3. Financing Noise Abatement

Noise abatement is primarily financed by *national road, railway and aviation administrations* and to some extend by *municipalities*. There are no data concerning private sector funding. Better information about noise abatement expenditure is needed.

Nevertheless, since 2000, the Road Administration[12] has spent roughly EUR 2.2 million per year, the Rail Administration[13] about EUR 3.3 million per year and Finavia[14] up to EUR 0.6 million per year. Expenditures of municipalities for noise barriers for railways have been EUR 0.6 million per year on average. The corresponding total public expenditure of EUR 7.7 million is an underestimate of yearly expenditure, which is rather in the range of EUR 10 million per year. This represents about 1.3% of PAC public expenditure (Chapter 6).

A 2007 *package of noise abatement measures*[15] was prepared to estimate financial support needed for noise abatement projects in public road (77 projects) and rail transport (9 projects) in Finland, including for noise "hot spots". Costs were estimated at EUR 30 million a year over a period of 15 years. The package include: construction of noise walls, introduction of speed limits, façade insulation, use of porous low-noise surfaces, quiet vehicle procurement, as well as inspection and enforcement of noise emissions from vehicles. The package is expected to decrease exposure to noise to guidelines levels of over 25 000 inhabitants from road traffic and exposure to noise of over 6 000 inhabitants from rail traffic. No financial allocation has been made yet.

A 1999 abatement research assessment concluded research efforts on environmental noise were fragmented and insufficient. In recent years, more emphasis has been placed on integrating noise abatement into R&D activities. Research has been done to reduce the impacts (rolling noise and inhalable dust) of studded tyres on "low-noise" pavements. MoE is preparing a *strategy to strengthen R&D in noise abatement*. Finland should participate more actively in the European Technology Platforms (ETPs) which include addressing transport noise ("ERTRAC" for road traffic, "ERRAC" for rail traffic and "ACARE" for air traffic).

2.5 *Waste management expenditure*

Expenditure for waste management by the *public sector* increased from EUR 67 million in 1995 to EUR 141 million in 2005 (Table 4.7). Operating expenditure still account for 70% of the total but investment spending has increased dramatically, from around EUR 3 million in 1995 to EUR 39 million in 2005. Most of the expenses (in the Helsinki Metropolitan Region all expenses) related to the collection and treatment of waste, including hazardous, are covered by waste charges and taxes.

Waste management *investment expenditure by business* increased from EUR 29 million in 1997 to 41 million in 2005 with the average annual level of around EUR 30 million. Oil and coal products and wood processing industries accounted for the highest investment spending on waste prevention and soil protection in 2005, with EUR 8 million and EUR 7.6 million respectively, followed by pulp and paper and chemicals industries with EUR 6.6 million and EUR 4.3 million respectively.

5.1 *Forests: a key role in preserving nature and biodiversity*

Some 74% of Finland's land area (23 million hectares) are covered by forests.[19] Nearly all Finnish forests (96% or 22 million hectares) are certified under the *Finnish Forest Certification System* (FFCS),[20] which is part of the Programme for the Endorsement of Forest Certification schemes (PEFC) (formerly known as the Pan-European Forest Certification Council). Another 10 000 hectares have been certified under the Forest Stewardship Council (FSC). A Finnish FSC (Forest Stewardship Council) Standard is being prepared for international accreditation. The annual removal of roundwood in recent years has been about 78% of the calculated *maximum sustainable removal* (the level to which fellings could rise without prejudicing the size of future removals).[21]

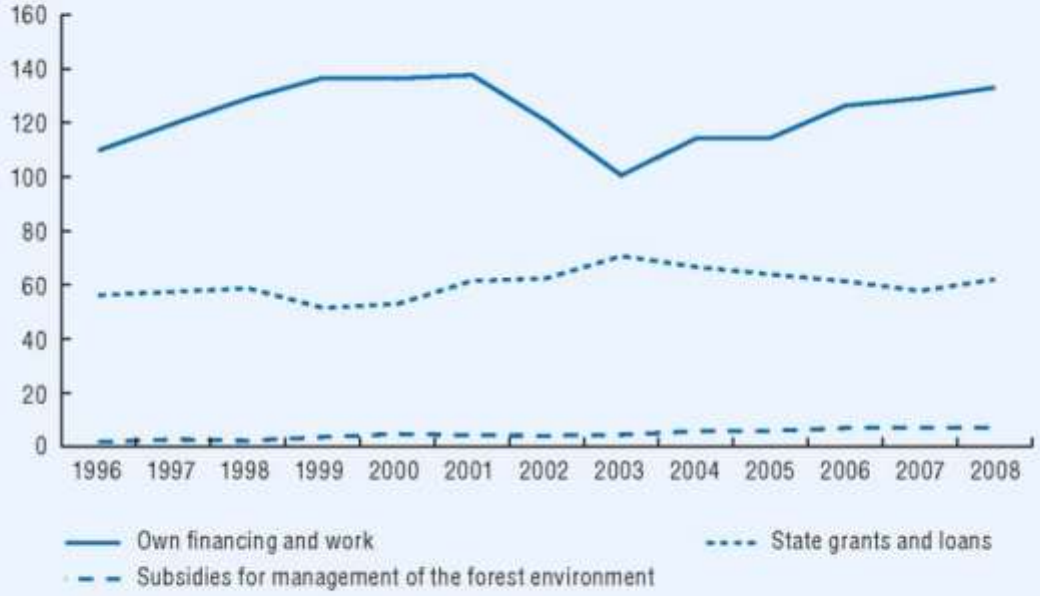
However, the 2008 Red List of habitat types revealed that nearly half of the area of Finnish forests (nearly 70% of the number of forest habitat types) were threatened (vulnerable, endangered or critically endangered), mainly reflecting an increase in the share of young and middle-aged forests with reduced ecological integrity and quality of the habitats (*e.g.* characteristics of living and dead trees), which in turn results from increasingly intensive forestry practices. Many of the threatened habitat types are typically small in size. The 1996 Forest Act defines particularly significant habitats in commercial forests where management has to be carried out in a way that retains certification characteristics. But *only 8.2% of Finland's forests are protected*, 4.5% under strict protection schemes that prohibit logging (8.3% in northern Finland,

only 1.5% in southern Finland).

The National Forest Programme 2015 (NFP 2015) sets *very ambitious targets to improve the economic viability of Finland's forestry.*[22] The aim is to reverse the trend of decreasing profits in the sector. This is particularly true now as, due to the economic downturn, weakening demand for forest products in western Europe has led to markedly decreased sawn wood prices in 2008. No major improvements in paper prices can be expected in the near future either (UNECE Timber Committee, 2008). However, wood, energy, labour and other input costs have increased. In the light of weakening profitability and oversupply situation in western Europe, the Finnish forest industry has reacted with plans to cut capacity.[23] An additional concern is wood availability after the expected rise of Russian roundwood export tariffs in 2009, which would impact on markets not only in Finland, but also in the rest of the world (Box 5.5). Japan and China are large importers of Russian wood and will have to find other sources of raw material supply for their forest industry. Sawlog prices will probably rise globally and the rising Asian demand for sawnwood and plywood will push up prices in these product groups in Europe.

The *private family forests* are of crucial importance for the industry's roundwood procurement, as about 80% of the domestic roundwood (and 60% of all roundwood, both domestic and imported) consumed by the forest industry is from such forests.[24] Over the last decade non-industrial private forest owners have invested some EUR 120 million a year for managing their forests, for the most part for forest regeneration work, representing 12-13% of their revenues (gross stumpage earnings).[25] In addition, in 1996-2008 government support to non-industrial private forest owners has been over EUR 60 million a year for "traditional" forest management[26] plus EUR 1.7 million a year for managing the forest environment (Figure 5.4). The government support to environmental management is thus a small part of total *government support to private forestry*, though it is increasing. It was EUR 7 million in 2007 (or 10% of total support) and is planned to rise to

Figure 5.4 **State and forest-owners of funding of investments in non-industrial private forestry,** 1996-2008[a]



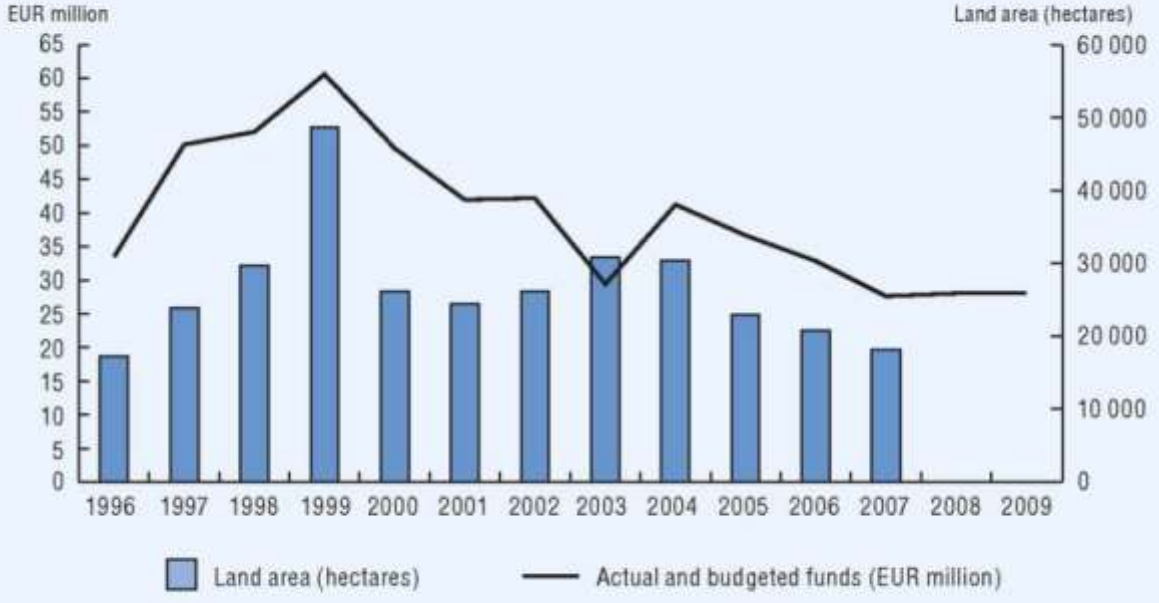
a) at 2006 prices.
Source: Finnish forest research institute.

EUR 13 million from 2010. About EUR 4 million (out of the EUR 7 million) is for paying environmental support under section 19 of the Act on the Financing of Sustainable Forestry. Almost one third of this sum has gone to forest owners in areas covered by the Lapland and Northern Ostrobothnia regional forestry centres. When landowners can demonstrate that environmental measures reduce the yield substantially they may ask for compensation. Losses exceeding 4% of the logging value or EUR 7 000 are compensated. Funding is granted for measures that maintain and promote biodiversity beyond the obligations set forth in the Forest Act. The amount of support is based on expected timber sale revenues. Landowners need to enter a 10 years commitment with the Forestry Centre to preserve biodiversity and refrain from forest practices in the commitment area. The remaining EUR 3 million is spent on larger projects that promote nature values.

Purchases of forest land by the State concern mainly old forests, the most important biotopes from an international perspective. The share of old forests in total forest land has decreased dramatically during the last century and now accounts for about 2-3% in the south and up to about 20% in some areas in the north. Since 1997, 300 000 hectares of private land has been purchased for nature conservation purposes (Figure 5.5). Since then some EUR 500 million have been spent for such purchases, and most were dedicated to the acquisition of old-growth forests. At the beginning of 2008, only about 1 % of the total surface area of old growth conservation programme in private ownership was still waiting for state purchasing or paying compensations to landowners.

The *Forest Biodiversity Programme for Southern Finland* (METSO) for the period 2008-16, approved by the Government in March 2008, will continue to promote voluntary conservation schemes with similarities to those tested in the programme's pilot phase over the years 2002-07. The pilot showed that the most effective way to preserve biodiversity in the mainly privately-owned forests of southern Finland is to get forest owners committed to conservation on a voluntary basis. The METSO Programme will start with the protection of 10 000 hectares of state-owned forests in southern Finland by 2010. The main focus of the new programme will nevertheless be in private forests, where new schemes will be

Figure 5.5 **Implementation of land acquisition programmes,** 1996-2009



Source: Ministry of the Environment.

increasingly adopted from 2010 onwards, following the completion of earlier conservation programmes. The METSO schemes in commercially managed forests will mainly start in 2010 on the basis of preparatory work that is already under way. Revision of ecological site selection criteria, which should ensure that the conservation of the most valuable sites is duly prioritised, was completed in June 2008. Funding decisions have so far guaranteed EUR 182 million of financing for the programme until 2012. During the years 2008-09 previous nature conservation programmes will be completed at a cost of some EUR 80 million, extending Finland's network of protected areas by some 45 000 hectares.

The METSO Programme is expected to *extend southern Finland's current network of protected forests* by some 88 000 hectares additional nature reserves. Another 8 000 hectares may additionally be designated for temporary protection, meaning that the total area under protection or conservation will expand by almost 96 000 hectares in addition to the 10 000 hectares to be protected within State forests by 2010. Metsähallitus is also now drawing up forest management plans that prioritise biodiversity in areas of importance for the coherence and interconnectivity of Finland's network of protected areas. The METSO Programme aims to halt the ongoing decline in the biodiversity of forest habitats and species, and establish favourable trends in southern Finland's forest ecosystems by 2016, in line with internationally defined biodiversity targets. The METSO Programme was launched at the same time as Finland's new National Forest Programme for 2008-15. The co-ordinated preparation and launch of the two programmes intend to illustrate that the commercial use of Finland's forests can be harmonised with the conservation of their biodiversity. During this period, the programme will be evaluated three times, with the first evaluation of future needs conducted in 2012.

5.2 Nature tourism: a rapidly growing sector

Nature tourism accounts for about 25% of the overall tourism activity in Finland and is rapidly growing, particularly in Lapland. *National parks and wilderness areas have become very important for tourism* (the number of visitors increased from 358 000 in 1992 to 1 410 000 in 2005) and provide income and work opportunities for local people, thus contributing substantially to the regional and local economy. It was estimated in 2003 that recreation and nature tourism in the most popular protected areas benefited EUR 230 million to local economies and will benefit about EUR 310 million by 2010.[27] In 2003 the Council of State adopted an Action Programme for Developing Recreational Use of Nature and Nature Travel (VILMAT), aimed at doubling the number of jobs in the tourism sector by 2010 to a total of 64 000.

Measures have been taken to regulate tourism in state-owned protected areas, notably through Metsähallitus, by obtaining prior commitments to guiding principles from local tourism companies willing to develop their activities in protected areas. Given the rapid growth of nature tourism it is important to continue *developing sound policy guidance* to avoid negative impacts of tourism on conservation objectives[28] and to support mutual benefits, including through indicators and monitoring schemes to assess the ecological, social and economic impacts of tourism on protected areas. Efforts should also be made to enhance the financial contribution of the tourism industry towards nature conservation, for example through public private partnerships or by setting fees for enterprises which rely on protected areas for a major part of their activity. This includes some big and many small tourism operators that organise guided tours in protected areas.

7. Financing Nature and Biodiversity Conservation

Government support for nature and biodiversity conservation ranged over the review period *between EUR 60 to EU 70 million a year* (Table 5.4). Most of it was allocated to land acquisition (by Metsähallitus) for the state, the management of protected areas, and compensation to landowners. The budget for land purchase has decreased as land acquisition programmes are coming to an end (Figure 5.5).[29] At the same time funding of Metsähallitus/NHS management work for state land protected areas has increased, reflecting efforts to establish and implement new management plans. Compensation payments have remained virtually unchanged. They cover both the loss of farm/forest income due to conservation easement, and damages due to attacks on domesticated animals (*e.g.* between 1998 and 2004 compensation for damages to reindeer populations by the golden eagle came to a total of EUR 2.3 million).

MoE has allocated EUR 0.2-0.5 million a year for the *management and protection of threatened species* on private land. By comparison, Metsähallitus spends annually EUR 0.5-1 million for biodiversity protection on state-owned land, excluding funding for restoration and management of natural habitats. The Red List of threatened species 2000 estimates at EUR 4 million per year the additional resources needed for the protection, monitoring and management of threatened species over the next ten years.

Table 5.4 **Public funding of nature conservation programmes**

(EUR million)

	2001	2002	2003	2004	2005	2006	2007[a]
Land acquisition	32	23	22	29	26	24	20
– Purchases of private land	17	13	6	14	26	24	20
– Land exchanges	15	10	15	15	–	–	–
Protected area management	14	16	24	21	25	26	26
Conservation compensation	12	16	9	16	17	15	14
LIFE Natura	2	2	2	2	1	1	1
Employment funds (Ministry of Labour)	3	2	1	1	1	1	1
Total	63	59	58	69	70	67	62

a) Budget proposal.
Source: Statistics Finland.

Sustainable consumption and production

Finland recognises that it still faces serious challenges related to sustainability, especially concerning the need to reduce CO_2 emissions, the consumption of natural resources, and the amounts of waste generated. In this regard, the inter-ministerial committee on sustainable production and consumption has put forward a proposed *programme to promote sustainable consumption and production* (SCP) (KULTU Committee, 2005). Its key objectives are to increase efficiency in the use of materials and energy through all stages of product life cycles, to promote environmental education, to develop and adopt environmental technologies. According to the programme, Finland must also play an active role in promoting these principles internationally. There are 73 proposals. Implementation of this SCP programme

should bring multiples benefits (environmental, economic and supply security). Gains in material and energy efficiency in buildings, transport, and in industry, must be seen as a priority.

1.3 Sustainable development in practice: market-based integration

Subsidies

Since Finland joined the EU in 1995, the Common Agricultural Policy (CAP) has governed the financing of Finland's agricultural sector (Box 6.1). The Single Payment Scheme (SPS), adopted in the context of the 2003 CAP reform, was introduced in Finland in 2006. It aims at moving away from a policy of market price support to a policy of farmer income support. As a general rule, no particular form of production is required to receive payment. Most (93%) of CAP payments are granted through the SPS in Finland (OECD, 2007). The SPS is implemented on the basis of a hybrid model consisting of a regional flat-rate payment and farm-specific top-up payments based on farmers' historical entitlement. These farm-level top-up payments (that apply to dairy cows, male bovines and starch potato) will stay at the same level until 2010 and then gradually decrease and be incorporated into the flat rate regional payments by 2016. Gradually decreasing farm-level top-up is also paid to sugar beet growers until 2019. *Cross-compliance conditions attached to CAP support* (first pillar of the CAP) have been introduced gradually between 2005 and 2007. In addition to EU cross compliance requirements, Finland has decided nationally that if a farmer sets aside more than the mandatory area, the unused arable area must be under grass (perennial green fallow) to be eligible for CAP support. Between 2006 and 2012, direct payments are to be reduced each year ("modulation"): by 4% in 2006 and then 5% annually. At EU level, the sums saved in accordance with this "modulation" are to be divided among the member states and allocated to rural development measures. In Finland, the funds released through the modulation of direct payments have been allocated to agri-environmental support.

Compensation to less-favoured areas (LFAs) and *agri-environmental support* represent most of rural development policy expenditure (second pillar of the CAP). They accounted respectively for EUR 543 million and EUR 348 million in 2005, including both EU and national support.[4] The rural development funding has been cut in the context of the new EU financial frameworks for 2007-13 and this has led to a reduction in rural development funding of about EUR 100 million per year. The agri-environmental support has been decreased to some EUR 300 million per year. The efficiency of agri-environmental schemes for the period 1995-2006 has been evaluated.[5] Because the criteria for granting subsidies are not very strict, environmental subsidies have predominantly ended up being income subsidies to farmers. The agri-environmental scheme did not notably improve the water quality in

water bodies under heavy pressure from agriculture. The total phosphorus load from agriculture to water bodies only decreased slightly during the period 1995-2006. Special subsidies (*e.g.* subsidies for traditional cultural biotopes), have been more efficient, but as a whole the agri-environmental scheme has not stopped the decline in biodiversity in agricultural areas.

Concerning *forestry*, the 1997 Act on the Financing of Sustainable Forestry[6] recognises that *forest owners are eligible to "environmental support"* provided they go beyond legal requirements in terms of maintaining forest biological diversity, mapping and protecting key natural habitats and/or using forests for purposes other than timber production.[7] As a prerequisite, forest owners must conclude an agreement with a Forestry Centre to commit to preserving biological diversity in specified forest areas, and not to practice any forestry activities without permission from the Forestry Centre. These agreements are valid for ten years and remain in force even if an area is transferred to a new owner. The number of such agreements has increased since 1997 and the environmental support currently accounts for 10% of total government support to private forest owners (*i.e.* EUR 7 million out of EUR 60 million per year).

Concerning *fisheries*, Finland is eligible to the EU's Financial Instrument for Fisheries Guidance (FIFG) to *co-finance restructuring of its fisheries sector*. Nominal support to the fisheries sector, as measured by government financial transfers (GFT), has decreased from around EUR 25 million in the mid-1990s to around EUR 15 million in recent years, with the EU supplying about half of the total. When expressed as a proportion of the value of landings, however, GFT support has increased[8] and remains much higher than the average of the 24 OECD countries with access to the sea. Finland is the only OECD country that provides GFT equal to the value of landings (the OECD average is 20%) (OECD, 2006). Most of GFT have been used to support investments by fish factories and wholesalers. According to a recent government audit, some of the firms that have received aid are quite profitable, and projects would have been probably carried out without government support (National Audit Office, 2007a). Fish factories now have overcapacity and some that have received aids had to close as a result of changes in the market situation. The audit found that aid measures did not play a key role in developing fisheries and recommended instead to shift support towards fishermen. This would also help ensure jobs in fish factories.

Regional development is given high policy attention in Finland. The EU Structural Funds have co-financed Finland's *regional development policy* (Box 6.2). A small part of the European Regional Development Fund (*i.e.* EUR 43 million out of EUR 260 million per year, over the period 2007-13) is devoted to "enhancing the operational environment", part of which includes activities to enhance natural and cultural habitats (some EUR 10 million a year).[9]

Box 6.2 **UE support mechanisms of regional and agricultural policy in Finland**

EU structural funds

Since 1995, the EU Structural Funds have co-financed Finland's implementation of *regional and structural policy*, with a view to reducing the disparities between regions and people's employment prospects. Finland received EUR 2.3 billion in the 2nd structural fund period (2000-06) and will receive EUR 1.7 billion in the 3rd programming period (2007-13), *i.e.* a decrease by about 25% in line with the new EU financial framework. In addition to EU funding, EUR 2 billion of national public financing are committed to EU programmes in 2007-13; this sum will come from the central budget (75%) and the municipalities (25%).

Support from the EU Structural Funds is implemented in Finland mostly through programmes co-financed from two European funds: the European Regional Development Fund (ERDF) and the European Social Fund (ESF). They contribute to the EU's Regional Competitiveness and Employment (RCE) objective. The ERDF assists the regions whose development is lagging behind (objective 1 regions), which receive more aid because of their sparse population,[a] and those facing the need for economic diversification (objective 2 regions); the ESF promotes employment. In 2007-13, EU funding in Finland will be EUR 974 million for the ERDF and EUR 615 million for the ESF[b] The ratio of structural funds to national public funds will be 50/50 in the ERDF operational programmes for the east and north of Finland and 40/60 in the ERDF operational programmes for the south and west of Finland.

EU Common Agriculture Policy

Previously financed by the European Agricultural Guidance and Guarantee Fund (EAGGF), as of 1 January 2007 the *Common Agricultural Policy* (CAP) is financed by two funds, the European Agricultural Guarantee Fund (EAGF) (first pillar of the CAP) and the European Agricultural Fund for Rural Development (EAFRD) (second pillar). The EAGF finances marketing and export promotion, intervention measures to regulate agricultural markets, and direct payments to farmers under the CAP. The EAFRD finances measures to improve the competitiveness of agriculture, promote the diversification of rural activities, keep population in the countryside and strengthen the rural environment, landscapes and heritage. Since 1995 (when Finland joined the EU) and until 2006, the EAGGF supported modernisation of agricultural holdings, processing and marketing of agricultural products, the setting up of young farmers and early retirement, compensation for less-favoured areas, agri-environmental measures, development and optimal use of forests, development of rural areas through the provision of services, support for the local economy, and encouragement for tourism and craft activities. Here also Objective 1 regions have received more EU support than other regions.

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a) In Finland, objective 1 regions are located in Northern and Eastern Finland.

b) The remainder of EU Structural funds (EUR 100 million in 2007-13) will be allocated to the European Regional Co-operation objective and the European Neighbourhood and Partnership Instrument (ENPI).

Concerning *energy*, Finland uses considerable *subsidies to promote renewable energy sources* (some EUR 85 million a year notwithstanding support for electricity production from renewable (Box 6.3). In 2007 a feed-in tariff was introduced for

Box 6.3 **Support to renewable energy sources**

Such support takes a variety of forms:

- implementation of the *EU directives*, including on renewable electricity, renewable for transport, renewable in CHP and others (EUR 15 million);
- *research and development* of new renewable energy technologies (EUR 15 million);
- subsidies for *investments* in energy production in combined heat and power (CHP) plants, wind power plants, and in the heating sector. Investments in new technology are prioritised. Subsidies go primarily to biomass (EUR 25 million);
- legislation on biofuels for transport, which gives an obligation to oil companies to have minimum share of biofuels in their sales of transport fuels. These minimum shares are 2% in 2008, 4% in 2009 and 5.75% in 2010, in line with the EU directive on biofuels; *development programmes for second-generation biofuels* to finance pilot and demonstration plants using, for example, wood biomass as a raw material (EUR 4-5 million).
- subsidies for renewable energy heating systems for *residential buildings* to encourage investments to change from high shares of existing electric heating and oil heating to district heating, wood pellets, heat pumps or other forms of renewable energy (EUR 4-5 million);
- support for energy investment in the *agricultural sector*, mainly for biogas plants and wood-based heating plants (EUR 5 million);
- support for energy wood harvesting and chipping to encourage *forest owners* to supply wood residues to energy markets (EUR 6 million);
- support for *renewable electricity* production funded from the electricity tax on consumers (EUR 10 million);
- 6.9 per MWh *tax support for electricity* produced from forest chips and wind; EUR 2.5 per MWh tax support for electricity produced from recycled fuels; EUR 4.2 per MWh tax support for electricity produced from biogas or small hydro ;
- *information* activities to increase motivation, primarily of small-scale consumers such as single family house owners, to select options such as wood pellets or heat pumps for their heating source (EUR 1-2 million).

Source: IEA.

electricity produced from *large peat-fired (conventional) power plants* aimed at enhancing energy security.[10] The interim support measure (till the end of 2010) consists of paying the power plants a premium above the market price for electricity, the size of which depends on the price of coal and on the price of CO_2 permits under the EU Emission Trading Scheme (EU-ETS) that started operating in 2005.[11]

The high quality of public transport in the Helsinki metropolitan area (reliable and frequent services), as well as its high market share (around 70% of peak hour trips), reflect very competitive public transport fares, particularly for monthly or annual tickets. This would not have been possible without *subsidies to public transport in urban areas*. In Helsinki the public subsidy is nearly 50%, in other metropolitan municipalities over 50%. In inter-municipal public transport the subsidy is about 30%. In the Helsinki metropolitan area, however, the share of the operating costs of public transport financed by ticket revenues is higher than in most European cities (MTC, 2007). Since 1981 a *regional transport subsidy* (EUR 4 million per year in recent years) has partially compensated small and medium-sized enterprises established in low-population density areas for the additional transport costs due to long-distance transport (Chapter 2). No subsidy was granted to cover the cost of transporting primary commodities, raw materials or intermediate products from the place of their production to the place of final processing, thereby complying with requirements of the EC Common Market.

Tax concessions

Unlike most EU countries, Finland does not currently have a feed-in tariff scheme in place to promote electricity production from renewables. Instead, *renewable electricity production is granted CO_2 tax refunds*. Before 2003, the refund was calculated as a share of the CO_2 tax on electricity; specific rates have since been set. There are also *tax incentives to diversify the energy mix*. By derogation from the EU energy tax directive,[12] which imposes minimum levels of taxation on energy products and electricity; natural gas (used as fuel) has a 50% rebate on the CO_2 tax rate. Since 2005, *peat has been CO_2 tax exempt*, even though CO_2 emissions from peat burning are greater than from other fuels. Methane and LPG (used as fuel or for heating) are also tax exempt.

Tax concessions are granted to *industry* to enhance competitiveness. Since 1997[13] industry has paid a lower tax on electricity consumption than households and the service sector. Since 1998 tax refunds have applied to some energy-intensive firms (those for which the energy tax burden exceeds 3.7% of their value added).[14] Industrial landfills are exempt from the landfill tax.

Farmers are granted a tax rebate on light and heavy fuel oil as well as electricity used in agriculture. The tax rebate was introduced in 2006, reaching, on average, EUR 21.5 million a year for the period 2006-08.[15] A 2007 government audit questions the efficiency and effectiveness of such scheme (National Audit Office, 2007b).

Environment-related taxes

Revenues from environment-related taxes have increased by 25% since 1998. But their share in GDP has decreased to less than 3% (Table 6.2). As often in OECD countries, most revenues originate from energy taxes and vehicle taxes. Other taxes relate to chemicals and waste management. Between 1988 and 2006 a pesticide fee (levied on the pesticide industry) was used to finance the administrative costs of registering new pesticides (EUR 2 million a year); the fee was repealed in 2007. Since 1976 (with a reform in 2005), a tax on disposable beverage containers has supplemented a deposit-refund scheme which applies to glass bottles (1950), metal cans (1996) and plastic bottles including non-refillables (2008), as an incentive to

Table 6.2 **Revenues from environment-related taxes**, 1998-2005

(EUR million)

	1998	2000	2002	2004	2005	2007
Energy taxes (fuels and electricity)[a]	2 574	2 596	2 756	2 901	2 885	2 938
Registration tax	885	1 059	1 023	1 235	1 277	1 217
Annual circulation tax	202	220	233	642	536	612
Annual circulation tax for diesel vehicles[b]	175	181	218	–	–	–
Landfill tax	31	33	32	42	53	56
Tax on disposable beverage containers	–	–	–	–	22	41
Alcoholic beverage surtax[c]	10	12	20	20	–	–
Soft drink surtax[c]	2	1	2	2	–	–
Oil damage duty	6	5	6	10	8	8
Waste oil duty	3	3	4	3	3	4
Pesticide fee[d]	2	2	2	2	2	–
Total	3 890	4 112	4 296	4 857	4 786	4 876
Share of total revenues in GDP (%)	*3.34*	*3.1*	*3.0*	*3.2*	*3.0*	*2.7*

a) Excluding strategic stockpile fee (about EUR 50 million annually).
b) Regrouped in 2004 with the annual circulation tax.
c) Both surtaxes were regrouped in 2005 to create the tax on disposable beverage containers.
d) Repealed in 2007.
Source: Statistics Finland.

reuse, recycle and minimise waste (Chapter 4). Since 1996, a landfill tax has been levied on landfill operators to make recycling and more advanced waste treatment technologies more attractive. Since 1987, a duty on waste oils (lubricating oils) has financed their collection and treatment, as well as the clean-up of contaminated soils. Since 1972 the oil damage duty has financed the National Oil Damage Fund to prevent and clean-up oil accidents;[16] in 1990 the rate was doubled for tankers without double hull; the duty is levied on crude oil and oil products imported to or transported through Finland.

Regarding *energy taxes and prices* (excluding road fuels), the structure of energy taxation has, with some exceptions, remained unaltered since 1997 (IEA, 2008). A *basic tax and surtax*, along with a security of supply fee (strategic stockpiling fee), form the basis for energy taxation in Finland (Table 6.3). The basic tax ("energy tax") is levied on mineral oil products and the surtax (introduced in 1990) is levied on energy products, including fossil fuels and electricity. The surtax is based on the fuel's CO_2 emissions, at a rate of EUR 20 per tonne of CO_2 (the rate was EUR 11.77/tonne in 1997). The surtax ("CO_2 tax") is the main tax on coal, natural gas and electricity consumption in Finland. Finland's *energy prices* for electricity, fuel oil (excluding transport fuel prices) and natural gas paid by Finnish households, and for electricity and natural gas paid by Finnish industries, tend to be lower than the OECD-Europe average (Table 6.4).

Regarding *taxation of road fuels*, tax rates in real terms have remained virtually unchanged since 1997, following a decrease for diesel and an increase for gasoline in the first half of the 1990s (Figure 6.4). Overall, tax rates for *diesel* have remained much lower than those for *gasoline*. The higher CO_2 tax for diesel does not compensate for the much lower energy tax as well as a lower security of supply fee (Table 6.3). Differentiated taxation according to environmental criteria other than CO_2 was introduced in 1986 (lead in gasoline) and in 1993 (sulphur content for diesel, lead, oxygen and benzene content for gasoline). Since the beginning of 2008, the energy tax, CO_2 tax and security of supply fee have been applied to *kerosene and aviation petrol used for private pleasure flying (commercial use is exempt)*.

Regarding *vehicle taxation*, motor vehicles in Finland are subject to a one-time registration tax and an annual circulation tax. Up to 2007, the *registration tax* was 28% of the vehicle's taxable value (*i.e.* the ordinary retail value on the Finnish market, including taxes). The tax was reduced by EUR 450 for diesel-powered vehicles and by EUR 650 if fuels other than diesel powered the vehicle. Delivery vans were charged with a lower rate. Passenger cars imported from a non-EU country were charged with an additional 10% toll. A new differentiation scheme was introduced on 1 January 2008

for passenger cars. The new registration tax is still *ad valorem* but the tax percentage now varies according to CO_2 emissions (grammes per kilometre) within a range of 10-40% of the taxable value: 10% is levied on cars emitting 60 g/km or less and 40% is levied on cars emitting 360 g/km or more.[17] Similar CO_2 differentiation for vans will come into force on 1 April 2009.

In 2004, the *annual circulation tax* (or motor vehicle tax) was made more transparent by regrouping the vehicle tax and the diesel tax. Since 2004, passenger cars and delivery vans below 3 500 kg have been subject to a basic tax of EUR 0.35 per day or EUR 127.75 per year.[18] Diesel powered vehicles are now charged with an additional EUR 0.067 per 100 kg per day (*e.g.* EUR 245 a year for a passenger car weighting one tonne). Heavy goods vehicles (HGV) are also charged per 100 kg per day but with lower rates (*e.g.* EUR 0.023/100 kg/day or EUR 1 679/ year for a HGV weighting 20 tonnes). A differentiation scheme (similar to the one in place for the registration tax) could be introduced in 2010. The new basic tax will be based on CO_2 emissions so that the annual level of taxation will vary between EUR 20 and EUR 605. The minimum rate will apply to cars emitting 66 g/km or less and the maximum rate to cars emitting 400 g/km or more. Between these two extremes, the rate will raise gradually, according to increases in CO_2 emissions/km.

Assessment

Finland has been *the first country in the world to introduce a carbon-based tax on energy consumption* in 1990. From 2013 on, (when the EU-wide cap on GHG emission allowances is scheduled to start), this "surtax" should be progressively abolished for facilities included in the EU-ETS (as they will become subject to auction or an implicit "carbon tax"), but it should be extended to all facilities and sectors outside the EU-ETS and its rate should be based on the price for emission rights in the EU-ETS (currently around EUR 30/tonne). To ensure the efficiency of economic instruments like carbon taxes or auctioning emission permits, it is important to allow their effects to be fully reflected in the user cost of all products; any existing direct or indirect energy subsidies (*e.g.* peat) should therefore be eliminated.

The shift to *vehicle taxation on the basis of CO_2 emissions* in Finland is a very positive step. It will likely become a *model* for other OECD countries: it creates additional incentives for car producers and customers to invest in more fuel efficient vehicles,[19] speeds up the renewal of the fleet with models incorporating the latest technologies, and helps improving air quality (*e.g.* reduced emissions of nitrous oxides and particulates). However, differentiated taxation (basic tax) of fuels between diesel and unleaded gasoline has encouraged the sales of diesel-fuelled vehicles, while their CO_2 emissions per litre are higher than those for gasoline (as reflected in

Table 6.3 **Environment-related taxes**, 2008

	Rate				Revenue in 2006 (EUR million)
	Unit	Excise duty: Basic tax (energy tax)[a]	Excise duty: Surtax (CO_2 tax)[b]	Security of supply fee[c]	
ENERGY[d]					
Fossil fuels[e]					
Coal	EUR/tonne	–	49.32	1.18	55
Natural gas	EUR/MWh	–	2.016[f]	0.084	34
Electricity[g]					461
Rate I	Eurocent/kWh	–	0.87	0.013	
Rate II	Eurocent/kWh	–	0.25	0.013	
Mineral oil products					
Gasoline					1 451
Normal grade	Eurocent/litre	59.89	4.78	0.68	
Reformulated and very low sulphur	Eurocent/litre	57.24	4.78	0.68	
Diesel					762
Normal grade	Eurocent/litre	33.32	5.38	0.35	
Reformulated and very low sulphur	Eurocent/litre	30.67	5.38	0.35	
Light fuel oil	Eurocent/litre	2.94	5.41	0.35	156
Heavy fuel oil	Eurocent/kg	–	6.42	0.28	48
Pine oil	Eurocent/kg	6.7	–	–	0
Kerosene	Eurocent/litre	33.32	5.38	0.35	–[h]
Aviation petrol	Eurocent/litre	37.54	4.78	0.68	–[h]
MOTOR VEHICLES					
Registration tax	% taxable value	$4 + CO_2$ emissions (g/km)/10 for passenger cars 28% for other vehicles – less 650 EUR for gasoline – powered vehicles – less 450 EUR for diesel – powered vehicles			1 304
- Microsoft Outlook]					
Annual circulation tax	EUR/day	0.35 for all passenger cars + 0.067/100 kg for diesel cars			567
WASTE AND CHEMICALS					
Landfill tax	EUR/tonne	30			55
Oil damage duty	EUR/tonne	0.50; 1.00 for tankers without double hull			8
Waste oil duty	EUR/kg	0.0575			3
Tax on disposable beverage containers	EUR/litre	0.51[i]			31
Deposit on bottles[j] and cans	EUR/bottle	0.1 to 0.4 depending on bottle size; 0.15 for cans			
Pesticide registration fee					2[k]

a) Since 1974.
b) Since 1990.
c) Since 1974. In 1997 this "strategic stockpiling fee" was extended to coal, natural gas and electricity.
d) Peat is tax exempt.
e) Fossil fuels used for electricity production are tax exempt.
f) Natural gas has a 50% rebate on the unit CO_2 tax rate.
g) Rate I applies to households, services and agriculture. Rate II applies to industry.
h) Kerosene and aviation petrol were tax exempt until 1.1.2008.
i) The tax rate of 0.51 EUR/litre entered into force on 1.1.2005.
j) Extended to non-refillable plastic bottles on 1.1.2008.
k) Fee repealed on 1.1.2007.
Source: Ministry of Employment and the Economy; Ministry of the Environment.

the surtax). The taxation based on CO_2 emissions (registration tax and annual circulation tax) applies *only to passenger cars*, as only emissions for cars have been standardised so far. In the course of 2009 vans will be included in the system. The government is also planning to introduce a new, more informative, *eco-labelling* scheme for passenger cars, based on the ABCDEF model (widely used for eco-labelling of household appliances).

Efforts are underway to decouple *agricultural policy support* from the production of agricultural commodities, in line with the CAP reform. The complementary national direct payments ("top-up payments") have the potential to distort commodity production and thereby incite farmers to make decisions regarding production, based on criteria other than market and environmental criteria. Finland should design its top-up payments to maintain flexibility in the production choices of farmers. Since its inception in 1995, the agri-environmental programme has been highly attractive to farmers, to the extent that 90% of active farms participate and 96% of the arable area is covered. However, *agri-environmental measures should be better targeted* at specific environmental outcomes (*e.g.* protection of environmentally valuable permanent grassland).

The amount of *environmental support to forest owners* compensates for the expected loss in timber sale revenues due to the environmental effort, as provided for in EU legislation.[20] To increase economic efficiency and environmental effectiveness, the support should be based on unremunerated but beneficial "public" services (*e.g.* protection of environmentally valuable forest ecosystems).

Government support to fisheries should primarily aim at stock assessment and monitoring and enforcement (*i.e.* general services), and, as appropriate, at supporting the income of fishermen whatever their fisheries activity (*i.e.* decoupling income support from fish catches) so as not to divert fishermen from sustainable fisheries management. Direct payments that increase nominal fishing efforts can be deleterious to the long-term sustainability of fisheries (OECD, 2006).

Reviews of *environmentally harmful subsidies*, undertaken by the Ministry of Finance in 2004 and by the Ministry of the Environment in 2006, point out areas where subsidies and tax concessions can have detrimental effects on the environment. No action has been taken to remove such subsidies, or to launch an ecological tax reform.

1.4 *Environmental expenditure and financing*

Pollution abatement and control (PAC) expenditure (public and private) *decreased* from close to 1.1% of GDP in 1997 to *0.8% of GDP* in 2005[21] (Table 6.5). When expressed as a share of Finland's gross fixed capital formation, PAC investment expenditure (public and private) decreased from about 2.5% to 0.9%. The share of private PAC investment in total fixed investment by industry decreased from more than 5% to 3.6% (Table 6.5).

The share of the *public sector*[22] in total PAC expenditure (*i.e.* net expenditure concerning investment and operation) remained stable at about 52-53% over the review period. The share of the *private sector* (at about 47%) evolved with decreasing investment expenditure and increasing operating expenditure, the later reflecting the accumulation of the "environment-related fixed capital stock" over time. Public PAC expenditure has remained equally shared among central and local governments over the decade and is largely devoted to waste water management, and to a lesser extent, waste management. As waste and waste water charges cover some 90% of the corresponding costs, the *polluter pays principle* is well implemented for households and industry (Table 6.6).

Table 6.5 **Environmental expenditure,**[a] 1995-2005

(EUR million at current prices)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	1 034	1 167	1 206	1 177	1 106	1 297	1 294	1 339	1 318	1 397	1 353
Investment	390	479	463	389	289	413	355	397	340	353	260
Operating expenditure[b]	645	688	743	788	816	885	939	942	978	1 044	1 094
Public sector											
Investment	131	191	228	201	149	188	147	187	206	196	111
Operating expenditure[b]	390	411	430	452	471	505	538	556	589	602	635
Industry[c]											
Investment	259	288	235	188	140	225	209	210	134	157	149
Operating expenditure[b]	255	278	313	336	345	379	401	385	389	442	459
GDP	96 000	99 100	107 600	117 100	122 700	132 400	139 800	143 900	146 000	152 100	157 200
Fixed investments[d]	3 983	4 368	4 675	4 487	3 928	4 133	5 027	4 229	3 659	4 133	4 089
Gross fixed capital formation[e]	15 890	16 957	19 714	22 252	23 300	25 604	27 233	25 833	26 432	27 772	29 779
Environmental expenditure as a share of GDP (%)	*1.08*	*1.18*	*1.12*	*1.00*	*0.90*	*0.98*	*0.93*	*0.93*	*0.90*	*0.92*	*0.86*
Environmental investment/ total fixed investment[d] (%)	*6.6*	*6.6*	*5.0*	*4.2*	*3.6*	*5.5*	*4.2*	*5.0*	*3.7*	*3.8*	*3.6*
Environmental investment/ gross fixed capital formation[e] (%)	*2.5*	*2.8*	*2.4*	*1.7*	*1.2*	*1.6*	*1.3*	*1.5*	*1.3*	*1.3*	*0.9*

a) Including pollution abatement and control (PAC) expenditure and nature protection expenditure. Excluding water supply expenditure. Excluding research and development.
b) Excluding depreciations and interests paid.
c) Including mining and quarrying, manufacturing industry, and energy and water supply.
d) For industry.
e) For the Finnish economy.
Source: Statistics Finland; OECD.

Table 6.6 **Public environmental expenditure,**[a] 1997-2005

(EUR million at current prices)

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Waste water management									
Operating expenditure[b]	149.5	154.2	158.6	179.4	187.4	198.5	208.6	210.9	221.3
Depreciation	100.2	103.4	103.4	110.0	109.6	111.5	113.4	113.1	116.2
Revenue	303.2	305.4	314.7	317.4	323.1	339.4	345.9	355.4	366.2
Investment	129.8	117.2	112.7	141.4	103.0	144.6	158.7	147.6	51.2
Investment grants given	46.2	43.4	36.0	33.4	32.4	32.9	32.8	33.3	32.6
Investment grants received	11.9	14.1	14.2	4.2	4.1	3.6	0.3	3.9	3.8
Other transfers given	64.1	67.1	67.3	99.9	103.7	103.8	105.9	107.5	106.4
Total expenditure[c]	389.7	382.0	374.6	454.1	426.5	479.8	506.0	499.4	411.6
Total income[c]	315.2	319.6	328.9	321.6	327.2	343.0	346.2	359.2	369.9
Waste management									
Operating expenditure[b]	64.1	69.8	74.3	79.2	91.3	90.8	90.4	91.3	100.6
Depreciation	4.7	5.9	6.2	7.5	9.7	9.1	8.5	8.8	11.5
Revenue	92.7	103.9	106.5	113.7	121.0	106.5	122.4	116.4	130.1
Investment	15.1	14.5	13.5	19.0	13.5	18.4	20.3	26.0	38.8
Investment grants given	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Investment grants received	0.8	1.9	1.3	0.2	0.5	0.1	4.0	0.1	0.1
Other transfers given	2.4	2.4	1.9	3.0	0.8	1.0	0.6	3.5	1.7
Total expenditure[c]	81.6	86.6	89.6	101.2	105.6	110.2	111.2	120.8	141.1
Total income[c]	93.5	105.8	107.8	113.9	121.6	106.6	126.3	116.5	130.3
Nature protection									
Operating expenditure[b]	14.6	15.1	16.0	16.6	17.8	19.2	25.4	24.4	29.0
Revenue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Investment	15.3	13.1	11.8	11.3	12.3	9.7	13.2	10.0	7.1
Investment grants given	4.7	8.2	11.8	24.5	11.3	15.6	15.7	13.0	24.7
Investment grants received	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other transfers given	27.1	28.8	30.1	21.9	24.5	23.7	26.9	27.6	28.3
Total expenditure	61.7	65.3	69.6	74.3	65.8	68.2	81.3	74.9	89.1
Total income	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Research and development									
Total (estimate)	128.5	134.4	144.5	158.9	156.0	175.0	176.0	188.0	197.0
Administration, other environmental protection									
Operating expenditure[b]	185.2	195.9	205.0	230.3	241.0	247.9	264.5	275.5	284.2
Depreciation	0.7	1.0	1.0	1.0	1.1	1.5	1.3	1.1	1.0
Revenue	20.4	22.0	19.3	34.2	34.4	36.5	41.0	44.6	47.0
current transfers	6.2	8.2	2.1	4.2	3.5	4.6	4.0	4.5	3.6
fees and other	14.1	13.8	17.2	30.0	30.9	31.8	37.0	40.1	43.3
Investment	67.4	55.7	10.1	15.7	18.1	14.4	13.3	11.9	13.5
Investment grants given	4.5	11.6	6.6	11.1	11.0	10.7	10.5	13.4	11.1
Investment grants received	3.4	0.8	0.2	1.0	0.4	0.3	0.2	0.1	0.0
Other transfers given	138.1	134.9	128.1	98.7	103.4	100.5	102.2	102.6	103.2

Total expenditure	395.2	398.1	349.8	355.8	373.6	373.5	390.6	403.5	412.0
Total income	23.7	22.9	19.5	35.1	34.8	36.8	41.2	44.7	47.0

a) Excludes water supply expenditure. Includes expenditure directly made or supervised by national and territorial authorities.
b) Excludes depreciation and interests paid.
c) Total expenditure are largely covered by total income, as user charges are paid for the waste water and waste services provided.
Source: Statistics Finland.

2.4 *Economic instruments*

In addition to an extensive use of environmental and environment-related taxes Finland has for years relied on a number of other economic instruments: user charges and fees, deposit-refund systems, product charges, and subsidies have been applied in water, waste, air, noise, and nature protection management (Box 6.6). In line with the recommendation of the 1997 OECD Environmental Performance Review, Finland has *increased the rates of several charges* to give appropriate price signals to consumers. For instance, Finland's solid waste has been reduced by around 15% compared with

Box 6.6 **Economic instruments**

Water and waste water charges

The *2001 Act on Water Services* provides for water supply and waste water tariffs to (ultimately) cover investments and operating expenditure as well as environment costs, including restrictions on land use. In the short-run state aid (direct subsidies and public water management work) has been provided to municipalities, accounting for some 10% of their total cost of water management. *Municipal water supply charges* have increased by 31% since 1997 (being on average EUR 1.27/m^2 of water supplied in 2008). They consist of a fix (connection, basic charge) and volume-based components. *Municipal waste water charges* are based on water consumption (as a proxy for waste water volume); for large users they are based on the volume and quality of the waste water. These charges increased by 52% since 1997 (being on average EUR 1.90/m^2 of waste water in 2008). All municipal and industrial water usage is metered, however, only the minority of individual households is equipped with separate meters.

Water protection charges on industry and fish farms, applied in addition to compensation to owners of waters and commercial fishermen for loss of the value of a water area, were removed under the 2000 Environmental Protection Act. Where old permits apply charges continue to be used. Water abstraction charges and pollution charges are neither used nor in preparation in Finland.

Waste management

Waste charges for households, which include collection and treatment component, increased from EUR 6.54/4.05 per 600l/240l container in 2000 to EUR 9.25/5.42 in 2007. Many municipalities set lower charges for sorted waste and for waste that can be recovered. Waste treatment facilities charge waste transport companies by weighing the load: average municipal landfill charge in 2007 was around EUR 100/t. The treatment fees varied depending on the type of waste: *e.g.* EUR 68/t for biowaste and EUR 106/t for construction waste. Municipalities collect charges to cover the collection and treatment of waste as well as landfill closure and aftercare. Some estimates suggest that *revenues* to different actors increased from around EUR 200 million in 1997 to EUR 1 000 million at present. According to a study made by the Association of Finnish Local and Regional Authorities, in the half of the municipalities all waste management costs were covered by waste fees.

In addition to waste charges levied per tonne of waste 140 municipalities had introduced in 2002 an "*eco-charge*" at an average of EUR 33 per year per household. The purpose of the charge has been to promote waste sorting by covering costs associated with a network of recycling and collection stations where households can deliver card and paper, glass, metal, untreated wood and electronic waste and batteries free of charge.

Hazardous waste is subjected to service charges (EUR 270/t on average). The charges are collected by Ekokem Oy, a company that treats hazardous waste and is jointly owned by the state, municipalities and industrial companies.

Since 1996 a *tax has been applied to waste deposited in municipal landfills* with the aim of discouraging landfilling and stimulating waste recovery. Private landfills, including industrial waste dumps, are excluded from the tax. The tax rate was FIM 90/t (approx. EUR 15/t) in 1996, raised to EUR 23/t in 2003-2004 as a result of the 2002 amendment of the Waste Tax Act and then to EUR 30/t from 2005 onwards. The revenue from the landfill tax is not earmarked. The landfill operator is subject to the tax and passes the tax on to the waste generator via municipal waste charges. In order to promote recovery of waste, the tax does not apply to waste which is recycled or composted. The waste tax generated revenue increased from FIM 41 million (EUR 6.8 million) in 1996 to EUR 56 million in 2007. According to a *ex post* survey carried out by the MoE in 2005 the waste tax has proved to be an efficient instrument to divert some waste streams from landfills (*e.g.* recoverable industrial waste, construction waste); SMEs and services (which initially could access municipal landfills) have been encouraged to consider alternative options to dispose of their waste.

Economic instruments are also applied to *beverage packaging*. Individual packaging-related surtaxes on non-refillable alcohol and soft drinks packaging have been in place since 1976. The packaging which did not enter a deposit-return system approved by the government is subjected to a EUR 0.51/l charge. For non-refillable beverage packaging recycled via deposit-return system, a charge of EUR 0.085/l was applied until 2007 when the charge was removed.

Beverage packaging taxation has been complemented by a *deposit-return system* for refillable and non-refillable containers. The majority of bottles (0.33, 0.5, 1, 1.5 litre) are part of a deposit-refund system, as are aluminium cans. Non-refillable plastic containers were added to the system in 2008. The rates for containers, determined by the MoE, range between EUR 0.1-0.4 for glass and plastic bottles, EUR 0.15 for metal cans and EUR 2.2-4.2 for bottle cases. The rate of return of glass bottles for beer and soft drinks has been close to 100% for a number of years. However, the collection rate for beverage cans with deposit is lower (approximately 80%).

National legislation applying producer responsibility to *used tyres* was implemented in 1995, giving rise to the first systematic tyre recycling scheme in Finland. The scheme is financed by a recycling charge (EUR 1.85-61.1 per tyre) paid by the consumer on purchase of a new tyre. The proceeds are transferred by the retailer to the producer or the importer, who, in turn, passes the funds on to the producers' organisation (Finnish Tyre Recycling Ltd) to cover the associated treatment and disposal costs. Since 1996, improved logistics within the system has permitted charges to be lowered. In recent years the charges have remained stable, except for the largest machinery and forest tyres. Collection rates are close to 100%, the majority undergoes material recovery, and a small proportion is retreaded.

National legislation implementing the EU *End-of-Life Vehicles* (ELV) Directive came into force in September 2004, so the ELVs can be returned to authorised collection points without a charge. The Finnish legislation related to ELV vans was already in place in 2002. Finnish Car Recycling Ltd has been set up by car importers to coordinate the collection, treatment and recycling of ELVs according to the requirements of the directive.

An *oil waste charge* of EUR 0.06/kg is included in the price of lubrication oils and solid lubricants. The income from these charges is used to cover the costs of managing oil waste as well as cleaning up soil and groundwater contaminated by oil. In 2007 fiscal income from oil waste charges was EUR 4.25 million.

Nature conservation and biodiversity

There has been no significant change in the fishing and hunting fees. The *fishing licence fee* is collected by the State under the 1982 Fishing Act. In 1999 the annual fishing management fee was raised from FIM 80 to 90 (EUR 15) then to EUR 20 (or EUR 6 per week) in 2004. The revenue of EUR 8 million finances management of fish population. There is no data available on fishing fees collected by private owners of waters. Provisions on *fees related to recreational hunting* were laid down in the 1993 Act on Game Management Fee and Hunting Licence Fee. An annual hunting licence fee of EUR 24 (raised to EUR 28 in 2008) is paid to the State. A licence is required for the hunting of cervids and involves a fee of EUR 120. The revenue of EUR 14 million per year is used for financing game management.

Noise

The only economic instrument currently in use in the noise reduction policy is the *noise charge applied to night-time departures* with turbo jet aircraft in the Helsinki-Vantaa airport. The charge, introduced in 2008, is calculated according to the aircraft's noise certificate in accordance with ICAO and is included in the airport charges.

the business-as-usual prediction, thanks to the impetus of the economic instruments in the waste area. The revenue has enabled to finance environmental investments and services provided by public authorities in conformity with the Polluter Pays Principle.

Even though some *new economic instruments* have been introduced in the review period, for example on plastic non-refillable beverage containers, end-of-life vehicles and air traffic noise, as well as participating in the EU's CO_2 emission

trading scheme, further efforts are needed to increase impacts. A thorough evaluation of the various economic instruments in place could identify the most cost-effective ones. Initial steps have been taken, such as the establishment of a working group by the Ministry of Finance to assess and consider the renewal of the waste tax or plans for introducing road pricing by the Ministry of Transport and Communications. Such evaluations should be linked to the reform of the permitting procedures to ensure an optimal use of market-based approaches supplementing traditional regulatory approaches.

2.5 *Private sector initiatives*

The application of *environmental management systems* has expanded in Finnish businesses. At the beginning of 2007, there were a total of 991 enterprises with an ISO 14001 certification (up from 151 in 1997 and 508 in 2000) and 42 EMAS registered organisations (up from 9 in 1997). Virtually all forest industry companies have now an EMS system and publish environmental reports together with their annual reports even though corporate environmental reporting is not mandatory.[42] Timber used for the Finnish forest industry is subjected to environmental certification, including the national Finnish Forest Certification System (FFCS) and international quality standards (Chapter 5). The turnover of Finnish environmental businesses has been growing by around 3% per year over the last 5 years and it is estimated at around EUR 4.5 billion (SITRA, 2007).

Industry has also been actively involved in *energy conservation and efficiency agreements* concluded by Finland's Ministry of Employment and the Economy and the Finnish Confederation of Industries in 1997 (Chapter 2). Building on the success of the scheme a new set of agreements has been developed in 2008. Similar agreements are being developed to improve material efficiency in enterprises as part of Finland's national programme to promote sustainable production and consumption.

The Finnish government explicitly recognises *eco-innovation* as a key element of Finland's economic development and business competitiveness.[43] The Science and Technology Policy Council of Finland and the National Technology Agency (TEKES) have included environmental objectives in their strategies. Specific policies to support eco-innovation have been designed by the Ministry of Employment and the Economy in co-operation with the MoE, government agencies and industry and include: *i)* the development of technology supplies, *ii)* strengthening the relationships between research and industry, *iii)* dissemination of information about new technologies, and *iv)* financing (Box 6.7). Studies of environmental policy integration in the Finnish technology policy, especially those regarding R-D funding, have shown elements of environmental policy integration.

New instruments are being considered to *better link eco-innovation principles adopted at the strategy level and the actual practice of decision making*. These include: *i)* strengthening the regulatory instruments to increase the demand for eco-innovation and its products, *ii)* innovative funding for demonstration and pilot projects, *iii)* the assessment and verification of the environmental performance of technologies (in the context of Environment Technology Action Programme (ETAP) project on environmental technology verification), and *iv)* working with business associations and municipalities on dissemination of information about good practices and products (MEE, 2005). In addition, more explicit targets related to eco-innovation and its environmental benefits could strengthen whole-of-government efforts. This should be supplemented by the decision-making procedures that include a systematic *ex ante* assessment of the most essential positive and negative environmental impacts of proposals as well as *ex post* assessments of technology programmes and projects that incorporate analysis of environmental impacts. Incorporation of provisions for eco-innovation products in public procurement policies and practices should be of particular importance.

4. Environment and Employment

Estimates from 2004 indicate that approximately 20 000 persons were employed in *environment-related jobs*, with about 9 000 jobs in eco-industries and 11 000 jobs in environmental services. Finnish environmental technology net sales reach EUR 3.4 billion, similar in size to iron and steel production. Environmental service companies are engaged mostly in activities within Finland while eco-industry provided about 2 600 jobs abroad. One out of five environmental

technology companies has foreign operations and exports that make up a significant proportion of net sales in environmental technology, totaling nearly half of domestic net sales.

Finland does not have a detailed environmental employment strategy but various policy initiatives emphasise the connections between environmental policy and employment. Finland's programme to promote sustainable consumption and production (2005) provides new business opportunities with new jobs creation. The Finnish Roadmap for the *EU's Action Plan for Environmental Technologies* (ETAP) prepared in 2006 aims at strengthening the Finnish eco-industries by creating a greater market demand through regulatory and economic instruments and supporting start-ups, growth and internationalisation of eco-business by equity investments in SMEs, provision of business expertise and export promotion (MEE, 2005). The 2007 joint action programme Cleantech Finland was launched to boost environmental business, with a target of doubling the turnover of the sector by 2012 (SITRA, 2007). Increasing the presence of "green" criteria in public contracts is also expected to stimulate job creation in the environment sector as public procurement accounts for 15% of Finland's GDP.

Environmental tourism related to nature conservation efforts (*e.g.* bird life and wildlife watching tours, cross-country skiing and trekking), has already contributed to job creation, as for example in the case of the Syöte National Park (Chapter 5). Further promotion of natural and heritage assets, and healthy life styles, combined with the development of nature conservation areas and quiet areas could provide additional business opportunities, including for local populations.

3. Trade and the Environment

Within the World Trade Organisation (WTO) context, Finland considers that *trade and environment should be acknowledged as equal parts of international law*, and that conflicts among contracting parties should primarily be solved within the structure of MEAs, including observership status for these in the WTO. Finland aims at minimising environmentally harmful customs duties, trade barriers and agricultural and fishery subsidies, and at resolving the rights issues between the Convention on Biological Diversity (CBD) and the WTO agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).This helps developing countries to enter markets and fosters trade and environment preconditions. Finland supports acknowledging environmental labelling systems; jointly agreed rules and regulations catalyse innovations and facilitate exports of technology and expertise. Finnish authorities also promote *corporate environmental responsibility* (Box 8.2).

3.1 Ozone depleting substances

Ozone depleting substances (ODS) have never been produced in Finland. Finland is among the 20 OECD countries that operate a commercial ODS destruction facility, which explains why ODS production of these substances reported under the Montreal Protocol is sometimes negative, particularly for CFCs and halons. The use of most ODS has been forbidden in Finland in compliance with (and often ahead of) the Protocol (non-article 5 parties) and EU schedules. The Finnish Environment Institute (SYKE) estimates that the remaining emissions of CFCs are currently about 5% of the 1990 levels. HCFCs are the only ODS still in use in Finland. *The use of HCFCs has decreased* from 350 tonnes in 1990 to about 170 tonnes in 2007. Current HCFC emissions are about 70% less than the 1990 levels. Technology and legal provisions concerning HCFC use have substantially developed during this period.

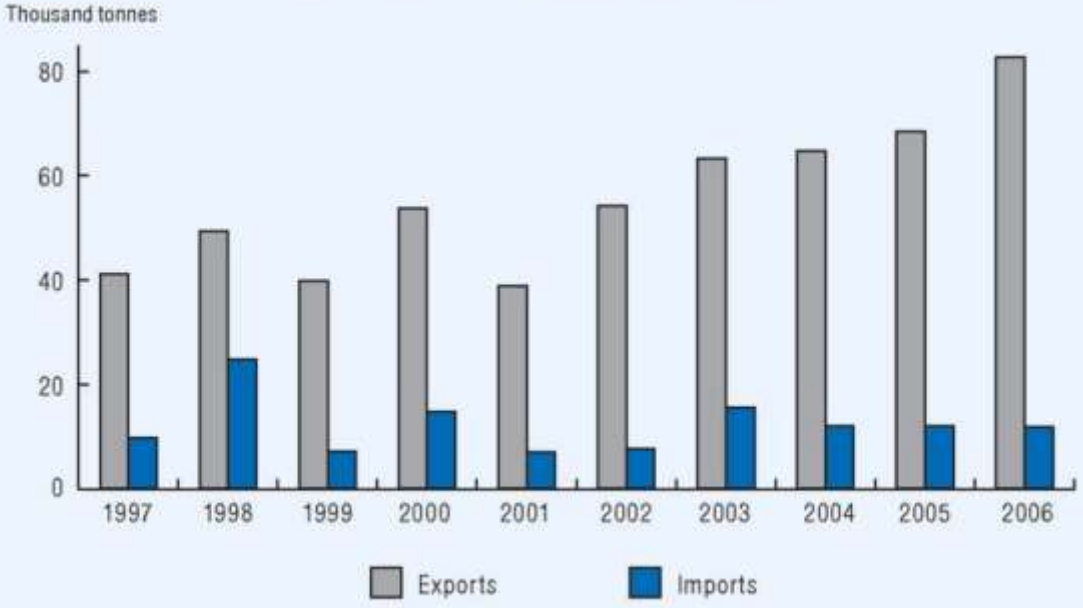
Concerning *ODS trade*, there have been no legal cases regarding attempts to trade ODS over the review period. According to customs and environmental authorities there was some illegal activity at the turn of the millennium, but it has clearly declined since, for two main reasons: appliances containing CFCs are fewer since their use in manufacturing has been banned; and, a fee is no longer charged for returning electronic waste (including refrigerators) in line with the EU Waste Electrical and Electronic Equipment directives (2002/96/EC and 2003/108/EC).[30] Furthermore, EU Council Regulation on ODS (No. 2037/2000) requires the removal of controlled ODS from refrigeration equipment before such appliances are scrapped. *Border measures* have also been put in place to prevent illegal trade of ODS. Customs Finland uses data systems that identify if customs tariff numbers of restricted substances (as per annex IV of EU Council Regulation No. 2037/2000) are to be declared, or if the registration number of the importer indicates prior offenses. Trucks from Russia are inspected by drive-through x-ray systems that reveal presence, for instance, of pressurized containers.

3.2 *Hazardous substances*

Finland seeks to ensure that the risks of hazardous substances will be controlled by 2020 by means of an *international chemical strategy*, with improved international chemical conventions and strengthened co-operation between them. Finland has therefore initiated and actively engaged in setting up a trio of complementary Conference of the Parties (COP) decisions for the *Basel, Rotterdam and Stockholm Conventions*. The resulting *ad hoc* joint working group (co-chaired by Finland) should identify ways to enhance co-operation and co-ordination at both administrative and programmatic level. To support *REACH*,[31] the new European Chemicals Agency has settled and started operations in Helsinki.

Finland became a party to the 1989 *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* in 1991. Trade in hazardous waste has increased over the review period, particularly exports, though not as quickly as the generation of hazardous waste that far exceeds national targets[32] (Figure 8.4). The National Waste Plan, which was implemented in 1998 and was updated in 2002,[33] set a maximum volume of hazardous waste generated in Finland of 700 000 tonnes/year by 2005 (compared to 500 000 tonnes in the late 1990s). The current generation is 2.3 million tonnes a year. Illegal trade does not constitute a

Figure 8.4 **Trade in hazardous waste,** 1997-2006



Source: SYKE.

problem in Finland, even though each year there are a few cases concerning hazardous waste traded without complying with the obligatory notification procedure. Pursuant to the new EU legislation[34] border-area agreements are being drafted with Sweden and Norway to simplify the notification procedure for cross-border shipments of specific waste flows to the nearest suitable facility in the border area. Under the 1995 ban amendment to the Basel Convention, which has been in force in the EU since 1998,[35] Finland must not export hazardous waste intended for recovery, recycling or final disposal to non-OECD countries. Finland has no restrictions on the import of hazardous waste for recovery (restrictions apply to the import of hazardous waste for final disposal). Finland has signed but not yet ratified the 1999 Protocol on Liability and Compensation for Damage Resulting from the Transboundary Movement of Hazardous Waste and their Disposal. This protocol provides for a compensation regime for liability and prompt compensation for damage resulting from the transboundary movement of hazardous waste and "other waste"[36] and their disposal, including in the case of illegal traffic.

In 2004 Finland accepted the 1998 *Rotterdam Convention on "prior informed consent"* (PIC), whose objective is to regulate the trade of 22 pesticides and 5 dangerous chemical substances that are widely prohibited or strictly controlled, including 7 of the 12 persistent organic pollutants (POPs) covered under the

Stockholm Convention. In Finland, chemicals subject to the (voluntary) PIC procedure have either been banned before 1995 or never approved to be used as pesticides, and a national notification procedure for the export of severely restricted or banned chemicals has been applied since 1989. No exports of PIC chemicals have taken place after the entry into force (in 2004) of the Convention and no cases of illegal exports have been detected by Customs Finland.

In accordance with the *Stockholm Convention on Persistent Organic Pollutants* (POPs), ratified by Finland in 2002, and entered into force in 2004, the use, production, marketing, import and export of the (intentionally produced) chemicals listed in Annexes A and B of the Convention (pesticides and PCBs) have been prohibited in Finland. Regulatory measures have been taken to limit emissions of unintentionally produced POPs (including dioxins, furans, PCBs and HCBs), as per the obligations set out in Annex C of the Convention. Products containing PCB are classified as hazardous waste and must be treated accordingly, mainly in the hazardous waste incineration plant in Finland. HCB releases by industry into water and municipal sewerage have been prohibited since 1994. Limit values on dioxin and furan emissions due to waste incineration have been imposed since 2006. Small scale burning of wood[37] is not regulated; attempts to reduce emissions have consisted of providing information on good combustion practices and fuel quality. However, atmospheric emissions of dioxins and furans (PCDD/F) have remained virtually unchanged since 1990 (Chapter 2). There is an urgent need to improve emission inventories and to produce more reliable monitoring data (SYKE, 2006). Dioxin and furan releases are estimated based on emission factors, with very few actual measurements. The overall assessment of PCB releases in Finland is still deficient. Few data are available on HCB concentrations, and are dating from the end of the 1980s.

3.3 Endangered species

In Finland trade in species and goods listed *under the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is modest*. There has been a steady rise in import permits for CITES specimens and goods (from 36 in 1997 to more than 120 in 2007) and in illegal trade (less than one CITES related seizure by customs per year in 1997-2002 to 20 seizures since 2003). Most cases involved tourists bringing home items subject to license (mostly from south-east Asia), stuffed animals and skin products. Since 1997 five detected cases have been serious nature conservation offences, including four transit cases of CITES specimens or goods (live birds, live reptiles, sea turtle shells, snake skin products). The fifth case involved a dealer, who on several occasions wilfully imported live orchids without due documentation.

No attempts to smuggle *Finnish wildlife* out of the country has been detected. In 2000 Finland made a unilateral statement ("reservation") that it will not be bound by the provisions of the CITES Convention relating to trade in three subspecies of red fox and four subspecies of weasels. These species that are used in *fur farming* are listed in CITES Appendix III (species that are not necessarily threatened on a global level, but that are protected within individual states).

4. Official Development Assistance

In 2007 Finland's Official Development Assistance (ODA) amounted to EUR 746 million, representing 0.40% of the Gross National Income (GNI). *Finland's ODA has increased over the review period*; it has remained higher than the OECD-DAC average, both per capita and as a share of GNI (Figure 8.5). In 2008 Finland's aid volume rose to EUR 830 million and the government decision on spending limits for 2008-11[38] has envisioned an increase to 0.51% of GNI by 2010. Responding to the OECD recommendation to restore the level of ODA to the UN target of 0.7% of GNI as soon as budgetary constraints permit, the 0.70% target has been deferred to 2015 (the EU timetable) from the previous commitment to reach it by 2010. Finland's ODA used to be at higher levels, (0.8% in 1990), before the deep economic recession of the early 1990s.

Although environmental protection has been identified as a key horizontal issue for Finland's development co-operation during the past years, *environmental objectives have not been sufficiently reflected in the funding of development co-operation activities*, accounting for less than 10% in 2001-06. Moreover, the level of funding has been decreasing in the past years, thus by 2007 only 7 % of the overall development co-operation funding was directed towards activities which have primarily supported environmental objectives.[39] Concomitantly, environment is not yet fully mainstreamed into project and programme interventions (OECD, 2007b). Positive steps have been taken to improve the situation. Policy guidelines on environment and development co-operation have been produced in 2007. Finland is committed to promoting the use of strategic environmental assessment (SEA) in its partner countries, as a tool to promote the integration of environmental concerns to development plans and strategies, as agreed in the Paris Declaration on Aid Effectiveness.[40]

The *support to multilateral environmental agreements* (MEAs) has remained unchanged in the 2000s (about EUR 35 million per year), despite Finland implementing an increasing number of Conventions/Protocols. Funding has been primarily directed to the three Rio conventions (*i.e.* the UN Framework Convention on Climate Change (UNFCCC), the UN Convention on Biodiversity and the UN

Convention to Combat Desertification), as well as the UN Forum on Forests.[41] Finland has met its "fair share" commitment (USD 6.4 million/year in 2005-07)[42] under the Bonn agreement on climate change, adopted in 2001, under which Parties to the UNFCCC agreed that predictable and adequate levels of funding be made available to developing countries to help them meet climate challenges. A challenge will arise from the need to provide new and additional funding to the three new funds of the Bonn agreement.[43] Support for chemical agreements has been relatively low, which can in part be attributed to their novelty.