YMPÄRISTÖMINISTERIÖ
MILJÖMINISTERIET
MINISTRY OF THE ENVIRONMENT

Ympäristö ja luonnonvarat 2006
Miljö och naturresurser
Environment and Natural Resources

Tilastokeskus
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Helsinki – Helsingfors 2006

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Kansikuva – Pärmbild – Cover photograph: Kuvaliiteri/Mattias Tolvanen.
The picture shows people on the ramparts of Suomenlinna.
Suomenlinna is a UNESCO world heritage site.

Kuvioiden tiedot lähdeviittauksineen on ilmoitettu tilastoliitteessä.
Uppgifter och källhänsvisningar till figurerna ingår in statistikbilagan.
Original sources for diagrams indicated in Statistical Appendix.

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Foreword

The UN Conference on the Environment and Development, held in Rio de Janeiro in mid–1992, formulated a sustainable development policy that still underpins international environmental policy. The 10–year follow-up World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa endorsed new objectives in September 2002 and accelerated execution of the sustainable development programme. The European Union has taken a leading role in promoting sustainability. The EU's new sustainable development strategy, approved in June 2006, closely integrates ecological, social and economic sustainability, while its sixth environmental programme and theme strategies integrate environmental challenges into other policy areas. During the second half of 2006, Finland will hold the Presidency of the European Union. With respect to environmental issues, it will focus on climate change, biodiversity and, related to the sixth environmental programme, the quality of the air, the marine environment, prevention of waste generation, and the use of control substances. The main theme of the unofficial Council of Ministers' Conference held in Turku in July 2006 was the New Generation Environmental Policy.

Finland is committed to nationally implementing the Johannesburg sustainable development programme in a time frame of around 15 years. This review, *Finland's Natural Resources and the Environment*, annually reports on the progress made. The Finnish Government Programme emphasises economically, socially and ecologically sustainable development, entailing the balanced integration of production, economic growth and environmental considerations. *Finland's Natural Resources and the Environment* focuses primarily on monitoring the commitments made with respect to the environment and the maintenance of the carrying capacity of ecosystems. At the present time, Finland's major environmental challenges relate to the promotion of sustainable consumption and production.

Finland's Natural Resources and the Environment was drawn up by a committee appointed by the Ministry of the Environment and chaired by Markku Nurmi, Director General at the Ministry of the Environment. The other members of the committee were Päivi Valkama, Budget Secretary at the Ministry of Finance, Juha Turkki, Senior Inspector at the Ministry of Trade and Industry, Tiina Wigelius, Researcher at the Ministry of Agriculture and Forestry, Outi Väkevä, Researcher at the Ministry of Transport and Communications, and Jarmo Muurman, Senior Inspector, and Auvo Haapanala, Administration Counsellor, both at the Ministry of the Environment. Acting as secretaries of the committee were Leo Kolttola, Statistics Manager at Statistics Finland, and Liisa Tuominen-Roto, Senior Planning Officer at the Finnish Environment Institute.

Helsinki, October 2006

Ministry of the Environment

Minister of the Environment
Jan-Erik Enestam

Statistics Finland

Director General
Heli Jeskanen-Sundström

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Appendices: *Principal international environmental agreements to which Finland is committed and their objectives and implementation; statistical appendix*

1 Environmental policy

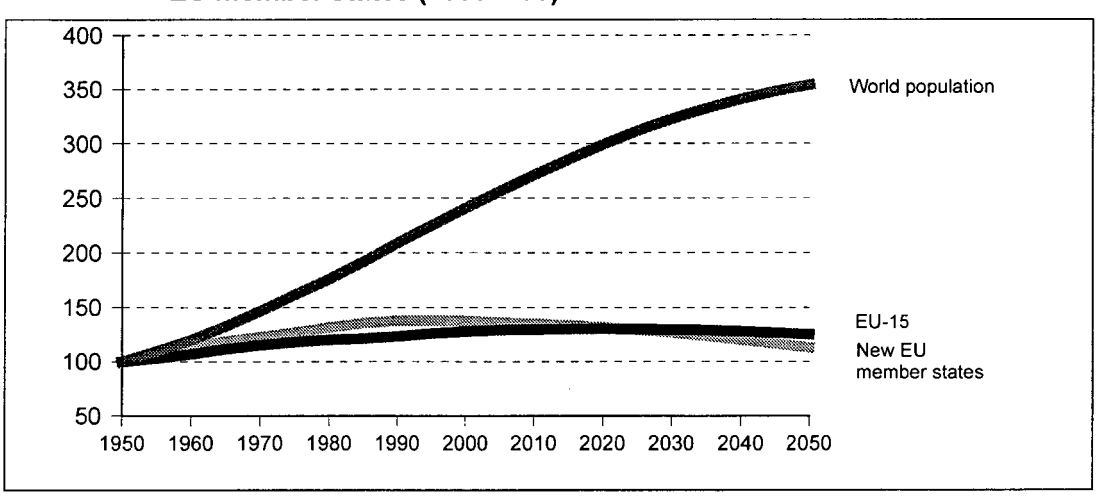
International environmental policy

Environmental problems are increasing due to world population growth and the prevailing production and consumption trends. The UN estimates that the world's population was 6.5 billion in 2005, and that this figure is increasing by 74 million annually. Population growth has slowed however, and, according to an estimate of the USA's Population Research Institute, the world mortality rate will exceed the birth rate by 2050. The UN estimates that the world's population will have reached 8.9 billion by then. A great concern is whether natural resources will be sufficient for all the people of the world, given current production and consumption trends.

The World Summit on Sustainable Development (WSSD) was held in Johannesburg, South Africa in 2002. New sustainability objectives were agreed upon, and implementation of Agenda 21 of the Rio de Janeiro Environment and Development Conference was accelerated. The principal issues of the summit were globalisation, poverty, production and consumption trends, environmental health, energy, ecosystems and environmental management. The main aim was to find a balance between ensuring the quality of the environment, strengthening the economy and increasing social equality.

One of the main concerns of sustainable development is to prevent acceleration of the greenhouse effect. At the UN's Kyoto Climate Summit in 1997, a global protocol was agreed for the reduction of greenhouse gas emissions. The protocol entered into force on 16 February 2005, at which time it had been ratified by 141 states, representing 61.6 per cent of industrialised countries' carbon dioxide emissions. Included were the EU member states, Japan, Canada and Russia. On the other hand, the USA and Australia did not sign the protocol.

Figure 1. Population trend globally, in the EU15 member states and in the new EU member states (1950=100)



1. Population growth in different countries

	Birth rate (children/ woman)	Predicted population changes in 2004–2050 (per cent)
Angola	6.80	+ 206
Nigeria	5.70	+ 124
India	3.06	+ 50
Brazil	2.18	+ 24
United States	2.02	+ 43
France	1.89	+ 7
Finland	**1.75**	**- 8**
Sweden	1.73	+ 18
Australia	1.73	+ 31
China	1.70	+ 11
Belgium	1.62	+ 5
Canada	1.50	+ 16
Estonia	1.41	- 23
Russia	1.39	- 17
Germany	1.30	- 9
Italy	1.29	- 10
Spain	1.26	- 3
Bulgaria	1.23	-38

The goal of the EU's climate policy is that the world's average temperature will not rise more than two degrees above that of the pre-industrial period. In order to achieve this target, a European Council meeting reacted positively in 2005 to a suggestion by the Ministers of the Environment of member states to research, together with other countries, the possibilities to cut greenhouse gas emissions by 15–30 per cent by 2020, compared with 1990 levels. However, the research target agreed by the Ministers of the Environment to cut emissions by 60–80 per cent by 2050 did not receive support. In the view of the EU countries, the EU should not commit itself to new cuts, unless the United States also commits to them.

The EU's sustainable development strategy was revised in June 2006. The new strategy presented objectives in climate change and pure energy, traffic, the utilisation of natural resources, environmental health, social discrimination and global poverty and development. The EU's environmental programme aims to promote sustainable development and to favourably influence its implementation in Europe. The main concerns are preventing climate change, halting the destruction of biological diversity and preparing a seven-theme strategy to guide actions over the next two decades with respect to air quality, the marine environment, the urban environment, waste from the use of natural resources, soil protection and the use of pesticides and other control substances. The means of implementation will be chosen after individual assessment of the effects. The intention is also to clarify and simplify legislation.

Sustainable development in Finland

Finland's new sustainable development strategy was finalised in June 2006. It endorses with the overall view of sustainable development embodied in the EU's sustainable development policy and the Lisbon strategy. The strategy pays attention to three key development challenges – climate change, globalisation and change in the population structure.

The new national sustainable development strategy's vision – *Towards sustainable choices – a nationally and globally sustainable Finland* – is to create sustainable well-being in a society that is safe, promotes participation and tolerates diverse values, and in which all people take responsibility for the environment. The strategy is designed to last for more than one generation and will form the basis for future government and policy programmes.

The objective of the sustainable development strategy is to combine the sustainable

use, care and protection of natural assets with the assured well-being of citizens and integrity of society in order to produce a multi-skilled and sustainable Finland that can utilise its strengths. It is also important for Finland's well-being and security to try and ensure that globalisation takes place as fairly as possible. According to the strategy, the solution of challenges in a sustainable manner will require simultaneous, compatible short and long-term policy actions at the national, EU and global levels.

Finland's government programme also aims at promoting sustainable development and implementation of the actions decided on at the Johannesburg summit. The goal is increased efficiency in using materials and energy during all stages of the product life cycle. To further this aim, the KULTU committee set up by the government made a proposal for a national sustainable consumption and production programme in 2005. The programme lists the additional objectives and environmental policy measures required for Finland to become an eco-efficient society. For example, a new advisory centre for materials efficiency is being founded at Motiva, which currently advises companies on renewable energy and how to use energy more efficiently.

The 2006 Environmental Performance Index (EPI) has been developed to complement the earlier compiled Environmental Sustainability Index (ESI) and to counter the the criticisms levelled against it. The new EPI index concentrates on the factors that describe the performance of the environmental policy in terms of sustainable development. It does this by setting precise and objective targets for each factor and comparing each country's accomplishments with them. Thus it is possible to compare countries and to make worldwide comparisons. Sufficient information has been received from 133 countries for the EPI comparison. The three most successful countries in terms of environmental performance so far have been New Zealand, Sweden and Finland.

Figure 2. Environmental Performance Index (EPI 2006) for designated countries

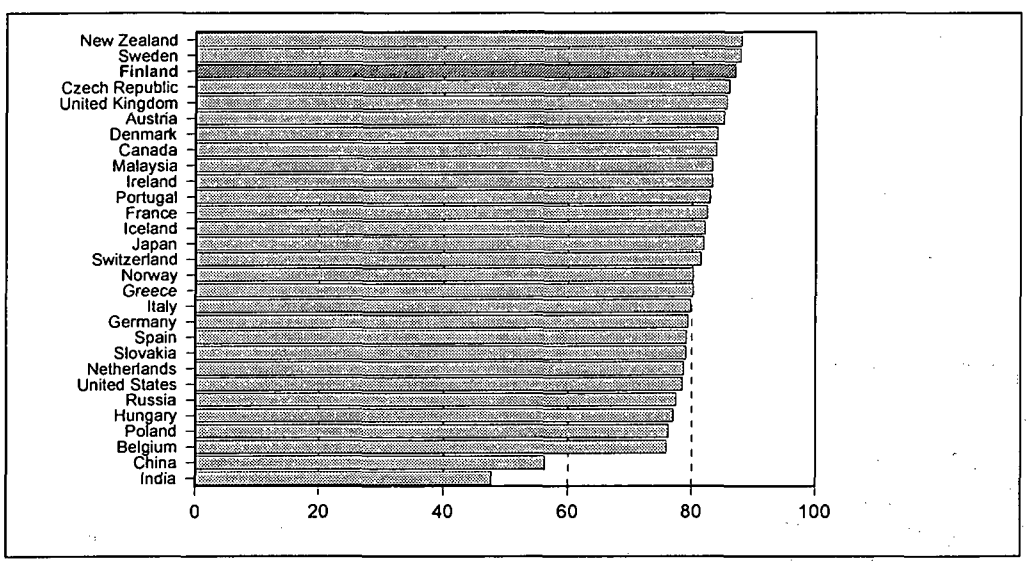


Figure 3. Trends in Finland's real GDP and consumption of energy and materials (1990=100)

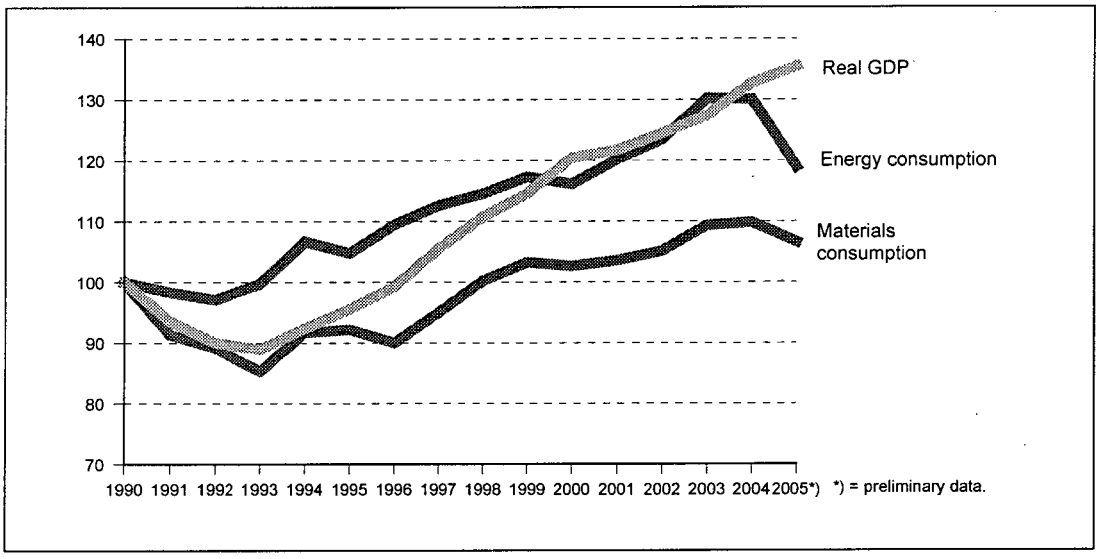
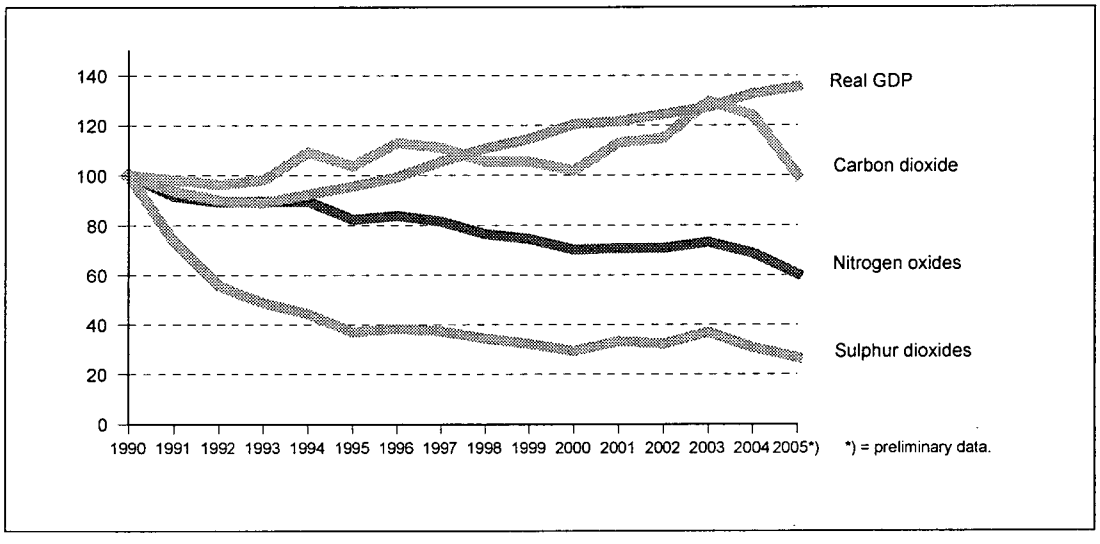


Figure 4. Trends in Finland's real GDP and atmospheric emissions (1990=100)



Environmental policy instruments

Government intervention in the realm of sustainable development has been stepped up in recent years. The current legislation on environmental protection came into force in 2000, updating and harmonising previously existing legislation and authorisation procedures. The Environmental Protection Act aims to bring uniformity to the process of restricting and managing emissions. Special emphasis is placed on applying the best available technology (BAT), risk management, and efficient energy use. A Land Use and Building Act supporting sustainable development came into force at the start of 2000. It aims to create the conditions for a favourable living environment, increasing the sustainable development of communities, and citizen participation and influence. These laws have been complemented by a range of other measures, including environmental taxes, environmental labelling schemes and voluntary agreements. Industry has also been actively involved in an energy saving agreement concluded by Finland's Ministry of Trade and Industry and the Confederation of Industries, EK. Over 90 per cent of the energy used in the forest industry and metal refining falls under this agreement.

According to the Government programme, ecologically sustainable development will be fostered through an environmentally responsible purchasing policy. The public sector annually spends EUR 20 billion (15 per cent of Finland's GDP) on purchases, and should integrate environmental considerations into this process by 2010. The public sector is a major purchaser of industrial investment and consumer goods, and can consider environmental aspects, especially in determining the objective of the purchase, in evaluating the overall economic benefit of tenders, and in the terms of the purchasing agreement. The idea is that local and central government organisations involved in environmentally responsible purchasing projects will learn from each other in developing best practices.

Most of the Government's environmental protection budget not allocated to the operating expenses of environmental administration is allocated to the environmental protection activities of industry and the municipalities. The Government uses nature conservation appropriations to acquire and manage nature conservation areas, and has a key role in sponsoring environmental research and development through the various ministries, the Academy of Finland, and the National Technology Agency of Finland (TEKES).

Finland is committed to helping developing countries attain environmentally sustainable development. In its development co-operation, Finland combats environmental problems by supporting 1) the development of environmental legislation and management, 2) the transfer of environmental protection technology, 3) the sustainable use of natural resources and the equitable division of benefits from them, 4) ecologically sustainable means of livelihood in rural areas, 5) environmental research, training and education, 6) citizens' participation opportunities and 7) preparation for the growing environmental requirements of trading.

2. Environmental aid in Finnish development co-operation in 2003–2006 (EUR million)

	2003	2004	2005	2006*)
Bilateral development co-operation				
Environmental aid as a primary objective	25	30	32	32
Environmental aid as a significant secondary objective	74	80	120	120
Multilateral development co-operation				
Support to the GEF	6	6	8	8
Support to the multilateral ozone fund	1	1	1	1
Total	**107**	**117**	**161**	**161**

*) = preliminary data.

3. Government taxes and fees relating to the environment (EUR million)

	2003 A	2004 A	2005 A	2006 B	2007 BP
Alcoholic beverage surtax*)	25	28	–	–	–
Soft drink surtax*)	4	5	–	–	–
Beverage container tax	–	–	22	18	22
Pesticide fee	2	2	2	2	2
Energy taxes	2 900	2 901	2 885	2 979	2 957
Oil waste fee	3	3	3	3	5
Motor car tax	1 207	1 235	1 277	1 325	1 350
Water protection fee	0	0	0	0	0
Oil pollution control fee	9	10	8	9	9
Vehicle tax	473	642	536	560	585
Waste tax	41	43	53	58	55
Total	**4 664**	**4 869**	**4 786**	**5 029**	**4 985**

A = Final accounts. B = Budget. BP = Budget Proposa. – = not in use. .. = data not available.
*) = packaging tax.

4. Government environmental expenditure (EUR million)

	2003 A	2004 A	2005 A	2006 B	2007 BP
Environmental administration	108	111	115	115	114
Central administration	*46*	*47*	*48*	*48*	*47*
Regional administration	*62*	*64*	*67*	*66*	*67*
Development co-operation	107	117	161	161	161 **)
Co-operation with neighbouring areas	10	10	10	8	5
Nordic Environment Finance Corporation	1	1	1	1	1
Research and development	176	188	197	201	203
Environmental protection and management [1)]	*17*	*18*	*18*	*18*	*17*
Use and management of natural resources [2)]	*38*	*39*	*46*	*47*	*46*
Universities[*)]	*56*	*60*	*59*	*61*	*62*
Development of environmental technology [3)]	*49*	*51*	*55*	*57*	*60*
Other environmental research [4)]	*16*	*20*	*19*	*18*	*18*
Environmental NGOs	1	1	1	2	2
Environmental protection	*54*	63	*53*	*44*	*55*
Clean air and waste management	*8*	*19*	*15*	*8*	*10*
Water protection	*8*	*9*	*10*	*9*	*9*
Environmental management and decontamination	*38*	*37*	*29*	*29*	*36*
Nature conservation	*58*	69	70	67	62
Promotion of energy saving	7	10	6	9	10
Promotion of renewable energy	27	23	28	23	23
Energy repairs for dwellings	15	17	17	17	4
Environmental protection of road traffic [*)]	20	27	31	18	19
Manure pit investment support	2	3	3	3	3
Agri-environmental support	288	294	290	265	311
Environmental support for forest management	4	6	6	7	7
TOTAL	**878**	**940**	**989**	**940**	**980**

A = Final accounts. B = Budget. BP = Budget Proposal.
*) = estimate. **) = forecast.

[1)] = Environmental Administration. [2)] = Agriculture and Forestry Administration. [3)] = Technical research.
[4)] = Other administrative branches.

The most significant environmental agreements for development co-operation are those on prevention of climate change and desertification and protection of the biodiversity of the nature and the activity of the UN's Forum on Forests (UNFF). Important are also agreements on protection of the stratospheric ozone layer and management of hazardous waste and chemicals harmful to the environment.

In the 2002 Johannesburg World Summit on Sustainable Development Finland published its own partnership initiative on co-operation in energy and environment issues with Central American countries. Partnerships are a new type of co-operation, where besides the public sector, funding is sought from the private sector. The project aims to advance the use of renewable energy modes and pure technology in partnership countries and it

includes experimental work in the wind power, solar power, small hydro power and bio-energy sectors, energy resource and feasibility studies, utilisation of the Kyoto mechanisms, development of energy markets and technology transfer and training. Thus far slightly over EUR 3 million have been allocated to 77 projects. The Energy and Environment Partnership event to be held in Panama in autumn 2006 will be the main event during Finland's EU presidency between the EU and Latin America. Based on positive international evaluations Finland will continue funding for the Partnership project until 2009.

With respect to neighbouring areas, Finland's aim has been to promote environmental protection in Northwest Russia, the Baltic countries and Poland. When the Baltic countries and Poland joined the EU in 2005, the operating environment for neighbouring area co-operation changed with the exception of Northwest Russia. Within this framework the aim has been to enable these countries to solve their own environmental problems and take preventive measures. The main aim of co-operation is to reduce the emissions from neighbouring areas that have an impact on Finland and especially the Baltic Sea.

Since the Baltic countries joined the EU, Finland has continued technical aid co-operation in a transition period until 2006. The eco-conversion co-operation with Poland ended in 2005. Co-operation with Northwest Russia will continue until 2010, focused on St. Petersburg, the Leningrad Province and the Karelian Republic. The Barents and Nordic scope areas are also possible co-operation areas. The main co-operation sectors are 1) reducing environmental loads in the Baltic Sea, 2) enhancing the ability to combat oil spills, especially in the Gulf of Finland, 3) improving hazardous substance management, 4) promoting sustainable forestry and nature conservation, and 5) enhancing environmental management. In an agreement made with the St. Petersburg Water Department until 2007, the aim is to execute projects having an immediate effect on the situation in the Gulf of Finland.

5. Finland's contribution to environmental protection in neighbouring areas 1991–2006 (EUR million)

	Investment projects	Technical assictance
Estonia	29.6	6.6
Latvia	12.0	2.8
Lithuania	8.8	3.9
Russia	38.3	16.0
Ukraine	1.0	0.0
Poland	16.4	0.1
Others*)	0.1	15.5
Total	**106.2**	**44.9**

*) = contributions to international financial institutions and co-operation projects in above countries.

Co-operation with Northwest Russia has focused on the treatment of wastewater in the St. Petersburg region. Finland contributed EUR 10 million to the building of the Southwest treatment plant in St. Petersburg. The project cost almost EUR 200 million. The wastewater of 715,000 inhabitants is treated in the St. Petersburg treatment plant completed in 2005. It is estimated that the new plant will reduce the nitrogen load in the Gulf of Finland by 2,200 tonnes and the phosphorus load by 360 tonnes per year.

In Finland, the granting and monitoring of environmental permits is mostly the responsibility of municipalities. Over 30,000 organisations operate under environmental permits in Finland. 80–85 per cent of these activities are monitored by the municipalities. The biggest environmental expense items for municipalities, joint municipal boards and municipal

corporations are sewerage and waste water treatment. Most of the costs of waste management, sewerage and waste water treatment are covered by the fees collected from users, but some of the money for investments in these projects comes from government funding. The municipalities finance environmental management themselves and with Government aid.

6. Environmental protection by municipalities (EUR million)

	2003	2004	2005*)
Waste management			
Investments	21	26	42
Operating costs	129	125	144
Waste water treatment			
Investments	46	43	44
Operating costs	125	128	131
Sewerage			
Investments	111	104	106
Operating costs	147	149	153
Environmental management			
Investments	6	4	4
Operating costs	58	57	65
Total	**643**	**636**	**689**
Investments	184	177	196
Operating costs	459	459	493

*) = preliminary data.

Ecological tax reform

Ecological tax reform refers to the introduction of a new environment-related tax or the development of existing taxes to support environmental policy aims. The reduction of income taxes is often a simultaneous objective. The reform strives for a double benefit, meaning that as the state of the environment improves, the economy also benefits and unemployment decreases.

According to the Government programme, the taxation structure will be reformed to promote sustainable development. The ecological tax reform will reduce the use of non-renewable natural resources and will reduce environmental damage. It will also promote recycling and the eco-efficiency of products, their use and energy consumption.

7. Percentage of environmental taxes in the EU15 countries in 2002

	Percentage of GDP	Percentage of Government tax revenue
Denmark	4.8	9.9
Netherlands	3.6	9.2
Portugal	3.2	8.8
Finland	**3.1**	**6.8**
Sweden	3.0	5.9
Italy	2.9	7.0
Luxembourg	2.9	7.0
United Kingdom	2.8	7.7
Greece	2.6	7.2
Germany	2.6	6.4
Austria	2.6	5.9
Irland	2.3	8.1
Belgium	2.3	5.0
Spain	2.2	6.0
France	2.0	4.5
EU15	**2.8**	**6.5**

The focus of Finnish taxation has gradually been shifted towards environment-based taxes for some time. Consequently, the revenue from environment-based taxes in relation to GDP is higher in Finland than on average in the EU. In the near future, Finland intends where possible to improve the environmental impacts of taxation through targeted actions (such as raising the oil waste fee to enhance the cost effectiveness of environmental policies) without changing the focus of taxation.

The most important environment-based taxes in Finland are energy taxes and fuel and

motor vehicle taxes associated with transport. Energy taxation aims to control the use and production of energy and generate tax revenue for the Government. To help reach these goals, the excise duty on energy products is divided into a basic tax and a surtax. The basic tax is a fiscal tax, and is levied on liquid fuels such as petrol, diesel, and light fuel oil. The surtax is levied according to carbon content, and it currently stands at EUR 18.05 per carbon dioxide tonne. Fuel taxation aims to limit the use of fossil fuels, while taking Finland's special traffic conditions into account.

Taxes targeted at road traffic include the motor car tax levied on acquisition of automobiles and motorcycles, the annual vehicle license tax and motor vehicle tax, and the fuel tax. As the fuel tax on road traffic is partly based on environmental impacts, the levy on sulphur-free and lead-free fuel is lower than on other fuels. Moreover, the surtax is based on the carbon content, being EUR 17.2 per tonne of carbon dioxide. Financial instruments have also been applied to rail traffic in Finland. The rail fee, renewed in 2000, is based on the "marginal social cost" charging principle and takes into account external costs caused by traffic volume. In 2004, EUR 42 million was collected in rail fees. The tax on fuel is the main source of revenue from the special taxes levied on road traffic. Taxes currently make up 71 per cent of the price of unleaded petrol in Finland, and 58 per cent of the price of diesel.

8. Special taxes levied on road traffic (EUR million)

	2003	2004	2005	2006	2007
	A	A	A	B	BP
Vehicle tax	243	642	536	560	585
Motor vehicle tax	230	–	–	–	–
Motor car tax	1 207	1 235	1 277	1 325	1 350
VAT on motor car tax	192	196	203	211	215
Fuel tax	2 183	2 159	2 160	2 192	2 242
VAT on fuel tax	218	215	216	219	224
Total	**4 273**	**4 447**	**4 392**	**4 507**	**4 616**

A = Final accounts. B = Budget. BP = Budget Proposal. – = not in use.

2 Global environmental challenges

Climate change

One of the main concerns of sustainable development is to prevent acceleration of the greenhouse effect. The Intergovernmental Panel on Climate Change (IPCC) estimates that, as a result of global warming, the average global temperature could rise by 1.4–5.8 degrees Celsius by 2100. According to the UN's Kyoto Protocol signed in 1997, industrial countries must reduce their greenhouse gas emissions by an average of 5.2 per cent from 1990 levels during 2008–2012. Although the Kyoto Protocol is a first step in reducing greenhouse gas emissions to a safe level, it has not yet slowed climate change. According to the IPCC, the emissions reduction requirement in the long term is in the order of 50–90 per cent worldwide, for atmospheric carbon dioxide content to be kept at no more than double pre–industrial levels. In the IPCC calculations, the carbon dioxide content in the atmosphere will rise from 365 ppm (parts per million) to at least 550 ppm by 2050.

In its Finsken project, the Finnish Meteorological Institute has produced a series of scenarios for the future climate in Finland and the composition of the atmosphere. According to the projections, in all scenarios the Finnish climate will become warmer, precipitation will increase and the exposure of forests to low-level ozone will exceed the critical level in southernmost Finland. The situation looks the least promising in the scenarios that aim at economic growth, i.e. those in which energy production relies mostly on fossil fuels. It is estimated that Finland's average temperature will rise by up to 6–7 degrees Celsius by mid-century, and that the ozone exposure of forests will reach critical levels even in northern Finland. In scenarios in which environmental values are given priority over economic growth, or in which economic growth is achieved through new, environmentally friendly technology, the ozone exposure of forests will begin to decrease by mid-century. On a global scale, the increase in emissions from traffic and energy production that cause ozone to form in the lower atmosphere will be so immense that the measures for reducing air pollution agreed upon in Europe will not suffice to prevent increases in ozone levels.

In 2004 Finland's net greenhouse gas emissions were the equivalent of 81.44 million tonnes of carbon dioxide, whereas in 1990, the Kyoto Protocol benchmark year, the emissions were the equivalent of 71.1 million tonnes of carbon dioxide. The total emissions of 2004 exceeded the Kyoto target by 14.6 per cent, or by more than 10 million tonnes. However, the emissions fell from the record level of 2003 by almost 5 per cent. Carbon dioxide is the major greenhouse gas, accounting for 85 per cent of the total. The main source of carbon dioxide is fuel use for the production of electricity and heat, and fuel consumption in transport. These account for 78 per cent of total greenhouse gas emissions and for 89 per cent of carbon dioxide emissions. In 2005, Finnish carbon dioxide emissions from fossil fuels and peat were 54 million tonnes, compared with 53.9 million tonnes in 1990. In 2005 total emissions were exceptionally low, maybe even below the Kyoto target, but in 2006 the emissions will grow again.

Administration of the Kyoto mechanisms was divided between the Finnish Ministries in 2005. The plan is to buy ten million tonnes of

carbon dioxide emissions reductions for Finland during 2008–2012. The Ministry of the Environment is responsible for joint implementation and inter-government emissions trading.

9. Finland's greenhouse gas emissions by sectors and sources in 2004 (million carbon dioxide-equivalent tonnes)

Energy	66.6
Energy production	*33.1*
Industry and construction	*11.4*
Traffic	*14.1*
House heating, etc.[*)]	*7.8*
Evaporative emissions, etc.	*0.2*
Industrial processes	6.2
Solvents, etc.	0.1
Emissions from agriculture	5.6
Waste	2.6
Other	0.3
Total emissions	**81.4**

*) = Households and services.

EU climate change policy

The EU has, in many connections, set a long-term climate goal that the world temperature should not rise by more than two degrees Celsius compared with pre-industrial times. Indeed, some of the member states will voluntarily reduce their emissions by more than the agreed amount. Sweden will cut its emissions by four per cent from 1990 levels by 2012, even though the EU's internal burden sharing would permit it to increase emissions by four per cent. In its energy strategy, the UK has also undertaken to reduce emissions by 20 per cent by 2010, instead of the 12.5 per cent required by EU burden sharing. The German goal was a 25 per cent reduction by 2005, even though under the burden sharing plan its target is a 21 per cent reduction by 2012. Furthermore, the UK and Sweden have expressed their intention to aim at emission reductions of up to 60 per cent by 2050.

The requirements set for the EU by the Kyoto Protocol in 1997 were divided among the 15 old EU member states by a Burden Sharing Agreement in 1998. The Agreement was ratified in 2002. The EU member states have made national implementation strategies to meet the requirements of the Kyoto Protocol. Some states will buy a significant amount of their required emissions reductions from other states through the Kyoto Protocol's flexible mechanisms. In 2004, total emissions exceeded the Kyoto target level by over 14 per cent.

Figure 5. Finland's greenhouse gas emissions 1990–2004 and climate strategy target to 2012 (million carbon dioxide-equivalent tonnes)

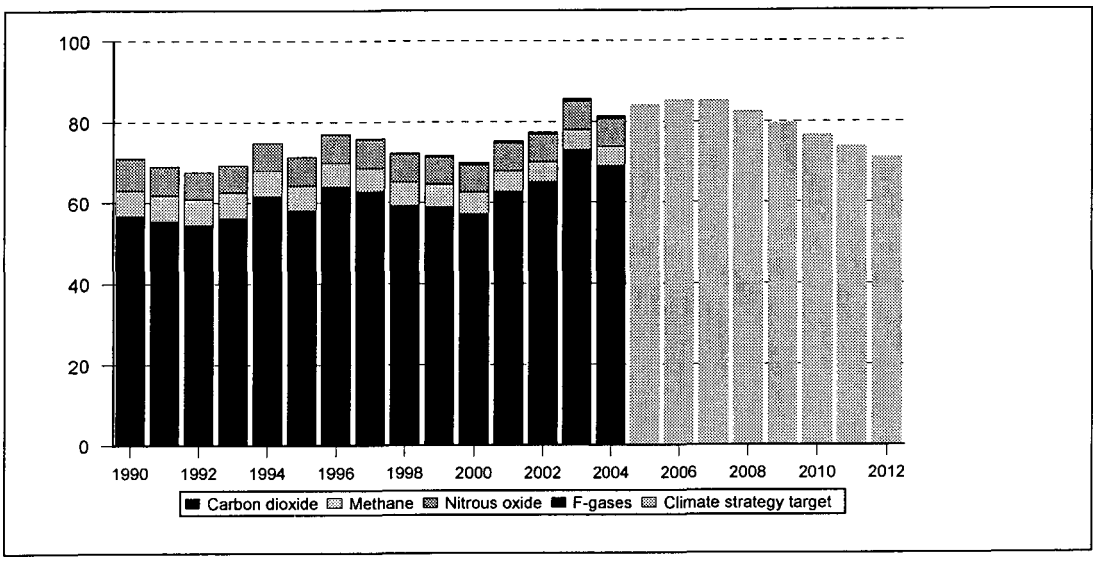
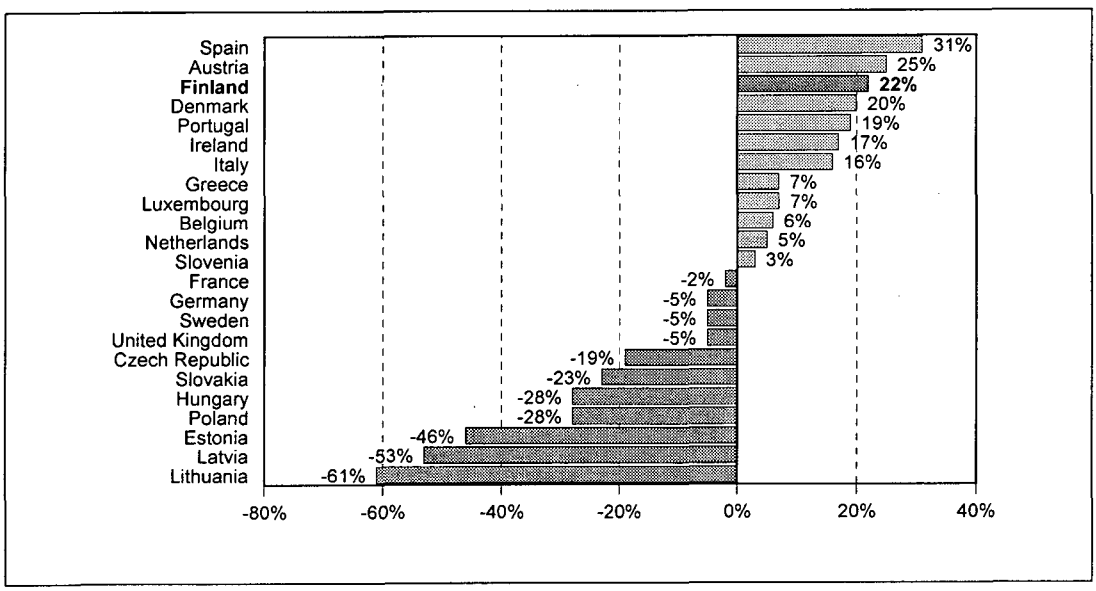


Figure 6. EU member states in relation to Kyoto target levels in 2003 (per cent)



EU emissions trading

At the beginning of 2005, the EU began an emissions trading system that is regarded as essential for achieving greenhouse gas reduction targets. The trading system for carbon dioxide emissions allowances is aimed at reducing emissions as cheaply as possible, and in an environmentally efficient way. The system begins with each member state allocating the emissions allowances site by site to the installations covered by the emissions trading scheme, after which the unused allowances can be traded within the Community. Those for whom it is more cost-effective to reduce emissions can sell their unused allowances to those for whom the reductions would be more costly. In the initial period, 2005–2007, member states must allocate at least 95 per cent of the emissions allowances free of charge. In the period 2008–2012, member states must allocate at least 90 per cent of the allowances free of charge. Member states must prepare national allocation plans containing details of the total amount of emissions rights the state will grant during the period specified in the Directive, and how it will allocate the emissions rights to sites within the scope of the Directive. In 2004 and 2005, the price of a carbon dioxide tonne varied between EUR 5.9 and EUR 30.

The EU's internal emissions trading has a significant effect on Finnish climate policy. Within the EU's Burden Sharing Agreement, Finland has undertaken to cut its greenhouse gas emissions on average to the 1990 level by 2008–2012. Since the cost of reducing emissions is comparatively high in Finland, Finnish companies will primarily be purchasers of emissions allowances. In August 2004, the Finnish Government approved a proposal for the Finnish National Allocation Plan for the first emissions trading period, which was delivered to the European Commission for approval. The Commission accepted the Finnish Allocation Plan in October 2004. The Finnish Government made a decision on the granting of emissions allowances on 21 December 2004. The total emissions allowance for Finland is 136.5 million tonnes of carbon dioxide, which is around three per cent less than the estimated carbon dioxide emissions. The figure includes 2.5 million carbon dioxide tonnes reserved for new participants. Emissions allowances were allocated to installations, site by site, free of charge. There were 530 sites within the scope of the emissions trading system in the first allocation phase, belonging to 147 installations. The companies taking part in emissions trading produce around half of Finland's greenhouse gas emissions, and 59 per cent of Finland's carbon dioxide emissions.

10. EU15 states' greenhouse gas emissions (CO_2 equivalents) and burden sharing

	Emissions 2004	Change 1990–2004	Burden-sharing target 2008–2012
Luxembourg	13.8	+ 8.7	– 28 %
Germany	993.3	– 18.3	– 21 %
Denmark	68.1	– 1.7	– 21 %
Austria	91.3	+ 15.7	– 13 %
UK	659.3	– 14.1	– 13 %
Belgium	147.9	+ 0.7	– 8 %
Italy	571.0	+ 11.9	– 7 %
Netherland	217.8	+ 1.6	– 6 %
France	562.6	– 0.8	0 %
Finland	**81.4**	**+ 14.5**	**0 %**
Sweden	69.9	– 3.6	4 %
Irland	68.5	+ 22.8	13 %
Spain	424.3	+ 48.3	15 %
Greece	137.6	+ 23.9	25 %
Portugal	84.5	+ 40.8	27 %
Total	**4 191.1**	**– 1.1**	**– 8 %**

Finland's climate policy

The National Energy and Climate Strategy was approved by the Parliament in June 2006. According to the Strategy, Finland's greenhouse gas emissions will rise above the Kyoto target level unless determined and effective steps to restrict emissions are taken. Action is needed in energy production and consumption, road traffic, construction, community planning, the control of agriculture and forestry emissions, and waste management. The Finnish National Climate Policy is being implemented through broad co-operation.

The UN Framework Convention on Climate Change requires signatories to monitor their greenhouse gas emissions closely. It binds them to submit an annual inventory report on their anthropogenic greenhouse emissions for the last but one year. The European Commission also compiles an inventory covering the EU member states. In Finland, a greenhouse gas emissions inventory establishment as required by the Kyoto Protocol was established at Statistics Finland in 2004.

A JI/CDM test programme led by the Ministry for Foreign Affairs was set up in 1999 to gain experience with the project-based Kyoto mechanisms – Joint Implementation (JI) and the Clean Development Mechanism (CDM) – which aim to reduce greenhouse gases. The test programme has a total of EUR 20 million in appropriations for its operations. Some EUR 11 million has been invested in the World Bank's Prototype Carbon Fund (PCF) and the Baltic Sea Region Energy Co-operation Testing Ground Facility (TGF). The rest is used in bilateral JI and CDM projects and in the administration of the programme. According to current estimates, the projects presently under way will produce around 2.2 million carbon dioxide-equivalent tonnes in Kyoto-compliant emissions reductions in the first commitment period, 2008–2012. One JI project compliant with the Kyoto Protocol is the Pakri wind farm in Paldiski, Estonia, which was officially opened in June 2005.

Sustainable development and energy

In 2005 Finland's total energy consumption totalled 32.4 million oil-equivalent tonnes. Consumption declined from the previous year by nine per cent and Finland's energy intensiveness, i.e. total energy consumption as a ratio of GDP, continued the decline that began in 2004. The end-use of energy, i.e. the energy remaining for use by companies, households and other consumers, fell by four percent from the previous year. This was due to the reduced output of energy-intensive industry and the mild weather of the previous year which diminished the need for heating energy in buildings.

Fossil fuels and peat were used less in 2005 than in the previous year by 15 per cent and 26 per cent respectively. Of fossil fuels, the biggest drop was in the consumption of coal. Fossil fuels accounted for clearly less than one half of the total energy consumption. Renewable energy sources continued to account for 25 per cent of total energy consumption, even though hydropower production decreased by nine per cent. On the other hand, wind power production increased significantly – as it had in the previous year – by over 40 per cent. Its output remained under 0.2 TWh, however.

In 2005, almost two per cent less electricity was consumed in Finland than in the previous year, and more electricity was imported than ever before. Domestic electricity production dropped by 17 per cent, i.e. by 68 TWh, whereas the net electricity imports increased

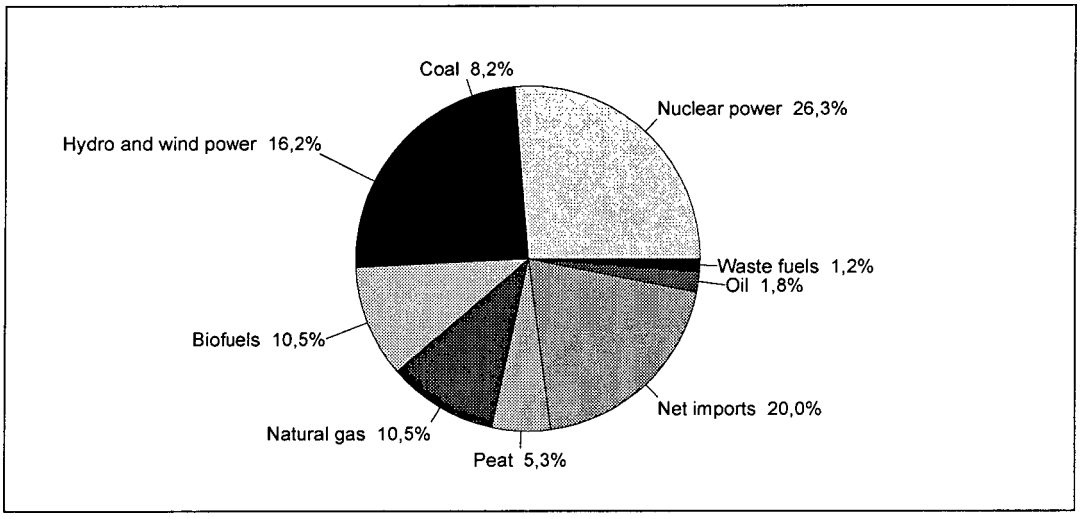
to 17 TWh, corresponding to one fifth of total electricity consumption.

In 2002 the Finnish Parliament made a decision in principle to approve the building of a fifth nuclear power plant on the following conditions. It was decided to take quick measures to limit the use of coal, to speed up implementation of the energy saving programme and the saving of energy, to promote R&D related to renewable energy sources and their introduction, and to present a report to Parliament concerning these actions.

11. End-use of energy by sector in 2005

	Petajoules (PJ)	Per cent
Industry	515	48
Heating	236	22
Traffic	183	17
Other	143	13
Total	**1 077**	**100**

Figure 7. Breakdown of electricity production by energy sources in 2005 (per cent)



The promotion of renewable energy sources and the more efficient use of energy are key conditions for sustainable development and fighting climate change. The International Conference for Renewable Energies, held in Bonn in June 2004, concluded that renewable energy sources and energy efficiency will increase in importance, and will be critical, widely available energy sources in the future. It is planned to renew EU funding programmes, in order to focus more on innovation, competitiveness and providing risk capital for small and medium-sized enterprises (SMEs). The Competitiveness and Innovation Framework Programme (CIP) for 2007–2013 also includes the current long-term programme for the energy sector, the Intelligent Energy Europe programme (2003–2006). The new programme is expected to expand both the renewable energy sources (ALTENER) and the improved energy efficiency (SAVE) parts. The part of the programme devoted to energy saving in transport (STEER) continues to be a key focal area. In the EU's Sixth Framework Programme for Research and Technical Development, started

in 2003, energy research focuses on "Sustainable development and global change". The EU's Seventh Framework Programme, approved in April 2005, makes the environment (including climate change) a thematic domain. A proposal for a framework programme dedicates EUR 2,552 billion to environmental research between 2007–2013.

Figure 8. Total energy consumption in EU25 countries by GDP in 2004

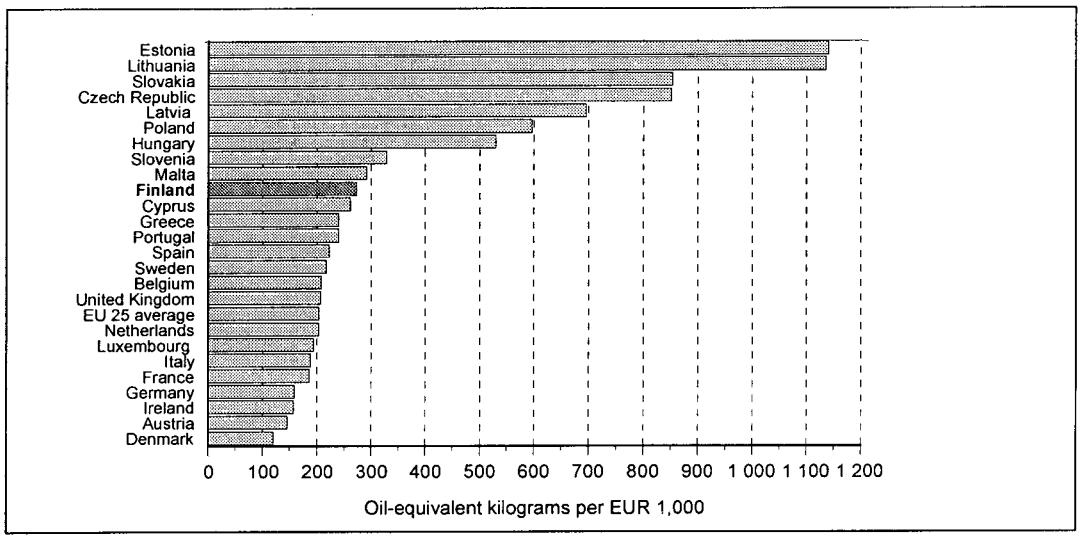
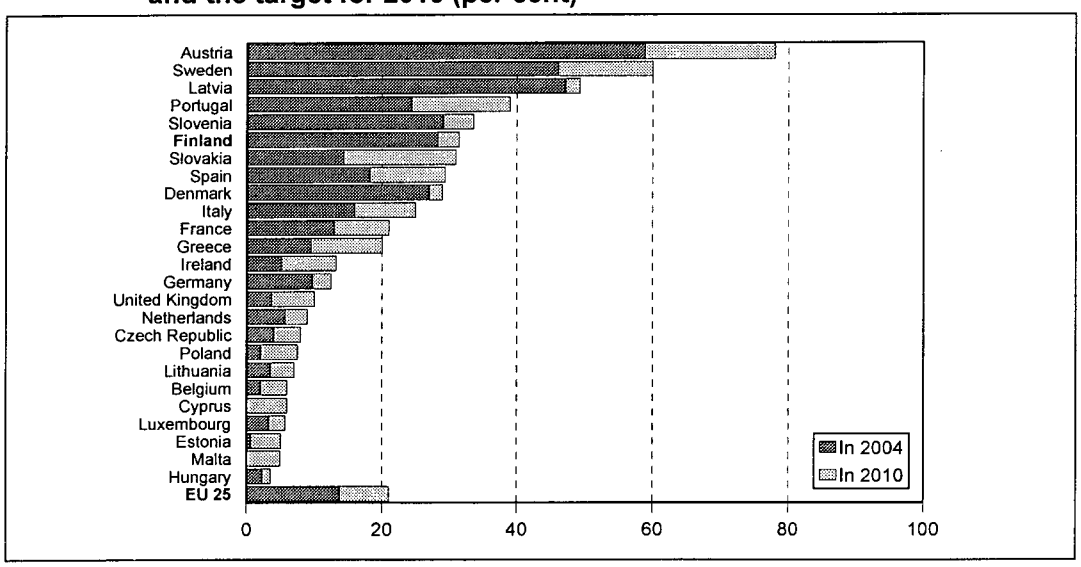


Figure 9. Renewable energy as a proportion of electricity consumption in 2004, and the target for 2010 (per cent)



The European Commission aims to double the use of renewable energy sources from the earlier figure of six per cent by the year 2010. In the Directive promoting the use of electricity produced from renewable energy sources, each member state is given an individual indicative target for the percentage of total energy consumption to be produced from renewable energy sources by 2010. The target for Finland is 31.5 per cent. To promote combined heat and power (CHP) production, the European Commission has set a target for the EU to double its share of CHP by 2010. To achieve this and other targets, the Commission drafted a Directive on combined heat and power production, which came into force in February 2004.

The goal of Finland's National Climate and Energy Strategy is that the total use of renewable energy sources would grow by at least one quarter by the year 2015 and by at least 40 per cent by the year 2025. The strategy will increase particularly strongly the use of woodchips made of logging waste, field biomass, recycled fuels and biogas. The objective is that their share of primary energy will at least triple from the present two per cent to over six per cent during 15 to 20 years. The share of renewable energy of primary energy could then rise to almost one third. In 2003 it was 23 per cent.

One of the aims of the National Forest Programme and the National Climate and Energy Strategy is to increase wood fuel use. In 2005, 13.7 million solid cubic metres of wood fuel were used in heat and power plants to produce 26 TWh of energy, representing seven per cent of Finland's total energy consumption. An even greater source of energy was wood-derived waste liquor. Of the other wood fuels, the most significant is the burning of firewood. The most significant solid fuel is bark, accounting for 65 per cent of the total. Bark, like sawdust, wood chips and forest industry residues, originates from, and is thus dependent on, the wood-processing industry. Wood-based fuels accounted for around 20 per cent of Finland's energy consumption in 2005.

The world's wind-power capacity has grown swiftly in recent years. Europe's wind-power production, 82 TWh, already exceeds Finland's electricity consumption. During 2005 11,769 megawatts of new wind-power were installed throughout the world, and at the end of 2005 the whole world's wind-power production capacity rose to 59,322 megawatts, up by 25 per cent on the previous year. At the end of 2005, the EU's wind power capacity was 40,500 megawatts. Despite abundant potential, most of the EU member states are still at a low level of wind-power production. So far, the construction of more wind power sites has been hampered by the low price of electricity. Emissions trading and its electricity price raising effect will advance the growth of wind-power production. At the end of 2005, Finland had 82 megawatts of wind power capacity in 94 plants.

12. World wind power capacity, Dec 31, 2005 (megawatts)

	Capacity	Percentage
Germany	18 428	31.0
Spain	10 027	16.9
United States	9 149	15.4
India	4 430	7.5
Denmark	3 122	5.3
Italy	1 717	2.9
UK	1 353	2.3
China	1 260	2.1
Japan	1 231	2.1
Netherlands	1 219	2.1
Other countries, total	7 368	12.5
Total	**59 322**	**100.0**

Finland has a high standard of know-how in the exploitation of solar energy. Current solar energy applications are mainly to provide electricity to holiday homes and remote regions. A total of some 30,000 solar panel units have been sold to generate electricity for holiday homes. Solar energy is used to light 1,500 shipping beacons, and four experimental solar power stations have been connected to the electricity network.

Fuel peat accounts for six per cent of Finland's total energy requirement. The main arguments for supporting fuel peat use are that it is indigenous, the certainty of the availability of energy, and the employment perspective, particularly in northern and eastern Finland. Peat is suitable for use as a fuel, particularly when combined with wood, and is classified as a slowly renewing biomass fuel. However, emissions arising from the burning of peat fall under the category of fossil-fuel greenhouse gas emissions. A total of around 2.2 million oil-equivalent tonnes of peat were burnt in 2004, and there has been a definite rising trend since the 1980s. According to the National Climate Strategy, the aim is for peat use to remain at the current level in terms of quantity, in the production of combined heat and power and in the production of heat alone.

Improving energy efficiency

Finland's energy supply system relies largely on conventional forms of energy whose efficiency is high, due especially to the production of combined heat and power (CHP). Around half of the output goes into industry, and half into the needs of communities. CHP uses just two-thirds of the amount of fuel that would be required to generate power and heat separately. In 2003, 75 per cent of district heating and 34 per cent of all electricity was produced by CHP production. All-in-all, 29.9 TWh of district heating were consumed in 2003. Some 46 per cent of the population live in housing connected to a district heating system. In the largest cities the figure is around 90 per cent.

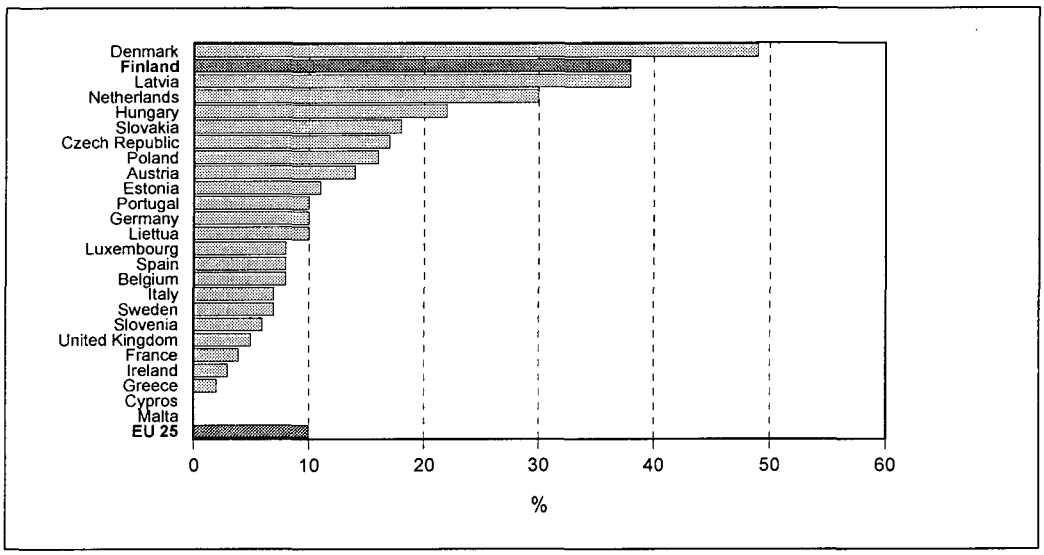
Significant results have been achieved by energy savings actions so far. The actions taken under the National Energy and Climate Strategy are expected to accomplish five per cent additional savings by 2015 compared with a situation with no actions. The main areas in the energy savings programme are development and commercialisation of energy-efficient technology, financial mechanisms, more efficient use of standards, implementation of energy savings agreements, and further development of energy review and analysis activities. The effectiveness of actions will be increased through information, education and motivation. Motiva, an incorporated advocacy unit funded primarily by the Ministry of Trade and Industry, has a central role in promoting these actions.

The EU's Energy Efficiency Directive came into force in May 2006. Its aim is to improve the efficiency of energy use in sectors outside the scope of emissions trading, of which road traffic is the biggest. Sea and air traffic are not covered by the Directive. The Directive's indicative target is to improve energy efficiency by an average of one per cent annually over the years 2008–2016, i.e. a nine per cent cut on the average of the final consumption for 2001–2005.

In Finland, the energy performance certificates and inspections of boilers and central air conditioning systems required by the EU Directive on the Energy Performance of Buildings will be in full use by 2009. Steps are being taken across the EU to prepare for the requirements of the Directive on the Eco-design of Energy-using Products (EuP), and the Directive on Energy End-use Efficiency

and Energy Services, which will provide a framework for energy-saving measures in public corporations and energy companies, among others.

Figure 10 Electricity produced in combined heat and power (CHP) production as a percentage of total electricity production in EU25 member states in 2002



3 Environmental impacts of the economy

Steering and control of environmental protection

The European Union and the ISO (International Organisation for Standardisation) have created operating models for the systematic management and development of the environmental issues of companies and other organisations. The EMAS (Eco-Management and Audit Scheme), based on an EU regulation, and the ISO 14001 environmental management systems standard are in use in Finland. It is possible to join EMAS in all the EU countries, as well as in Norway, Iceland and Liechtenstein. There has also been interest in EMAS in countries outside its actual scope of application, for example in Romania, Switzerland, China and Korea.

In EMAS, openness and the need to inform stakeholders are given special attention. Organisations registered under EMAS regularly publish an environmental report on their activity, which has been confirmed by a third party. In Finland, the fee for processing an environmental permit can be reduced if, for example, an environmental management system shortens the processing time. Environmental management systems can be used as proof that environmental requirements in tender offers of public contracts are met.

Finland's industrial sector has invested more and more in environmental protection in recent years, with the emphasis starting to shift to the various dimensions of social responsibility. The European Commission's Integrated Pollution Prevention and Control (IPPC) Directive underlines the responsibility of companies to employ the best available technology (BAT) in their processes and other functions. In Finland, the BAT requirement has been included in the Environmental Protection Act and in legislation dealing with water protection, waste disposal and marine protection. The Act contains the major elements of legislation tackling environmental pollution. The Environmental Protection Act and Decree require environmental permits to be acquired for any operation that carries the risk of environmental pollution.

Energy production

Energy production causes the emission of many air pollutants with serious environmental impacts. The most significant are sulphur dioxides and nitrogen oxides. Many international agreements were signed in the 1980s and 1990s to cut these emissions. As a result of these agreements, sulphur emissions in Europe decreased by 60 per cent between 1980 and 2000. Emissions of nitrogen oxides have also decreased significantly since the 1980s.

In 2005 Finland's sulphur dioxide emissions totalled 73,000 tonnes, according to estimates, which meant a reduction of 73 per cent from the 1990 level. This reduction was the result of changes in the structure of energy production, reduced fuel oil use, decreased sulphur content in fuel, and improvements in process technology. Finland's sulphur dioxide emissions in proportion to GDP are about one-third less than the average in European OECD countries. Electricity and heat generation account for almost 70 per cent of the emissions, and industry for 26 per cent.

In 2005 there were around 180,000 tonnes of nitrogen oxide emissions in Finland, nearly 40 per cent less than in 1990. Almost 36 per cent of these emissions were caused by domestic traffic. Energy generation accounted

for 37 per cent of nitrogen emissions. Measured against the country's GDP, nitrogen oxide emissions are comparatively high in Finland, about 70 per cent higher than the average in European OECD countries.

Figure 11. Finland's sulphur dioxide emissions and reduction target for 2010 (1,000 tonnes)

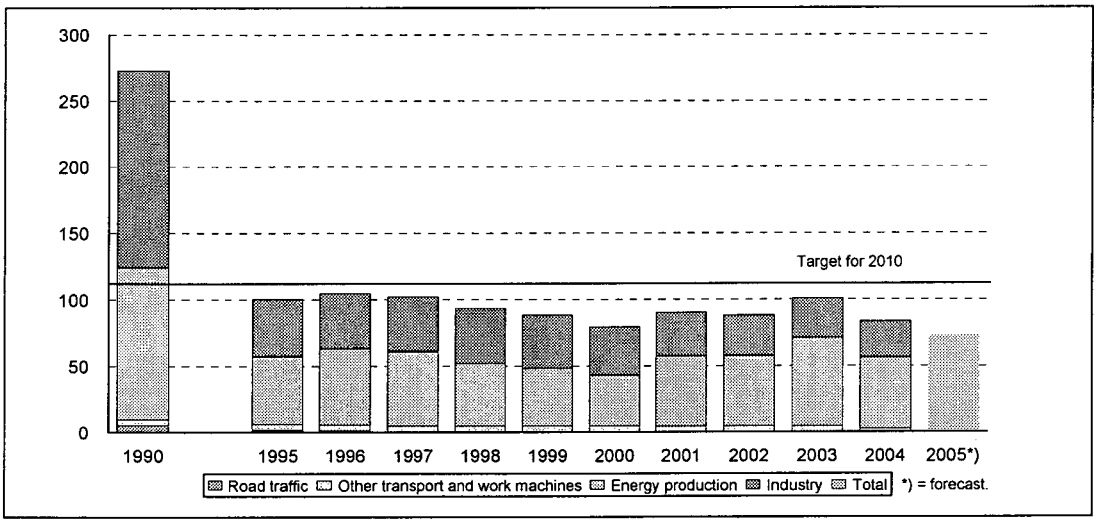
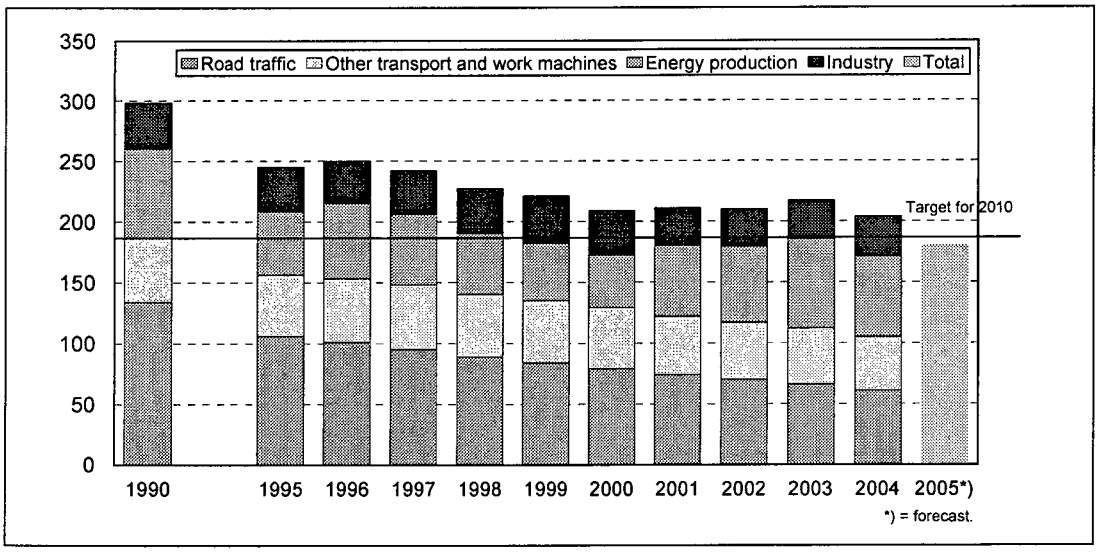


Figure 12. Finland's nitrogen oxide emissions and reduction target for 2010 (1,000 tonnes)



Sulphur dioxide and nitrogen oxide emissions are converted into acids in the atmosphere through various chemical processes and then deposited on the ground either as particle-like compounds or absorbed by moisture in the air or in rainwater. Acid deposition has many consequences for the soil or the watercourses if the critical load of the ecosystem is exceeded. As a result of emissions decreases, sulphur deposition in particular has decreased both in Finland and elsewhere in Europe. At Finnish gauging stations, sulphur deposits have decreased by 50–60 per cent since 1985, and nitrogen deposits by 20–40 per cent. However, acidification still affects the soil and water in those areas of Finland that are the most sensitive and under the greatest pollutant load. Nitrogen oxide emissions also cause eutrophication of the ground and watercourses.

Environmental protection in industry

While industry was accounting for more of Finland's GDP in the 1990s; services, construction and agriculture were accounting for less. Growth was fastest in the electronics industry, whose production increased sevenfold in the wake of soaring sales. In 2004, the metal, electronics and electrical industry accounted for 47 per cent, the forest industry for 15.6 per cent, and the chemical industry for 9.3 per cent of total industrial output in terms of value added. Metal production accounted for 12.7 per cent of the value of Finnish exports, machinery and equipment production for 11.6 per cent, the electronics industry for 24.7 per cent, the forest industry for 19.5 per cent, and the chemicals industry for nine per cent.

Finnish industry invested EUR 157.2 million in environmental protection in 2004. Water protection accounted for around 34 per cent of this, and air protection for 39 per cent. In 2004 the metal production sector invested the most in environmental protection, around EUR 46 million. The pulp and paper industry allocated the next largest amount to environmental protection, approximately EUR 36 million. The operating costs from environmental protection measures in 2004 totalled EUR 455 million.

Environmental technology net sales were around EUR 2.1 billion in Finland in 2003. Taking into account Finnish companies' foreign operations, Finnish environmental technology net sales rose to around EUR 3.4 billion. The industry provides 9,000 jobs in Finland, and 2,600 abroad. Exports still make up a significant proportion of net sales in environmental technology, totalling nearly half of domestic net sales. Furthermore, one in five companies in the sector has foreign operations. The Finnish environmental technology sector, including foreign operations, is in the same size category as iron and steel production.

Virtually all forest industry companies now have an environmental management system and publish environmental reports together with their annual reports. The forest industry's continuing efforts to raise environmental protection standards and to minimise discharges require good control of the entire production process. The key concern in improving production processes in the pulp and paper industry is to minimise raw material consumption – wood, water, chemicals and pigments. In 2005, the forest industry used 68 million solid cubic metres of wood, of which 50 million were of domestic origin and 18 million were imported. Wood consumption was at a similar level to that of the previous year. Timber imported for the Finnish forest industry is covered by ISO quality and environmental certification. The most important fuel is wood, used in the form of bark, wood chips and

black liquor in the pulp industry. The forest industry is the largest consumer of biofuel in Finland.

Figure 13. Pulp and paper industry production and effluent load in rivers and lakes (1990=100)

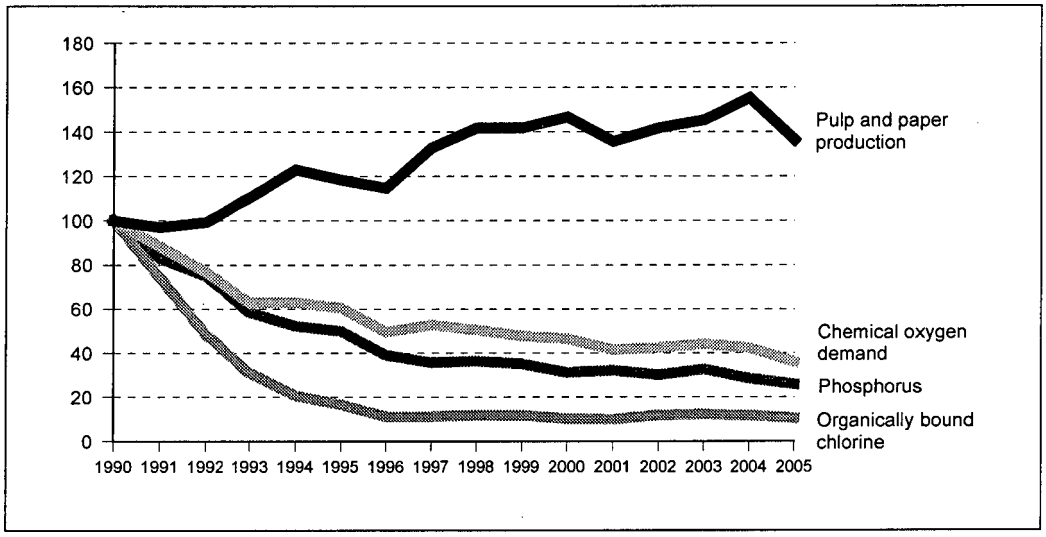


Figure 14. Pulp and paper industry production and emissions into the atmosphere (1990=100)

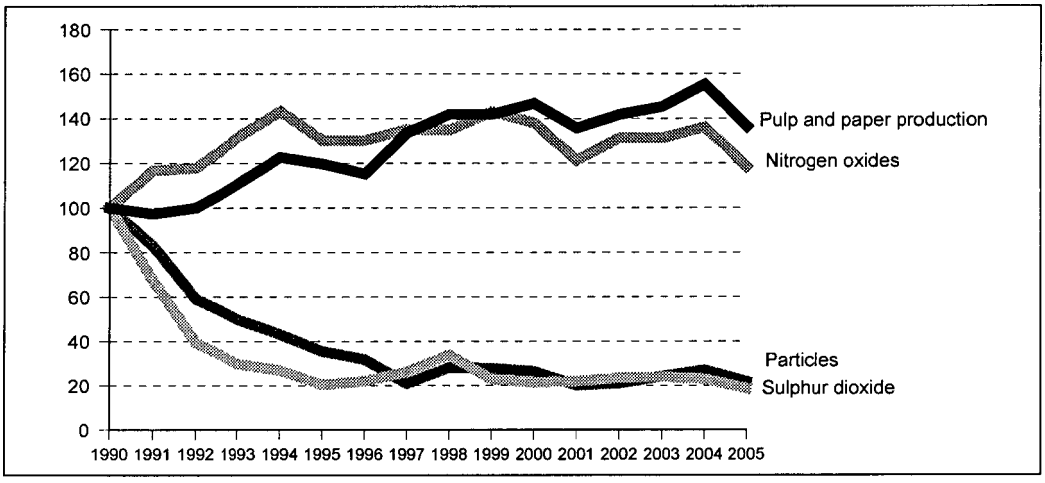
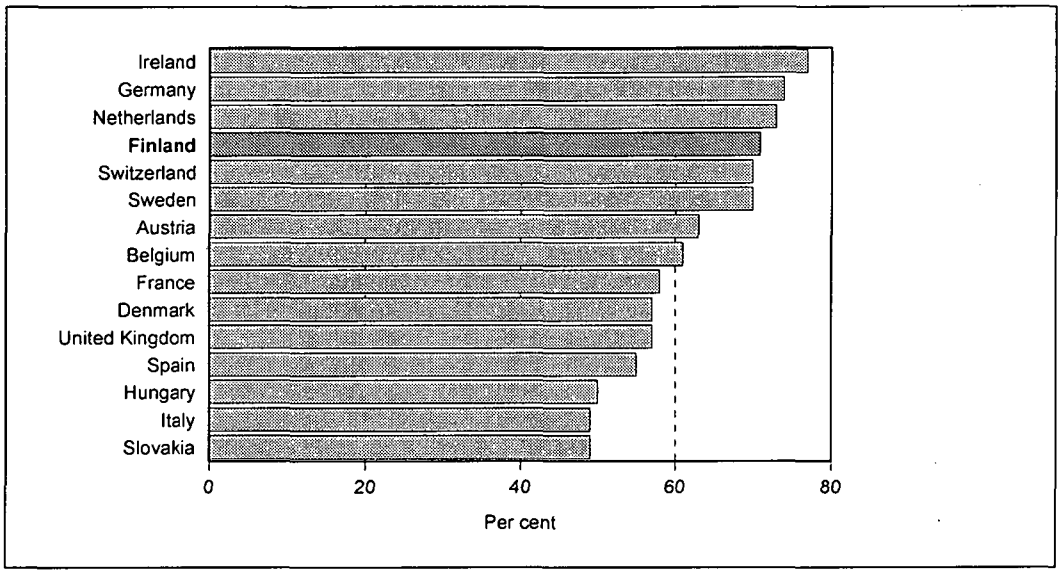


Figure 15. Recovery of waste paper in the EU15 countries in 2004



Finland accounts for five per cent of the world's forest industry production and 10 per cent of its exports. Of the 9.8 million tonnes of paper produced in Finland in 2005, more than 90 per cent was exported, and of the 2.5 million tonnes of board produced, more than 80 per cent was exported. In recent years the forest industry has been producing record quantities of paper and other wood products. In 2005 forest industry production fell by 12 per cent from 2004, due to lengthy industrial action affecting the sector. The carbon dioxide emissions of Finland's pulp and paper mills fell by 13 per cent to 4.3 million tonnes. Forest industry effluents emitted into the watercourses decreased on the whole more than production, i.e. mills improved their environmental efficiency, as in previous years. In 2004, the pulp and paper industry's environmental investments totalled EUR 76 million, a 55 per cent increase on the previous year. Of implemented environmental investments, 25 per cent concerned water protection, 33 per cent air protection, three per cent waste management and 39 per cent other measures. The forest industry's operating costs for environmental protection in 2004 totalled around EUR 100 million.

The use of recycled paper and board has increased rapidly all over the world, and recycled fibre is expected to account for around half the raw material used in paper production by 2010. According to a 1998 decision in principle by the Finnish Government, the aim was for at least 75 per cent of the volume of paper products sold in Finland to be reused primarily as recycled material by 2005. In 2004, 796,400 tonnes of paper and board were recovered in Finland, or 71 per cent of all paper used. The average global recovery rate of waste paper is around 40 per cent.

Since only approximately 10 per cent of Finnish paper and board industry production is consumed domestically, the potential for increasing the share of recycled fibre is limited. All-in-all, Finnish industry used 617,000 tonnes of recovered paper as raw material in 2004. Of this 96 per cent was used by the

paper and board industry, while the rest was used by companies producing heat insulation solutions. Recovered fibre accounted for five per cent of the raw material used in the pulp and paper industry. Recovered paper was used mainly in the production of various boards, newsprint and tissue.

Chemicals are an important branch of industrial production in Finland both in terms of end products intended for consumers and especially intermediate products supplied to other branches. However, even small quantities of many of the hazardous substances used and processed in the chemical industry may have serious environmental impacts, underlining the need for reliable and comprehensive environmental protection. Most investments in environmental protection made by the chemical industry consist of conventional external measures to reduce emissions, whereas investments in process technology are less significant. Nevertheless, the chemical industry has managed to significantly reduce certain emissions into the water and air. The amount of waste has also been decreasing since 1994.

13. Chemical industry effluents emitted into the watercourses (tonnes)

	2001	2002	2003	2004	2005
Production volume (2001=100)	**100.0**	**102.7**	**102.9**	**103.6**	**102.0**
Sulphate	64 550	64 500	77 550	91 499	79 544
Phosphorus	13	11	11	13	13
Nitrogen	465	438	326	363	360
Mercury *)	7	5	7	11	6
Cadmium *)	0	0	2	17	17
Lead *)	3	4	2	4	13

*) = kg

14. Emissions and discharges from oil refining (tonnes)

	2001	2002	2003	2004	2005
Production volume (2001=100)	**100.0**	**112.3**	**110.2**	**116.6**	**108.1**
Volatile hydrocarbons	4 590	4 085	4 379	3 956	3 688
Nitrogen oxides	2 915	3 203	3 179	3 209	2 407
Sulphur dioxide	3 383	3 199	3 340	3 373	3 536
Oil spills into water	9	3	2	9	9

The chemicals legislation under preparation in the EU aims for safe chemical use throughout the production chain, and for products to be safe for the consumer and the environment. The central element of chemicals legislation, REACH (Registration Evaluation and Authorisation of Chemicals), includes the wide-scale testing and registration of all chemicals not yet studied, with the testing schedule drawn up according to quantities of substances. It is estimated that 4,500 deaths will be avoided every year in the EU due to the new legislation. The REACH regulations are intended to come into force in 2007. The European Chemicals Agency (ECA) whose remit relates to the implementation of REACH will begin in Helsinki at the same time.

The chemical industry has taken voluntary steps to raise the standard of its environmental protection and industrial safety within the international Responsible Care programme. In 2004 the programme covered over 80 per cent of production and nearly 20,000 employees in the Finnish chemical industry. The companies involved reported that the investments in their environmental, health, and safety systems totalled EUR 70 million in 2005, about five per cent less than in the previous year. The costs were mainly derived from water protection, waste management and air pollution control. The operating costs of environmental, health and safety measures were EUR 106.8 million in 2005.

The major emissions reductions under the Responsible Care programme were made in the early 1990s. Acidifying emissions into the air have decreased by over 80 per cent since 1988, while volatile organic compound emissions have decreased by over 60 per cent in the same period. Greenhouse gas emissions have increased by about six per cent from the 1999 level. According to water discharge indices, water discharges that cause eutrophication have decreased by over 40 per cent, and potentially ecotoxic discharges have decreased by nearly 80 per cent.

Metal refining production has grown steadily, doubling over the past ten years. In the same period, production has grown almost fivefold in the electronics and electrical industry. Of total sales in the metal and electronics sectors in 2005, 43 per cent were from the electronics and electrical industry, 40 per cent were from machinery and metalworking and 17 per cent were from metals refining. Most environmental impacts in the metallurgical industry arise from metals refining, where raw materials are produced for use by other industries. Extensive metals recycling reduces the demand for extracting virgin ores, as metals are almost entirely recyclable. Recycling raw materials greatly reduces energy consumption when making metals. Furthermore, metals do not lose their properties when recycled.

15. Emissions and discharges from metal refining

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Production volyme (1995=100)	**100.0**	**103.9**	**109.3**	**115.4**	**119.6**	**125.0**	**122.2**	**113.7**	**128.0**	**152.6**	**150.4**
Atmospheric emissions (1 000 tonnes)											
Sulphur dioxide	8.1	8.1	7.5	7.6	8.1	7.8	8.4	7.6	8.4	7.8	8.3
Nitrogen oxides	3.2	3.1	3.5	3.5	4.1	4.1	4.0	4.0	4.7	4.3	3.7
Discharges into water (tonnes)											
Nitrogen	420.6	449.3	421.6	526.0	490.0	520.5	351.4	307.5	399.3	340.0	290.7
Chromium	3.5	2.3	3.9	4.2	5.8	3.0	1.4	1.1	1.1	1.2	1.1
Nickel	12.4	6.0	10.3	6.8	9.3	7.2	5.6	3.8	3.4	1.8	1.7
Copper	8.2	8.7	8.9	6.8	7.1	9.7	7.9	3.3	6.0	2.4	2.3
Zinc	10.7	9.9	9.4	6.9	7.6	7.3	4.0	3.2	2.6	3.7	3.8

Environmental protection in transport

Passenger traffic in Finland increased to 75.8 billion person kilometres in 2005, compared with 74.7 billion person kilometres in 2004. This is due to the increase in passenger car traffic from 60.9 billion person kilometres to 61.9 billion person kilometres. At the same time Finnish goods traffic decreased from 38.3 billion tonne kilometres to 37.9 billion tonne kilometres, although road transport grew by about 2 per cent. In all other EU countries, too, it is road transport in particular that has caused an increase in goods traffic. Traffic volumes have many direct impacts on the state of the environment. For example, traffic-induced greenhouse gas emissions and noise problems are exacerbated when traffic volumes increase.

The National Traffic Survey conducted in 2004–2005 also showed that the use of passenger cars had significantly increased in Finland compared with the survey conducted six years previously. In particular, lone driving and women's motoring had increased. Although people move less on foot and by bicycle, about one third of the total number of domestic trips are still made on foot or by bicycle. According to the Survey, public transport accounts for eight per cent of trips, while all forms of mass transport account for 15 per cent of trips. The most commonly used mode of public transport is the bus. The number of trips made by and the distance travelled on public transport have decreased in the 2000s except for air transport.

In 2005, the Ministry of Transport and Communications adopted its third environmental programme – "Environmental Guidelines for the Transport Sector until 2010" – which will be applied to all forms of transport. Implementation of the programme will be monitored by joint administrative programmes for the protection of groundwater, investigation and processing of contaminated soil, the more efficient use of materials, reduction in emissions that impair air quality and noise abatement.

Motor vehicle emissions limit values have been tightened a lot in recent decades, and continue to be tightened. The beginning of 2005 saw the entry into force of the Euro 4 standards for new passenger cars and vans which halve particle emissions per vehicle compared with Euro 3 and reduce other exhaust emissions (CO, HC, NOx) per vehicle. The Euro 5 standards for heavy transport vehicles will come into force in 2008. In its Euro 5 proposals for diesel passenger cars, the European Commission has proposed to further reduce particulate matter (PM) emissions by 80 per cent and nitrogen oxide (NOx) emissions by 20 per cent on the Euro 4 standards. Correspondingly, the nitrogen oxide and hydrocarbon (HC) emissions of petrol cars would be reduced by 25 per cent each, and the same particle emissions limit values would be set for cars equipped with lean burnt direct injection petrol motors as for diesel cars. The Commission's proposal for the Euro 6 standard for heavy vehicles will be ready by the end of 2006. The vehicle emissions limits in accordance with the new proposals will come into force in 2010 at the earliest.

The carbon dioxide emissions of the transport sector depend on traffic volumes and on the specific fuel consumption of vehicles. In Finland in 2005, the average fuel consumption in new petrol-driven cars was about 7.6 litres per 100 km, while carbon dioxide emissions were about 181 grams per km. For diesel cars, the corresponding figures were 6.4 litres and 172 grams. Compared with the previous year, the fuel consumption of new petrol-driven

cars decreased a little, while the fuel consumption of diesel-driven cars increased. The reason for this is the increasing demand for larger cars. In a contradictory trend to that seen in most other EU member states, specific fuel consumption figures have been rising in Finland in the 21st century, especially for vehicles running on diesel.

Figure 16. Trends in the use of public transport and passenger cars (1980=100)

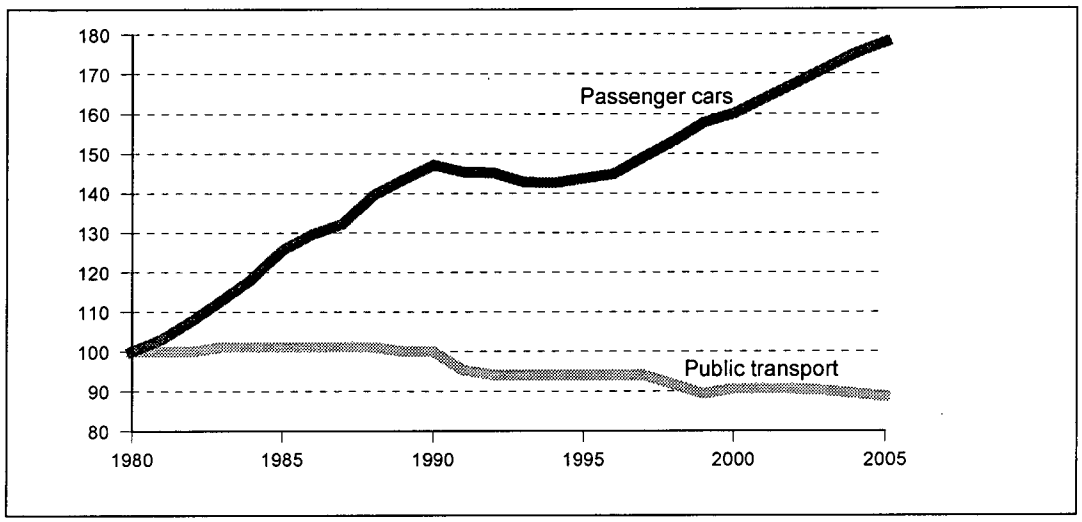
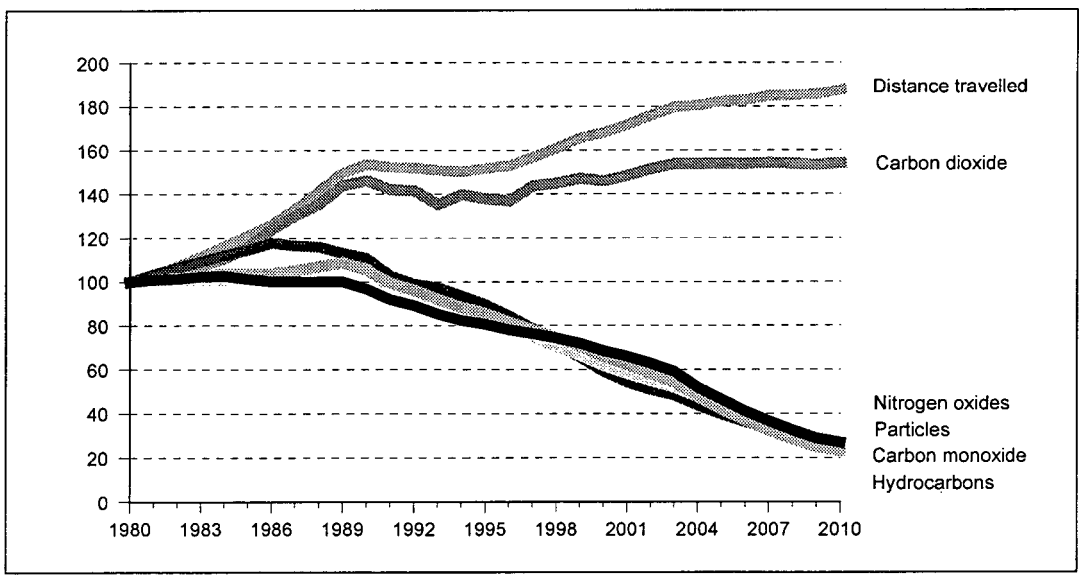


Figure 17. Trends in emissions from road traffic and projection to 2010 (1980=100)



The aim is to achieve improvements in the specific consumption of the vehicle fleet through agreements made between the EU and the automotive industry and by consumer information. According to the agreements the average fuel consumption of new passenger cars will decrease to 5–6 litres per 100 km, and average carbon dioxide emissions to 140 grams per km by 2009. According to a Directive on consumer information, information on the fuel consumption and carbon dioxide emissions of new passenger cars for sale must be provided to buyers at the place of sale and in advertising.

In a Directive on the sulphur content of fuels in EU road traffic, a schedule was made for lowering the sulphur content of fuels in stages to less than 10 ppm by 2009. Finland changed to fuels with less than 10 ppm in September 2004. The change was brought about by an amendment to the taxation of fuel which entered into force in 2004, which meant that it was no longer profitable for petrol stations to keep the more heavily taxed 50 ppm fuel in stock after September.

According to a task force that, in spring 2006, assessed the promotion of biofuel use and production in transport, the primary tool to promote the use of biofuel in Finland is its compulsory blending in petrol and diesel. The task force recommended gradual progress, so that the proportion of biofuel would be about one per cent in 2008, two per cent in 2009 and three per cent in 2010. With the current measures, Finland would probably not achieve the indicative target of the EU's biofuel directive, i.e. that biofuel would account for over 5.75 per cent of all transport fuel on the market by 2010. The target is achievable in principle, but a three per cent energy share by 2010 is a realistic target in view of the availability and cost of biofuels. According to the National Energy and Climate Strategy, it is also necessary to develop the carbon dioxide mechanisms of vehicle taxation. A proposal on the matter was prepared in spring 2006.

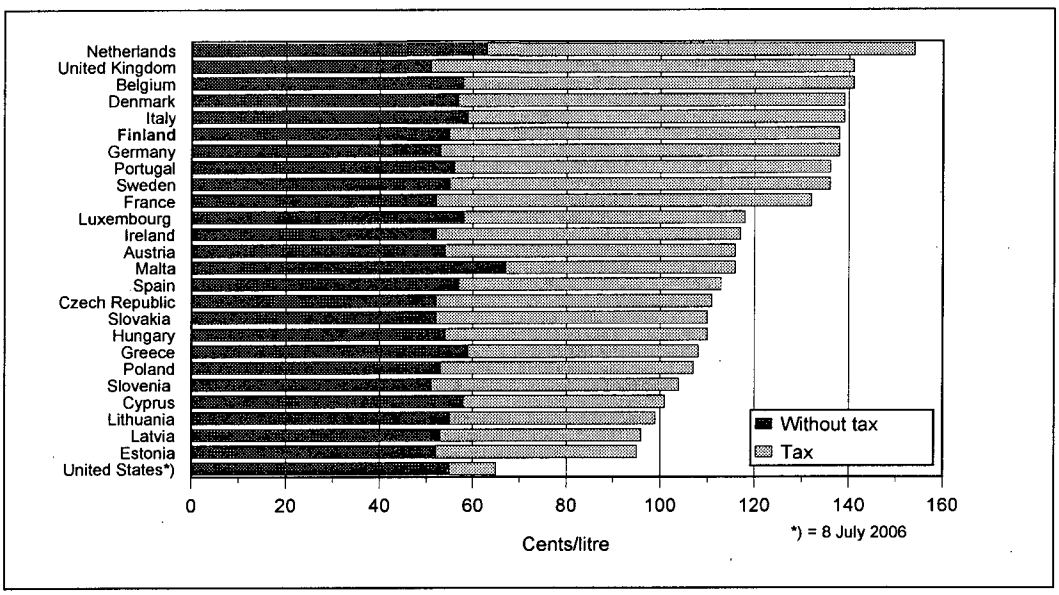
Nature is burdened not only by emissions from vehicles, but also by the need to maintain traffic routes. Significant amounts of de-icing agents are used for traffic safety purposes. For example, 101,000 tonnes of salt were used to de-ice roads in the winter of 2004–2005. The goal is to reduce the use of salt, especially in groundwater areas. Road engineers also avoid groundwater areas when planning new roads. Priority lists and protection resources are maintained with respect to areas in the current road network urgently requiring groundwater protection, and protection projects are implemented as finance permits. In the winter of 2004–2005, 4,300 tonnes of de-icing agents (mainly sodium acetates and potassium acetates) were used at airports, as well as 4,700 cubic metres of de-icing and anti-icing agents for aeroplanes.

Over the last decade, the use of natural resources and waste generation have decreased somewhat in the traffic sector. In road construction, the policy is increasingly to use soil available near the site itself, thereby decreasing the amount of soil transported to and from the construction site.

16. Material flows in road maintenance (1,000 tonnes)

	2001	2002	2003	2004	2005
Construction					
Aggregates from outside road routes	3 670	949	4 441	2 151	1 005
Road network maintenance					
De-icing salt	71	92	73	88	101
Spring maintenance and dust control agents	28	29	26	21	26
Grit	460	710	520	722	879
Waste collected	11	11	9	8	8

Figure 18. Retail prices of motor fuel (95E) on 15 July 2006 (euro cents per litre)



Maritime safety has been improved by both international and national measures. In July 2005, the Environmental Commission of the International Maritime Organisation (IMO) named the Baltic Sea (excluding Russia's territorial waters and economic zone) as a Particularly Sensitive Sea Area (PSSA). The additional security measures improving maritime safety and related to PSSA status came into force at the beginning of July 2006. The volume of oil transports in the Gulf of Finland continued to increase from 112 million tonnes in 2004 to about 120 million tonnes in 2005. It is forecast that, by 2010, the volume will have increased to about 190 million tonnes. The sharp increase in oil transportation is due mainly to increased Russian oil production and the introduction of new ports on the Russian side of the Gulf of Finland.

The illegal oil discharges of vessels will be curbed by more effective surveillance and by ensuring that those guilty of such acts are punished. As Finland established an Exclusive Economic Zone (EEZ) under the UN Convention on the Law of the Sea on 1 February, 2005, it can now apply its penal code to all illegal releases detected in the economic zone. In spring 2006, an oil pollution fee, i.e. an administrative fee for vessels caught discharging oil, was imposed as a new enforcement tool. The fee will be levied on the ship owner or shipping company, without any need to show who on the ship was guilty.

Environmental health

Many environmental problems clearly affect human health. The greatest global health risks are related to air pollution, dangerous chemicals, the contamination of water and food, noise, and traffic accidents. Air pollution causes most environment-related diseases in Europe. The most significant health effects of indoor air include lung cancer caused by radon, the health effects of passive smoking, and allergic symptoms caused by mould resulting from water damage in flats. Work time worth EUR 85–250 million is lost each year in Finland as a result of symptoms caused by poor-quality indoor air.

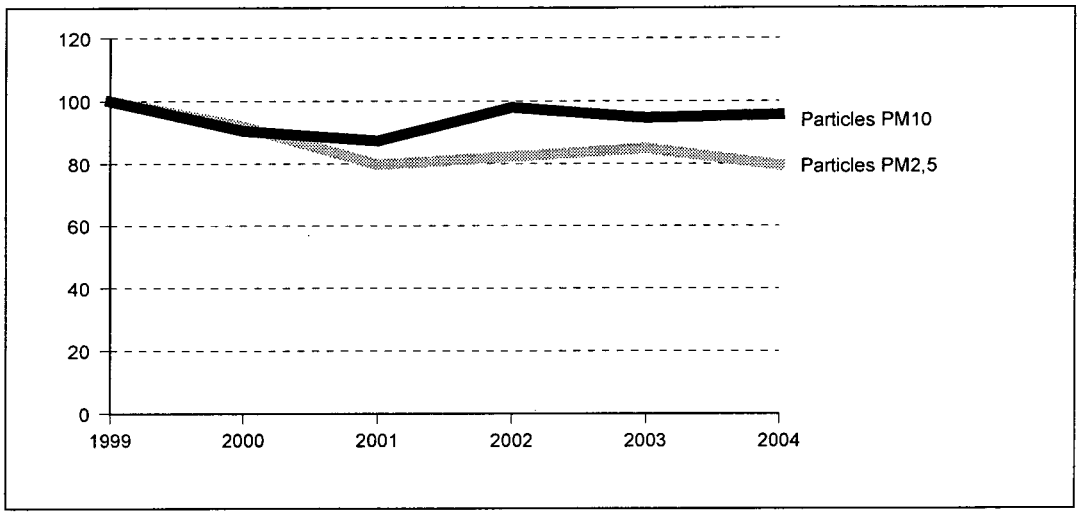
Impurities in the outdoor air are also significant health hazards to vulnerable groups of people. These include people with respiratory and cardiac diseases, elderly people and children. It is estimated that each year in Finland impurities in community air, especially particles, cause the aggravation of respiratory symptoms in around 30,000 people, and airway infections in 30,000–40,000 children. According to the most recent estimates, as many as 1,000 people die prematurely every year in Finland because of impurities in the air.

The measures used to control the effects of impurities in outdoor air include reducing street gritting in winter, improving grit quality, replacing grit with salt agents and improving street cleaning, especially in the spring. Despite these measures, the quantity of the most dangerous particles, those under 2.5 micrometres (PM 2.5) in diameter, has not been significantly reduced, as many originate from transboundary pollution. These particles are so small that they can enter the air sacks in the lungs and intensify the symptoms of asthmatics and people suffering from lung and heart illnesses. According to estimates by the EU's CAFE programme (Clean Air For Europe), PM 2.5 particles alone cause 350,000 premature deaths in Europe. Problems are also caused by carbon monoxide from traffic and nitrogen oxides, especially in the centres of built-up areas and alongside busy traffic routes.

Environmental noise is another notable environmental health hazard in Finland. The aim of a decision in principle on noise abatement made by the Government in May 2006 is to lower environmental noise levels and reduce exposure to noise. In order to fulfil these aims, noise abatement must consider all noise inducing activities when planning and implementing projects. This will require close cooperation between local and national government authorities. The resources of municipal and road corporations should be increasingly directed at noise abatement in order to achieve the target of the decision in principle to reduce the number of people living in noise zones by 20 per cent by 2020.

Nearly 838,000 Finns live in noise zones. The overwhelmingly most common source of environmental noise is road traffic. About 90 per cent of those living in noise zones live in road or street noise zones. Rail and air traffic are also major noise sources. Other significant noise sources include motor sport circuits, shooting ranges and industry.

Figure 19. Urban air particle concentrations in the largest cities (1999=100)



4 Non-renewable natural resources

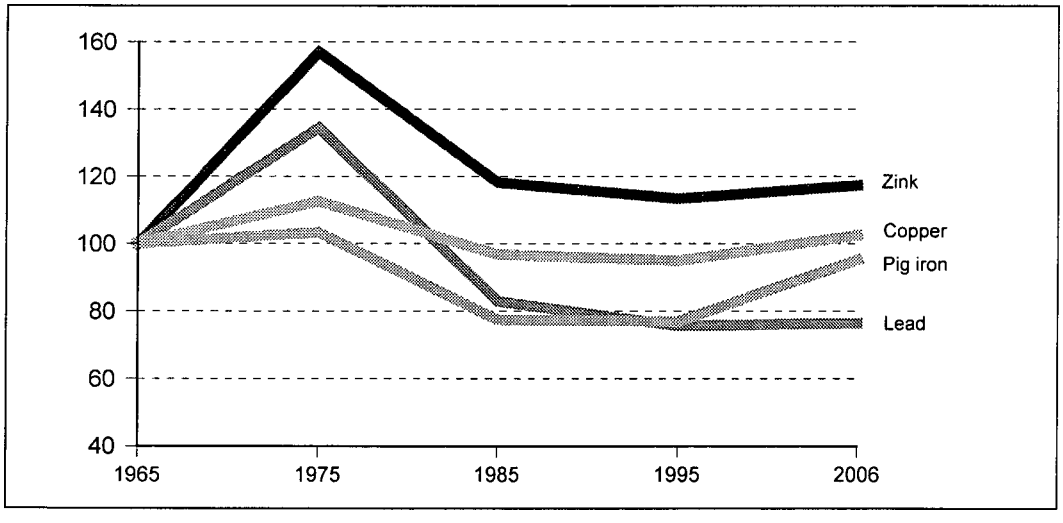
Sustainable use of natural resources

World population growth and the improvement in standards of living inevitably increase consumption. In particular, environmental impacts of the accelerating use of fossil fuels and natural resources are endangering the renewal and tolerance of the natural environment. Indeed, one of the greatest challenges for sustainable development is to change existing production and consumption patterns without allowing those changes to affect economic competitiveness. The utilisation of most raw materials has steadily increased and their real prices have declined over the past 30 years. In the light of current knowledge, there is no threat of non-renewable natural resources and fossil fuels being exhausted over the next few decades.

17. Ecological footprint in selected countries in 2002 according to WWF (hectares per inhabitant)

	Foot print	Bio-capacity	Diffe-rence
United Arab Emirates	10.5	0.9	-9.6
United States	9.7	4.7	-5.0
Canada	7.5	15.1	7.6
Kuwait	7.3	0.3	-7.0
Australia	7.0	11.3	4.3
Finland	**6.8**	**12.3**	**5.5**
Estonia	5.9	5.7	-0.2
Norway	5.9	7.0	1.1
France	5.6	3.2	-2.4
Sweden	5.5	9.8	4.3
Denmark	5.3	3.4	-1.9
Germany	4.4	1.8	-2.6
Russia	4.4	7.0	2.6
Japan	4.3	0.8	-3.5
Irland	4.2	4.6	0.4
Italy	4.0	1.1	-2.8
Brazil	2.1	10.1	8.0
Costa Rica	2.0	1.5	-0.5
China	1.6	0.8	-0.8
India	0.7	0.4	-0.4

Figure 20. Trends in world market prices of selected metals (1965=100)



According to the national sustainable development strategy, sustainable use of natural resources requires that non-renewable natural resources are used sparingly and efficiently and that they are replaced with renewable natural resources whenever possible. The objective is to ensure that, if non-renewable natural resources are used in economic activity, they are used in the most efficient way. The aim is thus to reduce the amount of waste generated, and to reuse and recycle materials. Finland's ecological footprint is large due to the substantial use of raw material by the forest industry and the conversion of nuclear energy into fossil fuels in calculating the ecological footprint. The entire world's ecological footprint is 2.2 hectares per capita and the biocapacity only 1.8 hectares. In other words, there is a deficit of almost 20 per cent.

The Government programme aims to ensure that Finland's competitiveness is based on production and consumption that fulfil the conditions of ecologically sustainable development. In 2005, over 224 million tonnes of primary materials were consumed in Finland. Of this, 139 million tonnes were non-renewable natural resources and 85 million tonnes renewable. Direct overall consumption of natural resources per GDP unit has declined steadily in the 1980s, 1990s and 2000s. In other words, greater economic wealth has been produced with fewer resources.

Use of fossil fuels

Much of the environmental damage caused by energy production is caused by the use of fossil fuels. The environmental impacts resulting from their use are considerable, and in many places they are now endangering the renewal and tolerance of nature. Given the currently known fossil fuel reserves, the world's oil resources will last for the next 40 years, those of natural gas for 55 years and those of coal for 200 years.

In recent years the world market prices have been rising as a result of a declining supply and rising demand. In the late 1990s, when supply still greatly exceeded demand, the real price of crude oil fell. At its lowest point, in 1998, it was in real terms below the price level preceding the first oil crisis in 1973. In 2005, oil prices rose as several hurricanes on the Gulf of Mexico disturbed production. The price of crude oil was at its highest in late August and early September 2005 at approximately 67 dollars per barrel. The price rise of oil products on the world market in recent years can be explained not only by a rising demand but also to a large extent a limited refining capacity. In 2005 global oil consumption was 3,816 million tonnes and consumption is expected to continue rising.

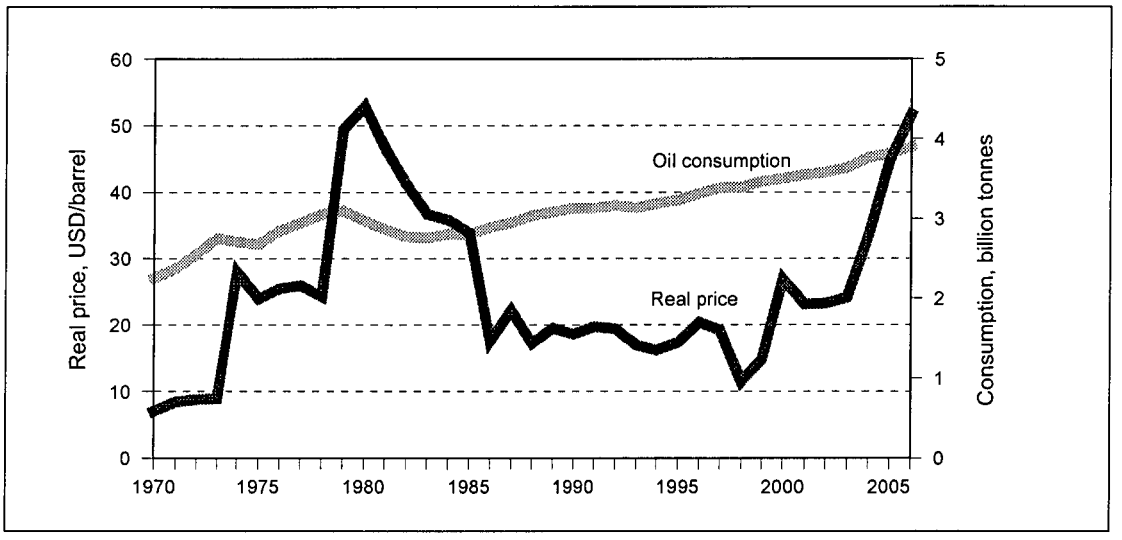
In Finland, oil consumption peaked in the 1970s at 10–12 million tonnes a year. Oil consumption declined sharply in the 1980s, and during the 1990s fell to less than nine million tonnes. In 2001, however, the consumption of oil products increased. Oil consumption continued to rise between 2002 and 2004, but levelled out in 2005.

18. Total consumption of oil, coal and natural gas in Finland

	Oil, million tonnes	Coal, million tonnes	Natural gas, billion m^3
1973	12.3	4.0	–
1980	11.0	6.7	0.9
1985	9.2	6.4	0.9
1990	9.0	6.2	2.5
1995	8.2	6.1	3.3
2000	8.4	5.8	4.0
2001	8.6	6.6	4.3
2002	8.7	7.3	4.2
2003	8.9	9.6	4.7
2004	8.9	8.6	4.6
2005*)	8.7	5.1	3.6

– = not in use. *) = preliminary data.

Figure 21. World oil consumption and real world market price (USD per barrell)



Ores and other land-extractable resources

The known Finnish ore resources are gradually being depleted, but since the metallurgical industry in Finland is modern and very competitive, there is good reason to expect that the processing of metals will continue in the country for some time, although it will have to rely on imported raw materials and recycling. For instance, most of the steel that is produced in Finland is manufactured from concentrates imported from Sweden and Russia and from scrap iron.

Ore production in domestic mines declined considerably in the 1990s, but is currently rising moderately. In 2005 ore production in Finland amounted to 3.6 million tonnes, which was slightly less than in the previous year. In 2004 the import of metals was 5.9 million tonnes, while in 2005 limestone production was 3.8 million tonnes and domestic industrial mineral production 11.6 million tonnes. The most important ores are chromium, zinc, nickel, copper and gold; the main industrial minerals are limestone, granite and talc.

The consumption of gravel and rock materials has once again risen as construction picked up in the late 1990s after the economic recession. In 2004, 31 million tonnes of gravel and sand and 42 million tonnes of rock materials were extracted. In recent years the use of natural rock as a substitute for gravel has sharply increased as gravel resources near residential areas are being depleted. In addition, the civil engineering industry is attempting to replace the use of virgin natural resources with by-products of industrial production.

Figure 22. Mining of ores and industrial minerals and quarrying of limestone in Finland in 1990-2005 (million tonnes)

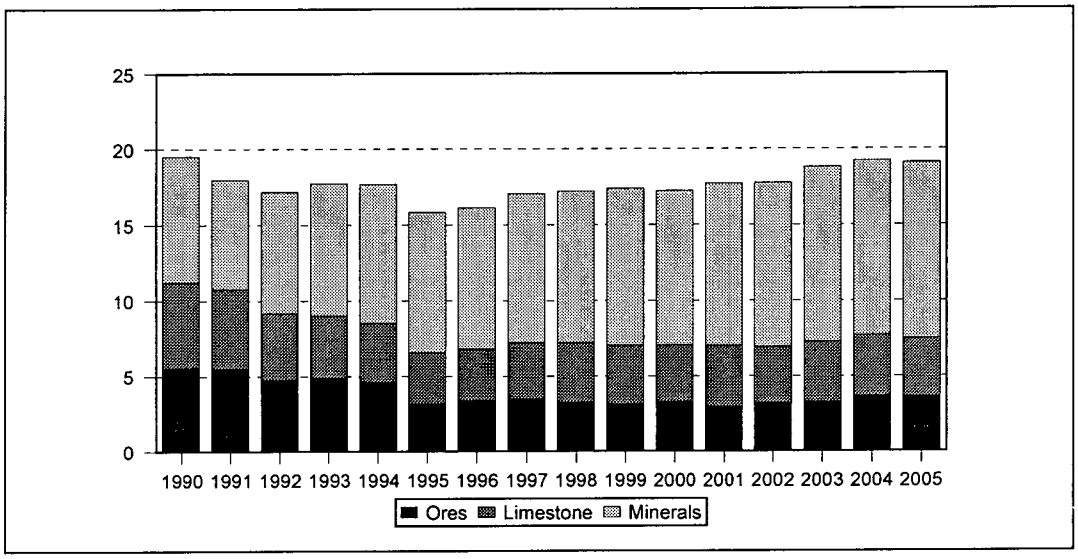
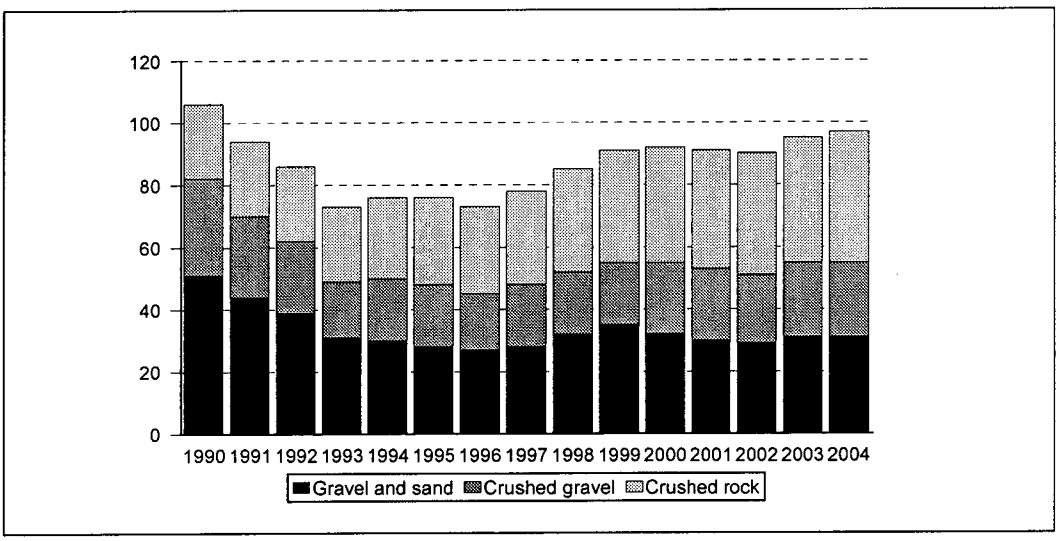


Figure 23. Consumption of extractable resources in Finland 1990–2004 (million tonnes)



Waste management

Almost 66 million tonnes of waste were generated in Finland in 2004. Just short of 2.4 million tonnes of municipal waste were collected, under half of it generated by households. The recovery rate of municipal waste went up somewhat, thanks to improved sorting and separate collections. Altogether 1.4 million tonnes of municipal waste were landfilled, which is slightly less than in previous years. Nearly 16 million tonnes of industrial waste were generated in 2004.

19. Waste generation in Finland in 2004 calculated in accordance with the EU regulation on waste management statistic (thousand tonnes)

	Generated volume
Agriculture, forestry and fishing	857
Mining and quarrying	23 819
Manufacturing	15 714
Energy production	1 573
Construction	20 843
Services	1 822
Households	1 164
Total	**65 792**

To improve the efficiency of waste recycling, Finland has adopted the principle of producer responsibility, in which the manufacturer or importer must play an active role in organising the disposal and treatment of waste products. This principle has already been applied to used car tyres, waste paper and packaging waste. Regulations on producer responsibility for the disposal of end-of-life vehicles and electrical and electronic waste entered into force in 2004.

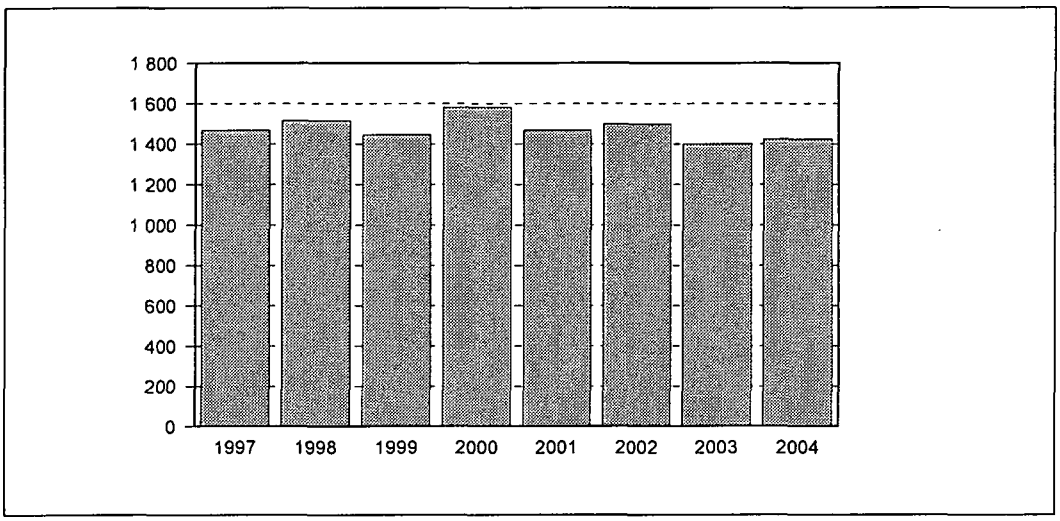
The National Waste Plan from 2002, based on the Waste Act and the EU's Waste Directive, presents the targets for the waste sector at the end of 2005. The Plan will be valid for the time being until the new plan extending to 2016 currently under preparation is approved. The National Biological Waste Strategy was completed at the end of 2004. Its objective is to reduce the amount of biodegradable waste being taken to landfills and to prevent the climate-warming methane emissions that are formed in landfills.

Finland had 175 operational landfill sites in 2005, of which 140 were for ordinary waste. Of the landfills that were for ordinary waste, 76 were for municipal and 64 for industrial use. The rest of the landfill sites were either for non-biodegradable or hazardous waste. These numbered 35. The trend has been to concentrate municipal landfill operations into a smaller number of larger sites. At the same time, more waste is being recycled and the waste is being treated more effectively. By January 2005, there were 180 urban waste recycling and treatment plants. By 2007 many of Finland's old landfill sites will have to be closed down, because they do not fulfil the Government regulation concerning liner requirements. After then, the landfill sites in use must have a structure that allows management of resulting liquids and gases.

The purpose of the National Waste Plan is to have a maximum of 30 per cent of waste materials ending up at the landfill site. The remaining 70 per cent should be utilised as raw material for production or as recycled products in consumption or construction and as energy. This target has not been achieved, because still some 60 per cent of waste ends up at the landfill site.

In 2005, 300,000 tonnes of urban waste was incinerated in Finland by co-incineration in ten plants and in one special incineration plant. This is around 10 per cent of urban waste. In addition, there are two plants in Finland specialising in the incineration of hazardous waste. The EU directive on the incineration of waste was brought into effect in Finland by a Government decree in May 2003. It clarifies and standardises the requirements for waste incineration.

Figure 24. Municipal waste delivered to landfill sites (1000 tonnes)



5 Renewable natural resources

Changeover to renewable natural resources

Sustainable development requires that non-renewable natural resources be used less and that renewable natural resources be used more. This changeover is implied by the following three rules of Economist Herman Daly.

1. Renewable resources cannot be used faster than they regenerate.
2. Non-renewable resources cannot be used faster than renewable resources can be substituted for these.
3. Pollutants and waste may not be emitted and produced at greater rates than they can be processed by the environment.

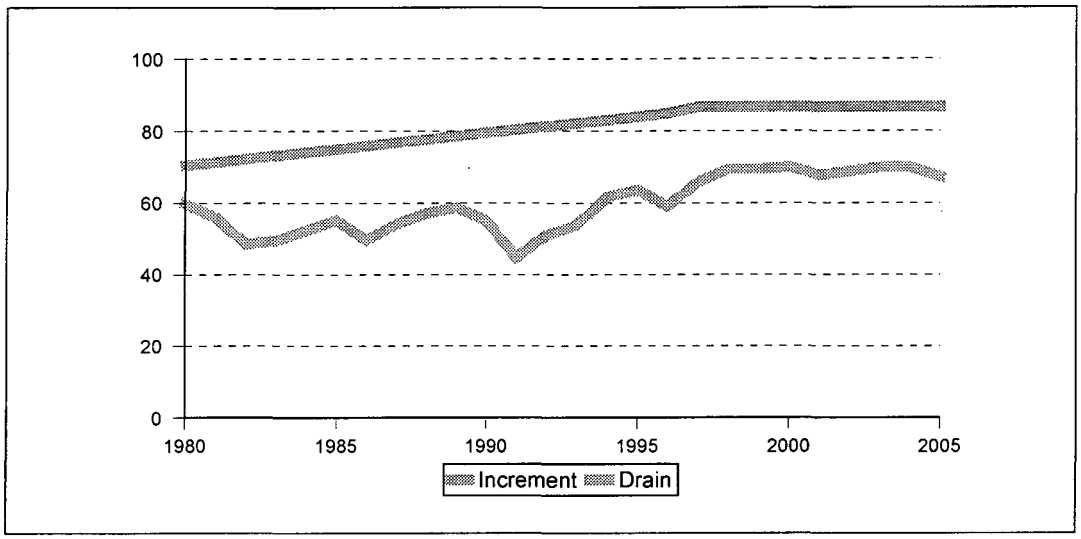
According to these rules, a sustainable economic system is only possible if renewable natural resources are used in ways that do not endanger their ability to regenerate.

Forest resources

Forests are Finland's most important natural resource. Most of the country is covered by naturally regenerated forests that are in commercial use. Finland has over 26 million hectares of forestry land, accounting for 86 per cent of its total land area. Forestland proper (i.e. productive forest) amounts to 20 million hectares. Altogether 52 per cent of forestry land is in private ownership, 35 per cent is owned by the state, eight per cent by companies and five per cent by others. The figure for state-owned forestry land also includes areas reserved for conservation. The total volume of growing stock is over two billion cubic metres. Of this, 66.5 per cent is owned privately, 19.7 per cent by the state, 8.5 per cent by companies and 5.3 per cent by others. The total annual increment of 86.7 million cubic metres exceeds the total drain. In 2005, 58.7 million cubic metres were felled. Allowing for waste and natural losses, the total drain of Finland's forests was 70 million cubic metres, which is 3.2 percent of the timber resources. Timber imports to Finland in 2005 totalled 21.2 million solid cubic metres, of which approximately 80 per cent came from Russia. The total usage of raw timber in Finland in 2005 was 68 million cubic metres.

The purpose of the National Forest Programme 2010 is to develop the management, use and protection of the forests, so that economic, ecological, social and cultural sustainability is taken into account in their exploitation. The goal stated in the Forest Programme is to gradually increase the total cut to 63–68 million solid cubic metres a year by 2010. As the Finnish Forest Research Institute's estimates put the growth of timber at 90 million solid cubic metres by 2030, the increase in felling will fix the total volume of growing stock at its current level. The National Forest Programme will be reviewed in 2005–2007. The reviewed programme will extend to 2015.

Figure 25. Growing stock increment and total drain (million solid cubic metres)



The way that the commercial forests are managed is of key significance to preserving biodiversity in Finnish nature. Intensive silviculture has had negative effects on the diversity of forests, for instance regarding the reduction in the total area of old-growth forests and the amount of rotting wood. However, the new silviculture recommendations for private forests also include biodiversity considerations. An important way to support the diversity of commercial forests is to preserve in their natural state the key natural habitats identified in the Forest Act, as well as other valuable nature sites as defined by silviculture recommendations and certification. Environmental support for forest management is paid to private landowners for losses caused by preservation of important natural habitats. Demand for this support has grown year by year.

In autumn 2002, the Government approved an action plan called METSO for the protection of the forests of southern Finland, the western part of Oulu province, and southwestern Lapland. The programme contains many experimental conservation methods, largely based on volunteerism. These include the trading of natural assets, bidding competitions and co-operation networks for forest biodiversity. Networks are formed around certain core areas that are important for biodiversity. They include national parks, national hiking areas and local recreation areas. The available appropriations were used to sign 38 natural asset trading contracts for 10 years. The total area of these sites is 228 hectares. The trial, which started in the late winter of 2004, has stirred widespread interest among forest owners.

In Finland 22.4 million hectares are certified by the FFCS (Finnish Forest Certification System), which is part of the PEFC (Pan European Forest Certification) system. The FFCS contains requirements that are in accordance with laws and international agreements for the management and use of forests, certification of the origin of wood, and the execution of external auditing. The nationally implemented "Survey of Habitats of Special Importance under the Forest Act" (METE pro-

ject) was completed in spring 2004 in private forests. The survey found 96,000 especially important natural habitats, as defined in the Forest Act, having an area of about 60,000 hectares. These represent an average of 0.5 per cent in private forests, but it varies from region to region. Results of the quality assessment show that an average of 80 per cent of the land area of such key natural habitats were found in the surveys.

The statutory regional target programmes for forestry aim to reconcile the objectives set for the different uses of commercial forests. Prepared jointly with forest owners and various stakeholders, the programmes provide an overall picture of the state and development needs of forestry in each district administered by forestry centres and the sector's development potential in general. The programmes also include surveys of forest resources, forest protection and diversity, and the employment effects of forestry and related business. The National Forest Programme 2010 is based essentially on these target programmes. Revision of the regional target programmes for forestry started in 2004.

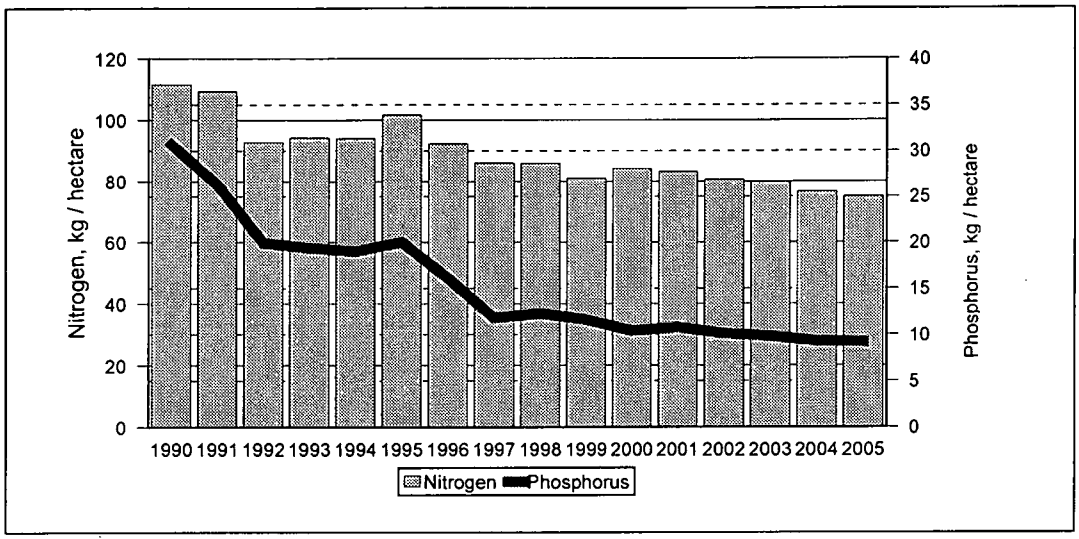
In recent years, Metsähallitus, the government body responsible for administering state forests, has made greater allowances for social and environmental considerations by working closely with stakeholders and local residents to draw up natural resource plans for areas covering 0.5 to 2 million hectares. The plans provide the framework for landscape ecological planning, which treats large forest areas of 40,000–100,000 hectares as single entities. Regional landscape ecological planning, which reconciles the different uses of forests, is aimed at securing biodiversity and the diverse utilisation of commercial forests. For example, rotten wood is left in forests, and buffer zones are established. Biologically rich forest sites are left intact and, where necessary, ecological corridors are established to connect these areas.

Cultivated resources

Eight per cent of Finland's land area is in agricultural use. There is a total of some 2.3 million hectares of farmland, i.e. fields and gardens, of which 1,993,400 hectares were under cultivation and 241,000 hectares lay fallow in 2005. Agricultural production in Finland is based primarily on animal husbandry, and 80 per cent of the arable land is devoted to growing grass, silage and fodder crops or used for grazing. In 2005, there were 69,517 farms in Finland with more than one hectare under cultivation, which is 2,500 farms fewer than in 2004. The number of farms is estimated to decrease further. The average field area of farms was 33.3 hectares, i.e. almost 2 hectares more than in the previous year. During Finland's EU membership the average field area of farms has grown by about 10 hectares. Of all farms, 19 per cent had less than three hectares of fields, while three per cent had more than 100 hectares of fields. The majority of farms have production that is eligible for agricultural support. Thirty-two per cent of farms supplement agriculture and forestry with other business activity. The total return from agriculture in 2005 was under EUR 4 billion. In 2005, fully or partly EU-financed subsidies were given out for a total of EUR 1,181 million. National agricultural subsidies funded by Finland totalled EUR 622 million in 2004.

The adverse effects of agriculture on the environment include the runoff of nutrients from fertilisers and farmyard manure into lakes, rivers and groundwater. Apart from cultivation and animal husbandry, other, more diffuse sources of pollution include natural leaching, forestry, sparse settlements and holiday homes. An estimated 60 per cent of the total phosphorus load and about 50 per cent

Figure 26. Fertiliser use in agriculture (kilograms per arable hectare)



of the nitrogen load caused by human activity can be traced to agriculture. The impacts of agriculture on eutrophication are most clearly visible in coastal areas and in small rivers. The first EU environmental support programme in use, in 1995–1999, was expected to reduce the amount of total phosphorus originating from agriculture and ending up in the watercourses by 40 percent, and total nitrogen by 30 percent. However, the actual reduction in nitrogen was estimated to be only 4–15 per cent and that of phosphorus 5–13 per cent.

The use of pesticides has increased in Finland in recent years, due mainly to the growing popularity of direct sowing. Moreover, the use of low volume substances is being replaced by the use of pesticides that must be applied in greater volumes. The cultivated area has also increased at the expense of grassed areas. The EU directive designed to protect watercourses against agricultural nitrate pollution was put into force in Finland by a Government Decree on nitrates in 2000. The Decree regulates the storage, application and quantity of manure and the location and maintenance of livestock shelters and exercise areas. It also contains regulations concerning the size of manure storage facilities, periods when manure may not be spread on the land, and the maximum nitrogen content of manure and fertilisers.

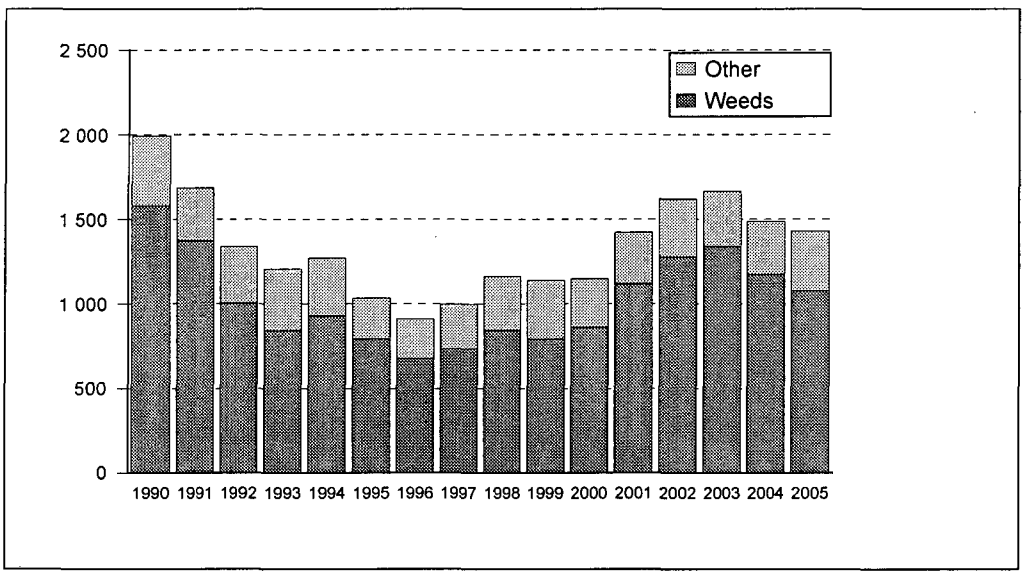
The EU's Common Agricultural Policy was revised in 2003. As a result, issues related to food product safety, the environment, and animal health and wellbeing have been highlighted. The horizontal plan for the development of rural areas accepted by the European Commission in 2000 also includes an agri-environmental support scheme for the 2000-2006 period. In Finland 93 per cent of farmers are committed to the scheme and it covers 98 per cent of arable land. The scheme takes more account of the differences between individual farms with respect to environmental management.

20. Organic farming and transition-phase field area in EU15 member states in 2003

	Hectares	Per cent of arable land
Austria	297 000	11.6
Italy	1 168 212	8.0
Finland	**156 692**	**7.0**
Denmark	178 360	6.7
Sweden	187 000	6.1
UK	724 523	4.2
Germany	696 978	4.1
Spain	665 055	2.3
Netherlands	42 610	2.2
Portugal	85 912	2.2
Luxembourg	2 004	2.0
France	509 000	1.7
Belgium	20 241	1.5
Greece	28 944	0.9
Irland	29 850	0.7
EU15	**4 792 381**	**3.5**

Organic farming is one of the areas of agriculture that has benefited from the agri-environmental support. A key feature of organic farming is the utilisation of nature's own processes by means of crop rotation. The use of artificial fertilisers and synthetically manufactured pesticides is forbidden. The authorities inspect the operations of organic farms at least once during the growing season. In 2004, a total of 148,183 hectares were organically farmed in Finland.

Figure 27. Use of pesticides in agriculture (1,000 kg of active ingredient)



21. Agri-environmental support (EUR million)

	2003	2004	2005	2006	2007
	A	A	A	B	BP
1. Basic and additional measures	254	255	250	..	..
2. Special support	34	38	39.5	..	..
2.1 Organic production	*17*	*17*	*16.5*	..	..
2.2 Buffer zones	*2*	*2.5*	*3*	..	..
2.3 Treatment of runoff	*4*	*4*	*4.5*	..	..
2.4 More efficient use of manure	*3*	*4*	*4.5*	..	..
2.5 Landscape management and biodiversity	*7*	*9*	*9.5*	..	..
2.6 Cultivation in groundwater areas	*0*	*0.1*	*0.1*	..	..
2.7 Native breeds	*1*	*0.7*	*1*	..	..
3. Training and advisory services	0	0.6	0.6	..	..
4. Experimental projects	–	..	..	..	..
5. Other environmental management programmes	–	..	..	..	..
Total	**288**	**294**	**290**	**264.6**	**311**

A = Final accounts. B = Budget. BP = Budget proposal. – = not in use. .. = data not available.

Water resources

Finland has abundant water resources in relation to its population and water consumption. On the basis of the Water Poverty Index (WPI), developed by the World Water Council and the UK-based Centre for Ecology and Hydrology, Finland is the world's richest country in terms of water - ahead of 147 other countries in the study. The index is compiled on the basis of water resources, access to them, use of water, capacity to manage resources and environmental impacts. Finland's inland watercourses cover some 10 per cent of its total area, i.e. 33,500 square kilometres, and territorial waters extend over 36,000 square kilometres. There are an estimated 56,000 lakes in Finland of at least one hectare in size. With respect to ground water resources, about 4–6 million cubic metres a day are available for water supply. Two to four per cent of the total yield of Finland's water resources is used annually for water supply.

22. Water resource usage in Euro pean countries (billion cubic metres per year)

	Renewable water recources	Water usage	Intensity of water usage (%)
Belgium	18	9	75
Spain	112	35	32
Italy	191	42	22
Denmark	6	1	21
Greece	74	9	12
UK	147	12	8
Switzerland	54	2	2
Russia	4 507	77	2
Finland	**110**	**2**	**2**
Sweden	174	20	2
Norway	382	2	1
Estonia	13	0.2	1

The use and management of water resources and areas is regulated in Finland by the Water Act. Activities and structures affecting watercourses or groundwater require a permit under the Water Act. Surface water and groundwater are primarily protected by the provisions of the Environmental Protec-

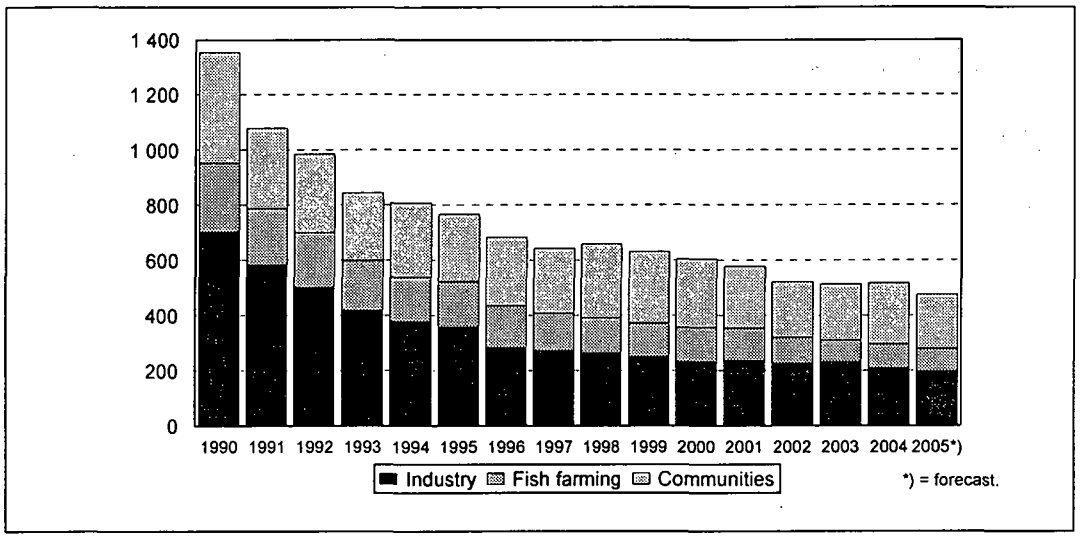
tion Act. The Water Supply Act covers water supply and water utilities. As an EU member, Finland is also bound by the EU's water sector regulations. The EU's Water Framework Directive has mostly entered into force through the Act on Water Resources Management. Decrees elaborating the law are under preparation. The above-mentioned national laws have also been revised to correspond with the Directive. The main aim of the new water management planning system is to ensure a good chemical and ecological state of surface waters and a good quantitative and chemical state of ground waters by 2015.

The sewer networks of public waterworks serve approximately 81 per cent of the population and there are a total of some 560 sewage treatment plants in population centres of over 50 inhabitants. The treatment plants remove 96 per cent of the organic matter in waste water, 94 per cent of the phosphorus and 49 per cent of the nitrogen. One of the great challenges for the near future is to decrease the nitrogen content of wastewater. The wastewater of properties not connected to the public waterworks must be treated adequately. The requirements concern both permanent and holiday dwellings. It is estimated that these measures will cause the phosphorus load from sparsely populated areas to drop to less than half of its present level, and the total phosphorus load caused by humans to decrease by 6–7 percent in the next 10–15 years.

Even though urban and industrial wastewater is treated adequately nowadays, surface water quality is still threatened by eutrophication. Many of Finland's originally nutrient-poor watercourses have become eutrophic and support the blooming of algae, for example. Diffuse pollution is still a major source of water pollution, and this has not been reduced to the same extent as point source pollution. Sources of diffuse pollution include agriculture and forestry and sparsely populated areas beyond centralised sewerage systems. According to a general usability classification of surface water, made with data from 2000–2003, 80 per cent of Finland's classified lake areas and 73 per cent of its sea areas were graded as excellent or good. The water of 43 per cent of the total length of classified rivers was graded as excellent or good. These rivers are mainly in northern Finland. The water quality of rivers was worse than that of lakes, because developed areas and agriculture are concentrated near them.

A Government resolution from 2002 for the protection of the Baltic Sea is carried out in practice with the Action Plan for the Protection of the Baltic Sea and Inland Watercourses approved in June 2005. In order to improve the ecological state of the Baltic Sea, measures must be taken to prevent eutrophication, to reduce the risks caused by hazardous substances, to reduce damage caused by the use of the Baltic Sea, to preserve and increase natural biodiversity and improve both environmental awareness and research and monitoring. The state of the coastal waters of the Baltic Sea is affected particularly by load occurring on the coast or arriving from inland waterways and rivers.

Figure 28. Finland's phosphorus discharge into watercourses from industry, communities and fish farming sources (tonnes)



Other natural resources

There are 61 species of fish in Finland. In terms of quantity, the important fish species for recreational fishing are perch, pike, roach, whitefish, pike-perch, vendace, bream, trout, and rainbow trout. The total catch of recreational fishermen in 2004 was 38.2 million kilograms, of which 81 per cent were caught in inland waters. The total value of the recreational fishing catch was EUR 47.5 million. The most important catches for professional fishing are the Baltic herring, whitefish, sprat, pike-perch, cod and salmon. The financially most significant catch in inland waters was vendace. In 2004, the value of the professional fishing catch was EUR 18.5 million.

Reindeer husbandry forms a quantitatively very small part of agriculture and the national economy. However, reindeer herding has great economic, ecological and cultural significance in the northern reindeer herding areas. The reindeer population density by lichen grazing area is the smallest in the northern regions, although by summer grazing area and by total land area, the density is greater than in the southern reindeer herding districts. The highest permitted number of live reindeer in all reindeer herding districts for 2000–2010 is 203,700. In recent years, reindeer populations have been reduced to the required level.

Finland's total annual berry harvest varies between 600 and 1100 million kilos. Of this amount, an average 40 million kilos are collected, of which 30 million kilos are used by households. The economically most important berries are lingonberries, blueberries and cloudberries. Otherwise the only berries of commercial importance are cranberries and buckthorn berries. More than half of all Finns of working age pick berries and over 40 per cent pick mushrooms.

In Finland, hunting rights belong to landowners. The number of registered hunters is 300,000. The most common game animals are deer and elk, hares, raccoon dog, mink, waterfowl and grouses. The management of hunting to ensure sustainability is based on the voluntary monitoring of game species by hunters.

23. Values of products from nature in 2004 (EUR million)

Game catch	67.0
Elk	*46.0*
Other game	*21.0*
Fish catch	71.4
Recreational fishing	*46.2*
Professional fishing	*25.2*
Reindeer herding	11.3
Berries*)	5.3
Christmas trees	7.0
Mushrooms*)	0.9
Lichen**)	1.3

*) = Amount entering into trade.

**) = Value of exports.

6 Nature conservation, communities and the built environment

Nature conservation

The purpose of nature conservation is to preserve natural biodiversity by establishing reserves on originally natural areas, by protecting endangered species and by integrating conservation aims into land use planning. The Finnish nature conservation area network is extensive, with state-owned conservation areas totalling some 1.5 million hectares, the same as wilderness areas (1.5 million hectares). Private nature conservation areas amount to approximately 160,000 hectares. In addition, some 800,000 hectares of land owned by the State and about 100,000 hectares owned privately have been reserved through various nature conservation programmes and zone reservations.

Most of the areas reserved for nature conservation are in the north of Finland. Indeed, the greatest challenge for nature conservation at the moment is to fill in gaps in the conservation area network in the south. This applies particularly to the improvement of forest protection. According to an action plan based on a Government resolution of 2002, Finland aims to improve the biodiversity of forests in southern Finland, Ostrobothnia and southwestern Lapland, and to find new means of nature conservation based on landowner initiative. The actions taken and results achieved in the programme will be evaluated by the end of 2006. Decisions concerning any further need for the forest conservation programme will be made in 2007. Funds allocated through the Forest Biodiversity Programme in Southern Finland (METSO) will be used for the environmental restoration of forests and peatland on 33,000 hectares. Environmental restoration is crucial, because some forests and peatland in the existing conservation areas in southern Finland and Ostrobothnia are no longer in their natural state. According to studies by the Finnish Forest and Park Service, there are almost 700 targets in these areas in southern Finland and Ostrobothnia that require environmental restoration. Some 11,000 hectares were already environmentally restored in 2003–2005.

Finland's conservation area network has been developed for a couple of decades through various protection programmes. A funding programme was approved in 1996 for the implementation of nature conservation programmes, with the objective of completing most compensation negotiations with landowners by the end of 2007. In late 2005, it was decided to extend the funding to 2009, because its implementation in southwestern and western Finland had taken longer than planned. During the funding programme, 272,000 hectares of land were included in the conservation programme. Some 90,000 hectares of private land are still to be included.

In 2005, the Government acquired approximately 9,100 hectares of land covered by approved nature conservation programmes, and 13,200 hectares of private protected forest were established. Some EUR 39 million will be spent to acquire conservation areas and to compensate owners. A common network of protected areas, called Natura 2000, has been created to fulfil the European Commission's Habitats and Birds Directives. The Commission has approved nearly all of the conservation areas proposed by Finland under the Habitats Directive. The network also includes

24. The funding of conservation areas and programmes (EUR million)

	2003 A	2004 A	2005 A	2006 B	2007 BP
Purchase of land	22	29	26	24	20
Purchase of private land	*6*	*14*	*26*	*24*	*20*
Land exchanges	*15*	*15*	–	–	–
Management of conservation areas	24	21	25	26	26
Compensation payments	9	16	17	15	14
Life (Natura)	2	2	1	1	1
Employment work	1	1	1	1	1
Total	**58**	**69**	**70**	**67**	**62**

A = Final accounts. B = Budget. BP = Budget proposal.

special protected areas subject to the Birds Directive and that are notified to the Commission after national surveys. The Natura areas can be protected in many ways, depending on the type of nature and the need for protection of species. The Natura 2000 network mainly coincides with established nature conservation areas and areas covered by nature conservation programmes. Finland has 1,715 areas subject to the Habitats Directive and 467 areas subject to the Birds Directive. These areas partly coincide. The Natura network covers 4.9 million hectares, of which three quarters are terrestrial. The largest Natura areas are situated in the Alpine region in Northern Lapland and their combined area is 1.79 million hectares.

The LIFE funding system established in 1992 by the EU has promoted nature protection and environmental projects that are in line with environmental policy and legislation in the Community. The programme was terminated in its present form at the end of 2005. 47 per cent of the funds were channelled into nature conservation (LIFE Nature). LIFE Nature is designed to protect the species and biotopes referred to in the Birds and Habitats Directives and especially to implement the Natura 2000 network.

During its EU membership, Finland has received EUR 33 million in LIFE Nature funding for 42 projects. Money has also been allocated from other Community funds, such as the rural development and structural funds, for the protection, management and use of the Natura 2000 network. An investigation is currently underway concerning the principles by which the EU's funding for the Natura 2000 network can be ensured for the financial period beginning in 2006.

The knowledge available in Finland regarding local species is among the world's best. Yet in reports made on threatened species in recent decades, two thirds of country's species have been excluded from assessment and thereby any protection because not enough information has been available on them. When the red list of Finnish threatened species was published in 2000, the total number of species was estimated at 43,000. But due to the steady increase in knowledge, current estimates put the number of species living in Finland in excess of 50,000.

This increasing information is largely the result of a research programme carried out between 2003 and 2007 on poorly known forest species. Between 2003 and 2005, 30 research projects were funded that mainly focused on groups of poorly known species,

i.e. invertebrates and mushrooms. They included aphids, thrips, fungus gnats, hoverflies, cortinaria, and endophytes living on moss and lichens. The size of Finland's flying squirrel population was estimated in one of the projects in the research programme. New information about poorly known species was provided not only by the research programme but also by expert teams each specialising in a particular species group.

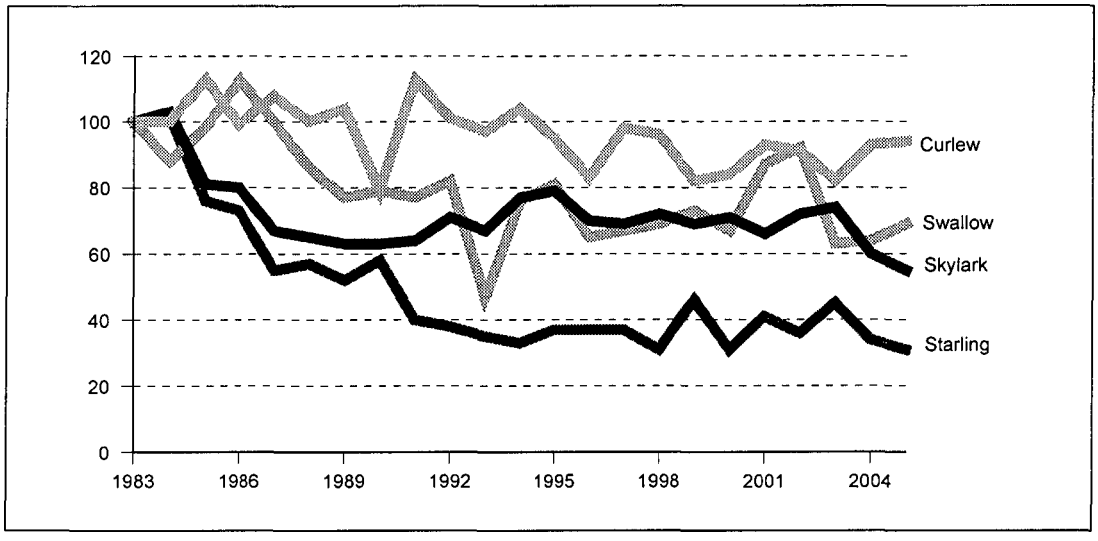
Baltic marine habitats are the poorest-known habitats in Finland. As part of Finland's Baltic Sea environmental action programme, the Finnish Inventory Programme for the Underwater Marine Environment (VELMU) was launched in 2003. The programme is supported by the Ministry of Transport and Communications, the Finnish Institute of Marine Research and the Finnish Maritime Administration. The purpose of the VELMU programme is to obtain a good overview of the biodiversity of the underwater environment in Finland's marine and coastal areas. The inventory programme will be carried out in all Finnish Baltic Sea coastal areas. The field inventories started in the Finnish Archipelago Sea in summer 2005.

25. Natura barometer in EU25, June 2006

	Number of SCI areas	Total area (km^2)	% of total land area
Slovenia	259	6 360	31.4
Spain	1 380	119 104	22.6
Portugal	94	16 503	17.4
Greece	239	27 641	16.4
Estonia	509	10 591	15.9
Hungary	467	13 929	15.0
Luxembourg	47	383	14.8
Italy	2 255	43 977	13.9
Sweden	3 981	62 557	13.7
Finland	**1 715**	**48 552**	**12.7**
Malta	23	39	12.5
Slovakia	362	5 739	11.8
Latvia	331	7 651	11.0
Austria	164	8 884	10.6
Irland	413	10 561	10.2
Lithuania	267	6 664	10.0
Belgium	278	3 221	10.0
Germany	4 617	53 294	9.9
Czech Republic	841	7 241	9.2
Netherlands	141	7 510	8.4
Cyprus	26	510	8.0
France	1 304	48 810	7.9
Denmark	254	11 136	7.4
UK	610	25 102	6.5
Poland	192	13 124	4.2
Total	**20 789**	**559 082**	**12.2**

SCI = Sites of Community Importance.

Figure 29. Population development of certain bird species in agricultural environments (1983=100)



As part of a Finnish biodiversity programme published in 2005, a forecast was made of the numbers of threatened species by 2010, which is when the next list of threatened species will be published. Of the less known groups, the number of species that could be assessed was up by 68 per cent, i.e. from 2,691 in 2000 to 4,524 in 2005. In 2000, there were 138 threatened species and 21 extinct species in less-known species groups, while in the 2010 forecast there are 380 threatened species and 82 extinct species. As more information becomes available, the threat of extinction or the vitality of species that previously have been less well known can be assessed better, and better protective measures can be taken.

One reason for species becoming threatened is the greater uniformity of the agricultural environment, which cuts certain bird populations. On the other hand, some non-indigenous species, such as the cormorant, have spread quickly due to eutrophication of our coastal waters.

World Heritage Sites in Finland

An international convention adopted by Unesco in 1972 lays the foundation for the protection of the world's cultural and natural heritage. Finland joined the convention in 1986. The purpose of the convention is to maintain different nations' unique heritage, to increase respect for it and to inform people of such. The convention supports international co-operation to save, preserve and restore cultural heritage sites when national resources are insufficient.

A natural heritage site is an example of a critical stage in the history of the world or of ongoing ecological or biological evolution. The site may also be an exceptionally beautiful landscape or the habitat of a threatened species. Inclusion on the World Heritage List requires that a cultural site is a masterpiece of human ingenuity or exceptionally significant proof of an existing or bygone culture. The site may be a building representative of a sig-

nificant historical period or reflect the traditional dwelling habits of a particular culture. It may also be related to events, living traditions, ideologies, religions and beliefs or artistic and literary work.

Unesco maintains, supplements and releases a list of World Heritage Sites that have universal value. In 2006 the list of World Heritage Sites contained 644 cultural, 162 natural and 24 mixed sites – 830 in total. They are located in the 138 countries that have signed the World Heritage Convention.

Currently there are seven World Heritage Sites in Finland:

1. Suomenlinna, an important example of a fortress in the Baltic region. (1991).
2. Old Rauma, a coherent and versatile old Nordic town constructed in wood. (1991).
3. Petäjävesi Old Church, a monument of northern wooden architecture. (1994).
4. Verla Groundwood and Board Mill, a unique and complete industrial settlement from the early years of the Finnish forest industry. (1996).
5. Unique Bronze Age Burial Site of Sammallahdenmäki in municipality of Lappi. (1999).
6. Struve Geodetic Arc, a chain of survey triangulation points in ten countries (Norway, Sweden, Finland, Russia, Estonia, Latvia, Lithuania, Belarus, Ukraine, Moldova). Six of the triangulation points are located in Finland. (2005)
7. Kvarken Archipelago / High Coast, showing the land uplift process in a uniquely concrete manner. The area has an exceptional number of inlets and lakes and washboard moraines. (2006).

Communities and the built environment

Zoning is the most important tool in land use planning. In zoning, areas are treated as a whole by co-ordinating measures targeted at different sectors. Zoning can be used to improve environmental quality and help prevent environmental damage. In drafting zoning plans, the effects of their implementation on the environment must be sufficiently investigated. The quality of zoning affects not only citizens' wellbeing, but also the functioning of society at large, the economy and sustainable development. From the perspective of sustainable development, the relative locations, intervening distances and traffic between residences, work places, services and other businesses are critical.

The Land Use and Building Act and Decree, which came into force in 2000, are intended to support sustainable development. The goal is to organise land use and building in a way that creates a basis for a good living environment, promoting ecologically, economically, socially and culturally sustainable development. In addition, the law requires increased utilisation of existing infrastructure and building stock and the continuous, systematic maintenance of the built environment and building stock.

An assessment of the efficiency of the Act completed in 2005 showed that it reached most of its targets. The law was expected to provide better means than previously to improve environmental quality, especially in terms of the built and natural environments, health aspects of the environment and traffic arrangements. Due to the reports and impact assessment made during the zoning process, land use solutions are now based on a broader information base, which has helped to improve the quality of zoning.

Finland is a sparsely settled country in which communities are spread out and built close to nature. Only two per cent of the land is built up. The built environment includes buildings, structures, roads, streets, parks and other facilities. There are about 2.5 million dwellings and almost 0.5 million holiday homes. Finland's regional demography is changing, with the urban population rising, and the rural population falling. Currently, around 80 per cent of the people live in densely populated areas. The growth centres of large cities attract an increasing share, with almost every other Finn living in one.

Dwellings and service buildings represent some 60 to 65 per cent of the entire building stock. Three quarters of Finland's dwellings and service buildings have been built after 1960 and over 40 per cent after 1980. The share of reconstruction in housing construction is steadily increasing. Finnish communities use many times more land per capita than other Western countries and even Nordic countries. This translates into longer commuting trips, high infrastructure and maintenance costs and high traffic costs caused by the daily needs of communities. It also results in extensive consumption of nature areas and resources, and emissions.

26. Different types of residences and holiday homes (1 000 residences)

	Houses	Row houses	Blocks of flats	Others	Holiday homes
1980	774	126	766	116	252
1995	898	291	928	64	416
1999	1 010	312	1 080	76	444
2000	1 014	338	1 094	67	451
2001	1 026	344	1 115	58	457
2002	1 031	349	1 133	62	461
2003	1 041	353	1 148	62	466
2004	1 052	358	1 162	62	469

Community structures form and evolve slowly. Changes are monitored by means of a community structure monitoring system maintained by Finland's environmental administration. In terms of population changes in urban areas, the community structure dispersed considerably in the 1980s. But this process slowed down in the 1990s, with most population growth taking place in built areas that were established in the 1980s. Changes in workplaces were monitored between 1985 and 2000. By 2000, more workplaces related to trading, business services and transport were located in suburban areas rather than city centres. The controlled dispersion of community structure is important in growing urban areas, since it affects the economy, the use of natural resources and emissions.

According to the results of a residential survey in 2004, the satisfaction of Finns living in population centres of over 10,000 inhabitants has increased. Compared with a 1999 residential survey, the availability of basic services – such as grocery stores, primary education and transport services – has deteriorated, especially in smaller towns of 10,000–20,000 inhabitants.

27. Population density and housing structure in certain EU countries

	Population density 2003 inhabitants/km^2	Detached houses in 2001 (%)	One-person households in 2003 (%)	Proportion of people living in cities in 2003 (%)
Netherlands	456	70.9	34	65.8
Belgium	339	80.0	32	97.2
UK	243	..	31	89.1
Germany	231	45.6	37	88.1
Italy	190	30.3	25	67.4
Denmark	125	58.5	37	85.3
Portugal	113	56.8	17	54.6
France	109	55.9	30	73.3
Austria	96	65.8	31	65.8
Greece	83	57.8	20	60.8
Spain	81	37.7	20	76.5
Irland	56	92.4	22	59.9
Sweden	20	45.7	47	83.4
Finland	**15**	**40.3**	**39**	**62.1**

.. data not available.

Shoreline planning and construction

At the end of 2005, there were 469,364 holiday homes in Finland and some 314,000 km of shoreline. The building of holiday homes has decreased compared with the early 1990s. While approximately 8,000 new holiday homes were built in the early 1990s, in recent years the figure has been about half of this.

Shoreline zoning became a distinctive form of planning in the early 1970s. But since the mid-1980s, comprehensive shoreline zoning has become more common, and has further spread throughout the 1990s. There are some 300 comprehensive shoreline plans in compliance with the Land Use and Building Act in force, i.e. about 20 per cent of shores are zoned. During the time of the Act, municipalities have planned and approved an average of 50 comprehensive shoreline plans per year, or a total of 250-300. As more shore areas are included in the zoning process, building in these areas has become more systematic and is increasingly based on the plans. Correspondingly, the number of decisions on exceptional permits has decreased in recent years. About 40 per cent of the granted building permits are based on exceptions.

Energy efficiency of buildings

In 2002, the Ministry of the Environment issued building codes on energy consumption requirements in buildings. The regulations and guidelines concern the heat insulation, indoor air quality and ventilation of new buildings. The aim is to reduce the energy consumption of buildings by 25 per cent. The Finnish Energy and Climate Strategy has also resulted in energy grants for repairs that improve the energy efficiency of blocks of flats and row houses. Improvements in the energy efficiency of housing are being advanced through a voluntary energy-saving agreement signed at

the end of 2002 by the Ministry of the Environment, the Ministry of Trade and Industry, and the ASRA Federation of Housing Property Owners and Developers.

A programme for the promotion of timber construction was launched for the years 2004–2010, and this has been set as a goal in the Government programme. The Government's goal of increasing the construction of urban detached house areas has also been taken into account. In March 2005, the Government made a decision in principle concerning promotion of the use of timber and timber construction. Its purpose is to promote and support measures by which the use of non-renewable natural resources can be replaced by renewable natural resources in construction, and by which the use of wood can be increased through international co-operation, particularly in the EU and in Finland's neighbouring areas.

The EU's building stock is estimated to account for over 40 per cent of energy consumption. According to a Commission projection, it would be possible to achieve a 22 per cent saving on consumption by 2010. The reformed energy and climate strategy takes into consideration the Emissions Trading Directive and the Kyoto Mechanisms. A directive on the energy performance of buildings came into force in 2003, and its national implementation is underway.

7 Towards sustainable development

The progress of sustainable development was evaluated at a ten-year follow-up summit (the World Summit on Sustainable Development, WSSD) held in Johannesburg in 2002. The primary aims currently include sustainable production and consumption, eradication of poverty and the preservation and sustainable use of natural resources. Among the key achievements of the summit were a decision to create a 10-year framework of programmes on sustainable production and consumption, and scheduled goals relating to biodiversity, chemicals and fish stocks. The UN has declared 2005–2014 as the decade for education for sustainable development. Finland is also involved in the development work.

Over the last decade, the European Union has assumed a leading role in promoting the policies and actions of sustainable development. The EU ratified the Kyoto Protocol prior to the Johannesburg summit. One important method of reducing greenhouse gas emissions is EU-wide emissions trading, which started in early 2005. The strategy for sustainable development renewed in June 2006 by the EU presents objectives in climate change and clean energy, transport, management of natural resources, public health threats, social exclusion and global poverty and development. The EU's environmental programme aims to promote sustainable development and contribute to its implementation in Europe. EU chemicals legislation is also expected to enter into force in 2007.

Finland's new sustainable development strategy was finalised in June 2006. It endorses the overall view of sustainable development embodied in the EU's sustainable development policy and the Lisbon strategy. The new strategy pays attention to three key development challenges: climate change, globalisation and change in the population structure. Its vision is to increase well-being within the limits of nature's tolerance on a national and global level, and its timeframe is trans-generational. The progress and realisation of the objectives is monitored with selected indicators, which are currently being developed and updated within a network of national indicators. Forming an overall view of the state of the environment and threats to it is one of the great challenges in the near future. Finland will continue to develop methods for environmental monitoring in the coming years.

Finland's Government Programme also aims to promote sustainable development and the implementation of the actions decided on at the Johannesburg summit. The goal is increased efficiency in materials and energy use in every stage of the product life cycle. As a part of this objective, a national sustainable consumption and production programme was completed in 2005, listing the further objectives and environmental policy measures that are required for Finland to become an eco-efficient society. The programme proposes to increase the eco-efficiency of production in the entire product chain to make Finland one of the world's most eco-efficient societies. This would give rise to new business opportunities and jobs in fields that improve wellbeing and create environmental innovations. The proposed programme comprises 73 specific measures broadly affecting different sectors of society.

The Government discussed five of these proposals in April 2006. Sustainable consumption and production will be promoted by

preparing long-term financial instruments. Public purchases will be made eco-friendlier by making action plans in which targets have been set. A study will be conducted on the potential establishment of a materials efficiency service centre, which would offer services and advice on materials efficiency to businesses and consumers. The environmental properties of products and services will be promoted and new, environmentally friendly services will be developed. The last item on the agenda was a dialogue process between different stakeholder groups, with the objective of agreeing on practical targets regarding the efficient use of materials and energy and the prevention of waste creation. The goal is to achieve an increase in the eco-efficiency of production in the entire product chain, and to make Finland one of the world's most eco-efficient countries.

Principal international environmental agreements to which Finland is committed and their objectives and implementation

Agreement	Objective	Implementation
Climate change • UN Framework Convention on Climate Change, 1992 (Rio de Janeiro).	To stabilise greenhouse gas concentration in the atmosphere at a safe level.	The treaty entered into force in 1994 (revised in 1998).
• Kyoto Protocol, 1997.	Kyoto Protocol industrial countries committed themselves to reducing their greenhouse gas emissions by a total of 5% from the 1990 level by 2008–2012. Finland's obligation in the joint EU target is to keep emissions at the 1990 level during the 2008–2012 period.	The Protocol has been ratified by 163 countries and the EU. The protocol entered into force on 16 February 2005. According to preliminary information, Finland's emissions in 2005 were approximately at the level of 1990, the benchmark year.
Substances depleting the ozone layer • Vienna Convention for the Protection of the Ozone Layer, 1985 (Vienna). • Montreal Protocol, 1987.	To stop the use of substances causing depletion of the ozone layer in the upper atmosphere.	The Vienna Convention has been ratified by 190 countries and the EU, and the Montreal Protocol has been ratified by 189 countries and the EU. The production, consumption, use, import and export of substances causing depletion of the ozone layer has been restricted by EU Regulation 2037/2000 and a Government decision (262/1998).
Convention on International Trade in Endangered **Species of Wild Flora and Fauna** (CITES),1973 (Washington).	To regulate the international trade of endangered species and their products.	The treaty has been ratified by 169 countries, but not the EU. The treaty is implemented with the EU Council Regulation 338/1997 and a number of Commission Regulations.

Agreement	Objective	Implementation
Biological diversity • Convention on Biological Diversity, 1992 (Rio de Janeiro).	To protect the diversity of global ecosystems, animal and plant species and their genes, to establish a pattern for their sustainable use and to achieve an equitable division of the benefits gained from the use of genetic resources.	The treaty has been signed by 167 countries and the EU and ratified by 188 countries and the EU. Finland ratified the treaty in 1994. The scientific evaluation of the Finnish national action programme on biological diversity (1997–2005) was completed at the beginning of 2005. A continuation of this is the strategy and action programme for the protection of the diversity of Finnish nature and for its sustainable use (2006–2016), prepared in 2005. The strategy and programme will be submitted to the Government in autumn 2006.
• Cartagena Protocol for Biosafety, 2000 (Cartagena).	The Protocol aims to ensure the safety of importing genetically modified organisms (GMOs) in terms of both biological diversity and human health.	The Cartagena Protocol entered into force on 11 September 2003. It has been signed by 102 countries and the EU and ratified by 131 countries (including 51 non-signatory countries) and the EU. Finland ratified the Protocol on 9 July 2004. The EU's GMO legislation has been complemented with respect to the export of GMOs by EU's export regulation 1946/2003.
Hazardous waste • Basel Convention on the Transboundary Transport of Hazardous Waste and Supervision of its Handling, 1989 (Basel).	Environmental viewpoints to be considered in the transboundary transport of hazardous waste. The production of waste to be limited and attempts made to utilise and process waste as close as possible to its place of origin.	The Basel Convention has been signed by 170 countries and the EU, and ratified by 167 countries and the EU. The monitoring of hazardous waste transport has improved as a result of the treaty. All EU countries prohibit the export of hazardous waste from industrial countries to developing countries. Finland has assisted developing countries in the management of hazardous waste disposal.

Agreement	Objective	Implementation
• Basel Protocol on Liability and Compensation for Damage resulting from Transboundary movement of Hazardous Waste and their Disposal, 1999 (Basel).	The aim of the protocol is to provide for a regime for liability and compensation for damage resulting from the transboundary shipment of hazardous waste, and for measures to restore the environment.	The Protocol on Liability and Compensation for Damage has been signed by 13 countries, but not the EU, and ratified by 7 countries. The protocol has not yet entered into force.
Persistant organic pollutants • Stockholm Convention on Persistent Organic Pollutants (POPs), 2001 (Stockholm).	To halt production and use of 10 pesticides and industrial chemicals and to regulate dioxin and furan emissions.	The treaty entered into force on 17 May 2004. The treaty has been signed by 150 countries and the EU, and ratified by 124 countries and the EU. Finland ratified the treaty on 3 September 2002, and the EU ratified it on 16 November 2004. The treaty has been put into effect in cooperation with the Regulation 850/2004 of the European Parliament and of the Council.
Trade in hazardous chemicals • Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC), 1998 (Rotterdam).	The export of dangerous chemicals and pesticides listed in the treaty is allowed only with the prior consent of the importing state, which may also refuse to accept the chemicals. The treaty applies to 39 chemicals or chemicals groups.	The treaty entered into force on 24 February 2004. The treaty has been signed by 72 countries and the EU, and ratified by 107 countries and the EU. Finland ratified the treaty on 4 June 2002, and the EU on 22 December 2002.
Convention on Long-Range Transboundary Air Pollution (Geneva, 1979). Protocols for reduction of emissions for different substances or restrictions of use of substances:	The treaty is one of key international environmental agreements for the protection of the environment and human health across country borders.	In 1979 the treaty was signed by 31 countries and the EU. The treaty has been ratified by 49 countries and the EU. Finland ratified the treaty on 15 April 1981.
• Volatile organic compounds (VOCs) (Geneva, 1991).	To cut emissions of VOCs by 30% from the 1988 level by 1999.	The protocol has been signed by 22 countries and the EU, and ratified by 21 countries. Finland's emissions in 2004 were 38% lower than in 1988.
• Sulphur (Oslo, 1994).	To ensure in the long run that sulphur deposition does not exceed the critical load for each area. Finland is committed to cutting down its sulphur emissions by 80% from the 1980 level by 2000.	The protocol has been signed by 27 countries and the EU, and ratified by 26 countries and the EU. Finland's emissions in 2005 were 87% lower than in 1980.

Agreement	Objective	Implementation
• Nitrogen oxides (Sofia, 1988).	The general aim is initially to freeze the level of nitrogen oxide emissions. The most common benchmark year is 1987.	The protocol has been signed by 25 countries and the EU, and ratified by 29 countries and the EU. Finland was committed to freezing nitrogen oxide emissions at the 1987 level by the end of 1994. Finland's emissions in 2005 were 35% lower than in 1987.
• Heavy metals (Århus, 1998).	To reduce emissions of mercury, lead and cadmium below the 1990 level.	The protocol entered into force on 29 December 2003. It has been signed by 35 countries and the EU, and ratified by 27 countries and the EU. Finland ratified the protocol on 20 June 2000, and the EU ratified the protocol on 3 May 2001. In 2004, Finland's mercury emissions were 32% lower, cadmium emissions 76% lower and lead emissions 92% lower than in 1990.
• Persistent organic pollutants (POPs) (Århus, 1998).	To restrict or discontinue the use of persistent organic pollutants. To regulate emissions of dioxin, furan, PAH compounds and hexachlorobenzene below the 1994 level.	The protocol entered into force on 23 October 2003. The protocol has been signed by 35 countries and the EU, and ratified by 24 countries and the EU. Finland ratified the protocol on 3 September 2002, and the EU ratified the protocol on 30 April 2004. Dioxin and furan emissions in 2004 were below the 1994 level. In 2004, emissions of PAH compounds exceeded the 1994 level.
• Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg, 1999).	To cut emissions of sulphur, nitrogen oxides, ammonia and volatile organic compounds (VOC) so that as from the year 2010 these emissions are permanently below the emission ceilings set in the protocol. Finland's emission ceilings as from 2010 are 116,000 tonnes of sulphur, 170,000 tonnes of nitrogen oxides, 130,000 tonnes of VOC and 31,000 tonnes of ammonia.	The protocol entered into force on 17 May 2005. It has been signed by 31 countries, and ratified by 19 countries and the EU. Finland ratified the protocol on 23 December 2003, and the EU ratified the protocol on 23 June 2003. Finland's emissions in 2004 were 83,500 tonnes of sulphur dioxide , 204,700 tonnes of nitrogen dioxide, 140,300 tonnes of VOC and 33,300 tonnes of ammonia.

Agreement	Objective	Implementation
Access to information and participation • Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Århus, 1998).	To guarantee public participation and the supply of information concerning environmental matters, as well as the right of appeal and the right to the institution of proceedings.	The treaty entered into force on 30 October 2001. The treaty has been signed by 39 countries and the EU, and ratified by 38 countries (including 6 non-signatory countries) and the EU. Finland ratified the treaty on 1 September 2004, and the EU on 17 February 2005. Finnish legislation fulfils the majority of the treaty's requirements. At the beginning of 2005, Finland delivered the first national report on the implementation of the treaty in the second official meeting of the parties to the treaty in May 2005.
• Pollutant Release and Transfer Register (PRTR) Protocol (Kiev, 2003).	To improve access to information in environmental matters with the help of a pollutant and transfer register.	The protocol has been signed by 36 countries and the EU. One of the signatories and the EU have ratified the protocol.
Environmental impact assessment • Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991).	To assess the environmental impact and prevent and limit the harm caused by projects that have a significant adverse environmental impact across borders, before making decisions related to them.	The treaty entered into force in 1997. By the end of 2005, it had been ratified by 40 countries and the EU. Finland has applied the treaty to 10 projects and has been the recipient 6 times.
• Protocol on Strategic Environmental Assessment (Cavtat, 2003).	Assessment of draft plans and programmes with likely significant environmental impacts and, where applicable, of the environmental impacts of policies and legislation, and public participation in the decision-making.	The Protocol has been signed by 36 countries and the EU, and ratified by 4 countries. Finland was the first country to ratify the Protocol on 18 April 2005.

Agreement	Objective	Implementation
Sea protection		
• Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992.	To prevent and stop the pollution of the Baltic Sea, to promote its ecological recovery and to preserve its ecological balance.	A revised treaty entered into force on 17 January 2000; the revisions to annexes III and IV on the prevention of pollution from agriculture and on organising the reception of ship-generated waste entered into force on 31 December 2000.
• Baltic Sea Joint Comprehensive Environmental Action Programme, 1992.	To eliminate the Baltic Sea's worst point source and diffuse pollution inputs.	Will be implemented through national permits and bilateral and multilateral co-operation, especially in neighbouring areas.
• Baltic Marine Environment Protection Commission (HELCOM) Recommendations and Ministerial Statements, 1988, 1998 and 2003.	To reduce emissions and discharges of nutrients, heavy metals and persistent or toxic organic pollutants into the Baltic Sea by 50% from the 1987 level by 2005. To focus actions on four priority areas: eutrophication, environmental protection and the loss of biodiversity, harmful substances in the marine environment, and environmental impacts of seafaring.	The targets will be implemented through the "Aims of River Basin Protection 2005" programme accepted by the Government, the "Operational Programme for River Basin Protection Until 2005" accepted by the Ministry of the Environment, the Finnish Baltic Environmental Protection Programme and EU regulations. In addition, the preparation of a Government decision in principle on guidelines of water protection until 2015 is underway.

Statistical appendix

1. Population trend globally, in the EU15 member states and in the new EU member states (1950=100)

Year	World	EU15	New EU member states
1950	100	100	100
1955	109	103	107
1960	120	107	114
1965	132	111	119
1970	147	115	123
1975	162	118	127
1980	176	120	132
1985	192	121	135
1990	209	123	138
1995	225	126	138
2000	241	128	137
2005	256	129	136
2010	271	130	135
2015	286	130	133
2020	299	130	132
2025	312	130	129
2030	323	130	127
2035	333	129	124
2040	341	128	120

Source: European Environmental Agency. EEA Signals 2004.

2. Environmental Performance Index (EPI2006) for designated countries

Country	Index	Country	Index
New Zealand	88.0	Norway	80.2
Sweden	87.8	Greece	80.2
Finland	**87.0**	Italy	79.8
Czech Republic	86.0	Germany	79.4
United Kingdom	85.6	Spain	79.2
Austira	85.2	Slovakia	79.1
Denmark	84.2	Netherlands	78.7
Canada	84.0	United States	78.5
Malaysia	83.3	Russia	77.5
Ireland	83.3	Hungary	77.0
Portugal	82.9	Poland	76.2
France	82.5	Belgium	75.9
Iceland	82.1	China	56.2
Japan	81.9	India	47.7
Switzerland	81.4		

Source: Pilot 2006 Environmental Performance Index. http://www.yale.edu/epi/2006EPI_Report_Full.pdf

3. Trends in Finland's real GDP and the consumption of energy and materials in Finland

Year	GDP at 2000 prices approx (EUR billion)	Consumption of materials (million tonnes)	Total consumption of energy (1,000 toe)
1980	80.8	163.6	22 623
1981	81.8	158.2	22 430
1982	84.3	164.1	22 038
1983	86.8	179.4	22 504
1984	89.4	181.1	23 417
1985	92.4	188.1	25 007
1986	94.8	183.3	24 803
1987	98.2	194.5	26 279
1988	103.2	194.8	26 573
1989	108.8	218.6	26 727
1990	108.9	210.1	27 296
1991	102.1	191.9	26 858
1992	98.2	187.4	26 518
1993	97.3	179.4	27 243
1994	100.8	192.7	29 135
1995	104.8	193.7	28 606
1996	108.7	189.1	29 898
1997	115.3	199.7	30 749
1998	121.2	210.7	31 277
1999	126.0	217.0	32 015
2000	132.3	215.7	31 693
2001	135.8	217.7	32 805
2002	138.0	220.9	33 696
2003	140.4	229.8	35 538
2004	145.4	230.8	35 494
2005*)	149.6	230.2	32 440

Source: Statistics Finland, National accounts and Studies 231 and Energy Statistics 2005; Ministry of Trade and Industry: Energy Reviews.

*) = preliminary data.

4. Trends in Finland's real GDP and atmospheric emissions

Year	GDP at 2000 prices (EUR billion)	Carbon dioxide emissions**) (million tonnes)	Sulphur dioxide emissions (1 000 tonnes)	Emissions of nitrogen oxides (1 000 tonnes)
1980	80.8	54	583	284
1981	81.8	45	534	286
1982	84.3	43	483	261
1983	86.8	43	371	249
1984	89.4	44	367	246
1985	92.4	50	382	263
1986	94.8	49	331	265
1987	98.2	52	327	276
1988	103.2	52	302	279
1989	108.8	52	244	288
1990	108.9	54	273	298
1991	102.1	53	200	273
1992	98.2	52	152	266
1993	97.3	53	133	267
1994	100.8	59	121	267
1995	104.8	56	101	245
1996	108.7	61	105	250
1997	115.3	60	102	243
1998	121.2	57	94	228
1999	126.0	57	88	222
2000	132.3	55	80	209
2001	135.8	61	91	211
2002	138.0	62	88	211
2003	140.4	70	101	218
2004	145.4	67	84	205
2005	149.6	54	73	180

*) = preliminary data. **) = from fossil fuels and peat.
Source: Statistics Finland.

5. Finland's greenhouse gas emissions 1990–2004 and climate strategy target to 2012 (million carbon dioxide equivalent tonnes)

Year	Carbon dioxide	Methane	Nitrous oxide	F-gases	Total	Climate strategy target *)
1990	56.7	6.3	8.0	0.1	71.1	–
1991	55.5	6.3	7.3	0.1	69.2	–
1992	54.5	6.3	6.7	0.0	67.6	–
1993	56.2	6.3	6.9	0.0	69.4	–
1994	61.6	6.3	7.0	0.0	74.8	–
1995	58.1	6.1	7.2	0.1	71.5	–
1996	63.9	6.0	7.1	0.1	77.2	–
1997	62.6	6.0	7.1	0.2	75.9	–
1998	59.2	5.8	7.0	0.3	72.2	–
1999	58.8	5.6	6.9	0.4	71.7	–
2000	57.1	5.4	6.9	0.6	70.0	–
2001	62.6	5.3	6.8	0.7	75.4	–
2002	65.0	5.1	6.9	0.5	77.5	–
2003	73.1	4.9	7.0	0.7	85.7	–
2004	69.1	4.7	6.9	0.7	81.4	–
2005	..	..	..	..	..	70.6
2006	..	..	..	..	..	81.9
2007	..	..	..	..	..	83.3
2008	..	..	..	..	..	84.6
2009	..	..	..	..	..	86.8
2010	..	..	..	..	..	85.4
2011	..	..	..	..	..	80.6
2012	..	..	..	..	..	78.3

– = not in use. .. = data not available. *) = forecast.

Source: Statistics Finland. http://www.stat.fi/til/khki/index.html

6. EU member states in relation to Kyoto target levels in 2003 (per cent)

Spain	31.0	Luxembourg	7.0	Czech Republic	–19.0
Austria	25.0	Belgium	6.0	Slovakia	–23.0
Finland	22.0	Netherlands	5.0	Hungary	–28.0
Denmark	20.0	Slovenia	3.0	Poland	–28.0
Portugal	19.0	France	–2.0	Estonia	–46.0
Ireland	17.0	Germany	–5.0	Latvia	–53.0
Italy	16.0	Sweden	–5.0	Lithuania	–61.0
Greece	7.0	United Kingdom	–5.0		

Source: European Environment Agency.

7. Breakdown of electricity production by energy sources in 2005 (per cent)

Nuclear power	26.3	Peat	5.3
Coal	8.2	Net imports	20.0
Hydro power	16.0	Oil	1.8
Natural gas	10.5	Wastefuels	1.2
Biofuels	10.5	Wind	0.2

Source: Adato Energia Oy.

8. Total energy consumption in EU25 member states by GDP in 2004

Country	Total energy consumption 1 000 toe/EUR 1,000	Country	Total energy consumption 1 000 toe/EUR 1,000
Estonia	1 140	Spain	223
Lithuania	1 136	Sweden	218
Slovakia	854	Belgium	208
Czech republic	852	United Kingdom	207
Latvia	696	Netherlands	203
Poland	597	Luxembourg	194
Hungary	531	Italy	189
Slovenia	329	France	186
Malta	292	Germany	159
Finland	**274**	Ireland	157
Cyprus	262	Austria	146
Greece	240	Denmark	120
Portugal	240	**EU-25**	**204**

Source: Eurostat.

9. Renewable energy as a proportion of electricity consumption in 2004, and the target for 2010 (per cent)

Country	In 2004	Target for 2010	Country	In 2004	Target for 2010
Austria	58.8	78.1	Germany	9.7	12.5
Sweden	46.1	60.0	United Kingdom	3.7	10.0
Latvia	47.1	49.3	Netherlands	5.7	9.0
Portugali	24.4	39.0	Czech Republic	4.0	8.0
Slovenia	29.1	33.6	Poland	2.1	7.5
Finland	**28.3**	**31.5**	Lithuania	3.5	7.0
Slovakia	14.3	31.0	Belgium	2.1	6.0
Spain	18.2	29.4	Cyprus	0.0	6.0
Denmark	27.0	29.0	Luxembourg	3.3	5.7
Italy	15.9	25.0	Estonia	0.6	5.1
France	12.9	21.0	Malta	0.0	5.0
Greece	9.5	20.1	Hungary	2.3	3.6
Ireland	5.1	13.2	**EU-25**	**13.7**	**21.0**

Source: Eurostat.

10. Electricity produced in combined heat and power (CHP) production as a percentage of total electricity production in EU25 member states in 2002

Country	Production in 2002	Country	Production in 2002	Country	Production in 2002
Denmark	49	Estonia	11	Slovenia	6
Finland	**38**	Portugal	10	United Kingdom	5
Latvia	38	Germany	10	France	4
Netherlands	30	Lithuania	10	Ireland	3
Hungary	22	Luxembourg	8	Greece	2
Slovakia	18	Spain	8	Cyprus	..
Czech Republic	17	Belgium	8	Malta	..
Poland	16	Italy	7	**EU-25**	**10**
Austria	14	Sweden	7		

Source: Combined Heat and Power (CHP) Plant Statistics in the EU 2000, Eurostat. .. Data not available.

11. Finland's sulphur dioxide emissions and reduction target for 2010 (1 000 tonnes)

Year	Road traffic	Other transport and work machines	Energy production	Industrial processes	Total
1980	8.9	4.0	274.0	296.0	582.9
1981	8.6	4.1	223.0	298.0	533.7
1982	8.4	4.1	122.0	348.0	482.5
1983	8.1	4.0	87.0	272.0	371.1
1984	7.9	4.1	97.0	258.0	367.0
1985	7.7	4.2	110.0	260.0	381.9
1986	7.3	4.2	87.0	232.0	330.5
1987	7.1	4.3	97.0	219.0	327.4
1988	6.3	4.4	81.0	210.0	301.7
1989	6.6	4.4	80.0	153.0	244.0
1990	5.3	4.4	114.5	148.9	273.1
1991	4.8	4.4	108.1	82.5	199.8
1992	4.7	4.3	76.2	67.1	152.3
1993	3.8	4.4	68.1	56.2	132.5
1994	2.2	4.6	62.3	51.6	120.7
1995	1.8	4.4	51.1	43.2	100.5
1996	1.2	4.4	57.6	41.5	104.7
1997	0.4	4.6	55.9	41.5	102.4
1998	0.3	4.5	47.2	41.8	93.8
1999	0.3	4.5	43.6	40.0	88.4
2000	0.2	4.6	38.2	36.7	79.7
2001	0.2	4.3	52.9	33.2	90.6
2002	0.2	4.4	52.9	30.7	88.2
2003	0.1	4.3	66.7	29.7	100.8
2004	0.1	2.5	53.8	27.2	83.6
2005*)	..	..	..	..	73.0
2010**)	..	..	..	..	110.0

.. = data not available. *) = preliminary data. **) = target.

Source: Ministry of the Environment, Finnish Environment Institute and Statistics Finland.

12. Finland's nitrogen oxides emissions and reduction target for 2010 (1 000 tonnes)

Year	Road traffic	Other transport and work machines	Energy production	Industrial processes	Total
1980	126.9	40.7	90.0	26.0	283.7
1981	127.3	41.8	86.0	31.0	286.0
1982	127.4	42.2	42.0	49.0	260.7
1983	127.6	41.7	36.0	44.0	249.3
1984	128.2	43.1	34.0	41.0	246.3
1985	129.4	44.8	47.0	42.0	263.1
1986	131.6	45.2	45.0	43.0	264.8
1987	132.5	47.8	52.0	44.0	276.4
1988	135.3	48.8	51.0	44.0	279.1
1989	137.7	51.0	53.0	46.0	287.7
1990	134.3	52.0	73.8	38.1	298.2
1991	123.8	51.7	62.6	35.0	273.1
1992	119.0	50.3	61.7	35.3	266.3
1993	115.5	50.7	65.2	35.9	267.4
1994	110.7	51.8	66.3	38.3	267.2
1995	106.3	50.3	52.2	36.5	245.3
1996	100.7	51.7	61.9	35.3	249.6
1997	95.2	53.3	58.2	35.8	242.5
1998	89.3	51.2	50.4	37.0	227.9
1999	84.3	51.1	47.3	38.9	221.6
2000	78.5	50.4	42.8	37.1	208.8
2001	73.9	48.0	57.8	30.9	210.6
2002	69.8	47.3	62.3	31.0	210.5
2003	66.2	46.3	73.2	32.2	218.0
2004	61.4	44.3	66.1	32.9	204.7
2005*)	..	..	..	..	180.0
2010**)	..	..	..	..	170.0

.. = data not available. *) = preliminary data. **) = target.

Source: Ministry of the Environment, Finnish Environment Institute and Statistics Finland.

13. Pulp and paper industry production and effluent load in rivers and lakes (tonnes per year)

Year	Paper and board production	Pulp production	Chemical oxygen demand	Organically bound chlorine	Phosphorus
1990	8 958 000	5 093 000	430 000	9 700	641
1991	8 777 000	4 894 000	380 000	7 200	532
1992	9 145 000	4 913 000	330 000	4 700	480
1993	9 953 000	5 589 000	270 000	3 000	375
1994	10 909 000	6 331 000	270 000	2 000	335
1995	11 012 000	5 797 000	260 000	1 600	320
1996	10 442 000	5 739 000	213 000	1 100	250
1997	12 149 000	6 620 000	227 000	1 300	228
1998	12 704 000	6 718 000	217 000	1 144	233
1999	12 947 000	6 977 000	205 267	1 127	225
2000	13 509 000	7 101 000	199 769	990	202
2001	12 503 000	6 548 000	178 246	949	206
2002	12 776 000	7 143 000	182 354	1 142	193
2003	13 059 000	7 350 000	189 095	1 164	209
2004	14 036 000	7 783 000	181 719	1 129	182
2005	12 391 000	6 773 000	155 140	1 019	165

Source: Finnish Forest Industries Federation, Yearbooks of Environmental Protection.

14. Pulp and paper industry production and emissions into the atmosphere (tonnes per year)

Year	Paper and board production	Pulp production	Sulphur dioxide	Nitrogen oxides	Particles
1990	8 958 000	5 093 000	24 100	16 200	22 000
1991	8 777 000	4 894 000	16 300	18 900	18 300
1992	9 145 000	4 913 000	9 500	19 100	13 000
1993	9 953 000	5 589 000	7 200	21 300	11 000
1994	10 909 000	6 331 000	6 500	23 000	9 500
1995	11 012 000	5 797 000	4 900	21 100	7 800
1996	10 442 000	5 739 000	5 300	21 100	7 000
1997	12 149 000	6 620 000	6 315	21 878	4 609
1998	12 702 000	6 718 000	5 435	21 834	6 219
1999	12 947 000	6 977 000	5 521	23 169	6 109
2000	13 509 000	7 101 000	5 178	22 351	5 809
2001	12 503 000	6 548 000	5 279	19 656	4 433
2002	12 776 000	7 143 000	5 649	21 269	4 614
2003	13 059 000	7 350 000	5 791	21 257	5 309
2004	14 036 000	7 783 000	5 516	22 041	5 932
2005	12 391 000	6 773 000	4 508	19 190	4 820

Source: Finnish Forest Industries Federation, Yearbooks of Environmental Protection.

15. Recovery of waste paper in the EU15 countries in 2004

Country	Recovery rate (%)
Ireland	77
Germany	74
Netherlands	73
Finland	**71**
Switzerland	70
Sweden	70
Austria	63
Belgium	61
France	58
Denmark	57
United Kingdom	57
Spain	55
Hungary	50
Italy	49
Slovakia	49

Source: CEPI. Annual statistics 2005. http://www.cepi-eurokraft.org/

16. Trends in use of public transport, passenger cars and motorcycles (million kilometres)

Year	Total	Cars	Motor-cycles	Public transport
1980	48 058	34 800	800	12 458
1981	49 262	35 900	800	12 562
1982	51 002	37 500	800	12 702
1983	53 046	39 300	800	12 946
1984	54 971	41 200	800	12 971
1985	57 445	43 700	800	12 945
1986	58 252	45 100	800	12 352
1987	59 669	46 000	800	12 869
1988	62 364	48 500	800	13 064
1989	63 779	49 900	800	13 079
1990	65 273	51 200	800	13 273
1991	64 195	50 600	900	12 695
1992	63 797	50 500	900	12 397
1993	62 882	49 700	900	12 282
1994	62 855	49 600	900	12 355
1995	63 479	50 000	900	12 579
1996	64 048	50 400	900	12 748
1997	65 820	51 900	900	13 020
1998	67 201	53 300	900	13 001
1999	68 662	54 900	900	12 862
2000	69 653	55 700	900	13 053
2001	70 802	57 000	900	12 902
2002	72 045	58 300	900	12 845
2003	73 241	59 590	900	12 751
2004	74 749	60 940	900	12 909
2005	75 781	61 910	900	12 971

Sources: VR Group Ltd, Helsinki City Transport, Finnish Road Administration, Finnish Maritime Administration, Civil Aviation Administration.

17. Trends in emissions from road traffic and projection to 2015 (thousand tonnes)

Year	Carbon monoxide (CO)	Hydro-carbons (HC)	Nitrogen oxides (NOx)	Particles	Carbon dioxide (CO_2)
1980	485.4	64.5	126.9	7.1	7 435
1981	489.9	65.0	127.3	7.4	7 534
1982	492.0	65.6	127.4	7.6	7 713
1983	496.6	66.2	127.6	7.8	7 980
1984	497.9	67.0	128.2	8.0	8 227
1985	491.5	66.7	129.4	8.2	8 618
1986	485.7	67.0	131.6	8.4	9 224
1987	485.7	67.8	132.5	8.3	9 688
1988	485.4	69.0	135.3	8.3	10 078
1989	485.6	70.2	137.7	8.1	10 705
1990	469.1	68.0	134.3	7.9	10 872
1991	446.0	64.2	123.8	7.4	10 564
1992	432.5	62.0	119.0	7.1	10 529
1993	414.0	59.4	115.5	7.0	10 058
1994	399.6	57.0	110.7	6.7	10 391
1995	391.0	55.2	106.3	6.4	10 245
1996	378.9	52.6	100.7	6.0	10 179
1997	370.2	50.4	95.2	5.6	10 684
1998	360.4	48.0	89.3	5.1	10 780
1999	349.3	45.5	84.3	4.7	10 942
2000	332.8	42.5	78.4	4.2	10 850
2001	320.3	40.1	73.8	3.9	11 032
2002	304.7	37.5	69.7	3.6	11 256
2003	286.8	34.9	66.0	3.5	11 440
2004	266.3	31.8	61.2	3.1	11 805
2005	**243.4**	**28.9**	**57.1**	**2.9**	**11 795**
2006*)	212.7	25.2	52.1	2.7	11 855
2007*)	192.2	22.3	47.4	2.5	11 899
2008*)	174.1	19.6	42.8	2.3	11 951
2009*)	158.2	17.3	38.8	2.1	12 000
2010*)	149.6	16.0	35.6	2.0	12 038
2011*)	144.0	15.3	33.0	1.9	12 054
2012*)	139.3	14.7	30.7	1.9	12 066
2013*)	135.3	14.2	28.7	1.8	12 085
2014*)	131.1	13.6	26.6	1.7	12 087
2015*)	127.0	13.1	24.8	1.7	12 082

*) = projection.
Source: Technical Research Centre of Finland; LIISA Calculation Model.
http://lipasto.vtt.fi/lipasto/liisa/paastodata.htm

18. Retail prices of motor fuel (95E) on 15 July 2006 (euro cents per litre)

Country	Refinery price	Consumer price	Taxes	Proportion of tax, %
Netherlands	63	154	91	59.1
United Kingdom	51	141	90	63.8
Belgium	58	141	83	58.9
Denmark	57	139	82	59.0
Italy	59	139	80	57.6
Finland	**55**	**138**	**83**	**60.1**
Germany	53	138	85	61.6
Portugal	56	136	80	58.8
Sweden	55	136	81	59.6
France	52	132	80	60.6
Luxembourg	58	118	60	50.8
Ireland	52	117	65	55.6
Austria	54	116	62	53.4
Malta	67	116	49	42.2
Spain	57	113	56	49.6
Czech Republic	52	111	59	53.2
Slovakia	52	110	58	52.7
Hungary	54	110	56	50.9
Greece	59	108	49	45.4
Poland	53	107	54	50.5
Slovenia	51	104	53	51.0
Cyprus	58	101	43	42.6
Lithuania	55	99	44	44.4
Latvia	53	96	43	44.8
Estonia	52	95	43	45.3
United States*)	55	66	10	15.2

*) = 8 July 2006.

Source: EU member states: EU/Oil Petrolier and Finnish Oil and Gas Federation; USA: Energy Information Agency.http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp

19. Urban air particle concentrations in the largest cities

Year	pm10	pm2.5
1999	100.0	100.0
2000	90.5	92.0
2001	87.3	79.7
2002	98.0	82.4
2003	94.7	84.9
2004	95.7	79.6

Source: Finnish Meteorological Institute.

20. Trends in world market prices of selected metals (1965=100)

Year	Pig iron	Copper	Lead	Zinc
1965	100.0	100.0	100.0	100.0
1975	103.3	112.5	134.5	157.0
1985	77.4	96.8	82.9	118.2
1995	77.0	94.9	75.7	113.4
2006*)	95.2	102.4	76.5	117.3

*) = I-IV/2006.

Source: United Nations Conference on Trade and Development – UNCTAD, Monthly Commodity Price Bullets.
http://www.worldbank.org/prospects/pinksheets/

21. World oil consumption and real world market price (USD per barrel)

Year	Current prices	Real (1996) prices	Billion tonnes
1970	2.1	7.0	2 254
1971	2.6	8.4	2 377
1972	2.8	8.8	2 556
1973	3.1	8.9	2 754
1974	11.2	27.9	2 710
1975	10.6	23.9	2 678
1976	11.8	25.5	2 852
1977	12.8	26.0	2 944
1978	12.9	24.3	3 055
1979	29.2	49.4	3 103
1980	35.5	52.9	2 972
1981	34.1	46.6	2 868
1982	31.4	41.2	2 776
1983	28.4	36.7	2 761
1984	28.3	35.8	2 809
1985	27.0	33.8	2 801
1986	13.8	17.5	2 893
1987	17.8	22.2	2 949
1988	14.2	17.3	3 039
1989	16.9	19.5	3 088
1990	17.6	19.6	3 136
1991	18.3	19.7	3 134
1992	18.2	19.4	3 165
1993	16.1	17.0	3 135
1994	15.5	16.2	3 192
1995	16.9	17.4	3 235
1996	20.4	20.4	3 316
1997	19.2	19.2	3 388
1998	13.1	11.5	3 398
1999	18.1	14.7	3 469
2000	28.2	26.8	3 504
2001	24.5	23.1	3 554
2002	25.0	23.2	3 855
2003	26.7	24.1	3 935
2004	37.7	29.6	4 109
2005	53.4	44.8	4 752
2006*)	62.8	51.7	..

NB. Concerns Crude Petroleum/Dubai, UK Brent and Alaska Average/W.Texas Average, spot, F.O.B
.. = data not available. *) = I–V/2006.

Source: United Nations Conference on Trade and Development – UNCTAD, Monthly Commodity Price Bulletins.

22. Mining of ores and industrial minerals and quarrying of limestone in Finland in 1980–2005 (million tonnes)

Year	Ores	Limestone	Industrial minerals
1980	10.5	3.1	3.1
1981	9.9	5.0	3.5
1982	9.7	5.5	5.1
1983	9.0	6.0	6.0
1984	9.5	5.6	7.1
1985	8.4	5.8	7.2
1986	6.9	5.0	7.2
1987	6.1	5.0	7.9
1988	6.1	5.4	8.3
1989	5.5	5.5	8.6
1991	5.5	5.3	7.2
1992	4.7	4.4	8.0
1993	4.9	4.1	8.7
1994	4.6	3.9	9.2
1995	3.2	3.4	9.3
1996	3.4	3.4	9.3
1997	3.5	3.7	9.9
1998	3.2	4.0	10.0
1999	3.1	3.9	10.4
2000	3.3	3.8	10.2
2001	2.9	4.1	10.7
2002	3.2	3.7	10.8
2003	3.2	4.0	11.5
2004	3.6	4.1	11.5
2005	3.6	3.8	11.6

Source: Mining Industry Association.

23. Consumption of land extractable resources in Finland in 1990–2004 (million tonnes)

Year	Gravel and sand	Crushed gravel	Crushed rock
1990	51	31	24
1991	44	26	24
1992	39	23	24
1993	31	18	24
1994	30	20	26
1995	28	20	28
1996	27	18	28
1997	28	20	30
1998	32	20	33
1999	35	20	36
2000	32	23	37
2001	30	23	38
2002	29	22	39
2003	31	24	40
2004	31	24	42

Source: The Central Association of Earth Moving Contractors in Finland.

24. Municipal waste delivered to landfill sites (1 000 tonnes)

1997	1 469
1998	1 514
1999	1 446
2000	1 580
2001	1 468
2002	1 485
2003	1 445
2004	1 423

Source: Finnish Environment Institute.

25. Growing stock increment and total drain (million solid cubic metres)

Year	Increment	Total drain
1980	66.8	59.7
1981	68.4	56.0
1982	69.4	48.5
1983	70.3	49.4
1984	71.3	52.3
1985	72.3	55.2
1986	73.2	49.6
1987	74.2	54.1
1988	75.2	57.1
1989	76.1	58.7
1990	77.1	55.1
1991	77.7	44.7
1992	78.2	51.0
1993	78.8	53.8
1994	79.3	61.7
1995	79.9	63.6
1996	80.4	59.0
1997	81.0	65.8
1998	81.0*)	69.4
1999	81.0*)	69.4
2000	81.0*)	70.0
2001	81.0*)	67.7
2002	81.0*)	68.7
2003	81.0*)	69.9
2004	81.0*)	69.9
2005	81.0*)	67.3

*) = estimate.

Source: Finnish Forest Research Institute, inventory of the Finnish forests.

26. Fertiliser use in agriculture (kilograms per arable hectare)

Year of fertilisation 1 July – 30 June	Nitrogen	Phos-phorus
1979/80	83.3	27.9
1980/81	82.4	27.8
1981/82	78.7	26.8
1982/83	91.4	29.9
1983/84	90.7	30.9
1984/85	88.9	30.8
1985/86	90.0	30.2
1986/87	94.4	31.0
1987/88	98.2	32.0
1988/89	100.3	29.7
1989/90	111.5	30.7
1990/91	109.4	26.3
1991/92	92.8	19.9
1992/93	94.3	19.4
1993/94	94.1	19.0
1994/95	101.6	20.0
1995/96	92.3	16.1
1996/97	86.0	11.8
1997/98	85.0	11.4
1998/99	81.0	11.0
1999/00	84.2	10.4
2000/01	83.2	10.8
2001/02	80.5	10.1
2002/03	80.3	9.9
2003/04	75.6	9.3
2004/05	75.0	9.2

Source: Information Centre of the Ministry of Agriculture and Forestry.

27. Use of pesticides in agriculture (1 000 kilograms of active ingredient)

Year	Weed killers	Others	Total
1990	1 580.1	413.8	1 993.9
1991	1 375.4	312.3	1 687.7
1992	1 006.7	332.8	1 339.5
1993	842.8	364.8	1 207.6
1994	929.2	342.5	1 271.7
1995	791.4	244.2	1 035.6
1996	677.3	234.8	912.1
1997	733.9	264.5	998.4
1998	843.9	320.3	1 164.2
1999	790.2	349.9	1 140.1
2000	862.4	284.9	1 147.3
2001	1 120.1	303.1	1 423.2
2002	1 277.8	342.4	1 620.2
2003	1 339.4	327.2	1 666.6
2004	1 174.2	314.7	1 488.9
2005	1 077.2	353.8	1 431.0

Source: Plant Production Inspection Centre.

28. Finland's phosphorus discharge into watercourses from industry, communities and fish farming sources (tonnes)

Year	Industry	Fish farming	Communities
1990	702	252	397
1991	583	204	292
1992	501	199	286
1993	417	182	245
1994	378	160	270
1995	358	165	245
1996	282	154	247
1997	273	135	235
1998	263	128	268
1999	250	122	259
2000	231	125	249
2001	234	120	220
2002	225	95	224
2003	230	80	200
2004	207	89	221
2005	195	84	197

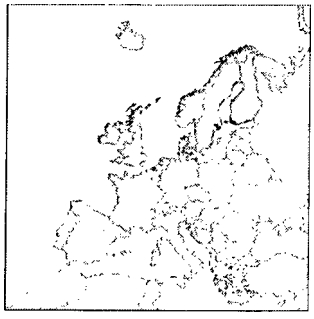
Source: Finnish Environment Institute.

29. Population development of certain bird species in agricultural environments (1983=100)

	Curlew	Swallow	Skylark	Starling
1983	100	100	100	100
1984	100	103	88	102
1985	113	81	98	76
1986	99	80	113	73
1987	108	67	100	55
1988	100	65	86	57
1989	104	63	77	52
1990	79	63	79	58
1991	113	64	77	40
1992	101	71	82	38
1993	97	67	47	35
1994	104	77	76	33
1995	95	79	81	37
1996	83	70	65	37
1997	98	69	67	37
1998	96	72	69	31
1999	82	69	73	46
2000	84	71	67	31
2001	93	66	87	41
2002	91	72	92	36
2003	82	74	63	45
2004	93	60	64	34
2005	94	55	69	31

Source: The Finnish Museum of Natural History

Finland in Figures



Suomi
Finland

Population: 5.3 million, with average density of only 16 persons per square kilometre; annual growth 0.2 per cent. Average household size is 2.8 persons. Of the total population, 79 per cent are urban dwellers, with 1.0 million living in the capital city of Helsinki and its surrounds. Ninety-two per cent speak Finnish and six per cent Swedish. Eighty-three per cent are Evangelic-Lutheran and one per cent Greek Orthodox. Seventy-three per cent of the population aged 25 to 64 have completed post-comprehensive education and 33 per cent have university degree or equivalent. Seventy-two per cent of Finnish households own a personal computer and 67 per cent have an Internet connection. Ninety-six per cent of households have a mobile phone.

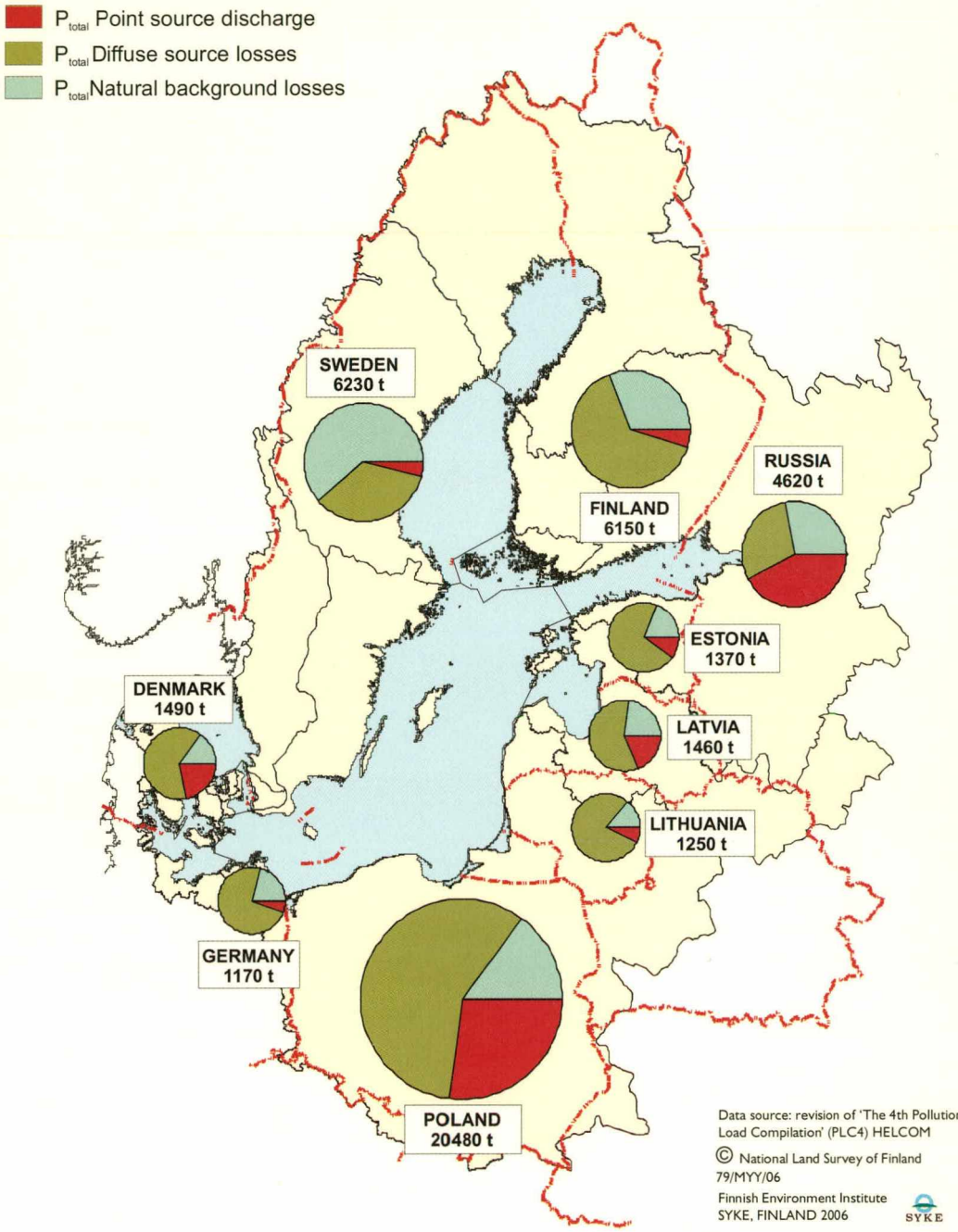
Area: Situated in northern Europe with an area of 338,145 square kilometres of which 304,473 square kilometres land area. Land boundary 614 kilometres with Sweden, 736 kilometres with Norway and 1,340 kilometres with Russia. Coastline approximately 1,250 kilometres. The greatest length is 1,157 kilometres, from Hanko to Utsjoki, and the highest point, Halti, 1,328 metres above sea level. Of the total area 10 per cent is covered by water. There are 188,000 fresh water lakes in Finland. Forests, mainly pine and spruce, cover 67 per cent of the country while 8 per cent of the land area is under cultivation, with barley and oats as the main crops.

Government: Finland has been a sovereign parliamentary republic since 1917. The head of the state is the president, elected every six years. The post has been held by Ms Tarja Halonen since 1 March 2000. The Parliament comprises 200 members, elected for a four-year term. The country is divided into 5 provinces and the Autonomous Territory of the Åland Islands. Member of the European Union since January 1995.

Economy: GDP in 2005 totalled EUR 155 billion (USD 200 billion), i.e. EUR 29,612 per capita when adjusted for purchasing power parity. One of the highest standards of living in the world. Of the total labour force 21 per cent are employed in industry, 35 in services, 15 per cent in trade, 14 per cent in financial and business services, 7 per cent in transport and communications, 2 per cent in agriculture and forestry and 6 per cent in construction. Unemployment rate, calculated according to EU standards, was 8.4 per cent in 2005.

Foreign trade: Main trading partners are Germany, Russia, Sweden, United Kingdom and USA. The value of imports totalled EUR 47 billion and that of exports EUR 52 billion in 2005. Of the imports 37 per cent were raw materials and 27 per cent consumer goods. Main exports are electrical equipment, pulp and paper products, machinery, and metal and chemical products.

Phosphorus discharges in the catchment area of the Baltic Sea



Finland's Natural Resources and the Environment 2006 is a review of the state of Finland's natural resources and the environment. It presents the main principles of interaction between the national economy and the environment and describes the extent to which the objectives of sustainable development have been realised in Finland. It also reviews trends in the main sectors of the economy as they affect the environment. These sectors include natural resources and environmental protection, industry, energy and transport. Finally, the publication contains a presentation of the principal agreements on the natural resources and the conservation of environment to which Finland is commited.

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