

1.3 Use of economic instruments

Economic instruments used in Poland to manage water resources comprise charges, fines, subsidies and tax relief. There are *charges* for intake of surface and groundwater, as well as for sewage discharges to water or to soil. *Fines* are levied for inappropriate use of the environment, including illegal water intake, exceedance of the permissible volume of water to be abstracted, and non-compliance with limit values specified for sewage discharges. *Subsidies* in the form of budgetary grants and preferential credits are provided by the national, regional, county, and municipal funds for environmental protection and water management, and the EcoFund foundation which manages expenditure for debt-for-environment swaps (Chapter 8, Section 1.1). *Tax relief* can apply to certain investment expenses and donations for environmental protection; a reduced VAT rate is granted to manufacturers of certain products and to companies that provide services related to environmental protection. Other charges introduced in the Water Law of 2001 include those for use of inland waterways and water installations owned by the State; access to fishing areas; use of water bodies owned by the State Treasury (projects associated with hydro-engineering, water transport, extraction of stone, gravel, sand and other materials, or removal of plants from water); construction of transport, industrial or agricultural infrastructure; and use of recreational facilities and amenities.

Until 2001, charges paid by municipalities and water utilities were only one-fifth those paid by enterprises. They provided little incentive to treat sewerage. The *new system of charges* for water intake and for sewage discharge (to water or soil), established by the Environmental Protection Act (2001), no longer differentiates among users. Charges for water intake vary according to the quality and type of water abstracted and the part of the country. Charges for sewage discharges to water or soil depend on pollution content (Table 3.1) and in certain cases on the temperature of the discharges. The system provides revenue earmarked for environment funds. The new charges provide much stronger *price signals* regarding the true costs of using the environment, and therefore may stimulate improvements in environmental performance.

In practice, the *collection rate for charges* is high for water intake (well over 90%) but low for waste water discharges (about 50%) due to the very low rate of collection of charges for saline water discharges by coal mines (some 50 to 60% of all the charges imposed). So far this new system of fees has worked reasonably well with respect to revenue raising, but less well as a means of providing price signals since charges for municipal waste water treatment plants were relatively low (e.g. several times lower than those in Slovenia or the Czech Republic).

Table 3.1 **Water resource charges**

For water intake ^a	Groundwater		
	Basic fee	8	groszy ^b /m ³
	Surcharge depending on quality	2-16	groszy ^b /m ³
	Surface water		groszy ^b /m ³
	Basic fee	4	groszy ^b /m ³
For effluent discharge to water or soil ^a	Surcharge depending on quality and region	2-13	groszy ^b /m ³
	BOD ₅	3.0	PLN/kg
	COD	1.2	PLN/kg
	Suspended matter	0.37	PLN/kg
	Volatile phenols	32	PLN/kg
	Hazardous substances		
	Heavy metals (mercury, cadmium, zinc, copper, nickel, chrome, lead, arsenic, vanadium, silver)		
	Organic compounds (hexachlorobenzene)	87.5	PLN/kg

a) As specified in the ordinance of 9 October 2001.

b) 1 groszy = PLN 0.01.

Source: MOE.

1.4 Water pricing

Prices of water piped to households have increased considerably in the 1990s. In 1992 they were estimated at between USD 0.15 and 0.35 per m³; in 1998 they varied between USD 0.19 and 1.42, averaging USD 0.42. This trend has been accompanied by development of the metering system, particularly in new dwellings (which must be equipped with individual metering systems), and by a considerable drop in water consumption by households (from 500/600 litres per person per day in 1992 to 129 litres in 1998 in urban areas; in part reflecting a decrease in system leakage). Prices of *waste water collection and treatment* are estimated at between USD 0.19 and

USD 1.47 per m³ for households, averaging USD 0.85. Overall, the *total price* of water supply and waste water treatment was estimated at USD 1.27 per m³ in 1998; in that year households spent 1.4% of their budget on water and sewerage.

With respect to *cost recovery*, although water users should cover the investment and maintenance costs of water supply installations (as well as sewage collection and treatment), in practice they pay operating and maintenance costs and pay only partially for capital costs. In large cities the trend is to make water users pay both operating/maintenance and capital costs; however, in some smaller municipalities capital costs are partially or totally subsidised by municipal budgets. Despite plans to increase water and sewage services and to develop a rational and stable price policy, decisions on price setting often remain highly politicised; for example, municipalities are reluctant to increase the prices on water services before local elections. This instability has a negative impact on effective management of water companies and deters private companies from entering the water services market.

In 1998 the price of water purchased from the municipal network by *industrial users* varied between USD 0.43 and USD 2.16 per m³, averaging USD 0.87; prices for industrial waste water sources were between USD 0.20 and USD 2.58 per m³, averaging USD 0.94. Prices for industrial users were nearly 50% higher than corresponding prices for households, implying some degree of cross-subsidisation.

Concerning *agriculture*, State-owned agencies provide water for irrigation at no charge. Farmers are exempt from the obligation to obtain a permit and pay water abstraction fees, provided their surface water abstraction is less than 50 m³ a day and groundwater abstraction less than 15 m³ a day. These exemptions are limited to total abstraction of 18 250 m³ per year.

Complying with EU water legislation will imply a further *heavy investment in infrastructure* (e.g. water supply and sanitation), which will impact water prices. Available studies suggest that a higher level of cost recovery for expanded environmental infrastructure should not create an excessive burden on the majority of households, provided investment programmes are cost-effective and the implementation period is sufficiently long. For example, the World Bank concluded that under a low-cost scenario with investment through 2015 (as agreed for the urban waste water treatment Directive), *changes in household water and waste water bills* should have a limited impact on most households. Another study concluded that if all costs (annualised capital cost, operating and maintenance costs) were translated into higher tariffs, water and sanitation bills would be unaffordable for under 10% of the population. However, even the most optimistic scenarios indicate that some *vulnerable groups* would need assistance. Targeted income support, rather than blanket price subsidies, would provide the right incentives for consumers to reduce water consumption and would be more affordable for local budgets.

1.5 Investment expenditure

Poland has successfully mobilised financial resources to address water pollution control and water supply management. Investment in *water pollution control* (sewerage and waste water treatment) increased by nearly 40% in real terms between 1990 and 2000, and represented 50% of all pollution abatement and control investment in 2000 (Table 6.4). Investment in *water supply management* (water intake and supply systems, water reservoirs, flood embankments) also increased but at a more moderate rate; emphasis has shifted from investment in water intake and water supply systems (before 1996) to investment in construction or modernisation of purification plants and the regulation and consolidation of rivers and streams (Table 3.2). After a major *flood* in 1997, there was increased investment in embankments and pumping stations in areas which experienced subsidence and depression (Chapter 3, Section 2.3). Since 1998 the shares of investment in water pollution control and water supply management in total

Table 3.2 Investment outlays on waste water and water management,^a 1992-2000
(PLN million)

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Waste water management	663.0	777.5	1 001.9	1 160.5	2 160.5	2 982.5	3 425.8	3 765.2	3 341.2
of which:									
Municipal treatment plants	—	—	—	1 103.0	968.6	1 277.5	1 325.7	1 471.0	3 341.2
Sewerage systems	—	—	—	—	962.6	1 330.5	1 567.1	1 752.3	1 902.2
Closed circuits	—	—	—	—	23.3	48.3	46.4	140.0	45.8
Water management	632.8	790.3	979.6	999.4	1 415.0	1 783.5	1 748.2	1 766.7	1 652.7
of which:									
Water intakes and supply systems	507.3	616.3	765.8	765.0	880.6	1 129.0	936.1	832.8	851.8
Water treatment stations	—	—	—	—	206.9	210.0	214.1	232.5	196.8
Reservoirs and dams	86.3	127.0	142.4	165.1	205.1	249.6	196.9	232.1	205.8
River regulation and consolidation	23.5	27.8	45.6	32.0	49.2	77.1	197.6	240.8	154.9
Flood embankments and pumping stations	15.7	19.5	25.8	39.1	49.9	105.5	203.5	228.5	243.4

a) At current prices.

Source: CSO.

investment in the national economy fell, although in absolute terms investments in municipal sewerage systems and waste water treatment plants continued to grow.

In 2000 *financing of water management investment* (PLN 1.65 billion) was by companies or municipalities (45.4%), central budget funds (9.6%), Voivodship budgets (9.7%), municipality budgets (1.3%), environmental funds (8.9%), foreign assistance (13.1%), domestic credits and loans (4.1%) or other sources (7.9%). In 1999 *financing of sanitation investment* was as follows: investment expenditure in sewerage systems (PLN 1.42 billion) was mainly by companies or municipalities (56%) and investment in waste water treatment plants (PLN 1.36 billion) was mostly financed by environmental funds (43.6%).

With total revenue from charges and fines already declining, it will be increasingly difficult for the environmental funds to secure a large share of the financing of the waste water treatment plants. This is particularly true with respect to meeting the *costs of implementing the urban waste water Directive*, which will require adoption of highly efficient technologies to remove total nitrogen and phosphorus in waste water from agglomerations of over 10 000 p.e. The Directive requires use of such highly efficient technologies only if treated water is discharged to water bodies sensitive to eutrophication; for other types of water, lower levels of treatment are considered sufficient. In the absence of a thorough analysis of water bodies' sensitivity, the government considers the whole country to be sensitive. Thus, to achieve at least a 75% reduction of the total nitrogen and total phosphorus load, it will be necessary to construct, modernise or expand sewage systems and waste water treatment plants in 1 479 agglomerations by the end of 2015 (Chapter 3, Section 2.2). Needed investment for construction, modernisation and expansion of sewerage systems has been estimated at PLN 18.3 billion; for waste water treatment plants required investment has been estimated at PLN 12.3 billion. Concentrating on *cost-effective investment* efforts (i.e. at plants where abatement costs are the lowest and environmental benefits the highest) would help minimise the burden. Raising tariffs, particularly municipal tariffs, for water consumption and release of waste water would also be essential. Bringing cost recovery ratios closer to international standards would not only further reduce water usage; it would also satisfy a necessary condition for attracting private and foreign funding.

Agriculture

The *economic and social importance* of the agricultural sector is much greater in Poland than in many other OECD countries. It is characterised by low-intensity traditional agriculture dominated by small, privately owned farms, especially in the eastern part of the country. Employing some 19% of the total labour force, agriculture is the main source of income for over 4 million people (more than 40% of the rural working population). Following privatisation of State farms and State-owned co-operatives (particularly in western Poland), public ownership of agricultural land dropped from 20% in 1990 to 8% in 2000. *External environmental costs* from agriculture are low in Poland compared with those in many other OECD countries, although 61% of total land area (312 000 km²) is used for agricultural production (78% arable, 22% grassland). Intensity of use of fertilisers and pesticides in Polish agriculture, and the intensity of livestock operations, are still several times below the OECD averages (Figure 6.1).

Poland has recently begun looking at ways to incorporate *environmental objectives* into agricultural policies, with the aim of reducing nutrient run-off and accentuating agriculture's contribution to flood control and climate protection. Despite the relatively light environmental pressure of the Polish agricultural sector, nutrient run-off remains a major concern, especially in the context of Poland's HELCOM commitments to limit inputs to the Baltic Sea (Chapter 8, Section 1.4). In 2001 Poland presented a strategy for protecting water resources against nitrate run-off from agricultural sources and the Ministry of Agriculture began to offer support for agri-environmental measures at Natura 2000 sites (Chapter 5, Section 2.2). The Second National Environmental Policy calls for intensive afforestation of areas unsuitable for agriculture, an objective with important implications for flood control and climate protection efforts.

In 1999 the *producer support estimate* (PSE) for Poland was PLN 13 billion. Transfers to agriculture are 90% provided through market price support, with the remaining 10% of PSE provided in the form of subsidies for use of inputs to stimulate

productivity (certified seeds, seed potatoes, new animal breeds) and to prevent increases in soil acidity (use of lime). In the late 1990s support to producers (PSE as % of total value of production) reached 25%, but it is still well below the OECD average. In the late 1990s approximately PLN 285 million per year was provided for use of high-quality seeds and breeding animals and PLN 100 million for use of lime fertilisers. Support to agriculture (especially market price support) as measured by PSE rose by about 20% in the 1990s, mainly due to a greater decline in world prices than in producer prices for grains and milk. Use of industrial fertilisers has been increasing, partly due to preferential credit supplied to farmers for this purpose.

1.4 Market-based integration: greening of sectoral taxation and price signals

Energy prices and taxation

In the 1990s *energy prices for households* increased steeply; between 1991 and 2001 they increased by 66% for electricity and by 179% for natural gas (in real terms). When adjusted for purchasing power parities, energy prices for households in 2001 were higher than the OECD average by 44% for electricity, 80% for light fuel oil and 66% for natural gas (Table 2.3). High prices are a strong incentive for households to use less energy.

Poland has taken steps to strengthen economic incentives for energy conservation, but there is still considerable scope to strengthen price signals in the *industrial sector*. Fuel prices for Polish industry, low compared with those in other OECD Europe countries (Table 2.3), could probably be adjusted upwards without jeopardising competitiveness. Taxation of fuels used in stationary combustion plants is so far limited (Table 6.2). While light fuel oil for heating purposes (e.g. in households) is subject to a 7% excise duty introduced in 1999, most fuels used in industrial stationary combustion (e.g. coal, heavy oil) are exempt. Exemption of fuels with such high pollution potential from taxation provides no incentive to choose less polluting fuels. Consideration should be given to expanding taxation of non-automotive fuels, with some differentiation according to environmental impacts.

Subsidisation of coal production (hard coal and lignite) distorts domestic market prices in favour of this relatively pollution-intensive fuel. Between 1998 and 2001, direct State subsidies to support coal production increased by 97% (from EUR 199.7 to 393.8 million), even as output declined by 10% (from 116 Mt to 104 Mt). In other words, direct subsidisation per tonne increased from EUR 1.7 in 1998 to EUR 3.8 per tonne in 2001. Indirect subsidies take two forms: cross-subsidies from more to less profitable coal mines (carried out within industrial

Table 6.2 **Selected environmentally related taxes on energy and transport, 2002**

Stationary Combustion fuels	Excise tax	(+7% VAT) Light fuel oil used for heating purposes	PLN/1 000 litre 160
	Exemptions	Coal, heavy fuel oil	
	Revenue 2000	..	
Transport fuels	Excise tax	(+22% VAT) Leaded petrol	PLN/1 000 litre 1 629
		Unleaded petrol	1 464
		Diesel fuel:	
		Sulphur content less than 0.005%	980
		Sulphur content range 0.005-0.05%	1 027
		Sulphur content range 0.05-0.2%	1 090
		Other diesel fuels	1 104
	Exemptions	Petrol containing 4.5-5% ethanol; diesel fuel containing at least 10% by volume regenerated waste oil	
	Revenue 2000 ^a	PLN 13 024 million	
Vehicle sales tax	Excise tax		In % of value
		Vehicle with engine capacity > 2 000 cm ³	12
		Vehicle with engine capacity < 2 000 cm ³	3
	Exemptions	..	
Vehicle import Duty	Revenue 2000	PLN 700 million	
		Differs according to country of origin	Minimum (EUR)
		Passenger cars (up to 4 years old) non-EU, 35% of vehicle value	1 250
		Passenger cars (older than 4 years) non-EU, 35% of vehicle value	2 500
	Exemptions	..	
	Revenue 2000	PLN 900 million	

a) 30% of revenue earmarked for road construction and maintenance.

Source: EU; Ministry of Finance, Polish Customs Service, Polish Official Legislative Record; OECD.

federations) and cross-subsidisation of coal exports through domestic sales. In 1999, EUR 458 million was provided as a cross-subsidy from domestic coal consumers (who pay 50% more for Polish coal than do buyers on the world market) to support the export of 26 Mt of coal. In the same year domestic consumers paid EUR 33 per tonne for Polish coal, which was sold on the world market at EUR 21 per tonne; extraction costs were about EUR 35 per tonne. Thus, the domestic coal industry – despite much progress – is still not competitive. The 2002 OECD study of regulatory reform in Poland recommended ensuring that cross-subsidisation of exports is phased out.

Transport prices and taxation

Use of *vehicle taxation* expanded in the 1990s through application of vehicle excise duty, annual vehicle taxes and company car charges (Chapter 7, Section 1.4). Some attempt has been made to reflect environmental concerns through differentiated rates (Table 6.2). Vehicle excise duties, introduced in 1993, have been differentiated by engine size since 2000. Cars with engine capacity over 2 000 ccm are taxed at 12% of their value; those under 2000 ccm are taxed at only 3%. This is a disincentive to purchase larger vehicles. The annual vehicle registration fee charged for lorries and buses is differentiated in favour of those with smaller loading capacity (two categories). In 2000 a special tax was announced for company cars, differentiated according to engine size and type of fuel. Most transport taxes so far are aimed at influencing car ownership choices rather than patterns of car use. A recent study found that about 70% of the total external costs of the transport sector were internalised through transport-related excise duties and VAT (Chapter 7, Section 1.4). Tax rates should be reviewed and adjusted with a view to full internalisation of these costs.

When adjusted for purchasing power parities, *road fuel prices* are among the highest in the OECD (Figure 7.2). Taxes on motor vehicle fuels increased substantially in real terms during the 1990s (for both petrol and diesel) and have been increasingly differentiated to reflect external environmental costs (Table 6.2). The tax on unleaded petrol is lower than that on leaded, helping to accelerate the phase-out of leaded fuel, which was almost complete in 2002. The excise tax on diesel fuel is differentiated according to sulphur content. An 11% value added tax (VAT) on motor vehicle fuels was introduced in 1993. It was raised to 22% (its present level) in 1994.

Environmental expenditure

Reported *pollution abatement and control (PAC) expenditure* in 2000 was PLN 13.8 billion (2.0% of GDP); the majority (61%) was borne by industry (Table 6.4). Most (57%) of public expenditure was in the form of investment, while industrial expenditure (i.e. by business in all sectors) was dominated by current expenditure (60%). As could be expected, the greatest portion (83%) of public PAC investment was for waste water treatment infrastructure. For industry, priority PAC investment areas were air and climate protection (66%), while most PAC expenditure was for air protection (56%) or waste management (21%). In addition to PAC expenditure, *other environmental expenditure* (i.e. on nature and biodiversity conservation) was about PLN 293 million, mainly by the public sector.

Since 1997 the cost of Poland fully implementing the *EU environmental acquis* has been the subject of various estimates. Estimates of the overall environmental investment required range from EUR 22 billion to EUR 50 billion (Chapter 8, Section 2.1). Spread over ten years, this would amount to between 1.2 and 2.7% of GDP per year. Estimates vary, depending on the envisaged method of implementation of the EU environmental acquis and on the projected growth rate of GDP.

Table 6.4 **Environmental expenditure, 2000**
(PLN million)

	Total	Public			Industry		
		Total	Investment	Current expenditure ^a	Total	Investment	Current expenditure ^a
Total env. Expenditure ^b	14 068	5 647	3 080	2 568	8 421	3 326	5 095
% GDP	2.1	0.8	0.4	0.4	1.2	0.5	0.7
PAC expenditure ^c	13 775	5 354	3 076	2 278	8 420	3 326	5 095
Air	5 788	749	211	538	5 039	2 197	2 843
Waste water	4 715	3 159	2 553	605	1 556	694	862
Waste	1 820	484	251	233	1 337	273	1 064
Soil and groundwater	409	28	2	26	381	65	316
Noise	49	38	36	2	11	11	—
Other ^d	993	897	23	874	95	86	10

a) Breakdowns by media are OECD Secretariat estimates.

b) The sum of PAC expenditure (as detailed below) and expenditure on conservation of biodiversity and landscapes.

c) Sum of parts may not equal whole due to rounding.

d) Includes expenditure for protection against radiation, environmental education and training.

Source: OECD.

Table 6.5 **Environmental charges and fines entering the National Fund^a**

(PLN million)

	1995	1996	1997	1998	1999	2000
Pollution charges	1 813.8	1 744.6	2 168.9	2 013	1 462.5	1 669.5
Air pollution	658.2	750.7	865.1	719.8	646.4	677.1
Waste water	699	498	825.8	861.7	459.2	551.1
Water	173.7	212.8	229.4	239.8	209.3	206.3
Waste	282.9	283.1	248.6	191.7	147.6	235
Fines for non-compliance	214.9	195.5	277.9	311.3	191.1	404.9
Waste water	77.6	99.1	133	123.9	72.9	151.7
Air pollution	102.1	52.8	56.2	22.8	45.2	25
Noise pollution	3.4	4.9	5.7	3.7	6.3	4.8
Waste disposal	31.8	38.7	83	160.9	66.7	223.4
Total	2 028.7	1 940.1	2 446.8	2 324.3	1 653.6	2 074.4

a) Charges are levied for allowable emission levels; fines are levied as penalties for non-compliance with environmental standards
Source: CSO; MOE.

Financing

Environment funds were created at the beginning of the transition period to provide financing for environmental projects at various administrative levels. Today they include the National Fund for Environmental Protection and Water Management (hereafter referred to as the National Fund), 16 voivodship funds, over 370 poviats funds and some 2 500 municipal funds. The large number of funds and a lack of transparency in their funding decisions likely lead to inefficiencies. One special environment fund, the EcoFund, manages funds received as part of international debt-for-environment swaps (Chapter 8, Section 1.1). On the national and regional levels, environment funds operate as independent public legal entities, managed by Executive Boards under the supervision of Supervisory Councils but with government-appointed managers and council members. Regional environment funds are the instruments of the administration elected at voivodship level, whereas the Minister of the Environment oversees the National Fund. Apart from the EcoFund, environment funds operate as *transfer mechanisms*, receiving revenue mainly from pollution charges and fines (in line with the PPP) and financing environmental projects.

Historically, environment funds have played an essential role in *financing environmental investments*. Their overall share in investment funding has fallen from 50% in 1992 to less than 30% today. The funds provide grants and soft loans, and sometimes take equity stakes in environmental projects. About 25% of collected pollution fees go to the National Fund and 75% is split between funds at the voivodship, poviats

and gmina levels. In addition to designated portions of pollution charges and non-compliance fines, the National Fund and regional funds dispose of some other resources such as foreign assistance and earnings from their own financial operations, with the later now exceeding revenue from fees and fines. During the initial transition period environmental funds provided an important, reliable source of financing at a time when little such financing was available from commercial banks (Table 6.5). Commercial creditors have become increasingly active in recent years, which has raised concerns regarding competition from environmental funds.

Several *shortcomings in the way environment funds operate* were pointed out in the 2001 and 2002 OECD Economic Surveys of Poland. Although these criticisms do not apply equally to all funds, they focus on transparency, rigour in project selection, consistency with strategic objectives, accountability, and in a few cases the influence of special interest groups. A recent review of the National Fund's project portfolio proposed more systematic use of cost-effectiveness as a criterion for project selection. The Second National Environmental Policy projected a gradual reform of the environment funds' income base. Reduced environmental charges and fines would be offset by the introduction of a system of product charges. This reform would give a greater

role to revolving financial institutions and would require a larger contribution from households. These planned changes reflect in part the aim of giving more equal treatment to enterprises in a European context.

Economic instruments

An ambitious system of *environmental charges* was introduced in 1980. There are currently charges for water consumption, waste disposal, pollutant emissions to air and exploitation of natural resources (Table 6.7). The charges have two purposes.

First, they are meant to raise revenue that is channelled to environmental investment through environment funds (Chapter 6, Section 3.4). Second, they send price signals concerning the true cost of using the environment and therefore stimulate improvements in environmental performance.

The environmental charge system has fulfilled the first, *revenue-raising function* reasonably well. In 1999 the charges generated totalled PLN 1.6 billion (0.26% of GDP and 1.3% of total tax revenues). Collection rates were high, well over 90% (close to 100% if the coal mining sector is set aside). Important elements of successful collection include a good system design, a decade of experience and familiarity with its operation, and strict elimination of administrative discretion in deciding whether fees should be paid. Concerning tax liabilities, until recently the authorities have not been allowed to negotiate the amount or schedule of payment with polluters. Forgiveness and offsets of pollution charges were also strictly prohibited until the 2001 Environmental Protection Act widened the possibilities for administrative discretion. As a result, the collection rate is already falling, and is expected to fall further.

The charges fulfil their second function – sending adequate *price signals* – much less effectively. Polish air pollution charges are high compared with those in other countries that use them primarily for revenue raising (France, Japan, Netherlands, United States), but they are several times lower than emission fees and taxes with incentive purposes (Germany, Norway, Sweden). The rates of Polish air pollution charges are established based on criteria unrelated to abatement costs, implying that *de facto* they are not designed with incentive effects in mind. The rates for air emissions remain in the low range of marginal abatement costs, indicating that they provide an incentive to reduce emissions for some sources. However, they are not adequate to achieve the emission reduction targets to which Poland is committed in the framework of EU accession. Waste water effluent charges were adjusted following the Ordinance of the Council of Ministers of October 2001. Whereas there was previously a considerable difference in the rates applied to industrial and municipal discharges, now a flat rate is applied to all. Furthermore, the rate has been increased to a level comparable with those applied by the Czech Republic and Slovenia, now providing a true incentive to treat waste water at least biologically.

A new *clarification of the objectives* of the system of environmental charges is called for, together with streamlining of certain charging schemes that are excessively complicated (e.g. air emissions charges, for 62 air pollutants) and thus inflate transaction costs for implementing authorities and industries alike. Left unchanged, the revenue-raising function of the emission charges will become less important as progress is made in reducing pollution. The historic high rate of collection has fallen rapidly since 2001, following introduction of provisions of the Environmental Protection Act

Table 6.7 Selected environmental charges

Air pollution	Levied on measured or estimated emissions, by pollutant	PLN/kg
	NO _x (recalculated as NO ₂), SO ₂	0.4
	CO	0.1
	NMVOCs	0.9
	CO ₂ , methane	0.2
	Asbestos, nickel, dioxins and furans	267.9
	Manganese	15.3
	Benzene	6.1
	Chrome, cobalt	38.3
	Molybdenum	9.0
	Zinc, tin	4.0
	Lead	30.6
	Cadmium, mercury, halons, trichloroethane	133.9
	Exemptions	Emissions from agriculture, fisheries, public institutions
	Revenue 2000 ^a	PLN 761 million
	Levied per unit estimated emissions, for certain activities	PLN/Mg
	Reloading of combustion fuels	1.2-4.2
	Combustion of fuels (lignite, wood, gas)	3.2-9.5
	Revenue 2000	..
Waste disposal	Levied per unit waste, by sector of origin	PLN/tonne
	Agriculture/Food processing	8.9-116.3
	Industry	7.8-101.5
	Construction	8.2-106.7
	Municipal	13.8-44.3
	Revenue 2000	..
Tree felling	Levied per cm of tree trunk circumference	PLN/cm
	Minimum-maximum	10-1 340
	Revenue 2000	..
Premature forest harvesting	The charge equals the estimated difference between market value that timber from the forest would have had at mature cutting age, and its market value at the time of pre-mature harvest	
	Revenue 2000 ^b	..
Forest conversion	Levied on estimated annual market value of timber no longer grown on converted land. Charge is 10% of the expected annual market value of timber, from the land subjected to changes (15% in the case of protected forests). Paid for 10 years if conversion is permanent.	
	Revenue 2000 ^c	about PLN 100 million

Mineral extraction	Levied per cubic metre of mineral extracted	% of market price
	Hard coal	2
	Brown coal, salt	4
	Gas, methane, crude oil, mineral resources	10
	Metals, sulphur and other chemical resources	3
	Revenue 2000 ^c	PLN 921 million

a) Earmarked for environment funds: 20% gmina funds, 10% powiat funds, 50.4% voivodship funds, and 19.6% National Fund.

b) 100% of the revenue goes to the State Forest Fund.

c) Earmarked for environment funds: 60% gmina and powiat funds, 40% National Fund. For minerals extracted from the sea-bed 100% of revenue earmarked for National Fund.

Source: Ministry of Finance; Decision of the Council of Ministers, 9 October 2001; Central Customs Office; Regional Environmental Centre for Central and Eastern Europe.

that opened the door to administrative discretion and individual negotiations concerning payment of pollution charges. The Ministry of the Environment estimates that this could ultimately reduce fee collection rates to an estimated 15 to 20% (similar to those for non-compliance fines), thus fragilising an effective system for financing environmental investments.

2.3 Cost recovery for environmental services

Prices of water for households have increased considerably since the 1995 Environmental Performance Review. In 1992 they were estimated at between USD 0.15 and USD 0.35 per m³; in 1998 they varied between USD 0.19 and USD 1.42 per m³, averaging USD 0.42. This trend has been accompanied by development of a metering system, especially for new dwellings (which must be equipped with individual meters), and by a decline in water consumption by households (Chapter 3, Section 1.4). These market trends, together with large investments in reducing distributive losses in urban networks, have helped lower per capita water consumption.

Cost recovery for water supply and sanitation has improved considerably in the past decade. Operating and maintenance costs are almost fully recovered. However, investment expenditure for water supply installations and municipal waste water treatment plants are not yet being recovered (Chapter 3, Section 1.5). In large urban areas, higher levels of cost recovery are possible. The opposite is the case in smaller municipalities, where capital costs are generally subsidised totally or partially from municipal budgets. Increasing prices to full cost-recovery levels has been difficult in Poland's rapidly changing socio-economic setting, as affordability issues immediately arise. In practice, it has been difficult to incorporate affordability concerns into stable pricing policies at the municipal level since the subject has become politically polarised. This makes it difficult to attract private operators. The level of private sector participation in providing municipal environmental services is presently lower than that in other EU accession countries.

Poland has a long history of *charging users for municipal waste management services*. Services are contracted on a commercial basis between generators (e.g. households, enterprises) and service providers, which are usually largely State-owned. Municipal governments set waste management charges, not necessarily with cost recovery as the goal. New legislation since 2000 will introduce a range of taxes and other economic instruments to help create markets for recycled materials (Chapter 4, Section 2.1).

3.4 Financing environmental investment through environment funds

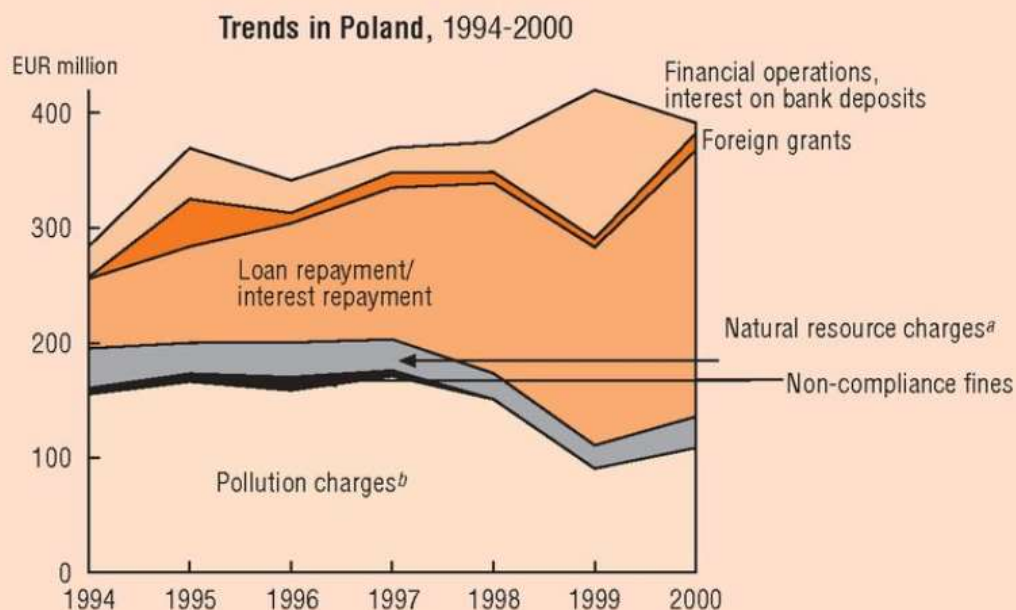
The National Fund

The National Fund for Environmental Protection and Water Management (hereafter referred to as "the National Fund"), established in 1989, is a major source of *financing for investment in environmental protection* and related activities (e.g. monitoring, research and educational programmes). It is administered by a Supervisory Council and executive board. The National Fund's income initially consisted mainly of pollution charges and fines and natural resource use charges; since 1998 it has consisted mostly of loan interest payments (Figure 6.4). The 2001 Environmental

Protection Act reduced the Fund's potential income from pollution charges by making their calculation the responsibility of enterprises and transferring income to regional and local funds. Reduction of industrial pollution as well as the new negotiable nature of charges help explain the recent decrease in the total amount of revenue entering the National Fund (Table 6.5).

The National Fund applies the *expenditure priorities stemming from the EU accession process*, as set out in the environmental policies Poland has adopted in recent years. The contribution of the National Fund and regional and local funds to environmental expenditure fell from 50 to 30% between 1992 and 1999. Its contribution is likely to remain large, but questions are being posed about the Fund's structure. This is mainly due to changes in the source and base of its income, of which a greater share is set to come from product charges rather than emission charges in the future.

Figure 6.4 **National Fund revenues by source**



a) Mostly mineral extraction charges.

b) 1998-2000: includes pollution charges and non-compliance fines.

Source: National Fund's annual reports; CSO.

Territorial environment funds – the example of Gdansk

There are 16 voivodship (regional), 370 powiat (county) and 2 500 gmina (municipal) environment funds. They operate as *independent entities* but sometimes finance projects jointly. The Voivodship of Pomerania (which includes the city of

Gdansk, the historic Baltic port which has a population of 460 000) has operated a regional environment fund (WFOS) since 1999. Playing the leading role in financing environmental protection in the Gdansk region, the WFOS channels revenue from pollution charges and fines to investment in environmental infrastructure (e.g. waste water treatment plants). A list of priority tasks is prepared on an annual basis, identifying the most important programmes and investments related to *environmental protection and water management in the Gdansk area*. WFOS revenues were PLN 54.5 million in 1999, PLN 65.0 million in 2000, and PLN 68.3 million in 2001. Revenues from environmental charges and fines make up about 65% of the total, with the remainder mainly generated from the fund's financial operations.

As with other regional funds, about 70% of the financing offered by the WFOS takes the form of *soft loans*. The rest is offered as *grants*. In 1999 and 2000, 62% of the financing made available by the fund was for water management infrastructure, 17% for air quality protection and about 7% for waste management activities. The WFOS participates in *nearly all major public environmental infrastructure investments* in the region of Pomerania. The WFOS (along with the EcoFund and other important sources) facilitated construction of the largest municipal sewage treatment plants in Gdansk (throughput 180 000 m³/day), Gdynia (throughput of 130 000 m³/day) and Jasturnia, as well as extension of sewerage systems in several other coastal communities. The WFOS fund has also co-financed construction of several industrial waste treatment plants (e.g. Dalmor S.A., Wilbo, S.A.) and numerous investments for the purpose of reducing air emissions or improving the energy efficiency of industrial processes. It has been instrumental in providing the financing necessary to upgrade and extend the Gdansk area's air monitoring network to bring it up to EU standards for measurement methods and data quality. This fund will clearly need to devote increasing resources to municipal waste management.

Strong international influences

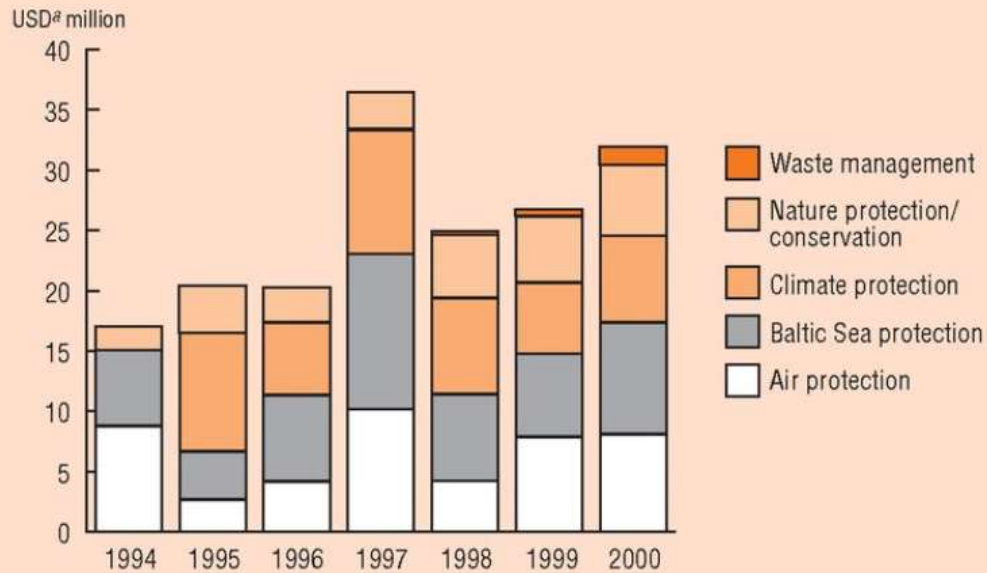
In recent years, while Poland has been engaged in negotiations on *EU accession*, it has made wide-ranging efforts to transpose EU Directives concerned with the environment. Issues regarding implementation (e.g. transition periods, investment programs) have also been addressed (Chapter 8, Section 2.1). In parallel with integration of legal commitments arising from international environmental conventions into national legislation, this process has resulted in significant and more or less continuous change in Poland's legislative and institutional landscape since the 1995 EPR (Chapter 6, Section 2.1). Negotiation of the environment chapter of the EU accession agreement, although problematic, proceeded rather quickly and was provisionally closed in 2001. Very little, however, has been done to ensure that environmental concerns are systematically taken into account in negotiating other chapters of the agreement (e.g. transport) which could have significant environmental implications.

The *EcoFund* is an independent, non-profit foundation established by Poland's Ministry of Finance in 1992. It has been an effective catalyst for initiating needed environmental investment in Poland, in a setting where there are many competing priorities. Created when six creditor countries (the "Paris Club") agreed to waive repayment of part of Poland's public debt on condition that the funds be used for environmental protection (so called "*debt-for-environment swaps*"), the EcoFund received about USD 235 million from 1992 to 2001 through the debt-for-environment mechanism. The EcoFund's revenue between 2000 and 2009 is projected to be an additional USD 335 million. Although funds provided by the EcoFund constituted only about 1% of total environmental expenditure from 1992 to 2000, projects financed with EcoFund support have accounted for over 10% of all environmental investment expenditure in Poland since 1992. The EcoFund finances investments which help address: i) regional environmental issues (reducing SO_x and NO_x

transboundary emissions, reducing pollution in the Baltic Sea); ii) reduction of GHG emissions; iii) biodiversity conservation; or iv) rationalisation of waste management and treatment of contaminated soils. To date, investments related to reducing air emissions (SO_x, NO_x, CO₂) have accounted for over half of EcoFund expenditure (over 90% of these investments have been directed to improvements in the energy production/heating sector). Investments in water supply and sanitation have accounted for a growing share of total EcoFund expenditure (Figure 8.1). Waste management has recently been designated as a priority area for investment.

Poland receives significant *funding inflows* of official assistance and foreign direct investment. The MOE works to ensure that part of these funds are used to stimulate transfer of innovative environmental protection technology and know-how. For example, such funds have been used to help promote cleaner production as recommended in the 1995 OECD EPR. In 2000 Poland received *official assistance* from OECD Development Assistance Committee (DAC) members totalling USD 1 396 million, representing 22% of their total assistance to Central and Eastern Europe. Additional funds were received through international sources (e.g. EBRD, UNDP, World Bank) and through bilateral projects funded by a number of OECD countries and by EU pre-accession funds. Since 1995 Poland has rather consistently received the highest inflows of *foreign direct investment* among non-DAC OECD

Figure 8.1 **EcoFund expenditure by environmental sector, 1994-2000**



a) At 1995 prices and exchange rates.

Source: EcoFund 2000.

countries, although it was surpassed in 2000 by Korea (USD 10.1 billion FDI to Korea; USD 9.3 billion to Poland). Consistent with world trends, the inflow of FDI to Poland fell off steeply (by 27%) in 2001. Most of this FDI has been associated with privatisation of previously State-owned enterprises, but greenfield investment has also been supported.

1.6 Trade and environment

Polish accession to the EU will entail *trade liberalisation* at the regional level, which can be expected to have some environmental impacts. The accession process has already resulted in the adoption of higher environmental standards. Poland should ensure that environmental objectives are reflected in the use of EU structural and cohesion funds following accession (Chapter 8, Section 2.1).

Poland is a party to the Montreal Protocol and has met nearly all the phase-out deadlines for *ozone depleting substances (ODS)* as established in the Protocol amendments. In 2000 Poland did not produce CFCs or halons and was only a small consumer of these chemicals. CFC consumption (production plus imports minus exports in bulk) dropped from 4 940 tonnes in 1990 to 310 tonnes in 1998; Poland considers its remaining consumption necessary for “essential uses”. Halon consumption dropped from 330 tonnes in 1990 to 33 tonnes in 1993 and has remained at zero since (thus meeting the 1994 deadline for complete phase-out). A Global Environment Facility project initiated in 1997 facilitated transfer of ODS-free technologies to the industrial sector, development of a national network for recovery of refrigerants, and strengthening of enforcement capacity through training.

Poland limits and regulates *international trade in hazardous waste* rather strictly. In the early years of economic transition there were plans to export hazardous waste from OECD countries to Poland. However, Poland became a party to the Basel Convention in 1992 and banned all imports of hazardous waste in 1993. These early proactive actions helped protect it against illegal imports of obsolete chemicals and allegedly recyclable material, which have been sent to other central European countries (e.g. Hungary, Romania and Albania). Although data on inspection and enforcement are not available, the Ministry of the Environment reports that controls of waste shipments in transit on Polish territory are very effective. This is partly due to co-operation among the Inspectorate for Environmental Protection, the Sanitary Inspectorate, the Customs Office and the Border Police.

As a party to the Convention on International Trade in Endangered Species (CITES), Poland has taken measures to prevent *illegal trade in endangered species* since 1989. Customs officials have been trained, and efforts have been made to improve co-ordination with neighbouring countries. Comprehensive data on searches and seizures are not available. Illegal smuggling of caviar (i.e. without CITES permits) from Poland to the United States became an issue in the late 1990s. Warsaw's Deputy Police Chief pled guilty to conspiracy to smuggle wildlife in a 1999 case involving some 9 500 kg of caviar. Poland is among the world's top ten exporters of medicinal and aromatic plants and plant parts, an increasing number of which are on endangered species lists; a recent WWF/IUCN report called for tighter regulation of commercial exploitation and exportation of these plants. In 2000 Poland began co-operation with France to increase public awareness of CITES issues in Poland and to improve Polish inspectors' understanding of EU CITES regulations.

Table 8.3 Protected status of some mammals offered for commercial hunting

Name	Price (EUR) ^a	CITES	EU Reg 338/97	IUCN (1996) Red List
Grey wolf (<i>Canis lupus</i>)	1 200	II, I	A	Removed 1996
Beach marten (<i>Martes foina</i>)	100	III	C	—
Pine marten (<i>Martes martes</i>)	100	—	—	—
Raccoon dog (<i>Nyctereutes procyonoides</i>)	90	—	—	—
Red fox (<i>Vulpes vulpes</i>)	70	—	—	—
European bison (<i>Bison bonasus</i>)	5 050	—	—	EN A2ce C2a

a) Prices reported are the maximum quoted in published offers by commercial agencies; may be considerably higher in reality.
Source: Traffic 2002.

According to a 2002 report by Traffic (the WWF/IUCN wildlife trade monitoring programme) on *commercial hunting*, approximately 15 000 tourists per year come to Poland to hunt (mostly from Germany, Italy, France, Austria and Spain), generating annual revenue of about EUR 2 million. Hunting tourism in Poland is mainly focused on non-CITES species. However, some listed species are commercially hunted, with permit prices roughly corresponding to their rareness (Table 8.3). Demand for hunting tourism has been increasing in the last few years.

2.1 Pre-accession negotiations and commitments

The environment chapter of the accession agreement

Investments and financing

Estimates of the amount of *investment necessary to implement the EU acquis* in the area of environment range from EUR 22 billion to EUR 50 billion; spread over ten years, this would entail investing 1.2 to 2.7% of GDP per year. However, it should

be noted that some investment costs would also have resulted from implementation of national environmental legislation and international commitments; thus they do not strictly represent the “additional costs” of implementing the environmental acquis. Still, necessary investment will be considerably more than the 1% of GDP spent by Poland for pollution abatement and control investment in 2000 (Table 6.4). It is anticipated that future expenditure will be borne primarily by companies and local governments. Modernisation of enterprises will be financed by the enterprises themselves or facilitated through loans. Investments by local governments will be financed from their own budgets and local environment funds. The continued existence of the *environment funds* (Chapter 6, Section 2.1) will no doubt be instrumental in ensuring that Poland meets its deadlines for full implementation of EU environmental legislation.

Investments in environmental infrastructure are also eligible for co-financing (before EU accession) by *pre-accession assistance sources* (e.g. PHARE, SAPARD, ISPA) or will be eligible after accession by structural or cohesion funds. The PHARE programme, established in 1990 to assist central European applicants in their preparations to join the EU, was refocused in 1999. PHARE funds liberated by the creation of SAPARD and ISPA were redirected towards promoting economic and social cohesion, particularly through institutional strengthening (e.g. institutional twinning, technical assistance). PHARE helped familiarise candidate countries with the structures and procedures they will need to use Structural Funds efficiently and effectively. SAPARD (Special Accession Programme for Agricultural and Rural Development) has taken the lead in promoting modernisation of agriculture and the development of rural areas, with the aim of helping accession countries comply with the Common Agricultural Policy. Annual financing available for Poland is approximately EUR 175 million.

ISPA (Instrument for Structural Policies for Pre-accession) has become the main instrument for promoting development of transport and environmental infrastructure in Poland. ISPA, a precursor to the Cohesion Funds, has committed to funding projects totalling EUR 7.3 billion (approximately EUR 1.0 billion per year) in the ten candidate countries between 2000 and 2006. Poland will receive about 35% of the total during this period. The rate of assistance will be up to 75% of eligible public expenditure (EPE), and in exceptional cases up to 85%. In 2000 and 2001, 35 Polish ISPA projects were approved, with ISPA's grant contribution totalling EUR 1.4 billion and EPE totalling EUR 2.06 billion. Of these projects, 14 were for environmental infrastructure (ISPA grant contribution of EUR 545 million, EPE of EUR 916 million). Polish environmental projects approved thus far have mainly been oriented towards helping Poland upgrade and expand environmental infrastructure, with the aim of complying with Directives on waste water treatment (approximately 65% of total investment), drinking water supply (17%) and solid waste management (15%).