures have been taken, significant resources will be needed to remediate contaminated sites.

Japan has played a leading role in improving *information on material flows* at the international level and is promoting the *3Rs in Asia*. However, an increase in the recyclables trade and price variations are undermining the effectiveness of the Japanese domestic recycling system. There are concerns that hazardous waste is being exported under the cover of trade in non-hazardous recyclable materials. This underlines the importance of co-ordinating waste management policies within the Asian region.

Recommendations:

- continue to promote the *3Rs strategy at national and local levels* and implement the Fundamental Plan for Establishing a Sound Material-Cycle Society: include targets on resource productivity by sector; continue to support analysis of resource productivity by sector and material flows, including better assessment of trade-related flows and their associated environmental impacts;
- continue to promote the *3Rs strategy internationally*, as well as international efforts to *control illegal shipments of hazardous waste*; promote the co-ordination of waste management and 3Rs policies in Asia;
- strengthen the *extended producer responsibility system* in order to reduce waste generation and illegal dumping of waste, for instance by promoting environment-friendly design and eco-labelling, further internalising recovery costs into product prices (e.g. by a recovery fee included in the purchase price), and abolishing charges to consumers for disposal of electric and electronic products;
- implement measures that promote *synergies between recycling, landfill diversion and reduction of greenhouse gas emissions* (e.g. develop incineration capacity with energy recovery, improve separate collection of bio-waste);
- *increase recycling and materials and energy recovery* to substitute primary resources for production and fossil fuels for energy supply;
- promote waste prevention and greater *cost recovery in municipal waste services* by expanding the use of waste charging schemes.

2.3 Nature and biodiversity

In recent years, protection of biodiversity has been assigned a higher priority in Japan: it is one of the three pillars of the 2007 Strategy for a Sustainable Society, and Japan will host the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD) in October 2010. In 2007, Japan adopted its 3rd *National Biodiversity Strategy*, and in 2008, the *Basic Act on Biodiversity* that is intended to guide the review of existing laws. In March 2010, Japan released its 4th National Biodiversity Strategy. However, protection of biodiversity within and outside protected areas has not been sufficient to significantly reduce the rate of biodiversity loss, which is the target agreed by the CBD Conference of the Parties in 2002.

Japan has a relatively high share of endemic species. *A high portion, by OECD standards, face extinction*; nearly a quarter of mammal species and more than a third of freshwater fish species. Conservation programmes are being implemented for 82 endangered species. The situation has deteriorated since the 2002 OECD Environmental Performance Review, underlining the need for strengthened protection measures. Intensive agricultural production, insufficient integration of environmental considerations into forestry and marine policies and, increasingly, invasive alien species have been the main sources of pressure on species and their habitats. Global warming is intensifying these pressures.

About 24% of Japan's territory is designated as protected in various forms, such as natural parks. However, *only 3.3% of Japan's territory has nature conservation as its primary function* (IUCN categories I and II), which is low by OECD standards. Japan hosts three UNESCO World Natural Heritage Sites, and 37 wetlands of international importance. Although two-thirds of Japan's land area is covered in forest (25 million hectares), only 781 000 hectares of national forests are protected as ecosystem reserves. The length of coastline in a natural state has continued to decline. Hence, there is scope to significantly increase the portion of *national forests and marine areas* dedicated to nature conservation and biodiversity protection. The variety of protection regimes has resulted in heterogeneous management practices, and a need to further streamline nature conservation laws. *Financing for nature conservation* remains at a low level and has not noticeably improved since the last OECD review. Opportunities to charge people for accessing nature conservation sites remain insufficiently exploited.

A number of efforts have been made to *monitor ecosystems* and to *restore habitats*. However, a national strategy should be developed and implemented for restoring nature along rivers which serve as important corridors for biodiversity. More generally, biodiversity corridors need to be expanded to allow species to adapt to global warming.

There has been some progress in *inter-ministerial coordination in the management of protected areas*, for example, the Ministry of the Environment and the Ministry of Agriculture, Forestry and Fisheries have worked to connect existing protected

forests. However, there is generally a need for closer, more effective coordination, particularly between these two ministries. An effective and policy-relevant biodiversity monitoring system involving all relevant ministries is needed.

The area of farmland has decreased continuously over the last 20 years, due to residential, commercial and infrastructure development. *Agricultural production is heavily supported*, 85% of assistance to farmers is in the form of market price support, which is more environmentally damaging than some other forms of support. Japanese agriculture is generally very intensive. More effective means must be found to integrate biodiversity protection into sectoral policies, particularly for agriculture, forestry and fisheries. This includes withdrawing or redesigning subsidies to provide better incentives to protect biodiversity, and establishing payments for ecological services.

The Japanese government is actively promoting the *Satoyama Initiative*. Domestically, this involves revitalising landscapes that once had achieved a balance between production and conservation of biodiversity and ecosystem services. However, there are questions about the extent and changes in the area of *satoyama* landscapes. Moreover, many *satoyama* areas have not proven to be economically viable under current policies. Many have been abandoned, and the increasing age of local communities has reinforced this trend.

There have been many valuable initiatives at the local level in rural, coastal and urban areas. Local populations have actively participated in protecting biodiversity in designated areas and in developing *green urban areas*. The national target of establishing 13 square metres of public open space per resident in urban areas was achieved. However, there is scope for better *co-operation among prefectures* to address biodiversity protection issues, such as maintaining game populations to an optimal size that cut across their jurisdictions.

Recommendations:

- consolidate the *policy framework for biodiversity protection*, in particular streamline nature protection legislation, strengthen inter-ministerial co-operation and better link biodiversity monitoring with policy-making;
- expand the territory allocated to nature protection, in particular in *national forests and marine areas*, and provide additional finance for this purpose;
- develop a *strategy for biodiversity corridors*, particularly in forests and along rivers, taking account of possible impacts of climate change;
- redesign *agricultural support measures* so as to reduce the negative impacts on biodiversity, and provide incentives to protect it;
- establish *payments for ecological services* as a means to protect biodiversity, including in *satoyama areas*.