

Box 2.4 Compensation payments in river basin management

The titles of each of all four river basin laws adopted between 1999 and 2002 for the Han, Geum, Nakdong and Yeongsan rivers refer to both water management and community support. “Community support” refers to an innovative Korean approach to river basin management, the collection of *revenue from downstream users* of the water to compensate upstream residents for losses due to land-use regulations imposed to protect water quality downstream.

The *principle of compensation* of citizens on a continuing basis for actual harm, loss of economic opportunity, constraints on property rights, or some other reason already existed in Korea. It is applied, for example, for people living close to large water supply/hydropower reservoirs and for people living close to energy and waste facilities (*Law for the Support of Areas Neighbouring Power Plants*, Act on the Promotion of Waste Disposal Facilities and Support for Surrounding Areas).

The basin laws created a *Watershed Management Fund* financed by a system of *water use charges*. The charges (KRW 120-140 per cubic metre) are paid by consumers receiving water from a public water supply system; in 2004, they yielded a total of KRW 617 billion (EUR 470 million) in the four basins. Roughly 60% of this revenue was used on infrastructure and other water quality improvement projects, 20% on land acquisition such as purchasing of riparian buffer zones, and 20% on community support programmes.

The four basin laws stipulate for what purposes money from the Watershed Management Fund can be allocated to communities and individual residents. Assistance to communities may include the building of, for example, a community water supply, a community hall or a swimming pool. Support to individuals may be in the form of education grants or money for home improvements. Actual spending decisions are made by the *Watershed Management Committees* established in each basin.

Box 2.5 Voluntary approaches *versus* regulation: the case of the Daepo River

The Daepo River is a 9 km-long stream flowing into the Nakdong River just upstream of the Mulguem reservoir, which is a drinking water source for Busan, Korea's largest port. Until the early 1970s, the Daepo could still be used as a source of potable water without treatment. From then on, water quality became increasingly impaired due to *waste water discharges* from: 10 villages (4 300 people), 500 small factories, livestock enterprises (30 000 pigs), and 100 restaurants (all located in the Daepo catchment). By 1997, *BOD levels* exceeded 4.5 mg/litre and the river did not even meet Class III water quality criteria.

In February 1997, the local authority of Sangdong Township in Gimhae City drew up a water management plan and announced its *intention to designate the area as a water source protection area* in order to protect the water quality of the Mulguem Reservoir. The plan prompted protests from local residents who feared the regulations would stifle their economic opportunities. As the authorities explained the objectives of the plan, however, a consensus emerged that improving the water quality of the Daepo would benefit the local population as well as the citizens of Busan. There was also an agreement that if local residents could revive the river, they could ask the government to reconsider its designation.

As a result, the *residents formed a "task force for water quality improvement"* and launched a drive to voluntarily clean up the river. Each household contributed KRW 2 000-3 000 every month to raise a KRW 30 million fund. Women's associations in each village organised campaigns to save water (including a ban on washing cars at home) and to reduce the use of detergents. The Gimhae city council

installed settling tanks for every household and restaurant so as to prevent food wastes from running into the river. The task force appointed two paid monitors as well as three river watchdog groups (18 persons in total) for each watershed who patrolled day and night to *prevent illegal discharges from livestock enterprises and factories*. Livestock enterprises installed pre-treatment facilities and began sending remaining waste to animal waste treatment plants. The task force also mechanically cleaned up the river and removed livestock wastes deposited on the riverbed. Weekly clean-ups were organised in areas around enterprises located close to the river. Artificial wetlands were planted with parsley dropwort to filter domestic waste water outflows before effluents reached the river.

Within a year, these efforts managed to improve the *water quality of the Daepho to Class I* (in terms of BOD). The previously cloudy water turned clear, enabling crayfish, endangered shellfish and other fish to return. The task force continued its efforts and, when visiting the area in November 1999, the Minister of Environment pledged to put off the water source protection area designation as long as the water quality in the Daepho continues to be better than that of the main river, the Nakdong.

The arrangement was formalised in April 2002 when, for the first time in Korea, Sangdong residents (i.e. chief of the township, the task force, housewives, civil society, enterprises), the Minister, the provincial Governor and the Mayor of Gimhae

entered into a *voluntary agreement* in which, among other things, residents made a commitment to *maintain Class I water quality in the Daepho* in return for the government's agreeing to defer the designation of water source protection area and implementation of the TPLM System. The local residents plan to continue and expand their efforts. Sangdong township is aiming to become, by 2010, an "environmentally friendly agricultural district" where the use of agricultural chemicals is minimal and livestock waste is used as liquid or solid fertiliser. To maintain interest, a festival and academic event are staged every year.

5. Expenditure and Financing

5.1 PAC expenditure on air, water and waste

Pollution abatement and control (PAC) expenditure for air, water and waste management (i.e. public and private, investment and operating expenditure) was maintained at a robust level during the review period, despite some fluctuations. In 2003, expenditure amounted to KRW 12 122 billion (EUR 9.25 billion), or almost 1.7% of GDP.¹⁵ The public and private sectors were responsible for, respectively, 42% and 58% of the above expenditure. Of the amount invested in infrastructure, the respective shares for air, water and waste were 20, 61 and 19% (Chapter 4).

Expenditure on *air management* (including climate) amounted to KRW 2 388 billion (of which KRW 1 041 billion investment), or 20% of the above PAC expenditure in 2003 (0.34% of GDP). As could be expected, the bulk (97%) was paid by the private sector.

Expenditure on *sewerage and waste water treatment* amounted to KRW 5 647 billion (of which KRW 3 275 billion investment), or 47% of the above PAC expenditure in 2003 (0.84% of GDP). Public expenditure represented 53% of the total. Just over half of the investment was in treatment plants and the remainder was for the construction and rehabilitation of sewerage networks. Public investment and operating expenditure for water pollution control (i.e. sewerage and sewage treatment) averaged 0.4% of GDP during 1997-2004 (Table 2.13). In the *next five years*, the government expects to spend *KRW 1.4 trillion* (just over EUR 1 billion) annually on *waste water infrastructure*, while gradually shifting the emphasis from building new treatment capacity to upgrading sewerage networks (from 65:35 in 2004 to 30:70 in 2010).

Expenditure on *waste management* amounted to KRW 4 087 billion (of which KRW 1 014 billion investment), or 34% of the above PAC expenditure in 2003 (0.52% of GDP). Both investment and operating expenditure were fairly evenly divided between the public and private sectors.

Table 2.13 **Annual expenditure by central and local government for sewerage and sewage treatment, 1997-2004**

(KRW billion, current prices)

		1997-2004	1997	1998	1999	2000	2001	2002	2003	2004
Central	Sewerage networks	2 983	203	201	204	283	363	505	557	508
	Treatment plants	6 649	586	638	646	825	928	1 015	1 077	932
	Sub-total central govt.	9 633	789	840	851	1 108	1 292	1 520	1 634	1 440
Local ^{a)}	Sewerage networks	4 407	417	543	595	624	487	591	737	410
	Treatment plants	4 038	367	380	328	489	578	660	675	557
	Sub-total local govt.	8 445	784	924	924	1 113	1 065	1 251	1 413	968
Total	Sewerage networks	7 391	656	768	821	957	905	1 068	1 294	918
	Treatment plants	10 687	953	1 019	974	1 314	1 507	1 675	1 752	1 490
	Overall total	18 079	1 609	1 787	1 796	2 272	2 413	2 743	3 047	2 409
	as a % of GDP		0.36	0.40	0.37	0.44	0.44	0.46	0.42	0.31

a) Includes a private investment of KRW 595.2 by concessionary private companies.

Source: MoE.¹⁶

5.2 Financing and pricing environmental services

Financing

Concerning *water supply* run by municipalities, revenue from water tariffs covered an increasing share of production costs, rising from 69.4 to 89.3% between 1997 and 2003. For multi-regional water supply systems, where water is supplied from large reservoirs by the Korea Water Resources Corporation, *full cost recovery* was achieved by 2004.

This is not the case for *sewerage and sewage treatment*, where revenue from tariffs (usually a fixed part of the water supply tariffs) falls short of actual total investment and operating cost. Over 1997-2004, the central government paid 53% of the total investment cost for sewage treatment, using proceeds from the national liquor tax (Box 2.7).

In the *waste management sector*, the relative contribution of user fees to management costs remains low. Revenue from the VBWF represented 43%¹⁷ of the actual cost of disposal in 2003. The revenue collected from the waste treatment fee is

Box 2.7 Using the liquor tax to finance environmental infrastructure

Since 1992, Korea has used the revenue from the national liquor tax to operate a *local development programme*: revenue is earmarked for several purposes including road maintenance (8.1%), rural community development (14.1%), water pollution prevention (46.6%), youth advocacy (1.2%) and regional development (30%).

From the year 2000, at least *KRW 1 trillion* (EUR 760 million) annually has been allocated to *financing environmental infrastructure*. MoE administers this funding, which is apportioned according to the size and need of local governments. Metropolitan areas receive a 10% subsidy, cities 50% and counties 70%. Of the *KRW 3.7 trillion* spent during 2001-03, 57% went towards the cost of building sewage treatment facilities, 35% towards maintenance of sewerage systems, and 8% to sewerage works in rural areas.

When local bodies do not have sufficient funds to finance expenditures not covered by the local development programme, the *Sanitation Facilities Private Investment Project* (set up in 2001) helps to attract private investment. One instrument used is guaranteeing a set level of financial return from the revenue generated by sewage treatment facilities. Over 2001-04, almost a fourth of local government expenditure on building sewage treatment stations came from private sources.

relatively small: a total of *KRW 402.7 billion* since 1993, or less than 10% of the annual PAC expenditure for waste management.

Pricing

All houses in Korea are metered and water pricing is progressive. The national average price for *domestic water supply* rose from *KRW 316* to *533* per cubic metre (EUR 0.41) during 1997-2003. Despite the increase, prices remain low, with an average household bill amounting to about one half of a per cent of the average wage. Prices are set by municipalities and reflect real costs as well as social considerations; in Seoul, for example, the city government pays the water bills for about 64 000 households on welfare.¹⁸

A different situation applies to *agricultural water*, 60% of which is supplied from the bulk government-built water supply reservoirs and canals. Traditionally, farmers have been charged for operational and maintenance costs but not for capital costs. As of 2000, it was decided that farmers would provide labour (instead of payments) for the operation and maintenance (OEM) of these large irrigation schemes. It is estimated that this is equivalent to 35% of the OEM costs.

Concerning *municipal waste services*, households are obliged to pay for rubbish bags under the VBWF system. The average price of the bags, currently *KRW 384* for a 20-litre bag, is increasing. Prices vary by local governments, from a low of *KRW 252* per bag in Gyeongbuk to *KRW 805* in Busan.

Fisheries

Total *fish catch* decreased from 2 million tonnes (1998) to 1.65 million tonnes (2003), while total *fish farm production* recovered from a low of 653 000 tonnes (2000) to 918 000 tonnes (2004), just under the 1997 peak of a million tonnes. Faced with difficulty in the traditional licensing system because of excessive fishing and accelerated depletion of fishery resources, Korea's fishery policy has become more resource-management oriented.

Korea operates a *fishing permit system* which sets the permissible number of fishing boats. The Directive on Fishery Resources Protection bans certain fishing gear. A "*total allowable catch*" system was adopted for four species in 1999 and expanded to nine species in 2004. The *fishery resource restoration projects* have been expanded. The artificial reef project has established 24 types of artificial reefs on 173 000 hectares, or 56% of the original plan. Eco-friendly fish release projects have been expanded. Korea is actively participating in international negotiations (e.g. the World Trade Organisation Doha Development Agenda) and has concluded 13 bilateral fishery agreements on sustainable fisheries.

Water management

The Stream Environment Restoration Initiative promotes the *restoration of aquatic ecosystems* and the improvement of water quality by restoring the natural conditions of streams. Implemented jointly by MoE and the Ministry of Construction and Transportation since 1998, it includes seven projects [e.g. Kyung-an Stream (22.5 km), Hwang-gu-ji Stream (16.3 km) and Sung-hwan Stream (8 km)]. A framework plan is being established and a comprehensive assessment of waterside environments is being conducted (47 sites; 1 386 km). Residents are responding favourably⁷ as the initiative brings positive results (e.g. in ecosystem restoration, space for leisure activities). However, there are still some projects to straighten natural waterways. Overall, water management should give more attention and higher priority to the management of aquatic ecosystems and related benefits.

Agriculture

Korea pursues *sustainable agriculture* through: direct payment for environmentally-friendly farming, a phase-out of chemical fertiliser and expansion of organic fertiliser, education about and promotion of environmentally-friendly agriculture, and initiation of environmentally-friendly agriculture district construction

projects. Korea has 679 eco-friendly family farmer complexes. Inspection for compliance with the Act to Promote Environmentally-Friendly Agriculture was carried out on 717 farms in 2004. The pressures of overpopulation and food shortages are pushing the Korean government to create more agricultural land by reclamation works such as the Saemangeum project (Box 3.3).

Box 3.3 The reclamation of the Saemangeum tidal flats

Located on the west coast of Korea, some 200 kilometres south of Seoul, the tidal flats of *Saemangeum* are a crucial feeding area and habitat for more than 50 000 shorebirds, including species with international importance (e.g. the Alaskan-breeding Dunlin, the Spoon-billed Sandpiper, the Spotted Greenshank, the Great Knot). The tidal flats are also a breeding ground for 158 fish species as well as for many crabs and seaweed.

The Saemangeum project, initiated in the 1970s and launched in 1991, set out to reclaim *part of these tidal flats to make rice fields*. The project covers an area totalling 400 km², composed of 282.4 km² of tidal land reclamation and a desalinated reservoir of 117.6 km², including 33 km-long sea dikes. The project has been the focus of intense criticism and opposition for many years, provoking protests by individual citizens and by NGOs such as Korean Federation for Environmental Movement (KFEM).

Between 1999 and 2001, the project was temporarily halted while a specific

committee, made of government officials and civilians (including NGOs), undertook a comprehensive assessment of its environmental impact and economic feasibility. In 2001, the *Presidential Commission on Sustainable Development* suggested reviewing the project. The lower court ruled to suspend the project in 2003. But the high court allowed the project to resume in 2004. Meanwhile, the government rejected the administrative court's earlier suggestion to conduct research, including on the environmental and economic consequences of the project. The administrative court issued an injunction to cancel or alter the original plan in February 2005. In December 2005, the high court ruled again in favour of the government. The case is currently being handled by the Supreme Court.

From 1991 to 2005, nearly KRW 2 trillion was invested for the project, and by 2005 the dikes were almost completed (except the 2.7 km of opened gaps).

3.5 Expenditure and financing

MoE expenditure for nature conservation and biodiversity protection has increased, reaching KRW 128 billion in 2005. A large part (about KRW 100 billion in 2004⁸) is devoted to investment and current expenditure for *national park management*,

with one-third financed through extra-budgetary sources (e.g. entrance fees, rentals and sales services) and two-thirds from government funds. Local government and private expenditure for nature conservation and biodiversity protection are not documented, but are probably comparatively small. Overall, expenditure for nature conservation and biodiversity protection is on the order of 1% of total pollution abatement and control (PAC) expenditure, or 0.02% of GDP.

To preserve certain ecologically sensitive areas (e.g. migrant bird observation sites), Korea has introduced biodiversity management agreements, under which *local governments* compensate residents for the losses incurred from biodiversity management, such as not harvesting some crops and rice straws, cultivating barley, or creating resting spaces for migratory birds. Compensation payments include a 30% contribution from the national government. Currently, there are nine *biodiversity management agreements* in cities and provinces. In addition, 15 private NGOs received a total of KRW 92 million in 2004, in support of their contribution to wildlife preservation.

Since 2001, Korea has established an ecosystem *conservation charge on large-scale developers* who destroy natural ecosystems (Chapter 4). The purpose of the charge is to preserve the natural environment and effectively manage natural resources; it is used for environmental conservation, including the purchase of land. The proceeds from the charge have significantly increased, from KRW 478 million in 2001 to KRW 20.5 billion in 2003.

1.3 Market-based integration with agricultural policy

Korean agriculture accounts for *4.1% of GDP and 8.8% of employment*. This reflects the labour-intensive nature of a predominantly small-scale farming system. The real net value of agricultural production has fallen since 2001. Agricultural imports and exports represent about 2% and 0.5% of GDP respectively.

Korea is concerned that its rate of food self-sufficiency is low (it was 49% in 2001). This rate reflects the country's physical conditions for agriculture (a large share of the land mass is forest or mountain) and its structural characteristics, with very small and fragmented farms. In 1998, the Presidential Commission on Rural Reconstruction reaffirmed the *national objective of food security*. Pursuing this objective requires high levels of support and protection, and results in high food

prices. Moreover, maintaining domestic production may result in environmental harm. A comprehensive study should be carried out to review the impact of agricultural subsidies on the environment.

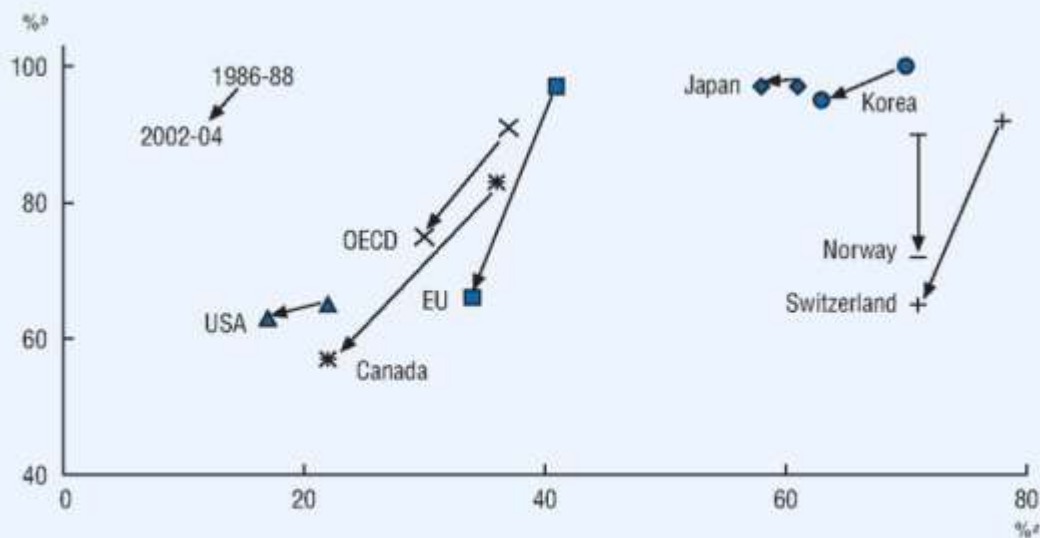
The Act to Promote Environmentally-Friendly Agriculture, passed in 1997, was revised in 2001 to adopt international standards of certified organic farming. In 1999, a committee for environmentally-friendly agricultural development was created, composed of government officials, NGOs, consumers, farmers and foresters.

Agri-environmental payments based on area planted were introduced over the review period. Since 2001, farmers who have cultivated paddy fields for the past three years and who conform to good environmental practice are entitled to USD 375 to 462 per hectare annually. The programme budget has steadily increased (it was USD 417 million in 2004) and the ceiling area for payment has been extended from three to four hectares. Direct payments for environmentally-friendly farming (in environmentally sensitive areas), introduced in 1999, were revised in 2003 to differentiate between low chemical, chemical-free and organic production. The budget of this programme has remained limited (USD 4 million in 2004).

Efforts have been made recently to develop *payments based on input constraints* since these were first introduced in the early 1990s (to improve livestock waste management and reduce fruit acreage). Since 2003, farmers who set aside rice fields for three consecutive years may receive USD 2 600 annually per hectare. Since 2004, livestock holders who recycle 60% of cattle manure or decrease pig and chicken stocking density by 20 to 30% below the national standards are entitled to USD 11 300 per farm (and an additional USD 1 700 if they comply with stricter requirements). However, such payments affect a limited area (e.g. 27 000 hectares of paddy fields have been set aside), and at USD 103 million in 2004, they only account for 7% of total direct payments.

However, *support to the Korean agricultural sector*, as measured by the producer support estimate (PSE), still ranks among the highest in the OECD. The PSE (transfers to Korean farmers as a percentage of their gross receipts) has slightly decreased (it was over 70% in the first half of the 1990s) but has remained over 60% since the mid-1990s (63% in 2004). The bulk of the support continues to be delivered through prices: direct input and price-related measures now account for 95% of total direct support to farmers compared to 100% when the Uruguay Round was launched in the mid-1980s (Figure 4.2). Market price support is the most production- and trade-distorting type of intervention (e.g. government purchasing prices and border protection exist for rice, barley, soybeans and maize). Since the late 1980s, Korean farmers have also been eligible for payments based on input use (one of the most distorting forms of support as regards impact on the environment), including

Figure 4.2 **Agricultural support: evolution of levels^a and mechanisms^b**



- a) PSE (Total producer support estimate): transfers to farmers as a percentage of their gross receipts.
 b) Market price support + payments based on output or input use as a share of PSE. These are the most distorting forms of support as regards impact on the environment.
 Source: OECD PSE/CSE database, 2005.

payments for fertiliser use (USD 89 million in 2004) as well as for irrigation (USD 63 million in 2004). Legal provisions are in place to preserve land use by agriculture (use of farmland for non-agricultural purposes requires approval by the agriculture ministry).

Overall, support to producers has decreased, but it is still double the OECD average. Most continues to be provided through market price support (prices received by Korean farmers in 2002-04 were 159% higher than world market prices), largely for rice. There has been a limited shift towards the use of payments but these are generally linked to production. The introduction and development of agri-environmental payments are steps in the right direction although their *economic efficiency may be limited by the high level of output-linked support*. Further efforts are needed to pursue targeted environmental objectives in ways that are less distorting of production and trade.

1.4 Market-based integration with energy policy

Pursuant to the Rational Energy Utilisation Act, every five years the Ministry of Commerce, Industry and Energy must formulate a *ten-year national energy plan*. The second such plan, covering the period 2002-11, projects total energy demand to increase by an annual average of 3.1% from 2001 to 2011 (and by 2.4% from 2001 to 2020). Per capita energy demand is also projected to increase (from 4.1 toe in 2000 to 5.3 toe and 6.2 toe in 2010 and 2020, respectively). Demand is expected to increase for both electricity and natural gas. The objectives of the second national energy plan are to maintain a diverse and stable energy supply (energy security), to reduce energy intensity (energy efficiency), and to introduce competition in the electricity and gas sectors (energy market deregulation). A new energy policy act is being considered, which could lead to creation of a *national energy committee* to deal with issues such as energy planning, energy policy co-ordination, prevention and resolution of social conflicts over energy issues, and nuclear energy policy. The committee would have at most 25 members, including the President as chair, the Prime Minister as vice-chair, relevant ministers, and five experts recommended by NGOs.

Energy pricing

The electricity and natural gas sectors are subject to *control by the government rather than independent regulators*, though collusion in fee setting has been made illegal. Efficiency gains from introducing competition in the electricity and gas markets might lead to a shift from coal-fired to gas-fired power plants, as experienced in other OECD countries.

Under the Electricity Enterprises Act, the government regulates the prices that the *Korea Electric Power Corporation (KEPCO)*² is allowed to charge for electricity. Prices are meant to reflect the cost of supply plus a fair return on investment. To make up the extra cost of supplying electricity to areas that cannot be served profitably (e.g. remote areas), the government contributed USD 93 million in 2005. The government plans to take on these costs directly once KEPCO is privatised. *Electricity market reform* has hardly progressed since the release (in 1999) of the Basic Plan for Restructuring the Electricity Industry. The plan paved the way for partial privatisation of KEPCO (leaving only nuclear and hydro assets as state property), but it was repeatedly postponed because of fierce union opposition and financial uncertainties facing potential buyers. The split of distribution/retail from KEPCO and the plan for introducing wholesale competition based on demand-side bidding were suspended in 2004. Nevertheless, in certain areas electricity can be

provided by a local franchised entity. The price of electricity is in the lower range among OECD countries, when measured at current exchange rates.

The government also regulates the prices that the state-owned monopoly gas company, *Korea Gas Corporation* (KOGAS), is allowed to charge for gas. Natural gas is imported exclusively by KOGAS, which also operates the country's high-pressure transmission system and sells gas wholesale to local distributors and to large industrial customers and power stations. *Gas market reform* has hardly progressed since the release (in 1999) of the Basic Plan for Restructuring the Gas Industry. The plan was strongly opposed, especially by trade unions. In 2003, the government announced that KOGAS terminals and transmission facilities would remain state-owned. Deregulation is now pursued through allowing new players to enter the liquefied natural gas (LNG) import/wholesale business. In 2004, some large-scale end-users obtained approval to import LNG directly (from Indonesia) and to use KOGAS's trunk line; they completed construction of a receiving terminal in July 2005. Local gas distribution companies and power generators are also interested in importing LNG directly.

In contrast, *complete deregulation of the price of oil products*, except for liquefied petroleum gas (LPG), was achieved by 1997. Oil product prices are high by OECD standards, for both industry and households (Table 2.4). The prices of road fuels in Korea are also high by OECD standards (Section 3). Crude oil prices have dramatically increased since 1997, especially following the devaluation of Korea's currency after the financial crisis. The increase in oil prices has also resulted from an increase in taxes.

Since 1998, *end-use prices have increased in real terms* for all types of energy, partly reflecting increases in taxation, thereby increasing energy savings signals (Table 4.2). For industry, the price gap has narrowed between the two qualities of heavy fuel oil (high sulphur and low sulphur content), though there is still a price incentive to use the former. After heavy fuel oil, the current price structure (in tonnes of oil equivalent) continues to encourage industry to use natural gas over electricity, and electricity over light fuel oil. Households in small to medium-sized cities (where natural gas is not available) still have incentives to use light fuel oil for heating instead of electricity while power plants still have an incentive to use heavy fuel oil instead of natural gas (though the price gap has narrowed). An assessment should be made, for both industry and households, to determine the environmentally preferable option; and efforts should be made to ensure that energy prices reflect environmental costs.

Table 4.2 Energy pricing in Korea^a

Type of energy	Unit	End use price				Tax rate ^e (%)		
		USD/unit ^b		Change (%) 1998- 2004 ^c	USD/toe ^b		1998	2004
		1998	2004		1998	2004		
Oil products								
Regular unleaded gasoline	litre	0.802	1.192	81	966.1	1 436.4	68.0	68.3
Automotive diesel for non commercial use	litre	0.395	0.793	144	429.7	861.5	33.0	49.4
Automotive diesel for commercial use ^d	litre	0.359	0.721	144	390.6	783.2	23.9	44.3
High sulphur fuel oil in industry	tonne	155.5	308.0	141	166.5	329.5	0	3.4
Low sulphur fuel oil in industry	tonne	200.9	317.4	92	214.8	339.5	0	3.4
Heavy fuel oil for electricity generation	tonne	155.5	308.0	141	162.1	320.9	0	3.4
Light fuel oil in industry	000 litres	323.5	602.1	126	376.5	700.9	16.6	27.1
Light fuel oil in households ^e	000 litres	369.9	656.6	116	446.7	793	25.7	33.9
Electricity								
Industry	kWh	0.039	0.053	65	456.9	611.7	0	10
Households	kWh	0.069	0.079	39	802.3	923.5	0	10
Natural gas								
Industry	107 kcal	246.2	393.4	94	273.6	437.1	19.1	19.1
Households	107 kcal	318.6	489.0	87	353.9	543.3	16.6	17.1
Electricity generation	107 kcal	199.5	314.8	92	221.7	349.7	18.9	19.5

a) Including 10% VAT.

b) Converted using exchange rates.

c) Changes in nominal terms of KRW equivalent. The increase in consumer price index for energy was 22.3% in 1998-2004.

d) Commercial vehicles are VAT exempt.

e) Commonly called kerosene.

Source: IEA Statistics, Energy Prices and Taxes, Ministry of Finance and Economy.

Energy subsidies

While most coal used in Korea is imported (in the form of bituminous coal from Australia, China and the United States), the government continues to *subsidise domestic coal production* for social reasons. However, the intention is to gradually phase out coal subsidies and promote other industries (e.g. tourism) in mining regions. Coal subsidies declined from USD 227 million in 1995 to USD 118 million in 2004, at a lower rate than the fall in domestic production.

Korea's large price differential between households and industry encourages over-consumption of electricity by industry. Prices for residential and commercial customers generally exceed the cost of supply (e.g. commercial customers paid on average 20% more in 2004). In contrast, prices for industry are set to recover the costs, and those for agriculture (including fisheries) cover only 50%. The annual subsidy to agriculture and to remote areas amounted to an estimated USD 387 million in 2004.³ To reduce the electricity price differential between industrial and residential/commercial consumers, the government initiated an electricity tariff reform in 2003. In 2003, prices for industry were increased by 2.5% whereas prices for households were decreased by 2.2%. To compensate for the gradual rise in the industry's electricity tax, efforts are being made to reduce the cost of electricity generation (through enhancing the competitiveness of the electricity supply industry). In 2004, electricity prices for industry were frozen, whereas prices for households and commercial customers were reduced by 2.8% and 3.5%, respectively. In 2005, prices for industry were raised by 2.4%, while those for households and commercial customers were raised by 1.5% and 1.9%, respectively.

Important price differentials between households and industry also exist in the natural gas sector. Prices charged to industrial consumers and power generators are only about 80% and 64%, respectively, of prices for household heating.

In 2001, the Korean government projected an investment of approximately USD 800 million over five years to help deploy renewable technologies. In 2003, financial support for the development of renewable energy was significantly increased, to total USD 7.6 billion between 2004 and 2011 (Table 4.3 and Box 4.2). This includes low-interest loans (with a three- to five-year grace period) and preferential tax treatments (local taxes, corporate tax) to build new facilities or upgrade existing ones. Since 1985, loan assistance has been provided from the government's special accounts for energy and resources. Funding comes mainly from a surcharge on crude oil imports *via* the Business Petroleum Fund. It is now mandatory for new public buildings with a total floor area of over 3 000 m² to allocate at least 5% of the construction cost to renewable energy equipment.

The nine largest energy suppliers made a commitment to include renewable energy sources in their power generation, as part of a voluntary agreement with the government.⁴ First steps have been taken to support the market price of electricity generated from renewable energy sources. The purchase of such electricity at guaranteed prices by government-owned utilities is specified in the Electricity Business Law of 2001 and the Promotional Law. Since 2001, KEPCO has been obliged to purchase electricity at feed-in tariffs (per kWh) of USD 0.555 for photovoltaic, USD 0.083 for wind, USD 0.057 for small hydropower, and USD 0.048

for landfill gas plants under 50 MW (USD 0.050 for plants under 20 MW). Korea should consider shifting towards use of market mechanisms as a more flexible, and therefore more cost efficient, way to meet the national targets for renewable electricity supply. This would involve creating a scheme that enables electricity supply companies to trade renewable electricity generation credits, also known as “green certificates”, to meet their required quotas of renewable electricity supply. Such a *green certificate market* is currently used in several OECD countries.

1.5 Market-based integration with fiscal policy

The *tax burden* (i.e. total tax receipts as a share of GDP) in Korea steadily increased over the review period, from 21.1% of GDP in 1998 to 25.3% in 2003; but it is still low by OECD standards (the OECD average in 2003 was 36.3%). In 2003, Korea’s tax burden was the second lowest among OECD countries (after Mexico). About 22% of tax revenues accrue to the local level, a rather high share compared to the non-federal OECD countries.

The *tax mix* (expressed as shares in total tax revenues) has remained relatively unchanged since 1998, with taxes on goods and services (37%) still prevailing over social security contributions (19%), in contrast to most other OECD countries (Table 4.4). The share of property tax has also remained stable (11-12%), while corporate income tax has surpassed personal income tax (respectively 11 and 19% in 1998, but 15 and 13% in 2003). The share of social security contributions is low by OECD standards, and the share of personal income tax is very low. In contrast, the share of corporate income tax and of taxes on goods and services is very high by OECD standards, and the share of property tax is among the highest. At 10% (rate unchanged since the last decade), VAT rate is low by OECD standards.

Three *earmarked taxes* (on road fuel, as well as the education and rural development taxes) collect around 8% of total tax revenues. Moreover, part of the revenues from the liquor tax accrues to water (Chapter 2). In 2004, the government postponed the planned elimination of earmarked taxes for transport and rural

development-related special accounts. These two earmarked taxes have been extended, respectively, until 2006 and 2014. The planned elimination of earmarked taxes for transport by 2007 opens a unique opportunity to revisit road fuel taxation as well as to harmonise fiscal and economic incentives.

In 2004, *revenues from environmentally-related taxes* accounted for 2.8% of GDP and the share of such taxes in total tax revenues was 11.6% (Table 4.5).

Oil products remain subject to several taxes whose primary purpose is to raise revenue. In 1996, the government replaced the value-added tax system with fixed-rate duties (special excise tax) on final sales of all oil products⁵ except road fuels. Gasoline is the most heavily taxed product, giving diesel and LPG used by vans and taxis a relative price advantage, though an energy tax reform is underway to narrow the price difference between unleaded gasoline and diesel and LPG (Section 3). More generally, *tax rates on energy* have increased for all fuel types, except natural gas for industry (Table 4.2). The increase was lower for unleaded gasoline than for automotive diesel, as part of the energy tax reform. Taxes (including 10% VAT) represent around 68% of end-use prices for unleaded gasoline and 49% for automotive diesel. For industry, the

Table 4.4 **Total tax revenue, 2003**
(USD billion)

	Tax revenues	% of total	Comments
Taxes on income, profits and capital gains	43.15	28	
Taxes on individuals			
Income tax	15.02		Subject to rural development tax and inhabitant tax
Capital gains	2.43		Since 2003 a tax of 60% applies to properties sold within a year of purchase (to restrain speculation)
Corporate taxes			
Corporate tax	21.52		Subject to rural development tax and inhabitant tax
Social Security contributions	30.11	19	
Taxes on property	18.21	12	
Taxes on immovable property			
Property tax (local)	0.76		
City planning tax (local)	0.84		Applies to urban real estate
Tax on aggregate land holdings (local)	1.35		Subject to rural development tax
Taxes on financial and capital transactions			
Registration tax ^d	6.34		Subject to rural development tax
Acquisition tax ^d	4.62		Subject to rural development tax

Taxes on goods and services	57.26	37	
Taxes on production, sale and transfer			
VAT	28.08		CNG buses are exempt
Liquor tax	2.30		Subject to education tax
Road fuel tax	8.40		Subject to education tax
Special excise tax ^b	3.97		Subject to rural development tax and education tax
Motor fuel tax (local)	1.06		
Taxes on use			
License tax (local)	0.05		
Motor vehicle tax (local)	1.49		
Other	5.48	4	
Total	154.21	100	

a) Partly relates to the transport sector.

b) Partly relates to the energy and transport sectors.

Source: OECD, Revenue Statistics database.

Table 4.5 Environmentally related taxes

Tax	Fuel type	Unit	Tax rate ^a (USD/unit)		Total tax revenues (USD million)		Comments
			May 1998	July 2004	1998	2004	
Energy							
<i>National level</i>							
Road fuel tax	Unleaded gasoline	litre	0.421	0.475	4 646	8 809	Commercial vehicles are VAT exempt. Government target is to adjust the price ratio of unleaded gasoline to diesel and LPG butane from 100:70:53 in 2004 to 100:85:50 in 2007. Revenues accrue to the transport infrastructure fund
("transportation tax")	Diesel	litre	0.078	0.250			
Special excise tax on energy	Road fuel: LPG butane	kg	0.029	0.333	..	3 045	The tax rate on LPG butane for transport use was increased in phases since 2001 to raise revenues. Since 1998, the tax rate in KRW on LPG for cooking use and LNG has remained unchanged. Revenues accrue to the general budget
	Cooking fuel: LPG ^b	kg	0.029	0.035			
	Heating fuel: +Households						
	Light fuel oil ^c	litre	0.043	0.134			
	Natural gas (LNG)	kg	0.029	0.035			
	Electricity	kWh			
	+Industry						
	Heavy fuel oil: ^d high sulphur	litre	0	0.010			

	low sulphur	litre	0	0.010			
	Light fuel oil ^c	litre	0.043	0.134			
	Natural gas (LNG)	kg	0.029	0.035			
	Electricity	kWh			
	Electricity generation						
	Heavy fuel oil ^d	litre	0	0.010			
	Natural gas (LNG)	kg	0.029	0.035			
Education tax			15% of road fuel tax and 15% of special excise tax		629 ^e	1 803	Revenues accrue to the education fund
Rural development tax					Revenues accrue to the rural development fund
<i>Regional level</i>							
Road fuel tax ("motor fuel tax")	Unleaded gasoline	litre	-	0.102		- 1 883	Tax introduced in 2000
	Diesel	litre	-	0.053			Revenues accrue to the local budget
<hr/>							
Transport							
<i>National level</i>							
Special excise tax on passenger vehicles			4-8% of ex-factory price		186	515	Increases with engine size (4% under 2 000 cc; 8% above). Revenues accrue to the general budget
Education tax			30% of special excise tax on passenger vehicles		498	438	Revenues accrue to the education fund
<i>Regional level</i>							
Motor vehicle tax ("automobile tax")		cc/year	0.057 to 0.157	0.069 to 0.191	1 554	1 493	Increases with engine size. Rates in KRW have remained unchanged since 1998 and are 80-90% lower for commercial vehicles. Revenues accrue to the local budget
License tax		year		2 to 32	172	- ^f	Revenues accrue to the local budget
Acquisition tax			2% of retail price		201	501	Revenues accrue to the local budget
Registration tax			5% of retail		361	917	Tax rate is 2% for

	price		commercial vehicles. Revenues accrue to the local budget
Rural development tax	10% of acquisition tax	20	50 Revenues accrue to the rural development fund
Total		8 267 ^e 19 454	11.6% of total tax revenues in 2004 ^f

a) Excluding 10% value added tax.

b) Commonly called "town gas".

c) Commonly called "kerosene".

d) Commonly called "bunker C".

e) Excluding revenues from the special excise tax on energy.

f) The license tax was abolished in 2001, as it duplicated the motor vehicle tax.

g) National and regional tax revenues (including social security).

Source: OECD database on environmentally related taxes, MoE.

rate is only 3.4% for heavy fuel oil (high sulphur as well as low sulphur), around 19% for natural gas and 27% for light fuel oil. For households, electricity use is taxed at 10%, natural gas at 17% and light fuel oil at 34% (Table 4.2).

Efficient land use is hampered by complicated land regulations (land use is governed by 112 laws) and wrong incentives from *taxes on property*. Property taxation was reformed by gradually raising holding taxes. Between 2003 and 2005, the tax base for buildings was increased to their full market value, while that for land was raised to 50% (in 2003 the tax base for both was set at around 30%). In addition, comprehensive taxation of an individual's property holdings was introduced in 2005. Korea is considering further increases in property and capital gains taxes to combat real estate speculation. It also plans to gradually increase real estate property taxes while decreasing transaction taxes, such as acquisition and registration taxes. These measures should contribute to promoting a more efficient use of land by encouraging land transaction, refraining excessive ownership and stabilising land market value. The measures will also support local government revenues. For natural assets that belong to private owners, restrictions or easements linked to nature conservation could be rewarded by an easing of the land tax or estate duties.

The possibility of a *green tax reform* should be assessed, through restructuring existing energy, transport and property taxes in the context of low overall tax burden or on a par with reducing other taxes (e.g. with a view to fostering employment), so as to leave the overall tax burden unchanged. Such a reform would require discussions between MoE, the Ministry of Finance and Economy, and the ministries in charge of social affairs, in the context of sustainable development. An institutional mechanism, such as a green tax commission, should be established to carry out the analysis.

2.4 Economic instruments

Korea uses a *broad range of economic instruments* to implement its air, water, waste and nature management policies (Table 4.11). In addition to user charges for water, waste water and municipal waste services, other environmental charges produce USD 1.4 billion or 12% of total pollution abatement and control (PAC) expenditure. The *rates* are often too low to provide influential economic incentives, and some of the charges are earmarked for specific uses or funds. Nevertheless, they provide a step in the direction of a more balanced and efficient policy mix.

Air management

SO₂ and CO concentrations have decreased dramatically through implementation of a *policy mix, in particular in the energy and transport sectors*. To address the increasing pollution by particulate matter and ozone, linked to the increase in road traffic and industrial production, Korea enacted the Special Act on Metropolitan Air Quality Improvement, targeting a 41-47% reduction in emissions of PM₁₀, NO_x, SO_x and VOCs by 2014 in the Seoul metropolitan area (Chapter 2).

The Special Act opens the way to establishing an emission trading system for industry. A “*cap-and-trade system*” targeted at industrial emissions of SO_x, total suspended particulates (TSP) and NO_x in the capital area is scheduled to begin in 2007. For each pollutant and for each participating firm, MoE will allocate a maximum emission load. Firms with excess pollution load will then be able to purchase emission permits from those with surplus emission allowance. This scheme could help to inventory sources and emissions, since grandfathering permits (instead of auctioning them) creates incentives for firms to declare their emissions and claim the corresponding permits. In addition, many firms may take advantage of the market by buying permits instead of making irreversible investments that could prove uneconomical, for example if there is a shift to natural gas. The overall effectiveness

Table 4.11 Environmental charges

Charge (year first issued)	Unit	Charge rate ^a (USD/unit)	Rate unchanged since (year)	Amount collected ^b (USD million)	Use of revenues ^c
AIR					
Emission charge (1983) on all emissions (since 1996)				6	ENV
Dust	kg	0.67	1991		
SO _x	kg	0.44	1991		
on excess emissions (since 1983)					
Bad odour	000 m ³		1983		
Ammonia	kg	1.22	1983		
Carbon bi-sulphide	kg	6.46	1983		
Hydrogen sulphide	kg	5.24	1983		
Hazardous substances					
Chlorine	kg	6.46	1983		
Fluoride compounds	kg	2.01	1991		
Hydrogen chloride	kg	6.46	1983		
Hydrogen cyanide	kg	6.37	1983		
Environmental improvement charge (1992)				405 ^d	ENV ^e
Commercial buildings (fuel consumption)	litre	0.01-0.03 ^f	2000		
Diesel-powered vehicles	motor vehicle	base rate of 18/year ^g	2000		
WATER					
User charge (public water supply)				..	LG
Households	m ³	IBT ^h			
Industry	m ³	IBT ^{h, i} and fixed element			
Developers (1991)					
New construction		cost recovery		135	
Renovation		cost recovery		1	
Surcharge on public water supply					
Han River (1999)	m ³	0.10	2003	226	WMF
Nakdong River (2001)	m ³	0.095	2004	105	WMF
Geum River (2001)	m ³	0.11	2004	39	WMF
Yeongsan River (2001)	m ³	0.10	2003	33	WMF
User charge (sewage treatment)				..	LG
Households	m ³	IBT ^h			
Industry	m ³	IBT ^{h, i} and fixed element			
Developers (1999)					
New construction		cost recovery		373	
Renovation		cost recovery		..	
Pollution charge (1983) on all discharges				6	ENV
Organic matter	kg	0.22	1983		
on excess discharges					

Total nitrogen ^f	kg	0.43	2003		
Total phosphorus ^f	kg	0.43	2003		
Heavy metals					
Arsenic	kg	86.80	1983		
Cadmium	kg	434.03	1983		
Chromium	kg	65.10	1983		
Chromic (VI) compounds	kg	260.42	1983		
Copper	kg	43.40	1983		
Lead	kg	130.21	1983		
Manganese	kg	26.04	1983		
Mercury	kg	1 085.07	1983		
Zinc	kg	26.04	1983		
Toxic contaminants					
Cyanide compounds	kg	130.21	1983		
Organophosphoric compounds					
Phenol	kg	130.21	1983		
PCBs	kg	1 085.07	1983		
Trichloroethylene	kg	260.42	1983		
Pollution charge on livestock effluents ^k (1991)	m ³	..	1991	0.06	LG
Pollution charge on EIA standards ^k (1997)	m ³	..	1997	0.4	ENV
Pollution charge on BOD discharges ^k					
Nakdong River (2001)	m ³	..	2005	..	
Geum River (2001)	m ³	..	2005	..	
Yeongsan River (2001)	m ³	..	2005	..	
Environmental improvement charge (1992)					
Commercial buildings (sewage discharge)	tonne	0.07-0.15	2000	405 ^d	ENV ^e
Groundwater abstraction charge					
Bottled drinking spring water (1995)	sale price ^f	7.5%	2000	11	ENV
Soft drinks and liquors (1998)	sale price ^f	5 to 7.5%	2000		
WASTE					
User charge on municipal waste collection and disposal				..	LG
Non-recyclable waste ^m	bags	Discretion of local government			
Bulky waste	sticker				
Construction and demolition waste	container				
Product charge for hard-to-recycle products (1993)					
Antifreeze	litre	0.03	1997	39	ENV
Chewing gum	sale price ^f	0.27%	1997		
Cigarettes	pack of 20	0.006	2004		

Containers of cosmetics (glass bottles)					
Less than 30 ml	bottle	0.001	1997		
30-100 ml	bottle	0.003	1997		
More than 100 ml	bottle	0.004	1997		
Diapers	each	0.002	1997		
Plastic ^f					
Packaging	Kg ^g	0.007	2003		
Construction use (incl. pipes)	Kg ^g	0.003	2003		
Furniture (incl. toys)	Kg ^g	0.007	2003		
Hazardous substances					
Pesticide					
Less than 500 ml	container	0.006	1997		
More than 500 ml	container	0.014	1997		
Other toxic products					
Less than 500 ml	container	0.005	1997		
More than 500 ml	container	0.010	1993		
Product charge for recyclable products ^o (2003)		Non-compliance with EPR ^p		3	ENV
Liability charge					
Industrial complexes (1987)		..	1987	17	KWRC
Landfill operators (1991)		..	2002	0.8	ENV
Other industry (1999)		..	1999	0.1	ENV
NATURE CONSERVATION					
Entrance fees	person	0.52 to 1.13		..	NPS
Ecosystem conservation charge					
Base rate	construction cost	0.10-0.15%	2001	10	ENV ^q
Per-area rate	m ²	0.25			
Liability charge (1995)				0.5	NPS

a) Rates as of 1 January 2005, unless otherwise indicated.

b) In 2003.

c) ENV: Special Account on Environmental improvement; LG: local government; WMF: Watershed Management Fund; KWRC: Korea Water Resources Corporation; NPS: National Park Service.

d) Total revenues from the environmental improvement charge (air and water).

e) 10% of revenues transferred from ENV to local governments.

f) Increases with estimated fuel consumption.

g) Rate increases with engine size and age; varies by region (e.g. two times higher in Seoul metropolitan area).

h) Increasing block tariff.

i) For each block, the rate is much higher for industry than for households.

j) Implemented since 2003.

k) On excess discharges.

l) Ex factory.

m) Waste collection is free for recyclable municipal waste (paper, cans, bottles, metal and plastics).

n) For imports, 0.7% of CIF price.

o) Includes glass and PET bottles, metal containers (except toxics), paper, electrical appliances, batteries, lubricants and tyres.

p) Extended producer responsibility.

q) 40% of revenues transferred from ENV to local governments.

Source: MoE.

of the cap-and-trade system in reducing emissions would be enhanced if it involved more than the industrial sector.

Industry has been subject to *emission charges* for ten air pollutants since 1983 (under the Clean Air Conservation Act) (Table 4.11). Until June 1996, the charge was imposed on emissions that exceeded of the emission standard, thereby acting as a fine. Since July 1996, for TSP and SO₂, the charge has applied to all emissions (even those within the allowable emission standard). The charge rate was revised in 1991 and has since been adjusted for inflation.

In the *area of transport*, the policy mix has included regulatory measures (standards for vehicle emissions, vehicle fuel efficiency, road fuel quality, and car emission inspection), voluntary restrictions on vehicle use, economic and fiscal incentives (subsidised introduction of low-emission vehicles such as compressed natural gas (CNG) buses, tolls on highways, congestion charges in cities, area-differentiated parking fees, traffic inducement charges levied on building owners, taxes on road fuels and vehicles) (Section 3).

As regards *energy*, the policy mix has included economic and fiscal incentives (coal subsidies, administered prices and cross-subsidies from households to industry for electricity and natural gas, financial and market price support to develop renewable energies, energy taxation) (Section 1). It has also involved regulatory measures, in particular standards on fuel quality and bans on the use of solid fuels. Since 2003, certain products such as refrigerators, passenger cars and air conditioners have been required to have labels indicating their level of energy consumption. In addition, most energy-intensive firms (1 063 of 1 514 firms whose annual energy consumption is higher than 2 000 toe) have signed voluntary agreements, accounting for 70% of total industrial energy consumption. In December 2004, the government launched a three-year plan for reducing energy intensity, with new targets for reducing energy consumption by 17.6 million toe (total final energy consumption was 138 Mtoe in 2003) by 2007 thanks to efforts in the industrial, transport and residential/commercial sectors.¹⁷ The plan includes tax exemptions for investments in energy conservation and mandatory energy audits for energy-intensive facilities (industry); improved supply chain management, wider use of public transportation and higher fuel efficiency of private cars (transport); and adoption of energy performance standards/labels and expansion of district heating (residential/commercial). These measures should be seen as complementary to taxation of the relevant externalities. An environmental improvement charge applies to *owners of commercial buildings* (whose floor area is greater than 160 m²) according to fuel consumption: rates are progressive. The aim is to limit air pollution, though the charge is based on estimates of consumption rather than monitoring. A similar charge applies to waste water discharges.

Water management

Korea undertook major *water pricing policy reform* in 1996. The aims were to achieve full cost recovery for water services, pursue demand management objectives and generate extra funds for investment purposes.¹⁸ Until 1996, a basic rate (essentially, a minimum consumption charge) was applied as a fixed charge, with additional consumption charged per volume. However, the basic rate covered a relatively large amount of initial consumption. In Daegu City, for example, the basic rate was paid for the first 15 m³/month, and this meant that only households of nine or more people were likely to pay for more. The 1996 reform led to the widespread abandonment of the basic rate by local authorities and a sizeable shift from two-part to increasing block tariffs.¹⁹

Water pricing by most utilities now uses a large number of blocks in their increasing-block tariffs structures for households (up to ten in some residential structures), thereby sending a strong conservation signal to households. Cost recovery for *public water supply* rose to 89% by 2003 (Chapter 2). However, the large cross-subsidies from industry to households encourage over-consumption of water by households. Following the reform, local governments raised the price of water.²⁰ However, household tariffs for public water supply are still extremely low by OECD standards (diluting the conservation signal). Concerning *sewerage and sewage treatment*, cost recovery has remained low (Chapter 2).²¹

Water tariffs for industrial use are much higher (155-200%) than for domestic use. This is due to higher rates as well as to the addition of a fixed element to the tariff, which varies by pipe size. However, a different system applies to large industrial complexes, where uniform (volumetric, non increasing block) tariffs are set by the Korea Water Resources Corporation at rates that are up to four times lower than the rate for industries located in areas supervised by local governments.²² This is a clear incentive for industry to locate plants in large industrial complexes. Korea has favoured the development of such business clusters, but not of “bubbles”. Within a given “bubble”, firms could decide how to meet an overall environmental target, such as through air or water emission trading. Since 1991, a *user charge on developers* has been imposed for individual houses, commercial buildings and factories, to fully cover the cost of building (or renovating) public water supply in the project area. Revenues accrue to the local government. A similar scheme has applied to waste water treatment since 1999.

Pollution charges have also been reformed. In 1994, a basic rate was attached to pollution charges (which have been in place since 1983 and were extended to livestock effluents in 1991), payable even without violation of effluent limits and dependent on the size of the firm.²³ The basic rate has remained the same since 1994. For discharges that exceed effluent limits, the charge rate is volumetric and increases with the toxicity of pollutants (Table 4.11). Total nitrogen and total phosphorus were added to the list of

targeted pollutants in 2003. Pollution charges no longer act purely as fines, but their efficiency would be enhanced if volumetric rates applied from the first cubic metre. In 2001, a new way of setting pollution charges was designed for the Geum, Nakdong and Yeongsan Rivers, in the context of the “*total pollution load management*” (TPLM) system (Chapter 2).²⁴ Under this system, the central government sets a total pollution amount for each stretch of river based on water quality objectives, and local governments then allocate emission rights among point sources (factories, hotels, sewage treatment plants). Charges apply to excess discharges. The TPLM scheme started to operate in 2004, focusing on biochemical oxygen demand (BOD). Its extension to chemical oxygen demand (COD), nitrogen and phosphorus is being considered.

To resolve conflicts along the four major rivers (Han, Nakdong, Geum and Yeongsan) and prevent pollution of the major cities’ water supply sources in an efficient way, a *surcharge on public water supply* is levied on residents of the downstream section of the river basin and the revenues are used to protect water quality in the upstream section.²⁵ The scheme has been implemented since 1999 in the Han River Basin, including the metropolitan areas of Seoul and Incheon and 22 municipalities in Gyeonggi Province. Since 2002, the scheme has also been used in the three other river basins. For each river basin, a *watershed management committee* sets the level of the surcharge and decides how to allocate the revenues that accrue to the Watershed Management Fund.²⁶ The committee members include the Minister of Environment (Chair), a Vice Minister of the Ministry of Construction and Transportation, heads of local communities and the President of the Korea Water Resources Corporation. An advisory committee was created to hear the views of local residents.

The surcharges have increased the average water price in the downstream section of the four basins by 30-40%. More importantly, the surcharges have a set rate rather than being progressive. Some 20-25% of the resulting funds have been used to offer incentives for stakeholders upstream, in particular to compensate for conservation easements imposed on their properties. Most of the rest has been allocated to water supply infrastructure development and land acquisition (Box 2.4). The allocation of funds should respond to the issues at stake and should be based on the *economic efficiency and environmental effectiveness of the proposed projects*.

The objectives of river management should also address problems arising from water scarcity and conflicts between competing users. While the surcharge applies only to public water supply, *agriculture* is the sector with the highest demand for water, suggesting that more attention should be given to the cost recovery of irrigation water supply. A more integrated water management policy is required: i) to promote efficient water transfer between sectors, and ii) to balance the financial resources devoted to classical pollution control and those devoted to other problems, such as

floods and pesticide run-off. The role of the watershed management committees should be expanded to cover a *more comprehensive river basin management approach that addresses such issues*.

Waste management

Since 1995, *user charges for the collection and disposal of municipal waste* have been *based on volume*. For *non-recyclable municipal waste*, residents pay by purchasing waste bags. In principle, the price of a bag should cover the full cost of its collection and disposal. In practice, however, the price of bags is left to the discretion of each local government, and the result is that bag prices vary greatly among local governments (e.g. between USD 0.22 and USD 0.70 for a 20-litre bag). Despite scale economies in waste management, bag prices are generally higher in metropolitan areas than in provinces: for example, Busan and Incheon have set higher prices as part of their proactive policy to reduce waste generation. Over the years, the price gap between metropolitan areas has become increasingly evident, and a direct correlation has been found between the price of waste bags and the quantity of municipal waste generated (in kg/year/person). Still, the scheme has proved successful. On average, per capita municipal waste generation decreased from 1.33 kg/day in 1994 to 1.01 kg/day in 2001. This is one of the few examples of successful household waste reduction in the OECD. For *recyclable municipal waste* (paper, cans, bottles, metal and plastics), residents do not pay for waste services. This has created a *strong incentive to recycle*: recycling of household waste jumped from 15% in 1994 (before the introduction of pricing based on weight) to 45% in 2003. Food waste is now collected in separate bins to promote its recycling.

For *bulky waste*, user charges also apply: a sticker must be purchased at a price set by the municipality according to the type and size of the item (e.g. furniture, white goods). *Construction and demolition waste* must be disposed of in a container rented from the local government. Large quantity generators (more than 300 kg/day) are responsible for treating their own waste (e.g. by contracting a private hauler).

Since 1993, *charges* have been paid by producers and importers of *products that are hard to recycle*, but the rates have been too low to create incentives to move towards recyclable products (Table 4.11).²⁷ Instead, the charges serve to raise revenues which accrue to the MoE budget.

Between 1992 and 2002, *product charges* were levied on producers and importers of *recyclable products* to provide for their collection and treatment (Table 4.11). The producers and importers could be refunded for the part they collected and treated themselves. Since 2003, this economic instrument has been replaced by an *extended producer responsibility scheme*, under which the producers and importers must fulfil a recycling/recovery target, through operating a take-back programme themselves or contracting with others to operate the programme. A

product charge is imposed for non-compliance (acting as a fine). The charge should be better designed to minimise the production of environmentally harmful products at the source and to finance safe disposal, recycling or reuse.

A *deposit-refund system* is being implemented for some disposable goods, as a result of a voluntary agreement between the government and the retail sector (including department stores and fast food chains).

Since 1987, a *liability charge* has applied to *industrial complexes*. Though there is no ceiling, the revenues collected are extremely low (Table 4.11). So far, they have accrued to the Korea Water Resources Corporation and have been used to operate sewage treatment plants in industrial complexes. There has not yet been a case where liability was actually imposed. Since 1991, *landfill operators* have had to pay liability charges to cover long-term treatment costs (leachate and gas) after landfill closure. In 1999, the scheme was extended to the *whole industrial sector* to provide for necessary solid waste treatment after factory closure. The charge varies according to the type and amount of waste generation, but the rates have been low, as reflected in the amounts collected each year (Table 4.11).²⁸ Such issues would be better addressed through liability insurance, as it is difficult to anticipate future remediation costs (which can be very high). Under the Soil Environment Preservation Act, any land transaction that involves a *contaminated site* requires an environmental site assessment to help assign remediation responsibilities. In 2002, the government signed ten-year voluntary agreements with five major oil companies to undertake surveys and restoration of contaminated soil.

Nature conservation

On the principle that urban expansion and infrastructure additions should be offset by action favouring nature, the government applies an *ecosystem conservation charge* to large scale development projects, mainly road construction but also buildings. It consists of a fixed charge (0.10 to 0.15% of construction cost, increasing with project size) plus a variable charge of USD 0.25 per m² of affected area. A refund is granted if the developer compensates for the loss of ecosystem by establishing new green areas or contributing to the country's reforestation. Since 2001 a "conservation value" has been attached to the type of affected/restored ecosystem (ranging from one for paddy fields and forests to four for protected coastal areas). The higher the conservation value, the higher the unit charge/refund (per m²). However, the rates have been set at very low levels and there is a ceiling of USD 434 000 per development project (raised to USD 868 000 in 2006).

Natural parks collect *entrance fees* that increase with the age of the park. Since 1995, small enterprises (e.g. restaurants) located in natural parks have been subject to a *liability charge* that is used to restore natural conditions after the activity has ceased. The charge is refunded if the natural environment is left in good condition.

Corporate environmental management is well developed in Korea, where more than 2 600 firms are ISO 14001-certified, the tenth best rate worldwide (in number of certificates). The approximately 2% of Korean firms that are ISO 14000-certified, essentially major companies, can offer guidance to their small and medium-sized business partners on how to simultaneously improve environmental management and competitiveness. The ISO 14001 standard for an environmental management system, first launched in 1996, was updated with the release of a new, improved version in November 2004. Korean firms that wish to remain ISO-certified will have to comply with the new version.

To promote green purchasing, Korea implements an *eco-labelling scheme* (pursuant to ISO 14024) and the Environmental Declaration of Products (pursuant to ISO 14025). By the end of 2005, 2 740 products had been granted the Korean eco-label and 266 products complied with the Environmental Declaration of Products scheme. The Green Procurement Act, which was promulgated in December 2004 and entered into force in July 2005, encourages public agencies to purchase environmentally-friendly products, in particular through E-commerce.²⁹

2.6 Environmental expenditure

PAC expenditure

After a period of stagnation during 1997-2000, in the wake of the financial crisis, total *PAC expenditure has increased significantly in volume since 2001*. As a share of GDP, PAC expenditure has remained at a robust level (1.6% to 1.9%) by OECD standards (Table 4.12).

However, implementation of Korea's environmental policy *still relies on the public purse to cover 32% of expenditures*, which are mainly to finance the creation of new infrastructure for sewage treatment and waste management (Table 4.13).³² This reflects low cost recovery in municipal waste management (43%) and sewage treatment (Chapter 2).

Table 4.12 **Total PAC expenditure** by environmental domain
(KRW billion at current prices)

	1995			2003		
	Total ^a	% public	% investment	Total ^a	% public	% investment
Waste water	3 075	56	59	5 647	53	58
Waste	1 910	57	33	4 087	48	25
Air	1 035	3	53	2 388	3	44
Other	286 ^b	31	51	1 703 ^c	56	40
Total	6 306	46	50	13 825	43	44

a) Public sector, business sector and households, including, in 2003, private specialised producers of environmental protection services.

b) Includes controls on noise and vibration and other environmental protection activities.

c) Includes soil and groundwater, noise and vibration, radiation, R&D and other environmental protection activities.

Source: OECD.

Table 4.13 **Total PAC expenditure** by economic sector^a
(KRW billion)

	EXP1 ^b		EXP2 ^c	
	Total	(%)	Total	(%)
Public sector	5 987	43	4 415	32
Business sector	4 548	33	7 813	56
Private specialised producers	2 758	20	-149	1
Households	532	4	1 750	13
Total	13 825	100	13 829	100

a) 2003 data.

b) "Abater" principle: includes all expenditure that the sector has for measures they themselves execute (e.g. household purchase of devices for motor vehicles).

c) Financing principle: measures how much money a particular sector (directly) contributes to overall environmental protection activities, wherever they are executed.

Source: OECD.

Other environmental expenditure

Over the period 2001-04, central government expenditure on *public water supply* was in the range of USD 400-500 million a year, paid mainly by the Ministry of Construction and Transportation (primary water supply) and MoE (drinking water supply in rural areas and islands). Central government expenditure for *nature conservation* rose from USD 70-100 million, mainly to manage national parks.

Overall environmental expenditure (i.e. PAC expenditure, as well as water supply and nature protection expenditure) is well above 2% of GDP.

Box 5.3 Taxation of land and property and local government revenue

Local government revenues include: i) local taxes (i.e. on land transactions, property holding and other local taxes), which make up about 40% of the total; ii) transfers from the central government, which make up another 40%; and iii) non-tax revenues (e.g. income from local public enterprises, public land development and various user charges as well as borrowing), which make up the rest. However, there are significant regional disparities: while metropolitan areas obtain 70% of their total revenue from their own sources, provinces and other cities obtain, on average, just 40% of their total revenue from their own sources.

Revenues from *land transactions* and *property taxation* reach about 20% of the total local government revenue. In 2003, land transaction taxes (the acquisition tax and registration tax) amounted to KRW 13.1 trillion. Taxes on property holdings (e.g. the comprehensive land tax and property holding tax) amounted to KRW 2.5 trillion. Since *regional disparities* in this tax base are larger than the disparities in income taxes, reliance on land and property taxation increases regional disparities.

Although local governments are allowed to adjust tax rates for 17 *local taxes* by as much as 50% above or below the standard rate, in practice they do not often do this, but instead grant tax reductions and exemptions as part of regional development policy.

5. Trade and Investment

Korean authorities have in recent years been concerned with a variety of issues that bring together *environmental, trade and investment policies*, both domestically and in international discussions and negotiations (e.g. in the World Trade Organisation and the OECD). These issues include:

- fulfilling Korea's obligations for trade controls under multilateral treaties and conventions on, e.g., endangered species, hazardous wastes and ozone depleting substances;
- influencing the design of evolving "rules of the road" on environment-related trade issues as they are negotiated in global, regional and bilateral forums;
- assisting Korea's emerging environmental technology and services industry to improve its competitiveness in world markets; and
- ensuring that firms operating abroad adhere to high environmental standards to help promote a good image of Korea and thereby support other national economic and political goals.

5.1 Korea's environment industry

Since 1995, Korea's environmental industry has *evolved rapidly*, pushed by the

higher environmental standards for goods and services that Korean firms must meet both at home and abroad, and pulled by the growing opportunities to export environmental technologies and green products around the world. In 2005, the industry included some 15 000 firms that provide a broad spectrum of environmental services (e.g. consulting/engineering, analytical and modeling studies; soil remediation) and/or develop, install or maintain environmental technologies and equipment (e.g. for water treatment, air pollution control, waste management and monitoring). According to MoE's latest survey (2004), *market growth* averaged 11.3% since 1995, and 15.4% since the Asian financial crisis of 1998, reaching USD 14.9 billion (2.06% of GDP) in 2004. This was fairly evenly divided among revenue from services, equipment and parts, and construction and installation. *Exports* of environmental goods and services reached USD 580 million in 2003 and are projected to increase three-fold, to USD 1 500 million, by 2007. Water quality control and supply and waste water treatment account for 50% of the export market, followed by air pollution control (25%) and waste management and recycling (approximately 15%). Korean firms are now highly competitive in this sector, with *world-class status* in eco-design, green materials, clean products and end-of-life recycling.

The *government has played a prominent role* in the growth of the industry, providing tax incentives, loans, grants, export credits, information and awards programmes, and public procurement. In 1992, the government introduced an eco-labeling programme to spur consumers, and in 1994 it financed a public green-procurement programme to help establish markets and contribute to profitability. Substantial funding has also been provided to the private sector to stimulate the development and deployment of state-of-the-art environmental technology. The G-7 Leading Technology Development Project (funded at the level of USD 181 million from 1992 to 2001) was conceived to develop seven areas of environmental technology to the level of the G-7 countries. Since 2001, MoE has been supporting a follow-up "Eco-Technopia 21 Project" (USD 1 billion from 2001 to 2010) to develop environmental technologies for the next generation, and a related "Eco-STAR" project (Eco-Science and Technology Advanced Research), to develop technologies that offer the most promise for marketability (e.g. no- and low-emission vehicles; advanced water treatment equipment and facilities).

Regionally, in 2001, *Korea, Japan and China* established a Roundtable Meeting on Environmental Industry Co-operation. Now held on a rotating basis, the meeting is attended by experts, researchers and financial consultants. Korea and Japan maintain an Eco-Labeling Forum, and Korea and China co-host the Korean Environment Industry and Technology Exhibit in Beijing.

Additional impetus was provided in 2002 by the government's designation of the *environment industry as a strategic national industry for the millennium*, along with information technology, biotechnology, cultural technology, nanotechnology and aerospace technology.

5.2 *Overseas investments*

Globalisation has induced many *Korean firms to move overseas* to open up new markets, to reduce labour costs, or to help support Korea's import needs (e.g. raw material acquisition). The government has been making efforts to ensure that these firms are "good citizens of the world", reflecting well on Korea and reducing the potential for economic or political issues to arise.

As an OECD member, Korea is expected to ensure that its industry adheres to the OECD Guidelines on Multinational Enterprises, and notably to a new chapter on the responsibilities of multinational enterprises for *environmental protection in host countries*. The government has, in accordance with the guidelines, established a National Contact Point in the Ministry of Commerce, Industry and Energy to undertake promotional activities and facilitate discussion and information exchange among firms about the guidelines. In 2002, the Korean Export-Import Bank published *guidelines on environmental audits*, and in 2004 it created an environmental technology department and launched an "environmentally friendly export credits" programme (e.g. supporting renewable energy projects).

5.3 *Free trade agreements*

The Korean government, through the Ministry of Foreign Affairs and Trade, has been making efforts to ensure that the *free trade agreements* that Korea proposes or enters into are sensitive to environmental protection and sustainable development considerations. A Korea-Chile free trade agreement concluded in 2002 contains a series of *environment-related clauses* in an investment chapter, including recognition that it is inappropriate to encourage foreign investment by relaxing domestic health, safety or environmental regulations. Korea also signed a free trade agreement with Singapore in 2005 and is currently negotiating with, Japan, ASEAN, Canada and the Europe Free Trade Association (comprised of Switzerland, Norway, Iceland and Liechtenstein) on

new *free trade agreements* that are expected to include environmental conditions.

5.4 *Endangered species*

Korea is a party to the 1973 *Washington Convention* on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Different governmental agencies take part in implementing the convention: import/export permits are issued by regional environment offices under MoE; permits for medical use are issued by the Ministry of Health and Welfare (Korea Food and Drug Administration); and border trade is controlled by the National Customs Offices.

Under CITES, Korea has banned trade in bear bladders and tiger parts used in traditional medicines and has instituted publicity campaigns (e.g. at airports) to educate citizens about their responsibilities to avoid and help thwart *illegal wildlife trafficking* (Table 6.9). A recent domestic act on endangered species, which incorporates CITES guidelines, should strengthen Korea's capacity to better control the trade. While progress has been made in recent years through improved surveillance and stiffer penalties for infractions, there continues to be a *need for increased manpower* trained to detect illegal traffic.

5.5 *Chemicals*

During the course of OECD accession and follow-up, Korea has taken major steps to fully incorporate the obligations of OECD membership, and sound environmental management more generally, into Korea's *chemicals management system*. This has included the revision of existing laws, the launching of new programmes, and the strengthening of relevant institutions. In 1997, a series of amendments to the domestic Toxic Chemicals Control Act of 1990 legislated a strengthening of Korea's efforts on, for example, good laboratory practices, the public's right to know in the event of a chemical accident, and the protection of proprietary rights for data submitted by companies for pre-market assessment.

The government's response has included the preparation by MoE of a *Framework Plan on Hazardous Chemicals Management* (2001-05) to promote cautionary measures for protecting the health of the Korean people. The ministry is also working to improve safety assessments of new chemicals by requiring new studies on, for example, repeated dose toxicity and acute toxicity in fish.

A *pollutant release and transfer register (PRTR)*, as recommended by the OECD, was launched by Korea in 1999, with data to be collected on the petroleum refining and chemical industries. The registry has since continued to expand and to be made more widely available. In 2000, PRTR data were collected and published for

23 industries (based on the Korea Standard Industrial Classification Code). To fulfill Korean NGOs' demand for early and complete information on pollutant releases, PRTR data for individual companies will be made public in 2008.

In addition to participating in the OECD Chemicals Programme, Korea is also active in an array of other multilateral activities and organisations involving chemicals, including the Strategic Approach to International Chemicals Management (SAICM) programme and the Intergovernmental Forum on Chemical Safety (IFCS). In 2001, Korea ratified the *Stockholm Convention* on Persistent Organic Pollutants (POPs), and in 2003 it acceded to the *Rotterdam Convention* on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. MoE is currently preparing a Dioxin and Persistent Organic Pollutants Control Act to facilitate implementation of Korea's commitments under the POPs Convention.

In 1999, Korean national laboratories began to conduct limited research on the behaviour and effects of *endocrine disrupting chemicals* in the environment. In 2001, an MOU on this subject was concluded between the Korean MoE and *Japan's* Environmental Protection Agency. An annual symposium is held under the MOU, and five research areas were selected and joint projects begun in 2003.

5.6 Forest products

Korea's *environmental and trade policies* recognise the *problem of trade in logs and other products* from forests that are not under sustainable management. This has been evident in Korea's efforts to curtail illegal logging in the tropics by both Korean

and non-Korean firms. Korea has also advocated sound forest management and marketing practices, including forest certification systems, stricter laws on logging, and eco-labeling, in a range of multilateral forums including: CITES, the FAO Committee on Forestry, the UN Forum on Forests, the International Tropical Timber Organisation, and the Asian Forest Partnership. The government's overall position, supported by the national forest products association, is to *promote sustainable forestry in both tropical and temperate countries* and to ensure that Korea's imports and domestic production of timber and wood products originate exclusively from well-managed forests. Korea has entered into bilateral co-operative forestry agreements with seven countries, including China, Mongolia, Myanmar and Australia, to enhance forest management through research collaboration, technology transfer and education.

Korea *remains a large timber importer* because its self-sufficiency in timber is less than 10%. However, its tropical timber imports have decreased markedly in recent years, falling from 935 000 cubic meters in 1998 to 654 000 cubic meters in 2003, with most timber imports now consisting of conifers from New Zealand that are lawfully logged. Several Korean forestry companies manage timber *plantations in other countries* from which they import, and Korea's largest paper manufacturing firms now derive the bulk of their raw materials from *recycled newspaper* rather than primary wood pulp.

5.7 Hazardous waste

Responsibility for import and export permits/authorisations, previously shared by MoE and the Ministry of Commerce, Industry and Energy, was centralised in MoE in 2001. The same year, the Act on the Transboundary Movement of Hazardous Wastes and their Disposal (enacted in 1992 in anticipation of the Basel Convention) was amended to, among other things, require the Environment Minister to *establish and promulgate waste item categories* to identify wastes eligible for import and export approval. In 1998, the public notification list had been amended to incorporate agreements and changes in categorisation standards made by the OECD (including the red and amber waste items) and the Basel Convention (including the Annex VIII items). Efforts are underway to adjust the list of restricted/controlled substances periodically, to amend the public notice on restricted items for transboundary movement, to publish a citizens guidebook on the import and export of wastes covering regulations and restriction standards, and to otherwise try to increase public awareness of hazardous waste trade policies and regulations.

In 2003, Korea exported 27 tonnes (USD 38 000) of *hazardous waste* and imported 44 190 tonnes (USD 55 million) (Table 6.10). Most exports consisted of wastes bearing PCBs, which were shipped to the Netherlands for destruction; most imports were used lead and nickel-cadmium batteries obtained for materials extraction. The government has been attempting to curtail the *illegal export of waste electronic goods*, such as abandoned computers and televisions, by requiring that they be disposed of at home or sold abroad as used products after repair and performance testing. Improved surveillance by *more and better-trained customs officers* is required as well as enhanced domestic management of this waste stream.

6. Development Assistance

6.1 Total Official Development Assistance

Korea became a *donor nation* in the late 1980s, creating the *Economic Development Co-operation Fund* (EDCF) in 1987 and the *Korea International Co-operation Agency* (KOICA) in 1991. Since 1990, Korea's GDP per capita has grown by 139%, to the point where Korea has the *capacity to take a larger role* in financing economic and social development and environmental management in poorer countries.

Korea's ODA programme totalled USD 57.5 million in 1991 and USD 423.3 million by 2004. In relative terms, Korea's ODA contribution of 0.06% of *gross national income trails that of the OECD Development Assistance Committee (DAC) donor nations*, whose average is 0.25% (Figure 6.2). Korea's announced goal is to raise this percentage to at least 0.1% by 2009, still a low level by OECD standards. *Bilateral aid* accounts for some *two-thirds of total ODA*, with 64% provided as grants. Korea is an observer but not yet a member of the OECD DAC.

6.2 Environment-related ODA

The environmental component of Korea's total ODA is also small but has shown modest growth since the last OECD environmental performance review (Table 6.11). In 2003, it stood at 1.46%, up from 0.5% in 1995 (although the percentage fluctuated during the period due to large EDCF loans in 1999 and 2001). *Bilateral grants* from KOICA have addressed prevention of industrial pollution in Viet Nam, afforestation in Western China, and establishment of a Dust and Sandstorm Warning Network in China. EDCF *loan financing* has been extended to a hospital waste water disposal facility in Indonesia, solid waste management and treatment facilities in Viet Nam, and ecosystem improvement in Inner Mongolia.

Table 6.11 **Korea's environment related ODA**
(million USD)

	1998	1999	2000	2001	2002	2003	2004
Total ODA	182	317	212	264	278	365	423
Env. ODA	1.64	41.48	6.42	23.89	4.41	6.39	5.84
KOICA projects	0.85	0.69	0.52	0.85	2.84	3.83	4.31
EDCF loans	–	40	4.98	19.6	–	–	–
GEF	0.59	0.59	0.59	2.85	0.73	1.16	0.97
World Bank	0.17	0.17	0.30	0.55	0.79	1.35	0.51
Others (IUCN)	0.04	0.04	0.04	0.04	0.05	0.05	0.05
Env. ODA/Total ODA (%)	0.09	13.06	3.03	9.03	1.58	1.75	1.38

Source: Communication from Korean authorities.

Korea's contributions to *multilateral institutions* have included a USD 470 000 annual contribution since 2002 to the World Bank-Korea Knowledge Partnership Programme trust fund, which finances Korean experts to assess environmental conditions in developing countries and identify policy options. Korea has also supported the GEF since joining it in 1994, and has made small annual contributions to the International Union for the Conservation of Nature and Natural Resources (IUCN).

KOICA carries out *environmental assessments* for the development projects it supports, consistent with an OECD Recommendation on this subject. Korea's *Export Credit Agency* undertakes environmental reviews of its lending activities.