1. Fiscal policy and the environment

1.1. *From economic recovery to recession*

Japan is the OECD's second largest economy in terms of GDP. While losing relative ground in the last two decades, Japan's GDP per capita was still slightly above the OECD average in 2008.[1] Japan is one of the largest merchandise exporters. High- and medium-high-technology industries, such as transport equipment, electronics and chemicals, make up the largest share of manufacturing and exports.

After the so-called "Lost Decade" of the 1990s, a prolonged period of economic stagnation and deflationary pressures, Japan's economy started to recover in 2002. Between 2000 and 2008, it grew by 10.6%, a rate much below the OECD average (18.6%). The recovery was mainly the result of a surge in exports caused by the low value of the Japanese currency, increased US demand, and stronger integration with other Asian countries. China is now Japan's main single country trade partner. However, domestic demand was weak: average nominal wages decreased as the number of lower paid, non-regular workers increased, household income remained stagnant and public expenditure contracted as part of the fiscal consolidation plan. General price levels slowly declined, a phenomenon not seen in any other OECD country during that period. Hence, the economic expansion primarily benefited the export-oriented manufacturing sectors and large firms, whereas the rest of the economy, which depends more on domestic demand, lagged behind.

The 2008 global economic slowdown and the simultaneous rise in the value of the yen sharply reduced the volume of exports. Consequently, the Japanese economy contracted by 1.2% in 2008 and declined by 5.2% in 2009, the sharpest fall in economic activity since the Second World War. The crisis had a severe impact on unemployment, and the unemployment rate was above 5% in 2009. Japan also faces greater deflationary risks than other OECD countries. The budget deficit (excluding one-off factors) is projected to climb

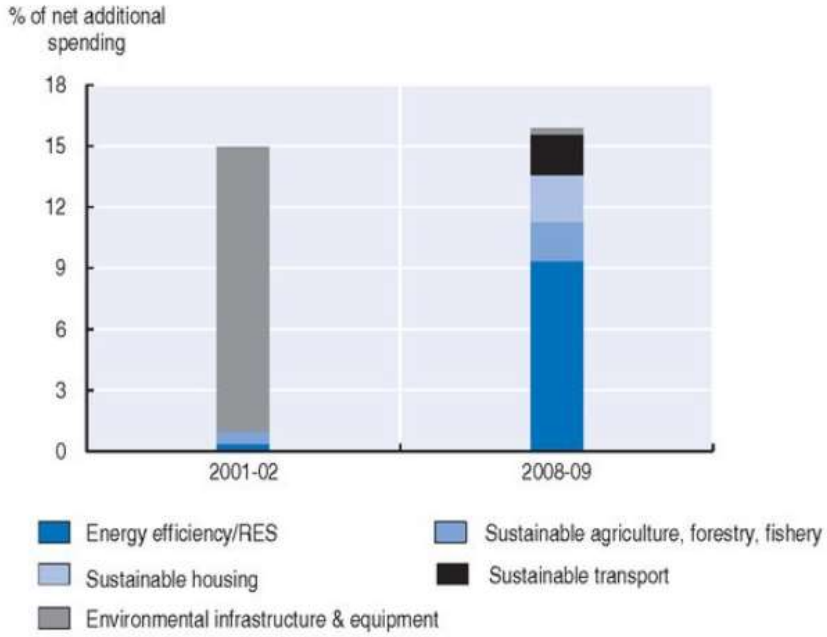
from 3% of GDP in 2007 to about 9% in 2010. Japan shoulders a very large debt-to-GDP ratio. At 167% in 2007, it was the highest gross government debt among OECD countries, and it could rise to over 200% of GDP in 2011 (OECD, 2010a).

During the economic downturn, Japanese authorities acted quickly to stabilise the financial markets, stimulate the economy, increase social security and prepare for future growth. Between August 2008 and April 2009, the government launched *four stimulus packages*. The stimulus totalled JPY 132 trillion (about USD 1.3 trillion) for 2008-09, or 4.7% of 2008 GDP. It was the second largest stimulus effort in G7 countries and was based on additional public spending (4.2% of GDP) (OECD, 2009a). The additional spending consisted mainly of: transfers to firms and households; investment in social infrastructure, education and technology; and active labour market policies.

A considerable part of the additional spending was environment-related, in an attempt to link the anti-crisis measures to the long-term goal of promoting green growth and a transition to a low-carbon society (Box 2.1 and Figure 2.1). In early 2010, the Diet approved another supplementary budget, which explicitly acknowledged the environment as one of the three pillars of Japan's response to the crisis, together with employment and economic growth.

The fiscal stimulus and large public investment partially offset the negative impacts of lower employment and wages on domestic demand. This, together with a rebound in exports, helped Japan to arrest the economic recession in the second half of 2009 and slowly recover (OECD, 2009b). Fiscal stimulus cannot continue for long, however, considering Japan's large budget deficit and government debt. Once a recovery is in place, *Japan should reduce the stimulus and move towards fiscal consolidation*, implementing spending reductions and a broad tax reform (OECD, 2009a). The upturn will need to rely primarily on private domestic demand, given the uncertainty of export markets. The New Growth Strategy, approved in December 2009, appears to be moving along these lines, as well as incorporating green growth features (Box 2.2).

Figure 2.1. **Environment-related investment in stimulus packages,[a] 2001-02 and 2008-09**



a) Data cover three stimulus packages in 2001-02, and four stimulus packages in 2008-09.

Source: Ministry of Finance and OECD calculations.

Box 2.1. **The environmental dimension of fiscal stimulus packages**

During the review period, Japan implemented *large stimulus packages* containing additional fiscal spending in 2001-02 and 2008-09. The 2008-09 fiscal stimulus is much larger than the previous one, with a higher weight of net additional spending and lower tax cuts. The composition of net spending is also different, with a lower share devoted to public investment (OECD, 2009a).

Direct environment-related investment and fiscal incentives are estimated at nearly JPY 2.9 trillion (USD 28 billion), equivalent to 0.57% of 2008 GDP and to 16% of the 2008-09 fiscal stimulus (considering the four packages approved between August 2008 and April 2009). While this share is only slightly higher than in 2001-02, the composition of the "green" stimulus differs greatly (Figure 2.1). The bulk of the 2001-02 environment-related stimulus consisted of public investment in environmental infrastructure and equipment, mainly waste and wastewater infrastructure development. This kind of investment accounted for only 2% of green investments in 2008-09. The *promotion of energy efficiency, renewable energy sources and related R&D* represents the core (some 60%) of the 2008-09 "green" anti-crisis measures, reflecting the emphasis Japan is putting on the transition to a low-carbon society. The remaining green component is almost evenly shared among support to sustainable housing (i.e. improvement of quality and energy efficiency of residential buildings), sustainable transport infrastructure (i.e. railways and local public transport), and rural development, including support to the *Satoyama Initiative* (Chapter 7).

The *green measures in the 2008-09 stimulus packages* include: *i)* tax reductions for fuel-efficient and cleaner vehicles (Section 1.2); *ii)* "eco-point" system to reward purchases of energy-saving home appliances (Section 1.3); *iii)* tax incentives for investments in energy-saving and renewable energy facilities, including the possibility to claim immediate depreciation of their costs; *iv)* tax incentives for R&D, especially for small and medium-sized enterprises; *v)* capital grants and tax incentives for businesses and households that install photovoltaic panels and energy-efficient appliances; *vi)* a feed-in tariff to support photovoltaic energy (Chapter 5); *vii)* tax incentives and capital grants for energy efficient renovation of residential and public buildings (including schools); *viii)* support for energy efficiency and biomass reuse in agriculture;

ix) forest maintenance, such as thinning, to enhance GHG absorption capacity (Chapter 5); and x) support for green investments at local level, through the Local Green New Deal Funds.

This kind of investment is likely to have a more immediate impact on economic activity than traditional infrastructure projects (OECD, 2009a). However, some measures included in the stimulus packages can have *negative environmental impacts* and should be carefully assessed for consistency with environmental objectives. These measures include:

- transfers to highway companies to compensate them for the *temporary reduction in highway* tolls until the end of 2010, which are intended to reduce travel and logistics costs and to stimulate domestic demand (Box 2.3);
- subsidies for the *automobile industry* in the form of car-scrapping incentives (Section 1.3);
- investments in *road construction*, airports and fishery infrastructure (*e.g.* ports); and
- *additional support to farmers* to expand production of rice, barley and beans, as well as measures to stimulate domestic demand for agricultural, forestry and fishery products, *e.g.* requiring schools to serve such products more frequently.

In January 2010, the Diet approved *another supplementary budget*, which diverts about JPY 7.4 trillion allocated in the previous budgets to new spending measures. All the environment-related measures were confirmed and partly extended, including the "eco-point" system for home appliances, subsidies for low-emission vehicles, and support for the renovation of buildings (with the introduction of a housing "eco-point" scheme). However, the 2010 regular budget includes some measures that are potentially harmful to the environment, including increased support for agricultural production, further discounts on highway tolls, and a provision for lowering motor fuel taxation in case of oil price peaks.

Box 2.2. **Japan's New Growth Strategy: towards green growth?**

In December 2009, the Cabinet approved *Japan's New Growth Strategy*. It outlines a model of growth based on domestic demand, innovation, and stronger economic integration of Japan in the Asia region, as well as less dependence on heavy public investment in infrastructure. The Strategy takes into account the challenges of climate change and Japan's ageing population. As a result, it identifies the environmental and health sectors, together with increased leisure time and tourism, as the main sources of demand and, hence, as the key drivers of future growth and job creation. In particular, the promotion of "green innovation", i.e. innovation in the environment and energy sectors to achieve a low-carbon society, is one of the six basic policies, as indicated below. Greening the tax system is one of the instruments that will be used to promote green innovation.

Basic policy	Objectives to 2020	Priorities
Become a leader in environment and energy through "green innovation"	Generate market value of over JPY 50 trillion and 1.4 million jobs in environment-related sectors; reduce global GHG emissions by at least 1 300 $MtCO_2eq$ by promoting Japanese technology worldwide.	• Renewable energies and innovative technologies. • Zero-emission residential and commercial buildings. • Comprehensive policy package to achieve a low-carbon society, including regulatory reforms and greening the tax system.
Health leader strategy through "life innovation"	Create market value of about JPY 45 trillion and 2.8 million jobs in health-related sectors.	• R&D in pharmaceuticals, medical and nursing care technologies. • Expand the availability of accessible housing for elderly and disabled people. • Strengthen medical and nursing care services.
Economic strategy for Asia	Establish a Free Trade Area of the Asia-Pacific (FTAAP); take advantage of Asia growth opportunities.	• Roadmap for reaching the FTAAP agreement. • Promote international adoption of Japanese safety standards. • Public-private support for sustainable transport and environmental infrastructure. • Make Haneda Airport an international hub; "open skies" agreement; port infrastructure. • Revise regulations that obstruct flows of people, goods, and capital.

Promote a tourism oriented nation and local revitalisation	• Increase annual number of foreign visitors to Japan to 25 million, for JPY 10 trillion of market value and 560 000 jobs. • Revitalise urban and under-populated areas. • Increase the self-sufficiency rate for food to 50% and for timber to over 50%; increase agriculture, forestry, fisheries, and food product exports by a factor of 2.5, to JPY 1 trillion. • Double the market of existing housing; reduce the share of insufficiently earthquake-proof housing to 5%.	• Ease tourist visa requirements for citizens of Asian countries. • Increase use of paid vacation time. • Use private finance initiatives and public-private partnerships to provide infrastructure in urban areas. • Introduce an individual household income support system for farmers; promote partnerships among agriculture, commerce and industry. • Revitalise forests and forestry, *e.g.* through biomass use. • Improve the market of existing housing. • Earthquake-proof renovation of buildings.
Strategy for a science and technology oriented nation	Increase public and private investment in R&D to over 4% of GDP; increase the number of Japanese world leading universities and research institutions; expand ICTs.	• Reform universities and public research institutions; ensure full employment for those who complete doctoral courses. • Reform systems and rules to foster innovation. • Provide "one-stop" government services; reform regulations to encourage ICT use.
Employment and human resources	• Halve the number of "freeters";[a] rectify M-shaped female employment; increase the number of job-card holders to 3 million;[b] increase the minimum wage; shorten working hours and increase utilisation of paid vacation time. • Achieve a sustainable increase in the birth rate; attain the world's top level of academic achievement.	• Increase the employment rate of young people, women, the elderly, and the disabled. • Improve assistance to job seekers and the unemployment insurance system; expand the job-card system to include vocational qualification. • Expand childcare services; make childcare leave more flexible. • Improve the quality of education. • Improve the social environment to ensure the safety of children.

a) "Freeter" is a Japanese expression for people between the age of 15 and 34 who lack full time employment or are unemployed (excluding students), live with their parents and earn some money with low skilled and low paid jobs.
b) Under the job-card system, businesses provide training to part-time and low-skilled workers and issue them with job cards that contain a record of their training, evaluation and employment.

Although very broad, the Strategy appears to include the main elements of the 2009 *OECD Declaration on Green Growth*: green investments, R&D, low carbon infrastructure, tax instruments, co-ordination of labour market with education policies, and international co-operation.

1.2. Greening the tax system

Japan's tax system differs from that of many OECD countries in several respects. In particular, the tax revenue to GDP ratio is one of the lowest in the OECD area (28.3% in 2007, compared to the OECD average of 35.8%). Revenues from indirect taxes on goods and services, including those on energy and transport, account for a much lower share of tax receipts than the average for the other OECD countries (18% of tax receipts in 2007, compared to 30.9%).[2]

As in all OECD countries, environmentally related tax revenues largely consist of revenues from taxes on energy use and vehicles. Japan imposes a multiplicity of such taxes, some of which are collected at local level. *Revenues from environmentally related taxes* (in real terms) have increased by about 6% since 2000 and accounted for 1.7% of GDP in 2007. This share is in line with the OECD weighted average, although well below the OECD Europe average (Figure 2.2), and it has slightly decreased since the previous review. Revenues from environmentally related taxes accounted for 5.9% of total tax receipts in 2007, down from 6.3% in 2000. This share is above the OECD weighted average, though it ranks in the lower half of OECD countries (Figure 2.2). Energy taxes play a relatively minor role in Japan compared with other major economies, accounting for less than 60% of environmentally related tax revenue (Figure 2.2).

Taxes on energy products

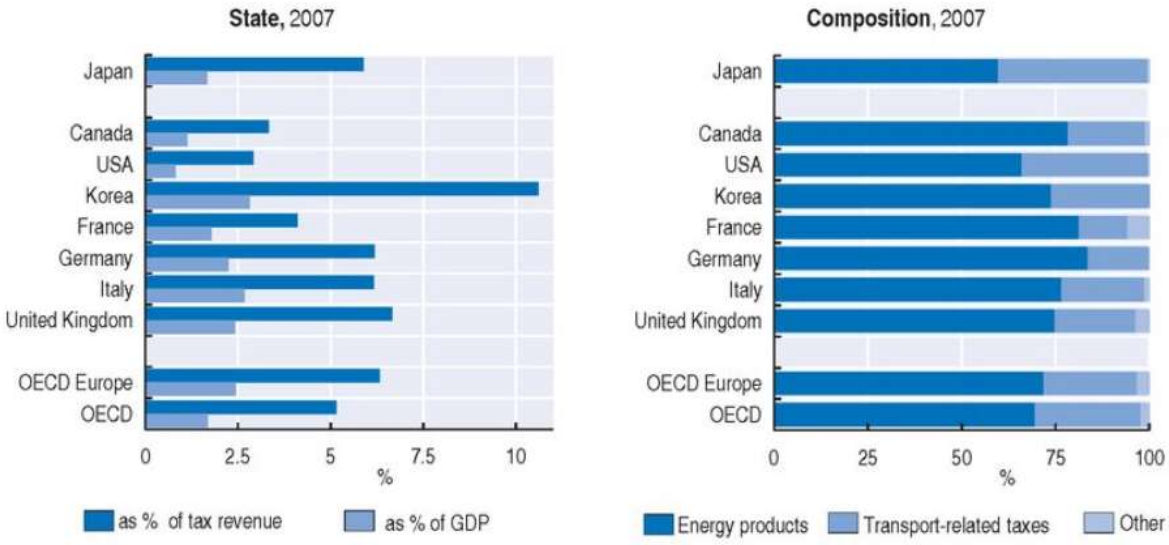
Tax rates on energy products are lower in Japan than in a number of other OECD countries, notably European countries, and have remained virtually unchanged (in nominal terms) since the previous review (Table 2.1). Exceptions include the extension of the petroleum tax to coal in 2003 and the increase of the tax rate on natural gas and liquefied petroleum gas (LPG), which partly corrected for the uneven tax burden on various fossil fuels (IEA, 2003).

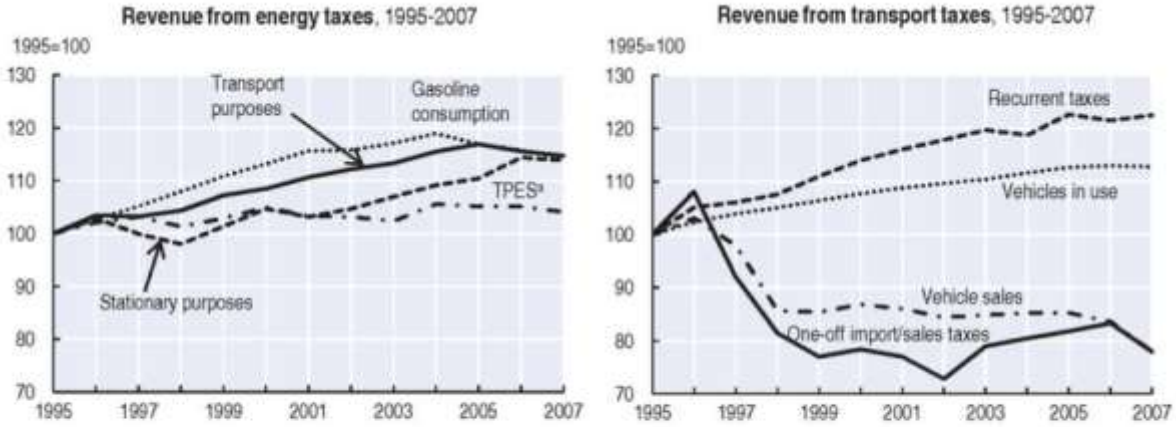
This, combined with the growing share of coal and natural gas in total primary energy supply (TPES), has led to an increase in revenues from energy taxes for stationary purposes (Figure 2.2), despite a rather stable TPES (Chapter 5).

Taxes on fuels for transport purposes account for some 83% of the revenue from energy-related taxes. Japan's taxation of transport fuels stands out among OECD countries in a number of ways. Japan is one of the few OECD countries taxing aviation fuel used on domestic flights. Gasoline and diesel taxes – and prices – are well below those of most OECD countries (Figure 2.3). In 2008, taxes accounted for 27% of the diesel price and 40% of the gasoline price, compared to a range of 48-58% of the diesel price and 59-65% of the gasoline price in the G8 European countries.[3] Bioethanol blended gasoline benefits from tax exemption on its bioethanol content (up to 3%).

While fuel prices have increased since 2003, in line with world oil prices, tax rates have remained unchanged in nominal terms and their impact on transport decisions has thus been negligible (Figure 2.3). Yet, *passenger demand appears to be sensitive to fuel prices*: passenger traffic by car continued to grow in the early 2000s and started to progressively decrease, as did gasoline consumption, when fuel prices rose (Figure 5.8). The gasoline tax represents over 65% of the revenue from transport fuel taxes, due to the dominance of gasoline vehicles in the fleet (Chapter 5). Consequently, revenues from fuel taxes largely follow the trend in gasoline consumption (Figure 2.2). The response of Japanese consumers to the rise in fuel prices, exacerbated by the 2008 oil price peaks, shows that *a higher and better targeted fuel taxation, e.g. on the basis of fuel carbon content*, would offer an incentive for

Figure 2.2. **Environmentally related taxes**





a) Total primary energy supply.

Source: OECD-EEA Database on Economic Instruments for Environmental Policy; OECD-IEA (2009), Energy Balances of OECD Countries; Ministry of Land, Infrastructure, Transport and Tourism; Japanese Automobile Manufacturers Association.

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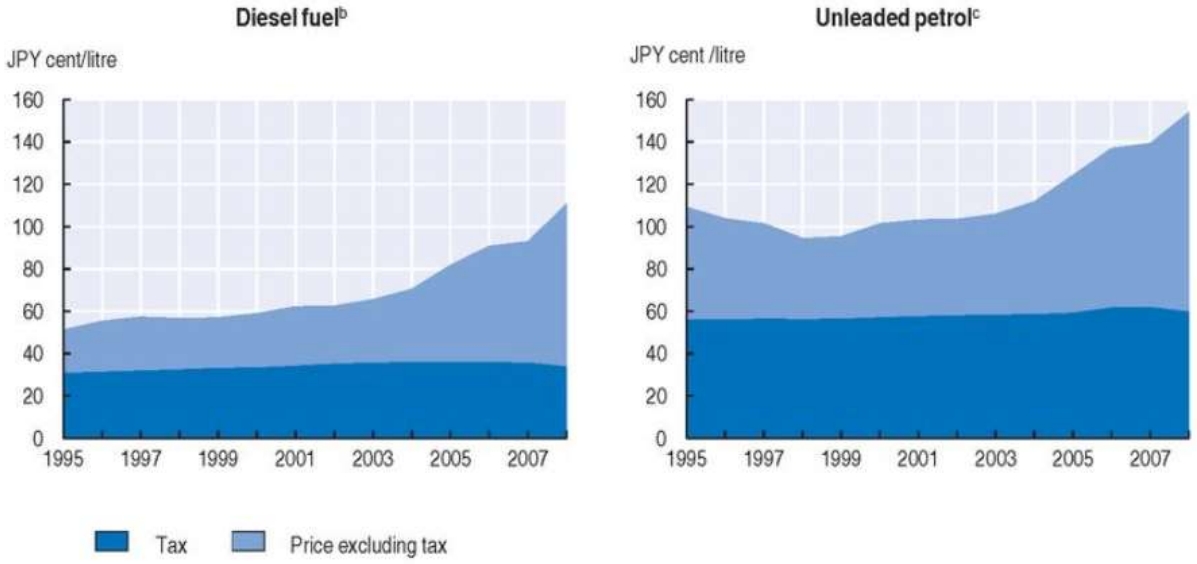
Table 2.1. **Energy-related taxes, 2001 and 2009**

		2001	2009	Exemptions
Gasoline tax	On unleaded gasoline			Aviation, diplomats, heating, gasoline used as solvent for rubber and as raw material for petrochemicals.
	Gasoline tax	48.6 JPY/l	48.6 JPY/l	
	Local gasoline tax	5.2 JPY/l	5.2 JPY/l	
Delivery tax	On delivery of:			Agriculture, forestry, fishing, mining.
	Light oil	32.1 JPY/l	32.1 JPY/l	
	Diesel fuel	32.1 JPY/l	32.1 JPY/l	
LPG tax	On LPG used for transport purposes	17.5 JPY/kg	17.5 JPY/kg	Exports; LPG used as heating fuel or in manufacturing.
Petroleum and coal tax	On natural gas, imported LPG	0.72 JPY/kg	1.08 JPY/kg	Exports; fuel oil used in agriculture, forestry or fishing; naphtha and gaseous hydrocarbons used as raw materials for production of petrochemicals and ammonia.
	On crude oil, imported petroleum products	2.04 JPY/l	2.04 JPY/l	
	On coal	–	0.70 JPY/kg	
Aviation fuel tax	On aviation fuels	26 JPY/l	26 JPY/l	Central and local governments, international air transport.
Power-resource development tax	On sale of electricity	0.445 JPY/kWh	0.375 JPY/kWh	

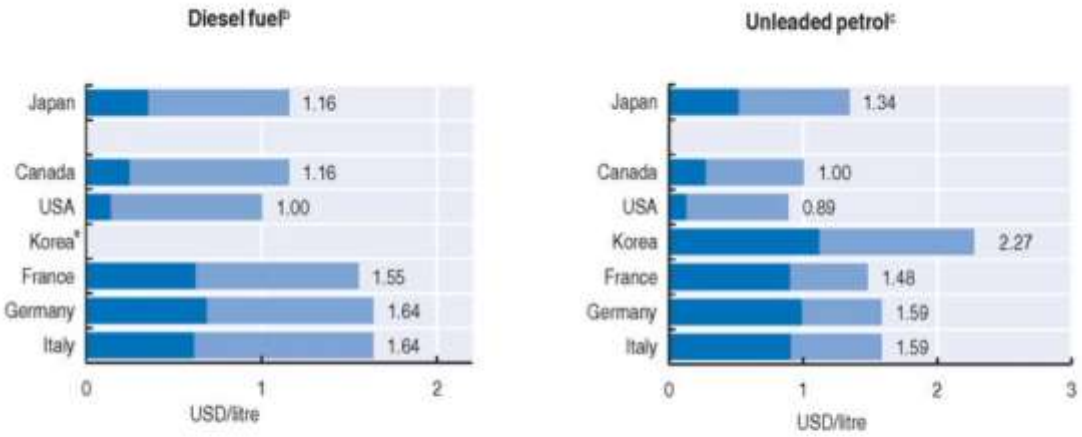
Source: Government of Japan.

Figure 2.3. **Road fuel prices and taxes**

Trends in Japan,[a] 1995-2008



State,[d] 2008



a) At constant 2005 prices.
b) Automotive diesel for commercial use.
c) Unleaded premium (RON 95); Japan and Korea: unleaded regular.
d) Diesel fuel: at current prices and exchange rates; unleaded petrol: at current prices and purchasing power parities.
e) Data not available.

Source: OECD-IEA (2009), *Database of End-use Prices*.

StatLink http://dx.doi.org/10.1787/888932318680

buying smaller and more fuel-efficient cars, driving shorter distances and shifting to public transport. However, in its 2010 budget, the government announced that fuel taxation would be reduced in case of new oil price spikes.

The government has been discussing the introduction of a *carbon tax* for several years and has signalled its intention to introduce such a tax as part of a comprehensive tax reform scheduled for 2011. In 2009, the Ministry of the Environment (MOE) proposed a tax of JPY 1 064 (USD 10) per tonne of CO_2 on fossil fuels, including transport fuels. This is a relatively low level compared to similar taxes applied in other countries (*e.g.* Finland and Sweden) and to the average price of a CO_2 allowance in the EU emissions trading system (Chapter 5). Under the proposed carbon tax scheme, the gasoline tax would be simultaneously reduced, so that the final tax rate, including the carbon tax, would be comparable to the minimum rate applied in the EU. Moreover, relief measures for specific industries would be considered. While such exemptions would help moderate the potential impacts of the carbon tax on the international competitiveness of Japanese industries, they would create uneven abatement incentives across sectors and should therefore be transitional and targeted to the most exposed sectors. A carbon tax could complement a new mandatory emissions trading system, thereby extending carbon pricing to households, offices and transport (Chapter 5).

The *revenue from most energy-related taxes is earmarked for several purposes.*[4] Earmarking revenue from transport fuel and vehicle taxes for road construction and maintenance was removed in 2009. For several years, the rates of these taxes had been based on the financial requirement for road work. The removal of earmarking is thus a positive step that allows these taxes to be better designed to meet environmental goals, primarily climate change goals. In general, earmarking tax revenue reduces the flexibility of fiscal decisions and, therefore, overall efficiency, and should be limited to the extent possible.

Vehicle taxes

Japan imposes *taxes on the purchase and ownership of motor vehicles* at prefectural and national levels. None of these taxes is directly based on the environmental performance or fuel efficiency of vehicles.[5] Nonetheless, during the review period, *tax breaks* were introduced to favour the purchase of more environment-friendly vehicles (Table 2.2). As

from 2001, the automobile tax was reduced by 25-50% depending on a vehicle's fuel efficiency and exhaust emission levels, and it was increased by 10% for old vehicles.[6] The tax break was extended in 2009 to the acquisition tax and the motor vehicle tonnage tax.

Table 2.2. **Tax incentives for fuel-efficient and low-emission vehicles**

Type of vehicle	Fuel efficiency	Emissions performance	Incentives		
			Automobile tax	Acquisition tax[a]	Motor vehicle tonnage tax[b]
Alternative-energy next generation vehicles	Electric (including fuel cell), plug-in hybrid, clean diesel, hybrid and natural gas vehicles that meet certain performance requirements		50% reduction	Exempted	Exempted
Passenger cars	Compliant with 2010 standards +25%	Emissions down by 75% from 2005 standards	50% reduction	75% reduction	75% reduction
	Compliant with 2010 standards +10%	Emissions down by 75% from 2005 standards	25% reduction[c]	50% reduction	50% reduction
Heavy-duty vehicles	Compliant with 2015 standards	Compliant with 2009 standards	–	75% reduction	75% reduction
		NO_x or PM emissions down by 10% from 2005 standards	–	50% reduction	50% reduction

a) From 1 April 2009 to 31 March 2012.
b) From 1 April 2009 to 30 April 2012, with reductions applicable once only, at the time of the mandatory vehicle inspection.
c) Discontinued in April 2010.
Source: Ministry of Land, Infrastructure, Transport and Tourism.

The so-called "next generation vehicles", including hybrid and plug-in hybrid, electric, clean diesel and compressed natural gas cars, are fully exempted. These tax breaks are set to be phased out in 2012.

Revenues from the acquisition tax decreased sharply in the second half of the 1990s, with both the decline of vehicle sales and the shift to small and mini cars. Revenues rebounded in 2002 with the introduction of the automobile tax break, which boosted sales of more expensive standard-size, albeit more fuel-efficient, cars. Revenues from recurrent taxes (automobile and motor vehicle tonnage taxes) have slightly decreased in nominal, though not in real, terms since 2002-03, with the growing number of small and fuel-efficient vehicles in the fleet. The vehicle stock has continued to increase until recently (Figure 2.2).

Other environment-related taxes

Several local authorities have introduced a landfill tax for disposal of industrial waste (Chapter 6). Some 0.5% of environment-related tax revenue is generated by *a levy on SO_x emissions* linked to the 1973 Law Concerning Compensation for Pollution-Related Health Damage. The purpose of the levy is to secure funding for compensating victims of air pollution certified by 1987 (OECD, 2002). The levy rate is set *ex post*: the financial requirement for health damage compensation (*i.e.* the revenue requirement) is shared among emitters proportionally to their 1982-86 emissions (60% of the revenue) and current annual emissions (40% of the revenue). Only installations that were active as of 1987 are deemed responsible for air pollution and are charged. The levy is thus more an instrument to enforce environmental liability than an economic incentive. Its burden on emitters is fading, as is the revenue. While it contributed to the uptake of SO_x abatement equipment in the 1980s, it is doubtful that it has played a role in curbing emissions in recent years (OECD, 2010b).

Other tax incentives

Japan provides *fiscal support* to both households and businesses. Households can claim tax credits for the purchase of new houses meeting energy efficiency standards and for the installation of energy efficient equipment, such as heat insulation materials and solar panels. Similarly, businesses can benefit from tax credits or special depreciation rates on investment costs for improving energy performance and controlling pollution. Tax credits are also given for investment in R&D (Section 2).

Assessment

Japan plans to carry out a *comprehensive review of the tax system by 2011*, which will include a review of environmentally related taxes and consider the reinforcement of such taxes. A number of fiscal incentives have been introduced to make the tax system more environment-friendly, notably in the case of vehicle taxes, as recommended by the 2002 *OECD Environmental Performance Review* (EPR) (Table 2.3). However, *tax breaks to subsidise environment-friendly vehicles* are generally less efficient than charging the polluting dimension of road transport. Such tax breaks represent expenditure for the government, in terms of foregone fiscal revenues, as was the case with the automobile tax. Moreover, they can contribute to increasing vehicle use, which can potentially offset the technical efficiency gains. Hence, the environmental effectiveness of these measures is questionable, *e.g.* in terms of reducing emissions of greenhouse gases or air pollutants.

Table 2.3. **Actions taken on the 2002 EPR recommendations for economy-environment integration**

Recommendations	Actions taken
Continue to *restructure environment-related taxes* in a more environmentally friendly way.	MOE established an Expert Committee to discuss potential effects of the carbon tax. Japan introduced tax incentives to favour more environment-friendly vehicles (see below).
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.	Taxation of road fuels has remained unchanged. Japan has introduced tax breaks for motor vehicle taxes to link them to fuel efficiency and exhaust gas emissions of vehicles, including heavy-duty vehicles. The earmarking of vehicle and road fuel taxes to road construction and maintenance was phased out in 2009.
Continue to *reduce sectoral subsidies* that have negative environmental implications.	Japan phased out subsidies for domestic coal production in the early 2000s. Support to farmers has decreased.
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.	Green public procurement requirements have been mandatory for central government institutions since 2001. The Eco-Mark certification programme has been extended and several other eco-labels apply. Several incentive schemes are in place to favour the purchase of cleaner products, including vehicles and electric appliances.
Review *distributional implications* of proposed market-based instruments for environmental management and sustainable development.	No actions taken.
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.	Some reports, including the White Papers issued by MOE and MLIT, describe the interactions between the environment, on the one hand, and social, demographic and settlement changes, on the other.

Source: OECD, Environment Directorate.

Higher oil prices have largely helped to moderate passenger traffic by car since 2003, and might have well been the primary incentive to shift to cleaner vehicles. Overall, Japan needs to redirect taxation from purchase and ownership of vehicles to their use and associated pollution load, *i.e.* through better targeted fuel taxes and road pricing (Box 2.3). Any remaining taxes on vehicles should be directly linked to their fuel efficiency and environmental performance.

Japan needs to reform its tax system to come to grips with urgent, and potentially conflicting, objectives: raising tax revenues to cope with high public debt and growing social spending resulting from an ageing population, while promoting economic growth and addressing widening income inequality (Jones and Tsutsumi, 2008). The OECD recommended raising the consumption tax rate and broadening the base of direct taxes by reducing allowances and deductions (OECD, 2009a).[7] Broadening the use of indirect taxes on the consumption of goods and services that are potentially harmful to the environment, *e.g.* through a carbon tax, can also contribute to reaching these goals. Such taxes would generate revenues that can help the government with fiscal consolidation and/or be used to partly reduce taxes on households and businesses, thereby promoting economic growth. The regressive nature of such taxes should be addressed through *ad hoc* social benefit schemes. The introduction of other taxes, such as on air and water pollutants, could also be considered. Japan needs to streamline its current environmentally related taxes, with a view to reducing overlapping tax bases and administrative burden, as well as improving the fiscal autonomy of local governments. The current municipal tax on immovable property could also be redesigned to offer incentive towards energy efficient housing.

Box 2.3. **Road pricing**

In addition to fuel and vehicle taxes, Japan applies a flexible and rather complex *system of road pricing for its nearly 9 000 kilometres of motorways*. The network is self-financed through the "toll-pool" system, which allows cross-subsidisation between profitable and unprofitable motorways, and prices are very high (OECD, 2005a). Lower rates apply to light vehicles and motorcycles. *Discounts* of 30 to 50% apply to motorway tolls at off-peak times and for long-distance use. To divert traffic from congested roads running through residential areas, a discounted toll applies on some urban stretches of motorways (so-called "*environmental road pricing*"). The 2008-09 anti-crisis package introduced further discounts on road tolls during weekdays and a flat rate of JPY 1 000 on weekends, aiming to stimulate travel and tourism. Furthermore, in its 2010 budget, the government approved the *expansion of toll discounts* on a pilot basis, with a view to progressively eliminating all road tolls. Overall, despite high prices, the toll system encourages long-distance driving, including over routes that are very well served by fast trains. The measures recently approved would strengthen this incentive, whereas an appropriate implementation of the polluter-pays-principle would require road pricing to reflect both the distance travelled and the environmental performance of vehicles.

1.3. *Subsidies*

The government provides various types of *financial assistance to businesses and households*. Subsidies to businesses included in the 2008-09 stimulus packages amounted to some 0.5% of GDP, the fourth highest GDP share for such subsidies among OECD countries (OECD, 2009c). Businesses often benefit from government financial assistance to meet environmental targets, also under negotiated agreements (Chapters 3 and 5), thereby undermining a consistent application of the polluter-pays-principle. Besides straining the public budget, some support measures can have harmful environmental effects, as they affect production and consumption

decisions. Japan needs to regularly review its subsidy policies to verify that the benefits are higher than the associated costs, including environmental costs. *Removing perverse subsidies* should be a central part of a comprehensive environmental fiscal policy reform, with a view to increasing the cost-effectiveness of policy measures, which are particularly important during times of economic crisis. As recommended in the 2002 OECD EPR, Japan has taken some steps to reduce environmentally harmful subsidies (Table 2.3).

Subsidies to promote environment-friendly products

Like other vehicle-producing countries, Japan introduced support measures for its car industry as part of the 2008-09 anti-crisis policy package. The so-called *Green Vehicle Purchasing Promotion Programme* provides subsidies for purchasing new fuel-efficient cars and heavy goods vehicles to replace old ones. Eligible vehicles need to comply with the 2010 fuel efficiency standards. However, purchases not associated with scrapping old vehicles can also benefit from a subsidy, albeit lower, if the new vehicle exceeds the 2010 standards by at least 15%. The government has allocated approximately JPY 370 billion (about USD 3.7 billion) to the programme, expecting an increase in sales of up to 690 000 vehicles. The programme is set to terminate in September 2010.

The *Eco-Point Programme* was launched in mid-2009 to encourage purchases of energy-efficient household appliances, namely TV sets, air conditioners and refrigerators. Consumers are awarded "eco-points" for the purchase of these products depending on

their energy performance, with or without scrapping old appliances. The "eco-points" can be used to buy other goods and services nationwide. The government covers the costs of the programme (some JPY 232 billion), which is set to end in December 2010.

These incentive schemes have softened the impact of the economic crisis on the automotive and electric appliance sectors. However, they distort the market by discriminating among manufacturing sectors and consumers, namely low-income households who cannot afford to buy new products. From an environmental perspective, *rewarding the purchase of energy-efficient goods is not a cost-efficient way to reduce environmental impacts*. These incentives encourage the use of subsidised products. The Japanese experience shows that despite the improved energy efficiency of electric appliances, overall electricity consumption in the residential sector has increased (Chapter 5). Moreover, the environmental impacts over the whole lifecycle of a product should be considered, including the increased demand for steel.

Energy subsidies

Japan offers financial support for energy efficiency programmes, renewable energy sources, and related research and development. In 2008-09, this support averaged some JPY 465 billion (about USD 4.7 billion) per year.[8] In the early 2000s, Japan phased out its *subsidies for domestic coal production*, following a restructuring programme of the coal industry.[9] However, Japan still subsidises other *fossil fuels* (Table 2.4), and exempts from excise duties fuels used in agriculture, forestry, fishery, mining, petrochemicals, manufacturing, and for heating purposes (Table 2.1).

Table 2.4. **Energy subsidies, 2007**

Subsidy	Purpose	Budget amount for 2007[a] (JPY million)
Natural gas exploration subsidy	Promote natural gas exploration by mining companies	907
Subsidy for oil refining technology programmes in oil-producing countries	Promote joint research with oil-producing countries on oil refining technologies	9 925
Oil prospecting subsidy	Support geological surveys abroad	1 812
Oil refining rationalisation subsidy	Assist the development of advanced oil refining technologies	12 457
Oil product quality assurance subsidy	Support analysis of petroleum products and development of analysis techniques	1 898
Subsidy for structural reform measures for petroleum product distribution	Assist business diversification and other structural reform measures by oil distributors	12 442
Large-scale oil disaster prevention subsidy	Support the construction and maintenance of oil fences and their transport in emergencies	800
Promotion of natural gas use subsidy	Help private firms convert coal-burning facilities to natural gas-burning ones	6 005

a) Financial year.
Source: IEA (2008).

Fisheries support

Government financial transfers to fisheries have continued to decline, from about USD 2.8 billion in 2000 to USD 2.2 billion in 2005. Nonetheless, Japan remains the largest provider of governmental support to this sector among OECD countries. This support is linked neither to production nor to investment in new vessels, which have the greatest potential to reduce fish stocks. Japan provides direct payments for fleet reduction (for scrapping vessels and surrendering licenses), as well as interest subsidies for the renewal of small fishing vessels, mainly to improve fisheries management and work safety.

Some 70% of government financial transfers to fisheries are for coastal infrastructure construction (*e.g.* fishing ports, coastal roads) (OECD, 2009d). While these subsidies do not increase fishing effort, they constitute payments to the construction industry and can provide incentives to invest in unnecessary or unprofitable infrastructure, especially at a time when the fisheries sector is declining (Chapter 7).

Agricultural support

Agriculture is a highly protected and low-productivity sector in Japan. *Total support to agriculture*, including general services such as education, marketing and infrastructure, decreased during the review period. It accounted for about 1% of GDP in 2006-08, which is in line with the OECD average.

Support to farmers also decreased from 58% of gross farm receipts in 2000-02 to 49% in 2006-08.[10] However, support to farmers in Japan remains twice the OECD average. Moreover, support linked to production (*i.e.* to levels of input or output) accounts for nearly 95% of support to producers, far above the OECD average (55%). This kind of support is generally distortionary and environmentally harmful, since it stimulates production and input use, with negative impacts on the use of water, land, fertilisers and pesticides. While administered prices of some agricultural products, including rice, were abolished during the review period, market price support still accounts for 85% of agricultural support.[11] Rice continues to be the most heavily supported commodity. As a result, Japanese consumers pay almost twice the world market price for agricultural products. Japan needs to reduce its high level of support, moving away from support to production and towards direct support to farmers. Improving the composition of support could bring benefits to farmers, consumers and the environment (OECD, 2009e).

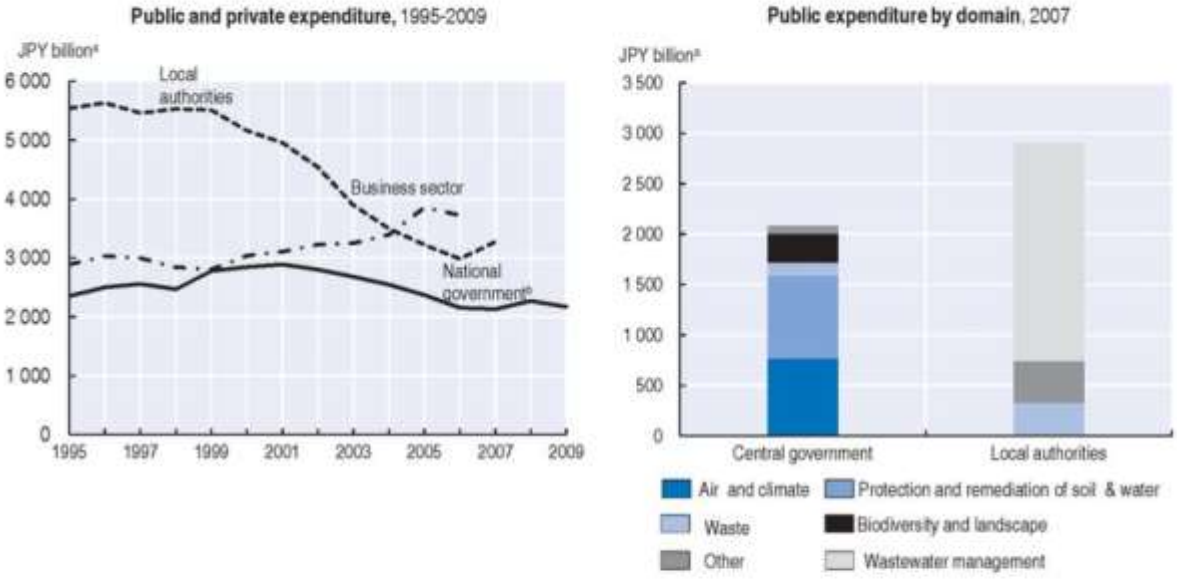
Japan has introduced direct payments for *environmentally friendly farming* that requires halving the use of chemical fertilisers and pesticides (Chapter 7). However, these payments account for only 0.5% of total payments to farmers, a very low share compared with agri-environmental payments in other major OECD economies. Further efforts are needed to make agricultural support conditional on meeting appropriate environmental standards, as recommended in the 2002 *OECD Environmental Performance Review*.

1.4. Environmental expenditure

Public pollution abatement and control (PAC) expenditure represented about 1.2% of GDP in 2007, down from 1.7% in 2000.[12] Also the share of public expenditure devoted to environmental protection has steadily declined since 2000, reaching 3.4%. Expenditure has been scaled down in all sectors, with the exception of those related to climate change. Most of Japan's public expenditure on environmental protection is spent at local level, by prefectures and municipalities, although with substantial financial transfers from the central government. Fiscal autonomy of local authorities is indeed low. PAC expenditure by the central government has decreased by 24% in real terms since 2000, while local expenditure has decreased even more, by 37% (Figure 2.4). These trends partly reflect the *increasing role of the private sector* in financing and managing environmental infrastructure and services, particularly in the waste sector (Chapter 6). Indeed, private PAC expenditure has increased by 22% since 2000.

Investment represented about 38% of public PAC expenditure in 2007, down from 55% in 2000. Despite this decline, *environmental investment* still represents 15% of Japan's overall gross capital formation, the highest share among OECD countries. This reflects an ongoing,

Figure 2.4. **Pollution abatement and control expenditure**



a) At constant 2005 prices.
b) 2009: previsional budget.
Source: Ministry of the Environment and OECD calculations.

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large-scale investment plan to fill Japan's environmental infrastructure gap, especially in sewerage and wastewater treatment facilities (Chapter 3). As a result, wastewater management still accounts for over 70% of public PAC expenditure at local level (Figure 2.4). On the other hand, the weight of the waste sector has slightly decreased, showing that progress has been made in developing waste treatment infrastructure and outsourcing municipal waste management to the private sector (Chapter 6). At the central level, growing attention to climate change has resulted in an increasing share of public expenditure, comparable to the share allocated to prevention and remediation of water and soil pollution, which had traditionally been higher in Japan (Figure 2.4).

2.4. Promoting green products

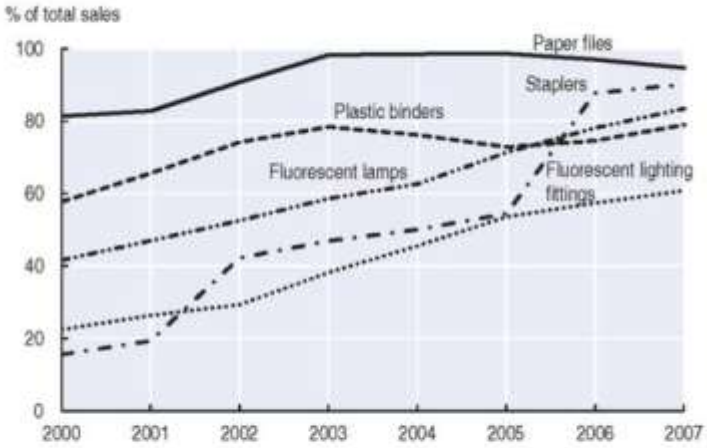
Green public procurement

Japan had introduced a green public procurement policy before the adoption of the 2003 OECD Recommendation on "Improving the Environmental Performance of Public Procurement". The 2001 Law for the Promotion of Procurement of Eco-Friendly Goods and Services (Law on Promoting Green Purchasing) requires all governmental institutions to develop green procurement policies, define annual targets for the purchase of selected eco-products, and annually report to MOE. The 2008 *Basic Policy for the Promotion of Procurement of Eco-Friendly Goods and Services* represents the framework for green procurement at the national government level. It defines evaluation criteria for 246 categories of products and services, up from 152 in 2002, including for materials and equipment used in public works construction. In 2007, Japan extended the green purchasing requirements also to the procurement of services.[23]

However, green public procurement requirements do not apply to the local level. Nonetheless, many *local authorities* have voluntarily implemented similar measures and subscribed the Green Purchasing Network's guidelines. Further extending the green purchasing requirements to local governments would enhance the effectiveness of the policy, in particular since a large share of public expenditure is invested locally. In expanding its green purchasing policy, the government should make sure that tendering procedures are transparent and competitive, and do not discriminate among potential suppliers.[24]

More than 90% of products and services procured by central government agencies meet the required environmental criteria. This outcome was achieved with minor increases in public expenditure. Since the introduction of the green public procurement policy, the *market shares of eco-friendly products* widely used in the public administration have substantially increased (Figure 2.6). According to MOE's estimates, the national government's green purchasing policy resulted in a reduction of carbon dioxide (CO_2) emissions by 89 500 tonnes in 2006, which is equivalent to the amount of CO_2 emitted by a town of 42 000 inhabitants. The overall costs to the Japanese economy of achieving such emission reductions should be assessed and compared with the costs of alternative policy measures.

Figure 2.6. **Sales of selected eco-products, 2000-07**



Source: Surveys of selected national associations (File and Binder; All Japan Stationary; Japan Luminaires; Japan Electric Lamp Manufactures).

Eco-labelling

The Japanese Environment Association (JEA), under MOE's aegis, manages the Japanese environmental product certification system, the *Eco-Mark Programme*. The label is assigned to products that have lower environmental impacts than similar products over their whole life cycle, from material extraction to disposal. Manufacturers who are awarded the Eco-Mark pay an annual fee that is proportional to product sales.

As of 2007, 4 617 products were awarded the Eco-Mark in 47 product categories. JEA aims to achieve 6 000 certified products in 51 categories by 2012. The *market share of Eco-Mark products* has increased. According to some estimates, the use of certified products

has led to some decreases in CO_2 emissions, resource consumption and waste disposal. Obtaining the Eco-Mark has become the norm for major manufacturers, which suggests that the awarding criteria need to be constantly revised to ensure that the environmental impact of a labelled product is substantially lower than average.

Many *other certification programmes* exist. For instance, an energy efficiency label is associated with products that achieve Top Runner targets, and a uniform energy conservation label applies to some home appliances (Chapter 5). Many companies have also launched their own eco-labels. However, criteria for awarding the labels may differ greatly. Japan should consider streamlining the overall eco-labelling system to improve reliability, send clear messages to consumers and reduce possibilities of falsification.[25]

3. Expanding environment related markets and employment

The *global and Japanese markets for environmental goods and services* have expanded in the last decade and are expected to grow faster in the future. According to some estimates, the value of the global market for environmental goods and services, including renewable energy technologies and low carbon activities,[26] was about USD 1.6 trillion in 2007-08. Japan accounted for 6.3% of this global market, the third largest share after the US and China (Innovas Solutions, 2009).

In the second half of 2008, overall Japanese exports suffered from declining global demand, but *exports of environmental products* grew by over 35% compared to the same period in 2007 (Nitta, 2009). According to a survey conducted by the Japanese External Trade Organization in 2009, some 18% of Japanese manufacturing businesses were producing and exporting environmental products, especially waste treatment devices, eco-paints and adhesives, photovoltaic cells and other renewable energy technologies, electric, hybrid and fuel cell vehicles, and wastewater treatment equipment (JETRO, 2009). The latter drove export growth in 2008. East Asia, particularly China, is the main export market for Japanese environmental products and technologies, followed by Europe.

In 2003, MOE estimated the market size and employment of environmental businesses.[27] According to this study, the *eco-business turnover* was JPY 30 trillion (USD 280 billion) in 2000 and will nearly double by 2020 (Table 2.5). The 2009 New Growth Strategy aims at enlarging the environment and energy-related markets by an additional JPY 50 trillion (USD 530 billion) (Box 2.2). Resource management, broadly defined and including housing renovation and repair, was estimated to account for two-thirds of the market in 2000; environmental protection, mainly wastewater treatment facilities and provision of waste services, accounted for the remaining third.

Table 2.5. **Market sizes and employment potential of the environmental goods and services sector**[a]

	Market size (JPY billion)			Employed		
	2000[b]	2010[c]	2020[c]	2000	2010[c]	2020[c]
Pollution management, *of which:*	9 594	17 943	23 706	296 570	460 479	522 201
Air pollution control	642	3 166	5 169	8 971	39 306	53 579
Wastewater management	4 818	5 821	5 831	59 099	62 353	54 224
Waste management	3 614	7 736	11 126	211 859	330 006	378 035
Cleaner technologies and products	174	453	609	3 108	10 821	13 340
Resources management, *of which:*	20 177	28 830	34 061	468 917	648 043	700 898
Recycled materials	7 878	8 744	9 404	201 691	211 939	219 061
Renewable energy	163	929	929	5 799	30 449	28 581
Energy conservation and energy management	727	4 883	7 868	13 061	160 806	231 701
Other[d]	10 794	13 720	15 275	218 436	219 059	195 655
Total	**29 944**	**47 227**	**58 376**	**768 595**	**1 119 343**	**1 236 439**

a) Private sector only.
b) The figures for the market size in the year 2000 use varying fiscal year definitions.
c) Forecast.
d) Includes: repair of machinery, furniture, etc.; housing renovation and repair, and urban greening.
Source: MOE (2003).

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In the MOE study, environment-related *employment* was estimated at 769 000 in 2000, equivalent to 1.2% of total employment, and was expected to grow by 46% in 2010 and reach 1.2 million employed by 2020. The largest growth in employment and market value was expected in the energy sector and in the manufacturing sector for air pollution control equipment (Table 2.5). More recent estimates indicate that employment in private environment-related businesses had already reached 1.4 million in 2006, compared to about 76 500 employed in the public environmental administration (MOE, 2009). Initiatives such as the *Eco-Town Programme* to improve resource and waste management have positively contributed to local development and employment, supporting industrial restructuring in favour of environment-related sectors (Chapter 6). In 2008, the government launched similar initiatives – the "Eco-Model City Projects" and the "Biomass Towns" – to stimulate a local development based on climate-related activities and biomass energy (Chapter 5).

The 2009 New Growth Strategy expects to double employment in environment-related businesses by 2020 (Box 2.2). Overall, the transition to a green economy will require industrial restructuring and, therefore, a reallocation of labour resources across sectors. *Net employment effects should be carefully assessed*; labour market and education policies should take into account the new skills and competences that will be needed to adjust to greener technologies, production processes and working methods.

Involving the financial sector

Japanese financial institutions have seized the opportunity offered by the growing interest in the environment to provide *targeted financial products*, such as low-interest loans for environmental investments or ISO 14001 certification of enterprises. Formerly public financial institutions have taken the lead. In 2004, the Development Bank of Japan (DBJ) launched a system of environmental rating of companies' activities, which assesses the companies' efforts to reduce their environmental impact, and adjusts the terms of financing accordingly. In 2002, a Shoko Chukin Bank investment fund was established to finance environment-related investments in small and medium-size enterprises (SMEs). Several private financial institutions are also increasingly providing this kind of service, and have broadened their target customers from large corporations to SMEs (Ito, 2006). Some local governments have co-operated with local banks to increase the availability of funds for environmental investments; the Environmental Finance Project launched by the Tokyo Metropolitan Government is an example.

The Japanese stock market has promoted some *eco-funds*, which invest in environmentally responsible companies, and are often combined with socially responsible investment funds (so-called Eco-SRI funds). Around 25 such funds were available as of July 2006. While in 2006, Eco-SRI funds accounted for only 0.4% of all investment funds in Japan, their net asset value had grown by more than 50% in about one year, indicating increased interest among investors (Ito, 2006).

1.3. Economic instruments of environmental policies

The use of *economic instruments*, other than environmentally related taxes, has been on the rise. This is particularly true in water management and nature conservation, while the use of market-based instruments in waste and air management has been very limited so far.

In water supply and sanitation, *domestic water tariffs* have been well designed to generate revenue and encourage efficient water use, and they have increased over the review period (OECD, 2010). All infrastructure operation and maintenance costs, and between one-third and one-half of the capital costs, are now recovered from the revenue of water charges (Murakuni, 2006). The remaining two-thirds or one-half of capital costs are financed by subsidies, which is mainly because water supply systems have been extended to new areas where the costs of providing services per person (or per cubic metre) are higher. Domestic water supply tariffs with an increasing-block charge component encourage efficient water use. Domestic and industrial water pricing includes differential charges for installed water pipe sizes. The industrial water tariff sets an upper limit for the volume of water that can be requested by users. The use of *agricultural water* is not metered and relies on flat rate pricing, which encourages excessive use of water. However, water trading between farmers is allowed within Land Improvement Districts, thus aggregate consumption is controlled. Moreover, farmers may sell part of their water rights to urban water utilities, further contributing to economic efficiency.

There are no entry fees for national parks, although service fees are sometimes charged for visitors' information centres and tourism activities (such as scuba diving). Parking fees are also sometimes charged, in which case the revenue is used to clean up the park. An access fee (JPY 1 000) is charged for regulated utilisation areas. The revenue from various levies, such as the prefectural forestry protection tax and the Yokoyama greenery tax, is increasingly used for *nature and environment conservation purposes* (Chapter 7).

Charging households and businesses for *waste management* has progressed, but cost recovery for municipal waste services is still low, about 13% nationwide, up from 6% in 2000. For industrial waste, 27 prefectures out of 47 and one ordinance-designated city (Kitakyushu) out of 60 had introduced a landfill tax as of 2009. The tax levied is mainly used for waste generation control, recycling, reduction, and other appropriate waste treatment measures (Chapter 6).

Japan has taken its first steps to implement a *CO_2 emissions trading system*. As of 2009, 303 companies participated in Japan's Voluntary Emissions Trading Scheme (JVETS), covering about 1% of industrial CO_2 emissions. In 2008, the government launched a trial emissions trading system, involving 715 firms and covering more than two-thirds of industrial CO_2 emissions. However, as in the previous programme, participants were not required to set a cap on emissions and no fine was issued in case of non-compliance (Chapter 5). The experience from CO_2 trading could provide a basis for introducing

emission trading of traditional pollutants (SO_x and NO_x). In addition, total pollution load programmes could serve as a basis for stimulating faster and optimised responses by the regulated community.

Japan has experimented with the introduction of *economic instruments in water pollution control*. For example, the Osaka prefecture has compensated the Shiga prefecture for sustainable forest management around Lake Biwa, which is the source of the Yodo River, Osaka's main supply for drinking water (Box 7.2). Thirty prefectures (out of 47) levy a forestry protection tax aimed at complementing allocations from the central budget for forest management and conservation activities. In most cases, a surtax is added for the management and conservation of regional forests, including the protection of headwaters critical to the water supply. First steps were taken to introduce tradable load reduction assignments for nitrogen and phosphorus in enclosed water bodies: a new framework for nitrogen and phosphorus loads trading was introduced through the amendments of the Sewerage Law in 2005 and a draft guideline for trading was issued by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) in 2007.

Japan has implemented *various initiatives to address water pollution from agriculture*. The 2003 Principles of the Environmental Policy in Agriculture, Forestry and Fisheries provided a new framework for agri-environmental policies, with a shift to cross-compliance measures targeted to environmentally beneficial practices, more clearly defined policy goals, and provision of a policy evaluation framework. With the full enforcement of the 2004 Act on the Appropriate Treatment and Promotion of Utilisation of Livestock Manure, provisions were applied to about 62 000 livestock farmers in an effort to eradicate improper practices, such as open stockpiling and landfilling, which result in groundwater pollution. About 90% of manure (80 million tonnes) is now recycled as fertiliser. In addition, the 2006 Japanese Biomass Strategy established a set of programmes aimed at recycling more than 80% of biomass waste (which includes livestock manure) and utilising more than 25% of unused biomass by 2010. In 2007, Japan introduced an agricultural support scheme designed to promote more environmentally friendly farming which involves reducing the application of chemical fertilisers and pesticides by half compared to conventional farming (Chapter 7). Organic farming techniques have yet to be adopted, for which the Ministry of Agriculture, Forestry and Fisheries (MAFF) established demonstration farms at a budgetary cost of JPY 4.4 billion (USD 47 million).[15]

1.1. *Institutional responsibilities*

Principal responsibility for the pursuit of Japan's international environmental agenda resides with the *Ministry of Foreign Affairs* (MOFA) and the *Ministry of the Environment* (MOE). MOFA is responsible for overall foreign policy, negotiation of government-to-government agreements, and formulation of official development assistance (ODA) policies and guidelines. MOE leads work on international environmental issues through its Global Environmental Bureau. It also provides information and guidelines, such as the 2004 International Environmental Co-operation Guidebook.

The *Japan International Co-operation Agency (JICA)* is the main institution for implementing development co-operation activities. JICA was given more independence in 2004. Its responsibilities were further broadened in 2008, incorporating parts of the former Japan Bank for International Co-operation, and it became the "new JICA". The new JICA is responsible for: *i)* technical co-operation projects (as before); *ii)* implementation of ODA loans; and *iii)* part of the grant aid formerly handled by MOFA. In 2008, an Office for Climate Change was established within JICA to manage climate-related aid activities. The new JICA is one of the world's largest bilateral development organisations working in about 150 countries.

A range of *other central ministries and associated institutes* are involved in environmentally-related development co-operation, including:

- Ministry of Finance (*e.g.* customs, management of contributions to multilateral funds, such as the Global Environment Facility and the World Bank Multilateral Fund);
- Ministry of Agriculture, Forestry and Fisheries (*e.g.* coastal and high seas fisheries management);
- Ministry of Economy, Trade and Industry (*e.g.* environment-trade relationships, environment and energy, some forms of environmental assistance for developing countries).

At the *sub-national level*, prefectural and municipal authorities formulate environmental plans and programmes, which may include international (environmental) components. For instance, Osaka territorial authorities and their business partners share their environmental experience with territorial authorities in a number of countries through twinning arrangements with other cities or ports. Osaka also hosted an Asia Metropolis Summit (October 2007), dealing with the environment, adopted a declaration for "creating harmony in Asia" and launched an urban network, ASIA11 + 1. Environmental non-governmental organisations (NGOs) are also playing an increasingly co-operative role overseas.

2. Official development assistance and bilateral co-operation

2.1. *Official development assistance*

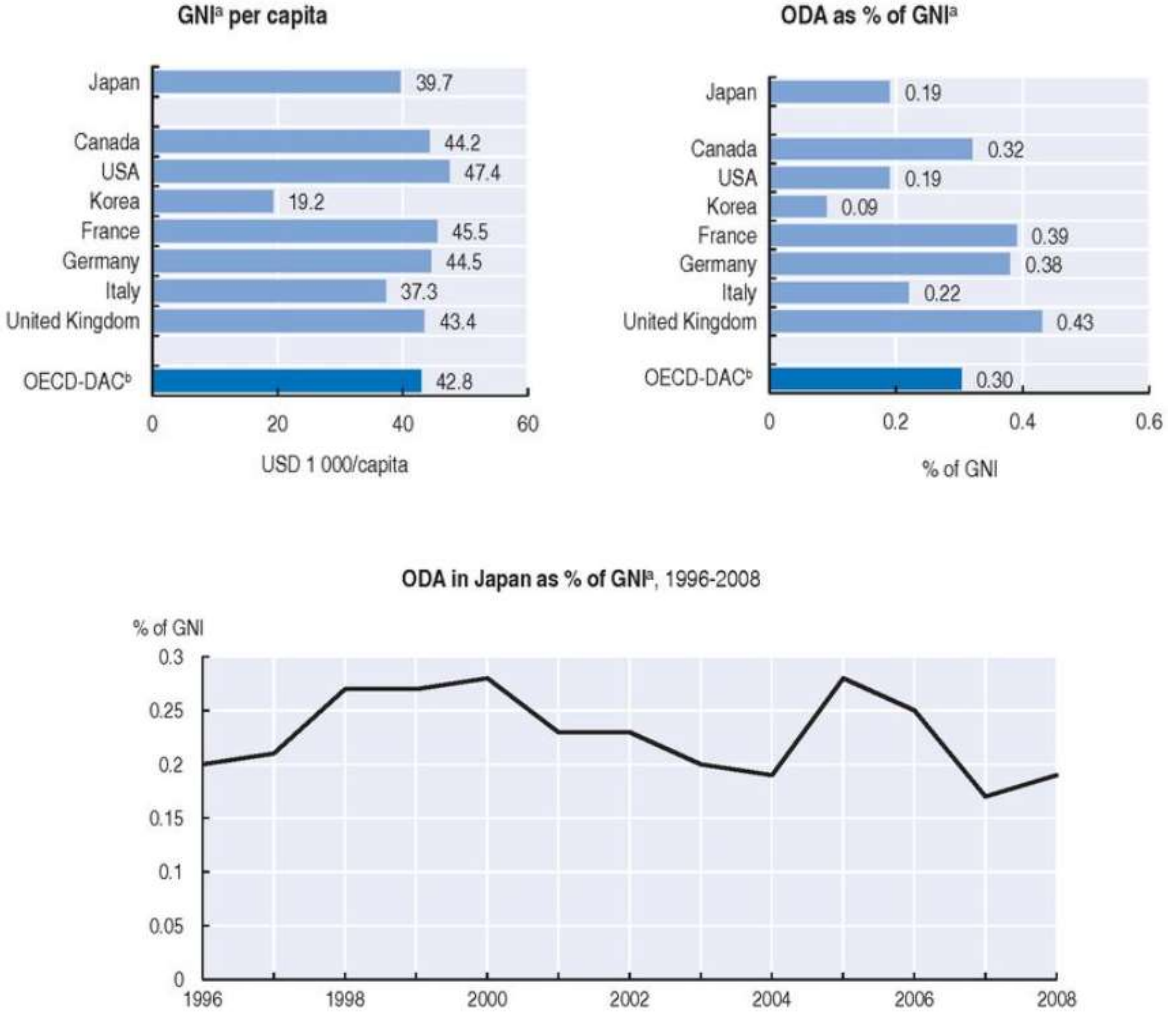
Japan's net *official development assistance* (ODA) was USD 9.58 billion[4] in 2008. While Japan remains the largest donor in a number of countries, it is one of the few OECD donor countries with declining ODA over the review period. From 2000 to 2008, the level of Japan's ODA fell from first to fifth place among OECD countries, representing only 0.19% of GNI, which is far from the UN target of 0.7%, and makes Japan one of the smallest donors using this measure (Figure 4.1).

The *structure of Japanese ODA*[5] in 2008 consisted of grants (44%), non-grant assistance, mostly loans (40%), and multilateral aid (16%). As for bilateral ODA, 66% went to Asian countries and 13% to Africa. China, Indonesia (Box 4.1), Iraq, Philippines and Viet Nam were the largest recipients.

A large share of Japan's bilateral ODA has environmental objectives.[6] According to Japan's reporting on the environment policy marker, in 2008 this share amounted to about USD 4.2 billion or about 30% of Japan's total ODA commitments.[7] Over 90% of this assistance is in the form of loans, with the remainder being bilateral grants (OECD, 2010a). Japan's environmental aid is in part provided under tied conditions. In particular, in 2002, Japan introduced the Special Terms for Economic Partnership (STEP) loans, which can be used for major infrastructure and environmental projects, and are tied to the procurement of Japanese technology, goods and services. Since lower interest rates and more concessional terms apply to STEP loans than to untied loans, partner countries can have an incentive to accept tied conditions. In 2008, STEP loans accounted for about 10% of loans disbursement (OECD, 2010a).

Overall, *Japan's environment-focused aid* increased during the review period (Figure 4.2).[8] However, aid activities strictly targeting the environmental sector *per se* represent a very low share.[9] Aid activities that have environment as a principal or significant policy objective have increased, although they do not necessarily target environmental sustainability in their entirety.[10] Some 70% of these activities include aid for social and economic infrastructure, mainly water supply and sanitation and transport infrastructure. Much of the environment-focused aid targets, directly or indirectly, the objectives of the 1992 *Rio conventions* on biological diversity, climate change and, to a lesser extent, desertification (Figure 4.2).

Figure 4.1. **Official development assistance, 2008**



a) Gross national income in USD at current exchange rates.
b) Member countries of the OECD Development Assistance Committee.

Source: OECD Development Assistance Committee.

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When allocating ODA, *JICA screens all development aid projects against potential environmental impacts* according to the "Guidelines for Environmental and Social Considerations". Projects are classified into four categories, according to their potential environmental impact. Related information is made available on the JICA website and the public is invited to submit comments on projects with potentially significant adverse environmental impacts. However, how opportunities and risks identified are followed up is not always clear. *Environmental impact assessment* (EIA) of aid projects is carried out by partner countries according to their own procedures. JICA provides technical support and reviews EIA reports submitted by partner

countries, although only a few projects have been abandoned due to negative EIA results (OECD, 2010a).

The Guidelines were revised in 2010. The revised guidelines include *strategic environmental assessment* (SEA), which will be conducted at an early stage of the planning process ("Master Plan Studies") but not for all development plans. Japan should continue to develop a more comprehensive approach to environmental screening of strategic interventions, building upon the OECD/Development Assistance Committee guidelines on SEA.

Box 4.1. **Bilateral environmental co-operation with Indonesia**

Japanese *ODA to Indonesia* represents roughly 50% of Japanese aid to ASEAN countries. The framework for co-operation with Indonesia was developed by the Ministry of Foreign Affairs, projects are being implemented by JICA, and much of this aid is focused on environmental issues.

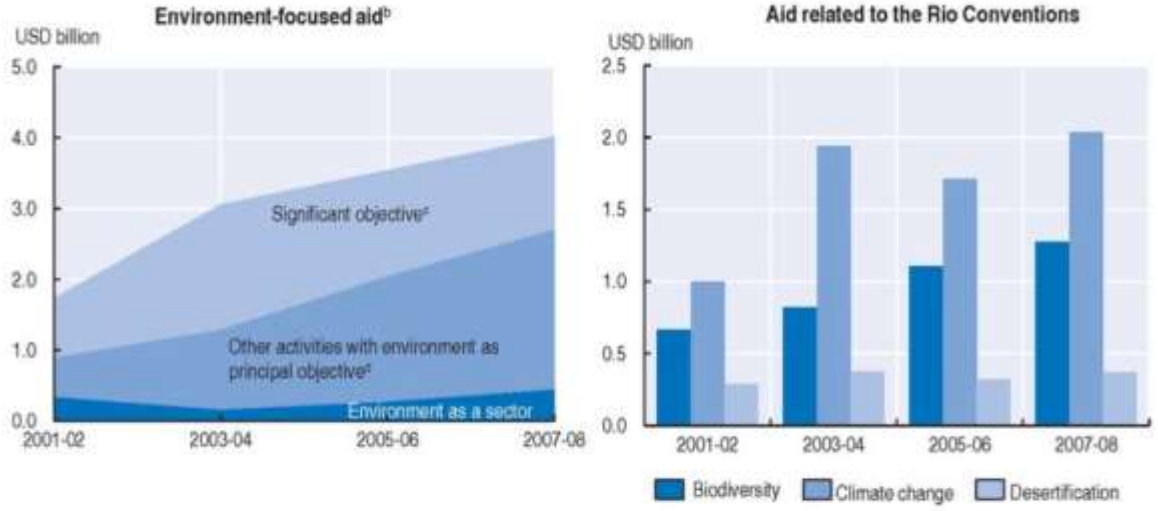
An action plan for co-operation in *combating illegal logging and trade in illegally logged timber and wood products* was signed in June 2003. As a result, Japan and Indonesia are working together to: *i)* monitor the state of forests and logging in Indonesia using satellite data; and *ii)* develop timber traceability technology using two-dimensional bar codes.

Since 2007, Japan has promoted the *co-benefits approach* to improve the environment and prevent climate change, while simultaneously benefiting the development process of partner countries. Two cities have been selected to implement model projects: a landfill in Banjarmasin (Borneo island) and a slaughter house in Palembang (Sumatera island). There are also plans to identify Clean Development Mechanism projects, another promising area for co-operation.

Currently, environmental co-operation is focused on: *i) capacity building* (improving the administrative abilities and institutional strength of national and local governments for natural resource and environmental management, and promoting environmental education); *ii)* establishing a system to *monitor atmospheric pollution and water contamination; iii)* improving the *urban environment* through measures targeted at urban slums; and *iv)* actions to repair damage from *natural disasters*.

Japan also provides *support for specific projects*, such as a project to strengthen management of the Gunung Halimun-Salak Park and the Programme on Mangrove Management. In addition, Japan is supporting a project to strengthen capacities to operate and maintain water infrastructures and implement comprehensive flood control, such as in the Citarum river basin. Furthermore, Japan provided support for the implementation of Indonesia's national action plan for climate change (including energy, forestry and water projects) through loans totalling USD 300 million in 2008 based on the Cool Earth Partnership approach, and USD 400 million in 2009 based on the Hatoyama Initiative (Chapter 5).

Figure 4.2. **Aid in support of the environment,[a] 2001-08**



a) Average commitments of bilateral ODA expressed at 2007 prices and exchange rates.
b) The coverage ratio for activities screened against the environment policy marker is 99% of total sector allocable aid.
c) Activities where environment is an important, but secondary, objective of the activity.
d) Activities where environment is an explicit objective of the activity and fundamental in its design.

Source: OECD, *Aid Activity Database* (Creditor Reporting System).

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Through the *Environmental Conservation Initiative for Sustainable Development* (EcoISD), which was launched at the World Summit on Sustainable Development (Johannesburg, 2002), Japan has committed itself to co-operation with developing countries (mainly through ODA) in implementing four action plans, namely on global warming, pollution control, freshwater issues and conservation of the natural environment. EcoISD has influenced Japanese environmental ODA for much of the last decade. Japanese bilateral environmental co-operation was given further impetus by framework statements and commitments at the highest level, such as the Water and Sanitation Broad Partnership Initiative, the Cool Earth Partnership Initiative and the Hatoyama Initiative on climate change (Chapter 5).

3. Environment and trade

3.1. The environment-trade interface

Japan is the *fourth largest trading country* in the world (after the US, China and Germany), with export revenues of USD 771 billion and imports of USD 698 billion in 2007. Its outward foreign direct investment (FDI) position was USD 680 billion in 2008, one of the largest FDI stocks among OECD countries. During the review period, China became Japan's major trading partner.

Japan has long been aware of the *environment-trade interface* and has co-operated actively with its partners within the frameworks of WTO, OECD, APEC and ASEAN to integrate trade and environment policies. A number of more specific environment-trade issues arise from MEAs. These include the 1989 Basel Convention on the transboundary movement of hazardous waste, together with the 1995 Basel Ban Amendment (Chapter 6); the 1998 Rotterdam Convention requiring prior informed consent for trade in certain dangerous chemicals; the 2004 Stockholm Convention, which promotes the phase-out of persistent organic compounds; the 1973 Washington Convention on International Trade in Endangered and Threatened Species of Wild Fauna and Flora (CITES); the 1985 Vienna Convention for the Protection of the Ozone Layer and its 1987 Montreal Protocol. In some cases, the implementation of these MEAs has generated concern over potential associated illegal trade.

3.2. Ozone depleting substances

In keeping with the 1987 Montreal Protocol, Japan phased out the production, import and export of chlorofluorocarbons (CFCs) in 1995. As recommended in the previous OECD EPR of Japan (2002), the country has increased *recovery of fluorocarbons* (CFCs, HCFCs, HFCs) contained in household, commercial and vehicle equipment (*e.g.* refrigerators, air conditioners) (Table 4.3). Recovery became mandatory in 2001 for domestic refrigerators and air conditioners, and in 2004 for freezers (Home Appliance Recycling Law); in 2002 for commercial refrigeration and air conditioning equipment (Fluorocarbons Recovery and Destruction Law); and in 2005 for motor vehicles air conditioners (Law for the Recycling of End-of-Life Vehicles). A revised version of the Fluorocarbon Recovery and Destruction Law came into force in October 2007. As of March 2008, there were 76 authorised destruction operators for commercial equipment in Japan.

Table 4.3. **Fluorocarbons recovery, 2001 and 2008**

Fluorocarbons recovery	2001 (tonnes)	2008 (tonnes)	2001-08 (% change)
Room air conditioner	467	1 167	*150*
Household refrigerators	136	299	*120*
Household freezers[a]	. .	557	. .
Refrigerators and air conditioners for commercial use	1 960	3 773	*93*
Automobile air conditioners	153	835	*446*

a) Added to Home Appliance Recycling Law in 2004.

Source: Association for Electric Home Appliances; Ministry of the Environment.

StatLink http://dx.doi.org/10.1787/888932319003

Both domestic and commercial users of equipment containing ozone depleting substances (ODS) are charged a *fee* at disposal time to cover the costs of recovery, transport and destruction of the fluorocarbons. As the fee may discourage people from turning in appliances for fluorocarbon recovery, and to some extent encourage illegal trade in these substances (*e.g.* CFC_{12}) in Japan or overseas, the effectiveness of this fee system should be reviewed, as should be the use of *sanctions* (Chapter 6).

Japan has been the second largest contributor to the *Multilateral Fund for the Implementation of the Montreal Protocol* since its creation in 1991. It contributed USD 88 million over 2006-08, or 22% of total contributions. It has been active, particularly in Asia, in assisting developing countries to phase out ODS, and in combating illegal trade of CFCs.

3.3. Chemicals

Japan recognises the high costs and time incurred when *testing chemicals* (Chapter 3). It has therefore actively supported international efforts to minimise costs by harmonising approaches for testing chemicals and sharing testing costs, especially for endocrine disrupters. Japan has also supported efforts to develop internationally-agreed methods that minimise or avoid the use of animals in chemicals testing. Harmonising testing methods and supporting the mutual acceptance of test data for the assessment of chemicals also contribute to avoiding non-tariff barriers to trade (OECD, 2010b).[13] Effective control of some chemicals can only be achieved through international co-operation.

Japan is also engaged in global and regional activities, especially with countries in the Asian region, where chemical production and use are increasing. Japan acceded to the *Stockholm Convention on Persistent Organic Pollutants* (POPs) in 2002. It has been the single

largest financial contributor among members and has regularly nominated experts to support the work of the technical bodies working under the Convention. In 2007, Japan was nominated as a member of the group conducting an effectiveness evaluation in the Asia-Pacific region. Japan acceded to the *Rotterdam Convention on the Prior Informed Consent Procedure* for certain hazardous chemicals and pesticides in international trade in 2004. In 2008, Japan contributed USD 448 102, 22% of the Convention's general trust fund for the operational budget, the single largest contribution. Japanese experts also participate in the technical bodies established under the Convention.

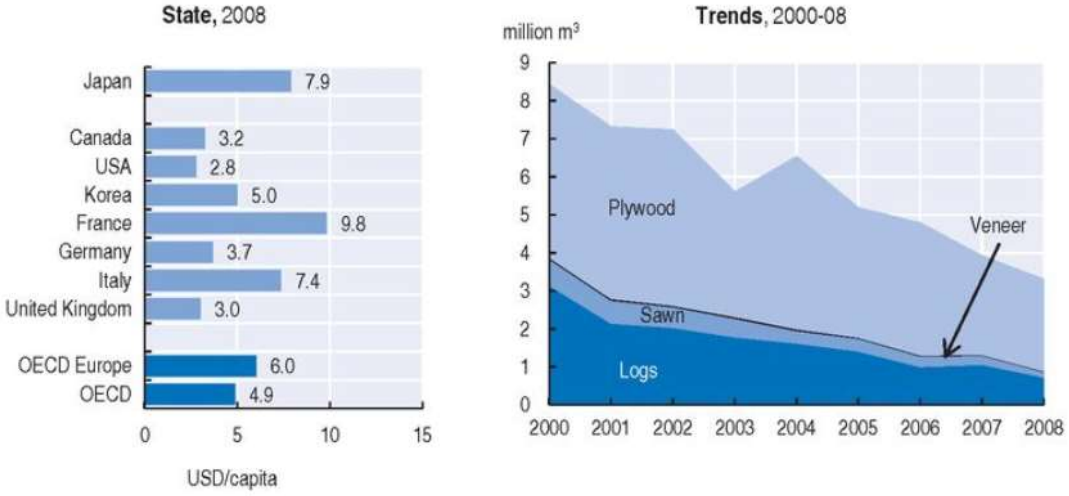
Japan served as the *Asia-Pacific regional focal point for the 2006 UNEP and WHO Strategic Approach to International Chemicals Management* (SAICM) from 2006 to 2009, and will be vice-chairing the International Conference on Chemicals Management until 2012. Japan has implemented bilateral co-operation projects with Thailand and Bhutan within the framework of the SAICM Quick Start Programme. It has also taken the lead in developing POPs monitoring in East Asia and has introduced chemicals management into the *Tripartite Environmental Ministerial Meetings with China and Korea*.

3.4. Forest products

In 2008, Japan accounted for some 8% of the volume of timber imports worldwide (*versus* 40% for the EU, and 16% for both China and the US). Its share of world *imports of tropical timber* was 12% (*versus* 17% for the EU, 33% for China, and 6% for the US), and it remains the world's largest importer of tropical plywood. Yet, between 2000 and 2008, Japan's imports of tropical timber decreased by 60%. This decline is linked to the contraction of the

Japanese economy, competition with China for log supply, and substitution of tropical hardwood logs by softwood in plywood manufacturing (Figure 4.3). Most of the tropical timber imported by Japan comes from Indonesia, Malaysia, Papua New Guinea and Africa (mainly Gabon and Cameroon).

Figure 4.3. **Tropical wood imports, 2000-08**



Source: OECD, Environment Directorate; International Tropical Timber Organization.

In line with the recommendation from the previous OECD EPR (2002), Japanese authorities have been actively *tackling illegal logging and trade in illegal timber*, which are serious global concerns. To combat illegal logging, Japan has included in its bilateral co-operation and ODA the surveillance of forest condition and deforestation using satellite

images and traceability (labelling and certification), for instance with Indonesia (Box 4.1). In its regional co-operation, Japan has promoted the development of standards for legality and a timber tracking system as part of the Asia Forest Partnership (AFP). Japan has hosted and supported the International Tropical Timber Organization (ITTO) and its projects for monitoring illegal timber trade. In addition, Japan has included action against illegal logging in its various climate initiatives.

Japan introduced the verification of legality of harvested timber and derived wood products (*e.g.* paper) in its *public procurement policy* in 2006. The Forestry Agency has drawn up guidelines for authorised suppliers and certifies wood imports. However, sustainable management of the forests of origin is a desirable, but not mandatory, feature of procured wood items (IGES, 2007). A large share of wood imports still originates from uncertified forests, partly because forest certification systems are not yet well recognised in Japan (MOE, 2009). Japan should provide an operational definition of sustainable forest management (SFM) in line with the international consensus on SFM criteria. Further advances will require further co-operation from both timber producing and timber consuming countries and particularly from important players, including the Russian Federation, China and Southeast Asian countries.

3.5. Trade in endangered and threatened species of wild fauna and flora

Japan is a party to the 1973 *Convention on International Trade in Endangered and Threatened Species of Wild Fauna and Flora* (CITES) and its Bonn Amendment (1979), but not to its Gaborone Amendment (1983). The Ministry of Economy, Trade and Industry (METI) is Japan's CITES management authority, except for "introductions from the sea", which are under the responsibility of the Fisheries Agency. METI co-ordinates the *CITES Enforcement Unit*, established in 2000, which includes the Customs Office, the National Police Agency and other CITES authorities.[14]

Efforts have been made over the review period to enhance public awareness and education, species protection, monitoring and enforcement. Close to 1 000 export CITES documents and 3 000 re-export CITES documents were issued in 2005-06, although the number of denials is unknown. NGOs have continued to play a significant role in reporting on illegal trafficking of wildlife and wildlife products. Japan is the second largest contributor to the Convention; in 2010, it also contributed USD 60 000 to the international Monitoring of Illegal Killing of Elephants (MIKE) project.

However, Japan is the *world's second largest import market for wildlife products*, including those linked to traditional medicine (OECD, 2002). Reports continue to document *illegal trafficking*. While the number of seized CITES specimen decreased from 2 382 in the biennium 2005-06 to 1 612 in 2007-08, criminal prosecutions or notifications (for violation of legislation regulating both internal and international trade) grew from 18 to 32 during the same period.[15] There is a need for improved surveillance and for enhanced public education.

4.2. Fisheries management

In 2007, Japan produced about five million tonnes of fish (including from marine fisheries, inland-water fisheries and aquaculture). About 80% were taken from the marine environment (coastal waters and high seas). Japan accounts for some 5% of *fish catches* worldwide (ranking second among OECD countries), and its fish catches per capita are well above the OECD average (Figure 4.4). With its imports of 3.5 million tonnes of fish per year, mostly from China, Japan is the world's leading importer of fish.

However, *the sector is declining* in Japan: fisheries production has decreased by nearly 17% since 2000. Fishers and fishing vessels are decreasing in numbers. Falling production is partly due to declining stocks in adjacent areas, as well as fewer and older fishers (OECD, 2009b). Nevertheless, fisheries still have high economic and social importance in Japan, particularly in coastal areas, where they are a major source of employment. There are about 2 900 fishing ports in Japan. The decline and vulnerability of fish and other marine resources are thus major and growing socio-economic concerns. *Japanese fisheries policy* is based on fishing effort regulations to secure both a stable supply of fishery products, and a sound development of the fishing industry with appropriate conservation of living marine resources (Chapter 7).

The resource-rich *Northwest Pacific region* is among the most heavily fished waters of the world. It contributes over 20 million tonnes of fish, or over 25% of world marine catches, per year (FAO, 2009). Japan is a party to bilateral mutual fishing access agreements with the governments of the Russian Federation (since 1984), China (new agreement since 2000), and Korea (new agreement since 1999). However, there are no region-wide agreements bringing together all fishing countries of the region, as recommended by OECD. Japan has been co-operating with countries in the region to introduce a regional fisheries management framework, and participates in other regional management regimes.[17]

Much of the fish resources consumed in Japan come from the *Economic Exclusive Zones (EEZs) of developing countries*. Some of these resources are imported and some are fished by Japanese vessels under bilateral agreements. Japan thus has a special responsibility in supporting developing countries' efforts to strengthen their fishery management. Japan continues to take measures against illegal, unreported and unregulated fishing, especially of tuna (OECD, 2002). In 2003, it started a new global trade monitoring and control system under which only tuna products from large-scale tuna longline vessels listed in positive lists are permitted to enter the country. Japan further strengthened its international co-operation in conservation and management of tuna and tuna-like species by ratifying, in 2005, the Western and Central Pacific Fisheries Commission (WCPFC) and, in 2006, the UN Agreement for the Implementation of the Provisions of the UNCLOS relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.

5.2. *Market-based approach*

Emissions trading

In 2005, *Japan's voluntary emissions trading scheme* (JVETS) was launched to gain experience in emissions trading. As of 2009, 303 companies participated in the programme, although they accounted for less than 1% of industrial CO_2 emissions. Participants in the JVETS voluntarily pledge to reduce emissions relative to their average in the previous three years. One-third of the abatement costs are borne by the government; this subsidy is returned if the target is not achieved, although no other penalty applies. To meet their targets, firms can either cut their emissions or purchase allowances from firms that have exceeded their targets, as well as credits from the Kyoto mechanisms. Targets have always been exceeded so far and the number of transactions has been modest. In 2008, companies achieved a 23% reduction in emissions from baseline levels, which was much higher than the committed 8%, and traded allowances at around JPY 800/tCO_2, compared to an average price of JPY 1 200/tCO_2 in the previous two years. The budget to operate the JVETS and subsidise participants has been between JPY 1.8 and 3 billion per year.

A *voluntary domestic credit scheme* was introduced in 2008, with the aim of reducing GHG emissions from small and medium-sized enterprises (SMEs). Under this scheme, large companies that finance emission reduction projects in SMEs can acquire credits certified as emission reductions in their joint project. These credits can then be used to meet the large companies' targets under the VAP.

In October 2008, the government launched a *trial emissions trading system* (ETS), involving 715 firms and covering more than two-thirds of industrial CO_2 emissions. Many ETS participants also take part in the VAP and set their reduction targets accordingly.[13] However, the trial ETS does not require participants to set a cap on emissions and no fine is issued in case of non-compliance. Participants receive for free an allocation of permits, equal to their baseline emissions net of their own reduction commitment. They can use emission credits acquired through the Kyoto mechanisms and the domestic credit scheme. It is too early to assess the effectiveness of the system.

These emissions trading experiences are a positive step forward, since they imply a *price signal for GHG emissions*, although the signal is still relatively weak. This voluntary approach reflects concerns of the business community about the potential negative impacts of mandatory emission caps on competitiveness. Japan needs to follow up on its plan to introduce a mandatory ETS at the earliest opportunity, with a view to achieving the announced mid- and long-term targets. A mandatory cap-and-trade system, which sets the overall desired level of emissions, would minimise abatement costs, create a clear and credible price signal for investment decisions and promote innovation. The possibility of banking permits (*i.e.* carrying over permits that are not used in the trading period in which

they are issued) would help limit uncertainty and price volatility. Auctioning would provide revenues to help fiscal consolidation (OECD, 2009a). To take account of acceptability issues, auctioning could be gradually introduced, aiming at full auctioning in the mid-term. The ETS should ideally cover the entire economy, including transport. A mandatory ETS could also be linked to such systems implemented in other countries, namely in the EU, thus reducing the overall cost of meeting the targets and lowering carbon prices (OECD, 2009b).[14] The 2010 bill of the Basic Act on Global Warming Countermeasures foresees establishing a mandatory ETS. A *mandatory cap-and-trade system is set to become operational in Tokyo in 2011*, covering around 40% of total emissions from the commercial and industrial sectors in the metropolitan area (Box 5.3).

Carbon taxation

The government has been discussing the *introduction of a carbon tax* for several years. In 2009, MOE proposed a tax of JPY 1 064 (USD 10) per tonne of CO_2 on fossil fuels, including transport fuels. Relief measures for specific industries would be considered, such as exempting coal for steel manufacturing and compensating large emitters. Such sectoral exemptions would create uneven abatement incentives across sectors and a loss of efficiency. Therefore, they should be transitional. Japan plans to introduce the carbon tax as part of the *comprehensive tax reform scheduled for 2011*. This would provide opportunities to raise additional revenues that can help fiscal consolidation, or partially or fully shift the tax burden from more distortionary taxes on businesses and labour (Chapter 2).

Box 5.3. **The Tokyo Metropolitan Emissions Trading Scheme**

Tokyo is one of the biggest cities in the world with 13 million population and USD 815 billion of GDP in 2006. It functions as Japan's political, economical and cultural centre, attracting people, companies and government institutions. This has resulted in *large CO_2 emissions* (56 Mt), which are comparable to those of a country like Norway, for example. The top contributor to CO_2 emissions is the commercial sector (21 Mt), followed by transportation (15 Mt) and households (14 Mt). Emissions from transport decreased by 16.5% in the 2000-07 period, whereas those from the commercial sector increased by 9%. The Tokyo Metropolitan Government (TMG) is committed to *reducing GHG emissions in the Tokyo area by 25% from the 2000 levels by 2020*. This target is shared among sectors, with larger cuts required in the transport (–40%) and residential (–20%) sectors, and a 10% cut in the business sector.

To tackle emissions from the public sector, TMG has implemented a *reporting system*. The system is based on the approval of five-year emission reduction plans at the government agency or institution level, mid-term reporting and final reporting. Successful government institutions receive an award. The system can be implemented relatively easily since fewer than 1% of these institutions in the metropolitan area emit approximately 40% of total CO_2.

TMG launched its metropolitan *cap-and-trade system* in April 2010. This set emission caps on some 1 400 buildings and commercial activities, with the aim of decreasing emissions by 6% in 2010-14 and 17% in 2015-19 from the base level (average of continuous three years in 2002-07 period). This is quite unique compared to other emissions trading systems (ETSs), which usually target the industrial sector. Participants in the ETS have several options to achieve their targets; for example, they can offset their emissions by reducing emissions from large sources outside of the Tokyo metropolitan area. Trading is set to begin in 2011.

According to the *opinion poll* conducted by the Tokyo Chamber of Commerce and Industry in May 2008, around 90% of firms acknowledged the importance of measures to combat climate change. About 60% declared that they expected an increase in economic costs from the implementation of the ETS, although only 4% opposed the introduction of the ETS and some requested relief measures to be included in the system.

TMG became a member of the *International Carbon Action Partnership* (ICAP) in May 2009, and presented its system as a model for low carbon metropolitan areas. In an effort to reinforce co-operation with neighbouring prefectures, TMG has launched a number of initiatives (*e.g.* workshops) in which 80% of prefectures and large cities have participated.

The private sector

Following a declaration of intent on nature conservation in 2003, the *Japan Business Federation* (Keidanren) released, in March 2009, its "declaration on biodiversity". The overall objective is to establish a corporate management vision for dealing with biodiversity concerns. More specifically, Keidaren encourages its members to:

- Assess the impacts of their planned activities on biodiversity, both at home and abroad.
- Consider biodiversity trading or off-setting measures, as appropriate.
- Engage in biodiversity programmes not directly linked to the operations of the company; and promote biodiversity-friendly technology.

Agricultural policy and biodiversity conservation

In 2007, Japan introduced an agricultural support scheme designed to promote more *environmentally friendly farming*. The scheme applies to five crops plus rice. To be eligible, producers have to be certified (by governors) as "eco-farmers". This involves reducing the use of chemical fertilisers and pesticides by half compared to conventional farming. The number of eco-farmers has rapidly increased, from 12 in 2000 to 186 000 in 2008 (or 10% of commercial farms), and Japan is on track for meeting the target set by the 3rd biodiversity strategy (200 000 eco-farmers). Such rapid enrolment in the scheme would not have been possible without (sufficient) incentives in the form of interest concessions and payments (by prefectures). Further expanding the scheme would require additional budgetary support, which was JPY 3 billion (about USD 30 million) a year in 2007 and 2008. *Payments for environmentally friendly farming* account for only 0.5% of total payments to farmers, a very low share compared with agri-environmental payments in the EU and the US.

The government is increasingly reducing its involvement in the price formation of agricultural products. Overall, there has been a *reduction in the level of support to producers*: the percentage Producer Support Estimate (% PSE) of Japan decreased from 58% in 2000-02 to 49% in 2006-08. However, *many production incentives remain* that have the potential to distort commodity production, and thereby make farmers more likely to take decisions based on production rather than environmental criteria. The level of producer support, as measured by the % PSE, is still almost twice the OECD average (Chapter 2). Further efforts are needed to reduce the high level of support to farmers and increase market access, while moving towards more decoupled policies that are better targeted to farm income, rural development, and environmental objectives (OECD, 2009a).

Direct payments to farmers in mountainous and hilly areas were introduced by MAFF in 2000 to lower the rate of farmland abandonment. Targeting agricultural areas that bring the greatest environmental benefits with policies aimed at securing those benefits will work better than policies affecting the agricultural sector more broadly (OECD, 2009b). To make the Satoyama Initiative a successful one, Japan should consider introducing *payments targeted to satoyama services*. This may help to achieve the first objective of the MAFF 2007 biodiversity strategy, namely conservation of the rural environment and satoyama.

Environmental performance of agriculture

MAFF is developing indicators to measure biodiversity in agriculture, an objective of the 2007 MAFF biodiversity strategy. A key agri-environmental challenge in Japan is strengthening the sector's capacity to provide *ecosystem and biodiversity services* in a context of abandonment of agricultural land. Many common species in agricultural landscapes (freshwater fish, insects, amphibians, paddy weeds, grassland plants) are now listed on national and prefectural red lists, suggesting that the biodiversity of agricultural

landscapes is increasingly under threat (Washitani, 2008).

The intensity of pesticide use in Japan remains very high by OECD standards (Chapter 3). *Organic farming* techniques have yet to be adopted, for which MAFF has established demonstration farms at a budgetary cost of JPY 4.4 billion (USD 47 million). It is expected that by 2011 all prefectures and half of the municipalities will have launched promotional plans for organic farming; 14 prefectures have already done so. Organic products currently account for only 0.2% of agricultural production (in volume).

4.2. Forestry

Forests play a key role in shaping Japan's nature and biodiversity as they cover *two-thirds of Japan's land area* (25 million ha). The area covered by forests has remained constant over time. The multifunctional role of forests is well rooted in public perception, and environmental functions have largely taken precedence over economic functions (*i.e.* wood production) in successive opinion polls (Table 7.3) Carbon sequestration has become the top forest management priority for the Japanese government. Disaster prevention, particularly protection against flooding, and headwater conservation are still fairly highly ranked forest functions, while social functions (*i.e.* recreation) rank in the middle.

Between 2000 and 2008, the forest areas designated as *protection forests* increased from nine million to nearly 12 million ha. Restrictions on forestry activities in these areas vary according to the services they are expected to fulfil: water resource conservation, erosion control, or public health and recreation. The conversion of these forests to other land uses is

strictly controlled, and permission from MAFF is required. *Intensity of forest use* is very low in Japan, with only about one-third of the annual growth harvested, mainly because of difficult access to forest areas.

The *river basin approach* provides a context for sustainable forest management, since well-maintained forests have a key role in preventing landslides and flooding, and in protecting headwater quality. In particular, the river basin approach permits links between upstream and downstream communities, so that mechanisms for compensation and equitable sharing of benefits and burdens can be developed.

Progress has been made to achieve the 2007 MAFF biodiversity strategy objective of *improving forest conservation through appropriate thinning*. For example, in Kyoto prefecture (where forests cover 75% of the land) enhanced thinning has been pursued to increase timber productivity (less competition among trees) and carbon sequestration, but also to support biodiversity (more light on the underground). The thinned wood is then used for biomass production. This type of forest management is certified under the "Miyako Somagi" forest certification system. In addition, Kyoto prefecture encourages more intense forest use, for example by subsidising the use of local timber to build local houses.

However, the share of conifer plantations (primarily Japanese cedar) has increased at the expense of *natural forests* and now accounts for 47% of the total forest area in Japan. MAFF is developing indicators to measure biodiversity in relation to forestry, which is an objective of the 2007 MAFF biodiversity strategy.

Some 781 000 ha (or around 10%) of national forests are protected by MAFF as *ecosystem reserves*. The goal of such reserves is to preserve primeval forests of substantial size and particular forest types, with a view to protecting biodiversity and ecosystems, preserving genetic resources and contributing to research.

4.3. Fisheries

Measures have been taken to enhance the *protection of living marine resources*. The capture of sea turtles (two species), whales (blue whale, bowhead whale and finless porpoise) and dugongs has been banned. Studies and field research have been carried out to investigate the ecology, stock and migration of blue whales. Also, efforts have been made to eradicate invasive alien fish species, and by-catch prevention technologies have been developed. However, among the various types of marine protected areas, the extent of *marine areas strictly protected* from any human activity has remained extremely small. Efforts are underway to define the

various types of marine protected areas as indicated by the 2007 Basic Act on Ocean Policy. The 2009 amendment to the Nature Parks Law and Nature Conservation Law stresses the importance of biodiversity conservation in marine areas. As part of its biodiversity strategy, MAFF is developing indicators to measure biodiversity in relation to fisheries.

Japan manages its fisheries through *fishing effort regulation*. Japan's Total Allowable Catch (TAC) systems currently cover 30% of total fishing in Japan's Exclusive Economic Zone (EEZ). Introduced in 2003, the Total Allowable Effort (TAE) sets an upper limit on the number of fishing days and the number of operating vessels in a specific area within the EEZ. For offshore fisheries, a license (per vessel) specifies detailed terms and conditions for the major fishery operations, including limitations on fishing areas, fishing seasons, base port, gear use and fishing methods. This "fishery licensing system" coexists with the TAC and TAE schemes. Moreover, the government maintains a "fishery vessel registration system", and the total number and the total gross tonnage of fishing vessels are closely monitored (OECD, 2009c).

Resource Recovery Plans are being implemented to rebuild the stocks of 74 fish species. A key component of these plans is to *preserve and rehabilitate fishing grounds* (*e.g.* sea grass beds, tidal flats). *Fishery management in coastal areas* is based on traditional local fishery rights, and could serve as a model for other OECD countries. Groups of fishermen (fishery co-operative associations) traditionally have exclusive rights for operating certain fisheries, and thus assume all responsibility for ensuring the long-term sustainability of the resources. Also, interest concessions are granted for the renewal of small fishing boats in an effort to perpetuate Japanese coastal fisheries.

5. Expenditure on nature conservation

5.1. *Public expenditure*

Little has been done since the 2002 OECD EPR to improve financing of nature conservation. In 2009, MOE was allocated JPY 16 billion (USD 170 million) from the *central budget* for its nature management activities. The same amount was allocated to nature protection by the Ministry of Education, Culture, Sports, Science and Technology.[22] Significantly more was allocated to nature protection by MAFF and MLIT. However, this represents a very minor part of the annual budgetary transfers to farmers and to MLIT water resource development plans, the latter being primarily used for building dams, canals and reservoirs. In 2009, nature management accounted for 7% of the total budgetary transfers to MOE, and for 12% of the total budgetary transfers to all ministries for environmental management.

Despite "society in harmony with nature" being one of the three pillars of Japan's 2007 Strategy for a Sustainable Society,[23] the JPY 15.4 trillion (USD 165 billion) government contribution to the *policy package to address the economic crisis*, released in April 2009, does not include support specifically intended for nature management.[24] In contrast, some 10% of this package (USD 16.7 billion) is devoted to further supporting the farming and tourism sectors. In September 2009, the new government announced its intent to *increase support to farmers* to JPY 1 trillion (over USD 10 billion) by 2013, a 50% increase over the current level of direct payments. This contrasts with the OECD recommendation to reduce the (already) high level of support to Japanese agriculture (OECD, 2009a). At a minimum, environmental cross compliance requirements should be attached to such support, which should not further distort agricultural production and trade; ideally, such support should also be linked to otherwise unremunerated but beneficial public services, such as environmental and biodiversity protection.

5.2. *Financing*

There is no *entry fee for national parks* but a service fee is sometimes charged for visitors' information centres (when these are managed by the private sector or a municipality). Parking fees are sometimes charged, in which case the revenues are used to clean up the park. An access fee (JPY 1 000) is charged for regulated utilisation areas. In *Okinawa*, a service fee for scuba diving has made it possible to raise money to fund nature protection projects. Such financing instruments could be introduced on other islands and applied to eco-tourism.

Thirty (out of 47) prefectures levy a *forestry protection tax* aimed at complementing allocations from the central budget for forest management and conservation activities. In most cases, a surtax is added for the management and conservation of regional forests, including the protection of headwaters critical to the water supply. In addition, in some prefectures, private companies, organisations and individuals living adjacent to downstream rivers may contribute to a fund for afforestation and thinning in upstream forests in exchange of tax breaks.

In 2009, Yokohama City began collecting a new tax, the *Yokohama greenery tax*, which will be applied for an initial 5-year period. The tax rate is JPY 900 (USD 10) per household and per semester. It will raise JPY 2.4 billion (USD 26 million) per year, which represents 15% of the central budget's annual allocation for MOE's nature management activities. Yokohama is the first (and so far only) city in Japan that applies such a greenery tax. The greenery tax rate should be differentiated based on the increase in property value, with houses close to new green spaces paying more than others.

In 2007, the Tokyo Metropolitan Government (TMG) established the *Fund for Green Tokyo*. Donators are eligible for income or individual inhabitant tax breaks. They can select the type of project their donation should be used for (*e.g.* roadside trees, planting grass in schoolyards).

There is scope to further develop *payment for ecosystem services* in Japan (Box 7.2). For example, private landowners could be compensated for the provision of well-defined and monitored biodiversity services, including in protected areas. This could prove a more cost-effective means of protecting biodiversity than relying on the public budget to finance additional MOE staff. Similarly, there is scope to increase or introduce fees for accessing environmental resources, for example in pristine coastal areas and protected areas.

Box 7.2. **Paying for ecosystem services: The Yodo River**

One example of a scheme involving payments for ecological services involves upstream and downstream communities on the Yodo River. It shows how mechanisms for compensation and equitable sharing of benefits and burdens can be developed. For 30-40 years Osaka prefecture has paid Shiga prefecture a cumulative amount of JPY 50 billion (about USD 530 million) for sustainable forest management around Lake Biwa as part of MLIT's Yodo River water resource development plan and the Lake Biwa comprehensive development plan.* The aim is to protect Lake Biwa (located in Shiga prefecture), which is the source of the Yodo River that supplies drinking water to Osaka prefecture and Osaka City. Effectively the downstream community is paying the upstream community to maintain its source of water supply. Such payments for ecosystem services could be extended to other river basins, based on a cost-effectiveness analysis of meeting the desired objectives (*e.g.* protect the city's water supply sources from pollution).

* The Lake Biwa comprehensive development plan is co-ordinated between MOE, MAFF and MLIT (through their regional offices in Kinki).