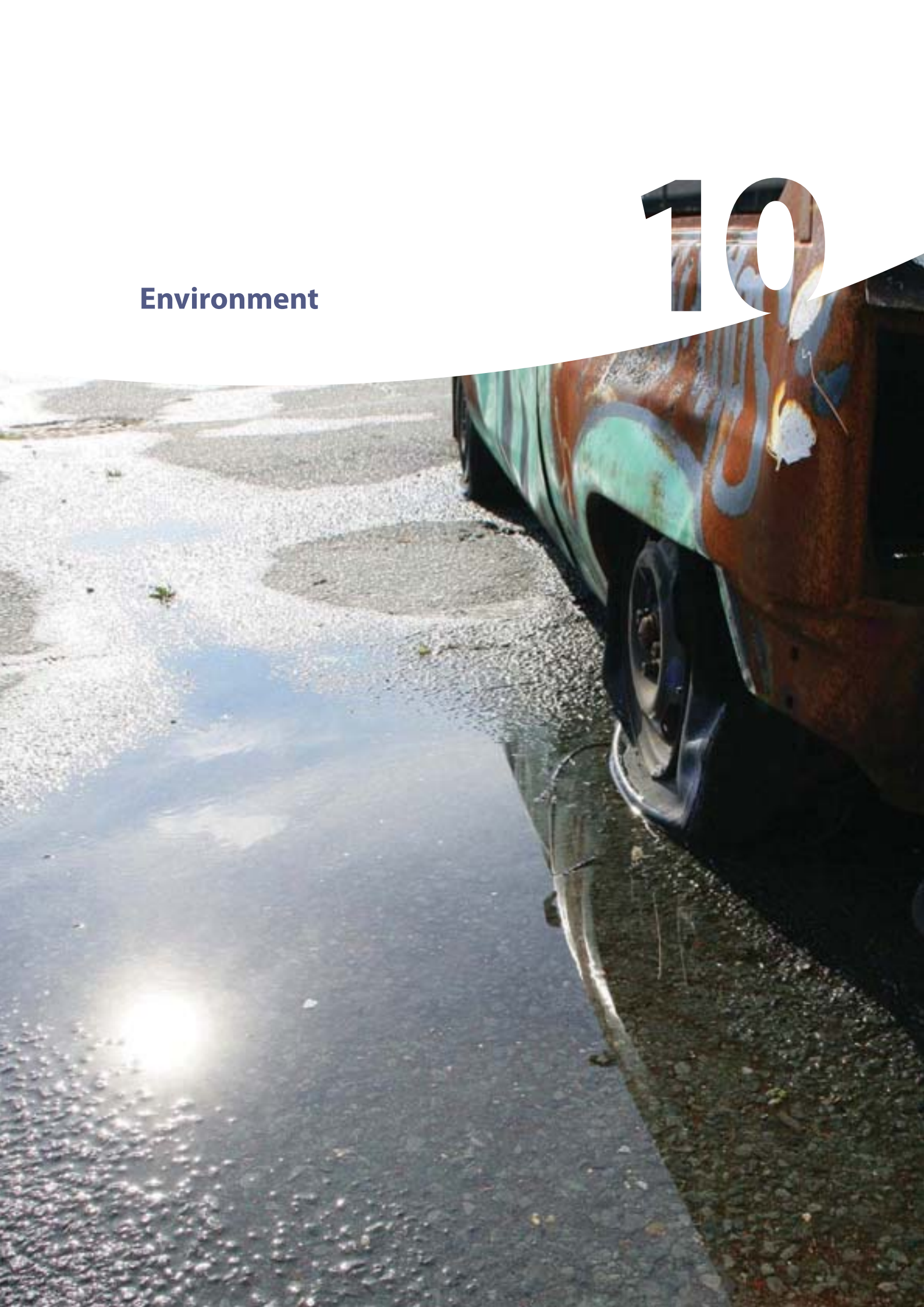
10

Environment





The sixth environment action programme (sixth EAP) [81], adopted in 2002, is the EU's ten-year (2002–2012) policy programme for the environment. It identifies four key priorities:

- tackling climate change: to achieve the EU's target of reducing greenhouse gas emissions by 8 % by 2008-2012 and target more radical global emission cuts in the order of 20 % by 2020;
- nature and biodiversity: to avert the loss of species and their habitats in Europe by completion of the Natura 2000 network and by developing new sectoral biodiversity action plans, and to pay greater attention to protecting landscapes, the marine environment and soils, and to establish measures to prevent industrial and mining accidents;
- environment and health: to completely overhaul the EU's risk-management system for chemicals, to develop a strategy for reducing risks from pesticides, protection of water quality in the EU, noise abatement and a thematic strategy for air quality;
- sustainable use of natural resources and the management of waste: to increase resource efficiency and decouple resource use from economic growth, to increase recycling and waste prevention with the aid of an integrated product policy and measures targeting specific waste streams such as hazardous waste, sludges and biodegradable waste.

(81) Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme; for more information: http://europa.eu/eur-lex/pri/en/oj/dat/2002/l_242/l_24220020910en00010015.pdf.

In order to implement the sixth EAP, the European Commission adopted seven thematic strategies; these are air pollution (adopted in September 2005), marine environment (October 2005), the prevention and recycling of waste (December 2005), the sustainable use of natural resources (December 2005), urban environment (January 2006), soil (September 2006) and the sustainable use of pesticides (July 2006).

Each strategy follows an in-depth review of existing policy and wide-ranging stakeholder consultation. The aim is to create positive synergies between the seven strategies, as well as to integrate them with existing sectoral policies, the Lisbon strategy and the sustainable development strategy.

The 2007 mid-term review of the sixth EAP [82] was held, and the results adopted by the European Commission in April 2007: this confirmed the programme as the framework for Community action in the field of the environment up to 2012.

Eurostat, in close partnership with the European Environment Agency (EEA), provides statistics, indicators and meta-information on environmental pressures and the state of the environment to support the implementation and monitoring of the sixth EAP.

(82) Commission Communication on the mid-term review of the Sixth Community Environment Action Programme, for more information: http://eur-lex.europa.eu/lexuriserv/lexuriserv.do?uri=com:2007:0225:fin:en:pdf.

SOURCES

Eurostat data in this domain

Environment and energy

- Environment
  - Air pollution/climate change
  - Waste
  - Waste statistics Regulation
  - Water
  - Environmental accounts
  - Biodiversity

Key indicators on EU policy (predefined tables)

- Sustainable development
  - Sustainable consumption and production
    - Resource use and waste
    - Consumption patterns
    - Production patterns
  - Public health
  - Determinants of health
  - Climate change and energy
    - Climate change
  - Sustainable transport
    - Social and environmental impact of transport
  - Natural resources
    - Biodiversity
    - Fresh water resources
    - Marine ecosystems
    - Land use

10.1 CLIMATE CHANGE

INTRODUCTION

The fourth assessment report from the International Panel on Climate Change (IPCCC) confirmed that climate change is happening and is projected to continue; the emission of greenhouse gases from human activities, such as the burning of coal, oil and gas, is causing an overall warming of the earth's atmosphere, and climate change is the most likely result with potentially major economic and social consequences [83].

Data on greenhouse gas emissions are officially reported under the United Nations Framework Convention on Climate Change – UNFCCC [84] – and the Kyoto Protocol. The so-called Kyoto basket includes six greenhouse gases (GHG): carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).

(83) 'Winning the battle against global climate change', COM(2005) 35; for more information: http://ec.europa.eu/environment/climat/pdf/comm_en_050209.pdf.

(84) For more information: http://unfccc.int.

Under the Kyoto Protocol, the EU has agreed to an 8 % reduction in its greenhouse gas emissions by 2008-2012, compared with a base year of 1990. The reductions for each of the EU-15 Member States have been agreed under the so-called EU burden sharing agreement, which allows some countries to increase emissions, provided these are offset by reductions in other Member States. The ten Member States that joined the EU in 2004, as well as Bulgaria and Romania, have chosen other reduction targets and other base years as allowed under the protocol. Emissions of the six greenhouse gases covered by the protocol are weighted by their global warming potentials (GWPs) and aggregated to give total emissions in CO_2 equivalents.

In February 2006, the European Commission adopted the fourth national communication [85] from the European Community under the UNFCCC, in which it describes the wide range of policies on climate change, provides projections for greenhouse gas emissions, and outlines the effect of European Community policies and measures on such gases. In August 2006, the European Commission adopted a communication implementing a Community strategy to reduce CO_2 emissions from cars [86].

(85) COM(2006) 40; for more information: http://unfccc.int/resource/docs/natc/eunce4.pdf.

(86) COM(2006) 463; for more information:http://eur-lex.europa.eu/LexUriServ/site/en/com/2006/com2006_0463en01.pdf.

In January 2007, the European Commission proposed a number of EU targets for 2020:

- greenhouse gas emissions should be cut by 20 % compared with 1990 levels;
- renewable energy sources (such as hydro, solar and wind energy) should provide 20 % of all energy used;
- biofuels should account for 10 % of all transport fuels; and
- total energy consumption should be cut by 20 % through increased energy efficiency.

At their spring European Council in March 2007, EU Heads of State and Government pledged that the EU would reduce its emissions in the order of 30 % below 1990 levels by 2020 provided that other developed countries agreed to make similar efforts. EU leaders endorsed the package of climate and energy measures put forward by the Commission as the basis for achieving this goal.

DEFINITIONS AND DATA AVAILABILITY

The European Environment Agency, assisted by its European Topic Centre on Air and Climate Change, compiles the annual European Community greenhouse gas inventory report for submission to the UNFCCC Secretariat.

Emissions data for the six greenhouse gases (GHG): CO_2, CH_4, N_2O, HFC, PFC and SF_6 are normalised by conversion to CO_2-equivalents. Land use changes and forestry are excluded from the calculations of GHG emissions. The base quantity is defined by the GHG emissions in the base year, which is 1990 for the non-fluorinated gases (CO_2, CH_4 and N_2O) and 1995 for the fluorinated gases (HFC, PFC and SF6), with exceptions for some countries. Greenhouse gas emission reduction targets for 2008-2012 are those agreed upon in Council Decision 2002/358/EC (for the Member States) or in the Kyoto Protocol (all other countries).

MAIN FINDINGS

Compared with the base year value of 100 in 1990, by 2005 the EU-15 Member States had reduced their greenhouse gas emissions by 2 %, with an 8 % reduction being calculated for the EU-27.

In 2005, GHG emissions in ten of the Member States (including Cyprus and Malta, which do not have a Kyoto target) were above base year levels, whereas emissions were below base year levels for the remaining 17 Member States.

The EU inventory of greenhouse gas emissions for 2005 showed that levels for the EU-15 and EU-27 were 0.8 % and 0.7 % lower than in 2004 respectively. These reductions took place against the background of a 1.8 % increase in GDP for the EU-27 in 2005.

Germany, Finland, the Netherlands and Romania were the largest contributors to the 2005 decrease in GHG emissions in absolute terms. Germany reduced its emissions by 2.3 % or 23.5 million tonnes of CO_2 equivalents, Finland by 14.6 % (11.9 million tonnes), Romania by 4.1 % (6.4 million tonnes) and the Netherlands by 2.8 % (6.3 million tonnes). Belgium, the Czech Republic, Denmark, Estonia, France, Luxembourg, Slovakia, Sweden and the United Kingdom also recorded falls.

The decrease in 2005 emissions for the EU-15 was due mainly to lower CO_2 emissions from public electricity and heat production, households and services, and road transport. Emissions of CO_2 from public electricity and heat production declined by 0.9 %, due mainly to a reduction in the use of coal. CO_2 emissions from households and services decreased by 1.7 %, with substantial falls in Germany, the United Kingdom and the Netherlands; one reason for this was the milder than usual winter. Germany also achieved significant reductions in methane emissions from its waste sector. CO_2 emissions from road transport declined by 0.8 % in the EU-15, largely due to a fall in Germany.

Among EU-15 Member States, Spain recorded the largest emissions increase in absolute terms in 2005, with a rise of 3.7 % or 15.4 million tonnes of CO_2 equivalents. This was due mainly to a 17 % increase in electricity production by fossil-fuel power stations, coupled with a 33 % fall in electricity generated by hydro-power plants due to reduced river levels.

Among the 12 Member States that have joined the EU since 2004, the largest increase in emissions in absolute terms was in Poland, for whom there was a rise of 0.6 % or 2.3 million tonnes of CO_2 equivalents in 2005. This higher level of emissions was due mainly to a 1 % increase in fugitive methane emissions from energy and rises in methane and nitrous oxide emissions from the agriculture sector of 5 % and 4.5 % respectively.

Emission levels for 2005 were also higher in Austria, Bulgaria, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Portugal and Slovenia.

Some 80 % of the GHG (mainly CO_2) emissions of EU-15 Member States came from the burning of fossil fuels for energy use (59 %) and transport activities (21 %) in 2005. This represented a 3.8 % increase on the levels in the base year of 1990. Agriculture (mainly CH_4) was responsible for 9 % of GHG emissions in 2005, industrial processes for 8 % and waste generation (87) a further 3 %.

The latest projections suggest that in order for the EU to reach its intended targets for 2020, it will have to put emissions on a much steeper reduction path after 2012.

(87) Report from the European Commission on 'Progress towards achieving the Kyoto objectives', COM(2006) 658 final, 27.10.2006, http://ec.europa.eu/environment/climat/gge_progress.htm#2006.

SOURCES

Pocketbooks

Energy, transport and environment indicators

WEBSITE DATA

Environment

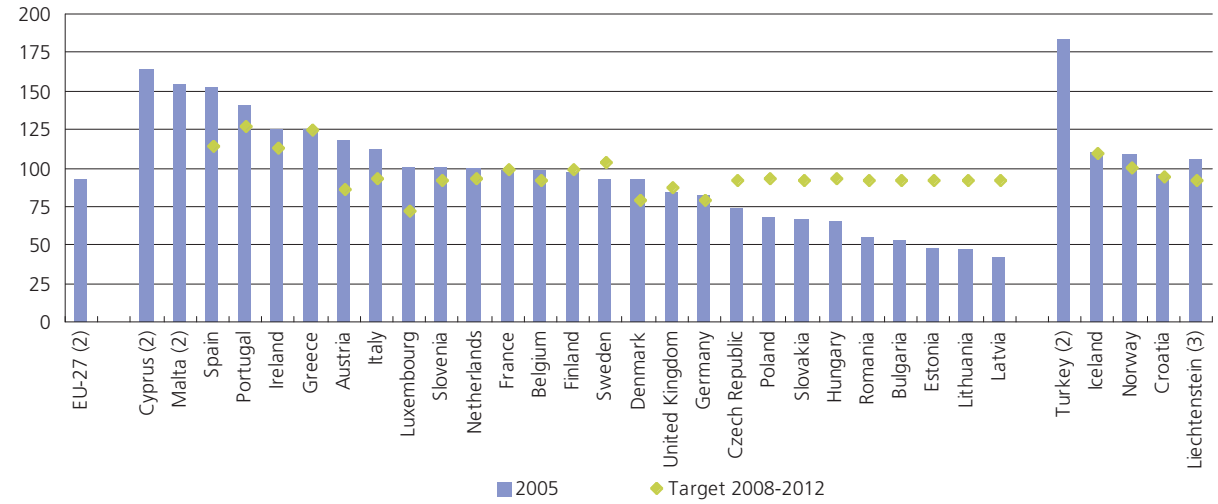
Air pollution/climate change

Indicators for air pollution and climate change

Air emissions

Figure 10.1: Total greenhouse gas emissions (1)

(1990=100)



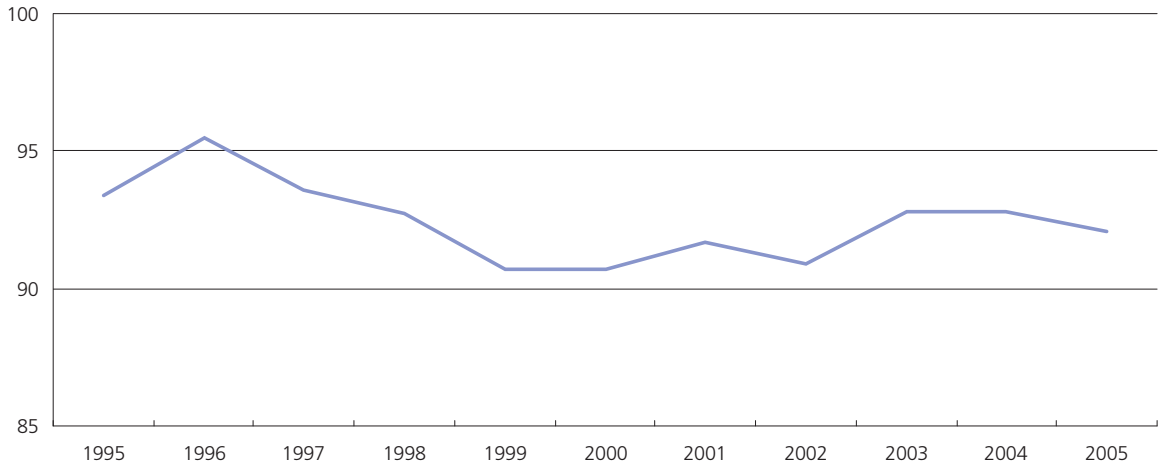
(1) Generally index based on 1990=100.
(2) No target under the Kyoto Protocol.
(3) 2003.

Source: Eurostat (tsien010), European Environment Agency

Under the Kyoto Protocol, the EU has agreed to an 8 % reduction in its greenhouse gas emissions by 2008-2012, compared to the Kyoto base year. The reductions for each of the EU-15 countries have been agreed under the so-called EU Burden Sharing Agreement (Council Decision 2002/358/EC), which allows some countries to increase emissions, provided these are offset by reductions in other Member States. Eight of the ten new Member States have chosen other reduction targets and other base years, as allowed under the Kyoto Protocol. These and the 'Burden sharing' targets for 2008-2012 are shown in the table as figures for 2010 (no target for Cyprus and Malta). Emissions of the 6 greenhouse gases covered by the Protocol are weighted by their global warming potentials (GWPs) and aggregated to give total emissions in CO_2 equivalents. The total emissions are presented as indices, with the base year=100. In general, the base year is 1990 for the non-fluorinated gases (CO_2, CH_4 and N_2O), and 1995 for the fluorinated gases (HFC, PFC and SF_6; exception see meta data). Data exclude emissions and removals due to land use change and forestry (LUCF).

Figure 10.2: Greenhouse gas emissions, EU-27 (1)

(1990=100)



(1) Weighted emissions of greenhouse gases represented 5 249 million tonnes of CO_2 equivalent in 1995 and 5 177 million tonnes in 2005.

Source: Eurostat (tsien010 and ten00072), European Environment Agency

The annual greenhouse gas (GHG) emissions are estimated and reported under the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Decision 280/2004/EC. The so called Kyoto basket includes six gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6). The impact of land use, land use changes and forestry (LULUCF) on the GHG inventories is excluded. Emissions are weighted according to the global warming potential of each gas. To obtain emissions in CO_2-equivalents using their global warming potential (GWP) the following weighting factors are used: CO_2=1, CH_4=21 and N_2O=310, SF_6=23900. HFCs and PFCs comprise a large number of different gases that have different GWPs.

Table 10.1: Greenhouse gas emissions

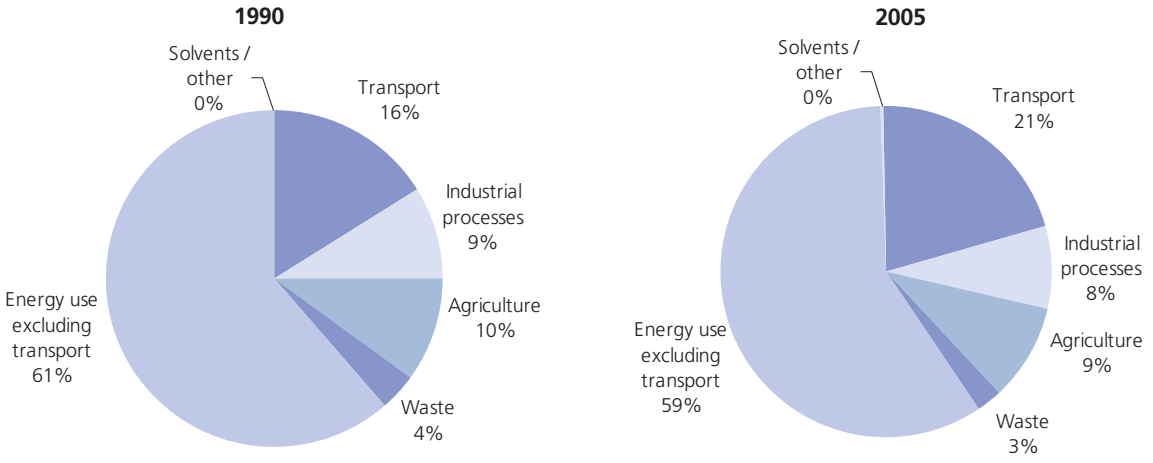
	Total greenhouse gas emissions (1990=100) (1)				Weighted emissions of greenhouse gases (million tonnes of CO_2 equivalent) (2)			
	1995	2000	2005	Target 2008-2012	1995	2000	2005	Share in EU-27 (%)
EU-27	93.4	90.7	92.1	-	5 249.4	5 099.7	5 176.9	-
Belgium	103.6	100.4	97.9	92.5	152.1	147.5	143.9	2.8
Bulgaria	65.6	50.7	52.8	92.0	86.7	66.9	69.8	1.3
Czech Republic	78.7	75.9	74.2	92.0	154.5	149.0	145.6	2.8
Denmark	110.0	98.4	92.2	79.0	76.3	68.2	64.0	1.2
Germany	88.9	82.7	81.3	79.0	1 095.7	1 019.8	1 001.5	19.3
Estonia	53.8	45.9	48.0	92.0	23.2	19.7	20.7	0.4
Ireland	106.4	123.9	125.4	113.0	59.4	69.1	70.0	1.4
Greece	101.9	118.6	125.4	125.0	113.2	131.8	139.2	2.7
Spain	110.0	132.8	152.3	115.0	318.4	384.4	440.6	8.5
France	99.1	99.3	98.1	100.0	558.9	559.7	553.4	10.7
Italy	102.5	106.6	112.1	93.5	532.5	553.8	582.2	11.2
Cyprus	119.5	144.7	163.7	-	7.2	8.7	9.9	0.2
Latvia	48.2	38.8	42.0	92.0	12.5	10.1	10.9	0.2
Lithuania	45.3	38.9	46.9	92.0	21.8	18.7	22.6	0.4
Luxembourg (3)	77.0	75.2	100.4	72.0	9.8	9.5	12.7	0.2
Hungary	65.9	64.3	65.5	94.0	81.1	79.1	80.5	1.6
Malta	122.4	129.0	154.8	-	2.7	2.9	3.4	0.1
Netherlands	104.9	99.9	98.9	94.0	225.1	214.4	212.1	4.1
Austria	101.7	102.7	118.1	87.0	80.3	81.1	93.3	1.8
Poland	77.2	69.0	68.0	94.0	453.2	405.1	399.0	7.7
Portugal	116.7	135.0	140.4	127.0	71.1	82.3	85.5	1.7
Romania	66.2	49.1	54.4	92.0	187.0	138.6	153.7	3.0
Slovenia	91.4	92.6	100.4	92.0	18.5	18.7	20.3	0.4
Slovakia	72.3	65.8	66.4	92.0	53.0	48.3	48.7	0.9
Finland	100.6	98.5	97.4	100.0	71.6	70.0	69.3	1.3
Sweden	102.0	94.5	92.6	104.0	73.7	68.3	67.0	1.3
United Kingdom	91.1	86.4	84.3	87.5	710.1	674.0	657.4	12.7
Croatia	70.4	81.1	95.5	95.0	21.9	25.3	29.7	-
Turkey	129.8	164.0	184.0	-	220.7	278.8	312.9	-
Iceland	93.6	109.9	110.5	110.0	3.1	3.7	3.7	-
Liechtenstein (4)	86.9	86.8	105.3	92.0	0.2	0.3	0.3	-
Norway	100.2	107.6	108.8	101.0	49.8	53.6	54.2	-
Switzerland	:	:	:	92.0	51.0	51.7	53.6	-

(1) Generally index based on 1990=100; EU-27, Cyprus and Malta, no target under the Kyoto Protocol.
(2) Estimates for Cyprus, Malta, Croatia (2005) and Turkey (2000).
(3) Total greenhouse gas emissions, break in series, 1995.
(4) Total greenhouse gas emissions, 2003 instead of 2005.

Source: Eurostat (tsien010 and ten00072)

Figure 10.3: Greenhouse gas emissions by sector, EU-15, 2005 (1)

(%, based on data in million tonnes CO_2 equivalent)



(1) Total emissions were 4 192 million tonnes of CO_2 equivalent for the EU-15.

Source: Eurostat (tsdcc100), European Environment Agency

Aggregated emissions of Kyoto basket of 6 greenhouse gases weighted by their global warming potentials (GWPs). Using GWPs, emissions of individual gases are translated into CO_2 equivalents that can be added up to one figure. Weighting factors: carbon dioxide = 1, methane = 21, nitrous oxide = 310 and sulphur hexafluoride = 23 900. Hydrofluorocarbons and perfluorocarbons comprise a large number of different gases that have different GWPs.

10.2 AIR POLLUTION

INTRODUCTION

Data on air pollution is officially reported under the Convention on Long-range Transboundary Air Pollution – CLRTAP – to the EMEP project; EMEP stands for Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air pollutants in Europe. The air pollutants that are reported are ammonia (NH_3), sulphur oxides (SO_2 and SO_3 as SO_x), nitrogen oxides (NO and NO_2 as NO_x), non-methane volatile organic compounds (NMVOC), carbon monoxide (CO), and particulate matter (PM10, particles defined as having aerodynamic diameter of 10 ìm or less). Where PM10 data are not reported by countries to EMEP/CLRTAP, emission estimates can be obtained from the Regional Air Pollution Information and Simulation (RAINS) model.

Air pollution caused by human activities, the rise of industrial and energy production, the burning of fossil fuels and increased transport can lead to serious health problems. Air pollution damages the health of hundreds of thousands of Europeans every year. A 2004 WHO evaluation found that air pollution contributed to 100 000 premature deaths and 725 000 working days lost annually in Europe.

Since the early 1970s, the EU has been working to improve air quality by controlling emissions of harmful substances into the atmosphere, improving fuel quality, and by integrating environmental protection requirements into the transport and energy sectors. Clean Air for Europe (CAFE) [88] is a programme of technical analysis and policy development that has led to a strategy setting out the objectives and measures for the next phase of European air quality policy.

Although ozone (O_3) is present in small concentrations throughout the atmosphere, most ozone (about 90 %) exists in the stratosphere, a layer between 10 and 50 km above the surface of the earth. This ozone layer performs the essential task of filtering out most of the sun's biologically harmful ultraviolet (UV-B) radiation.

At ground level, ozone is harmful. It is formed by atmospheric pollutants and is often associated with human activities, such as the burning of fossil fuels and biomass, traffic emissions, or the use of aerosols, while natural events, such as volcanic eruptions, can also have an impact. Areas with heavy traffic are particularly susceptible to the formation of ground level ozone; this problem is exacerbated by particular climatic conditions. Ground-level ozone is a secondary pollutant caused by nitrogen oxide and volatile organic compounds reacting in sunlight; it harms human health, nature and biological diversity, crops and materials.

(88) Clean Air for Europe (CAFE) was launched in March 2001 with a Communication (COM(2001) 245)); for more information: http://ec.europa.eu/environment/air/cafe.

People living in urban areas are therefore most at risk from ground level ozone. Higher concentrations of ground level ozone can have harmful effects on the respiratory tract, can cause breathing difficulties, damage lungs and can trigger asthma attacks.

Indeed, human health is also at risk from high concentrations of particles, particularly those smaller than 10 µm, which penetrate deeply into the lungs, increasing the death rate in members of the population suffering from heart and lung diseases. Particles smaller than 2.5 µm are mostly soot, especially wood smoke and diesel-engine exhaust. These can persist in the air for long periods and can be transported over long distances. Coarser particles (soil and mineral ash) originate mainly from mechanical processes such as mining, quarrying and other industrial processes, as well as wear and tear of tyres and brakes in road traffic.

DEFINITIONS AND DATA AVAILABILITY

The European Environment Agency (EEA) and its European Topic Centre on Air and Climate Change compile data on emissions of air pollutants and on air quality for the Member States and the candidate countries. A near to real-time ozone information system is available on the EEA website (89).

Emissions of key air pollutants are available in EPER, a web-based register, which enables the public to view data from large industrial point sources in the EU (90).

MAIN FINDINGS

Although the data is incomplete in terms of country coverage, the highest concentration of particulate matter among people living in urban areas was found in Italy in 2004, at about 50 % more than the EU-25 average level of micrograms per cubic metre day. Exposure to air pollution by ozone was highest for the urban population in Greece, where the mean ozone concentrations registered in 2004 were almost two and a half times as high as the EU-25 average.

(89) Ozone today – European status; for more information: http://www.eea.europa.eu/maps/ozone/welcome.

(90) For more information: http://ec.europa.eu/environment/ippc/eper/index.htm.

SOURCES

Pocketbooks

Energy, transport and environment indicators

Website data

Environment

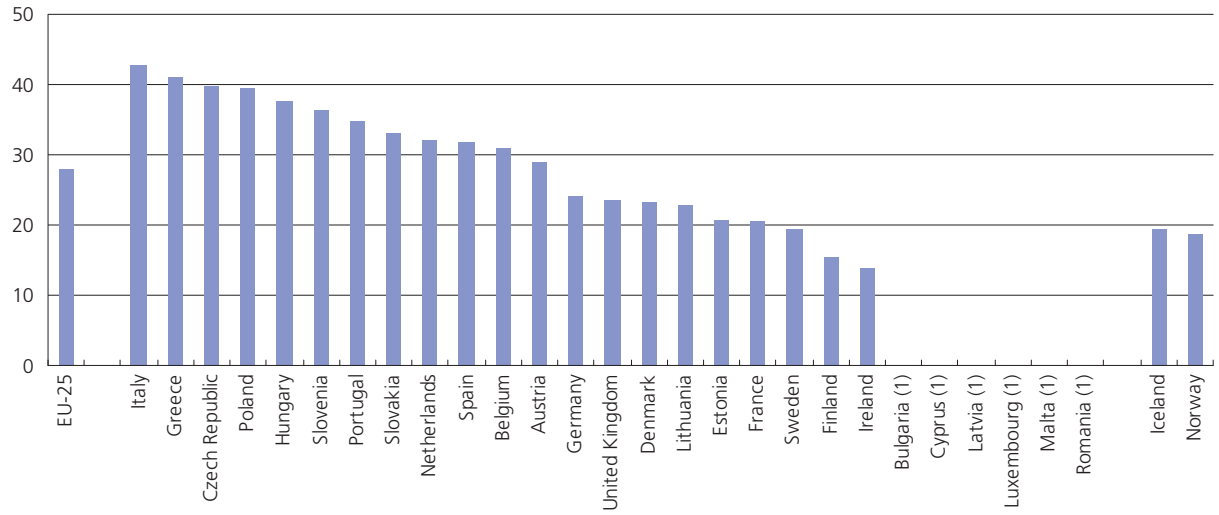
Air pollution/climate change

Indicators for air pollution and climate change

Air emissions

Figure 10.4: Urban population exposure to air pollution by particulate matter, 2005

(population weighted annual mean concentration of particulate matter – micrograms per cubic metre day)



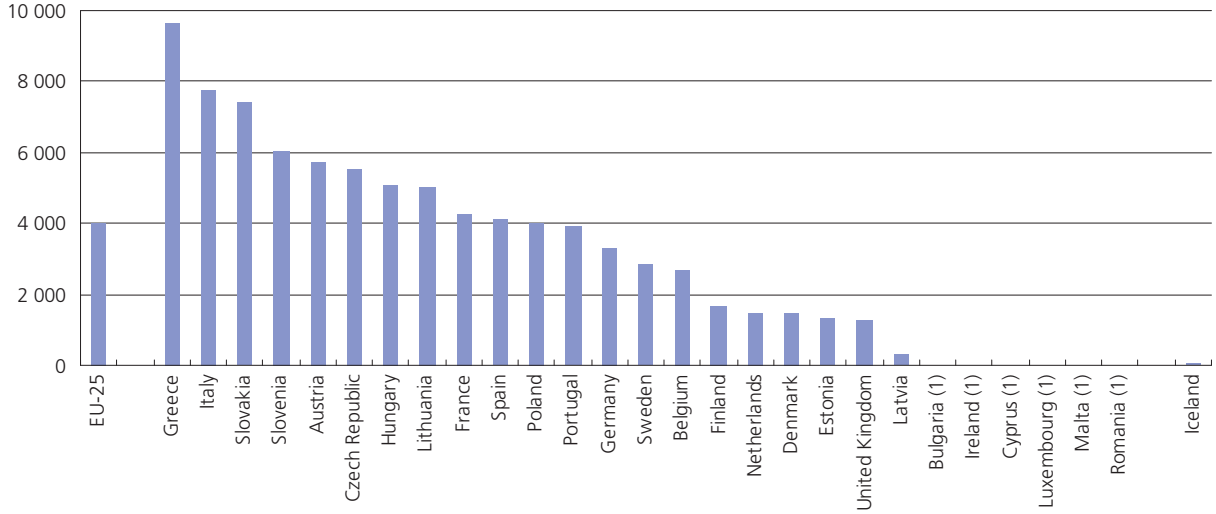
(1) Not available.

Source: Eurostat (tsien042), European Environment Agency, European Topic Center on Air and Climate Change

The indicator shows the population weighted annual mean concentration of particulate matter at urban background stations in agglomerations. Fine particulates (PM10), i.e. particulates whose diameter is less than 10 micrometers, can be carried deep into the lungs where they can cause inflammation and a worsening of the condition of people with heart and lung diseases. In 1996, the Environment Council adopted Framework Directive 96/62/EC on ambient air quality assessment and management. The first Daughter Directive (1999/30/EC) relating to limit values for PM10 and other pollutants in ambient air fixed an annual limit value of 40 microgram of PM10 per m³. Annual reporting must follow Commission Decision 2004/224/EC of 20 February 2004 laying down arrangements for the submission of information under Council Directive 96/62/EC in relation to limit values for certain pollutants in ambient air.

Figure 10.5: Urban population exposure to air pollution by ozone, 2005

(population weighted yearly sum of maximum daily 8-hour mean ozone concentrations above a threshold)



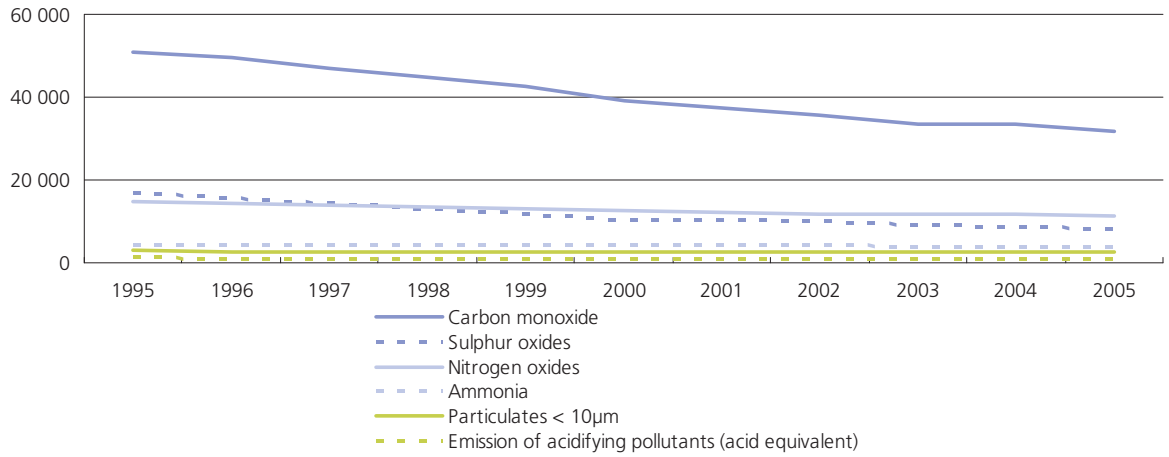
(1) Not available.

Source: Eurostat (tsien041), European Environment Agency, European Topic Center on Air and Climate Change

The indicator shows the population weighted yearly sum of maximum daily 8-hour mean ozone concentrations above a threshold (70 microgram ozone per m³) at the urban background stations in agglomerations. Ozone is a strong photochemical oxidant, which causes serious health problems and damage to the ecosystem, agricultural crops and materials. Human exposure to elevated ozone concentrations can give rise to inflammatory responses and decreases in lung function. In 1996, the Environment Council adopted Framework Directive 96/62/EC on ambient air quality assessment and management. The third Daughter Directive (2002/3/EC) relating to ozone was adopted on 12 February 2002 with a long-term objective of 120 microgram ozone per m³ as a maximum daily 8-hour mean within a calendar year. The annual reporting must follow the Commission Decision 2004/224/CE of 20 February 2004 laying down arrangements for the submission of information under Council Directive 96/62/EC in relation to limit values for certain pollutants in ambient air.

Figure 10.6: Air pollutants, EU-27

(1 000 tonnes)



Source: Eurostat (ten00073, ten00070, ten00074, ten00067 and ten00068), European Environment Agency

Carbon dioxide (CO_2) is by far the most important greenhouse gas, accounting for above 82% of the global warming potential due to anthropogenic GHG emissions covered by the Kyoto Protocol. The main source of CO_2 is the burning of fossil fuels. The annual emissions are estimated and reported under the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Decision 280/2004/EC. The impact of land use, land use changes and forestry (LULUCF) is excluded.

Carbon monoxide (CO) is an odorless, colorless and toxic gas. It is impossible to see, taste or smell the toxic fumes. It is a major product of the incomplete combustion of carbon and carbon-containing compounds. Carbon monoxide impairs the oxygen admission of people and animals as an air pollutant. Already low quantities of this breath poison have consequences for the central nervous system. In addition CO also takes part in the photo-chemical formation of near-surface (tropospheric) ozone. Therefore, CO emissions are reported under the Geneva Convention on Long-range Transboundary Air Pollution (CLRTAP).

Methane (CH_4) is a greenhouse gas and a precursor for tropospheric ozone. Agriculture is the dominant source of anthropogenic CH_4 emissions with 47 % in 2005 in the EU-27; the other two important sources are waste management and fugitive emissions by the energy use (31 % and 17 %, respectively). In agriculture, methane is produced as a by-product of enteric fermentation, an anaerobic digestive process. Both ruminant animals (e.g. cattle, sheep) and some non-ruminant animals (e.g. pigs, horses) produce methane; dairy cows are the principal producers. Livestock manure is the second most important source of methane. In this case, methane is produced during the decomposition of manure under anaerobic conditions, while under aerobic conditions, carbon dioxide will be produced. These anaerobic conditions often occur when large numbers of animals are managed in a confined area (e.g. dairy farms, beef feedlots and pig and poultry farms). The annual emissions are estimated and reported under the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Decision 280/2004/EC. The impact of land use, land use changes and forestry (LULUCF) is excluded.

Sulphur dioxide (SO_2) is colourless and non-flammable. The main sources of SO_2 are coal and oil combustion. Volcanoes are the most important natural source. SO_2 dissolves in water in the air to form microscopic acid aerosols that cause acid rain, acidifying lakes and rivers, and increasing erosion. It interacts with other substances, such as ammonia, being an important contributor to the formation of particulate matter, responsible for scattering and absorbing radiation, affecting our climate and contributing to produce a haze that reduces visibility (smog above urban areas). When combined with other gases and particles in the air it forms sulphates and other products that can have adverse effects on human health (respiratory system, eye and lung irritations), the environment (damage vegetation), corrodes metals and damages buildings and materials. The air emissions of sulphur oxides (SO_2 and sulphur trioxide-SO_3 reported as SO_x) are estimated and reported under the Geneva Convention on Long-range Transboundary Air Pollution (CLRTAP), the Gothenburg Protocol and National Emission Ceilings Directive (NEC Directive 2001/81/EC).

Nitric oxide (NO) is colourless and odourless. The nitric oxide molecule is a free radical, which makes it very reactive and unstable. In air, it quickly reacts with oxygen to form the poisonous nitrogen dioxide (NO_2) which is an odorous, brown, acidic, highly-corrosive gas responsible for the yellowish-brown colour of the photochemical smog. About 90 % of the nitrogen oxides (NO_x) from fuel combustion are emitted as NO. Nitric acid is formed by reaction of nitrogen oxides with water and it is a major contributor to acid rain. Nitrogen oxides (NO and NO_2 reported as NO_x) are the most important precursor for tropospheric ozone and particulate matter. The air emissions of nitrogen oxides (NO_x) are estimated and reported under the Geneva Convention on Long-range Transboundary Air Pollution (CLRTAP), the Gothenburg Protocol and National Emission Ceilings Directive (NEC Directive 2001/81/EC).

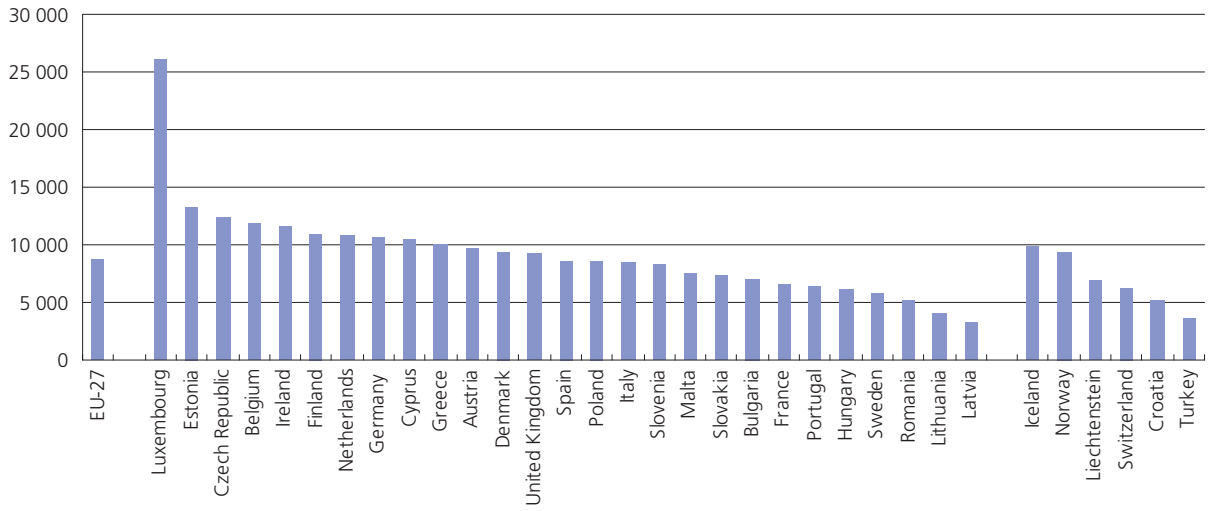
Table 10.2: Air pollutants

	Emissions of carbon dioxide (million tonnes)		Emissions of carbon monoxide (million tonnes)		Emissions of methane (million tonnes)		Emissions of sulphur oxides (million tonnes of SO_2 equivalent)		Emissions of nitrogen oxides (million tonnes of NO_2 equivalent)	
	1995	2005	1995	2005	1995	2005	1995	2005	1995	2005
EU-27	4 165.2	4 269.0	51.08	31.89	25.73	19.94	17.16	8.28	14.60	11.29
Belgium	123.7	123.3	1.11	0.88	0.51	0.37	0.26	0.15	0.37	0.29
Bulgaria	65.9	54.8	0.85	0.74	0.71	0.49	1.48	0.90	0.27	0.23
Czech Republic	132.1	125.9	1.00	0.51	0.64	0.52	1.09	0.22	0.37	0.28
Denmark	60.5	50.4	0.71	0.61	0.28	0.27	0.14	0.02	0.26	0.19
Germany	921.2	872.9	6.53	4.03	3.88	2.27	1.73	0.56	2.17	1.44
Estonia	20.1	18.0	0.21	0.16	0.10	0.09	0.12	0.08	0.04	0.03
Ireland	35.5	47.3	0.32	0.23	0.65	0.62	0.16	0.07	0.12	0.12
Greece	87.4	111.7	1.32	*0.64*	0.44	*0.40*	0.54	*0.53*	0.32	*0.32*
Spain	255.6	368.3	3.22	*2.38*	1.46	*1.77*	1.81	*1.36*	1.33	*1.53*
France	390.1	412.5	9.57	5.68	3.30	2.68	0.97	0.47	1.65	1.21
Italy	445.7	493.4	7.17	*4.21*	2.10	*1.91*	1.32	*0.50*	1.81	*1.17*
Cyprus	5.6	7.8	0.10	0.04	0.04	0.05	0.04	0.04	0.02	0.02
Latvia	9.1	7.6	0.32	0.34	0.10	0.09	0.05	0.00	0.04	0.04
Lithuania	15.0	14.2	0.29	0.19	0.18	0.16	0.09	0.04	0.07	0.06
Luxembourg	9.2	11.9	0.11	*0.04*	0.02	*0.02*	0.01	*0.00*	0.02	*0.01*
Hungary	61.9	61.8	0.76	0.59	0.39	0.37	0.70	0.13	0.19	0.20
Malta	2.3	*3.0*	:	:	*0.02*	0.02	*0.03*	0.02	*0.01*	0.01
Netherlands	170.6	175.9	0.86	0.60	1.13	0.80	0.13	0.06	0.47	0.34
Austria	63.7	79.7	1.01	0.72	0.41	0.34	0.05	0.03	0.19	0.23
Poland	377.5	326.5	4.55	3.33	2.04	1.82	2.38	1.22	1.12	0.81
Portugal	53.1	67.9	0.85	0.65	0.59	0.53	0.33	0.21	0.27	0.28
Romania	134.8	110.5	*2.09*	1.41	*1.49*	1.23	*0.89*	0.73	*0.32*	0.31
Slovenia	14.9	16.7	0.09	0.08	0.10	0.10	0.13	0.04	0.07	0.06
Slovakia	43.8	39.9	0.42	0.30	0.23	0.20	0.25	0.09	0.18	0.10
Finland	58.2	57.0	0.44	0.52	0.29	0.21	0.10	0.07	0.26	0.18
Sweden	58.0	52.6	0.90	0.60	0.32	0.27	0.07	0.04	0.28	0.20
United Kingdom	549.8	557.6	6.30	2.42	4.30	2.36	2.32	0.71	2.38	1.63
Croatia	16.3	*23.0*	0.34	*0.31*	0.12	*0.15*	0.08	*0.06*	0.06	*0.07*
FYR of Macedonia	:	:	*0.02*	0.10	:	:	*0.02*	0.10	*0.01*	0.03
Turkey	171.9	256.9	3.99	*3.78*	2.03	*2.35*	1.01	*1.35*	0.80	*0.95*
Iceland	2.3	2.9	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00
Liechtenstein	0.2	0.2	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*	0.00	*0.00*
Norway	37.8	43.2	0.73	0.45	0.24	0.22	0.03	0.02	0.21	0.20
Switzerland	43.3	46.0	0.49	0.33	0.19	0.17	0.03	0.02	0.12	0.09

Source: Eurostat (ten00073, ten00070, ten00074, ten00067 and ten00068)

Figure 10.7: Emissions of carbon dioxide, 2005

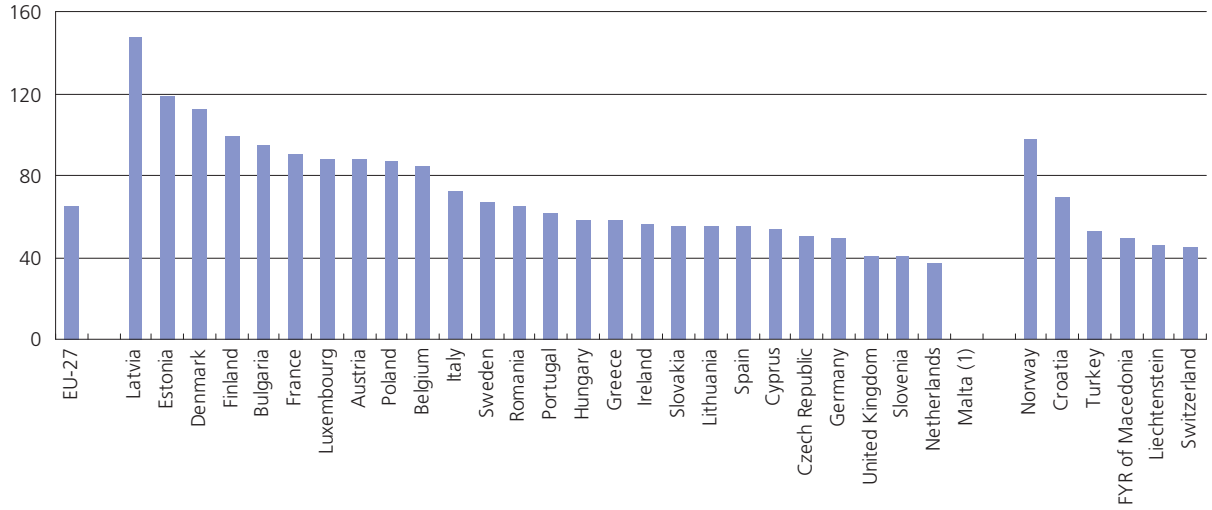
(kg per capita)



Source: Eurostat (ten00073 and tps00001)

Figure 10.8: Emissions of carbon monoxide, 2005

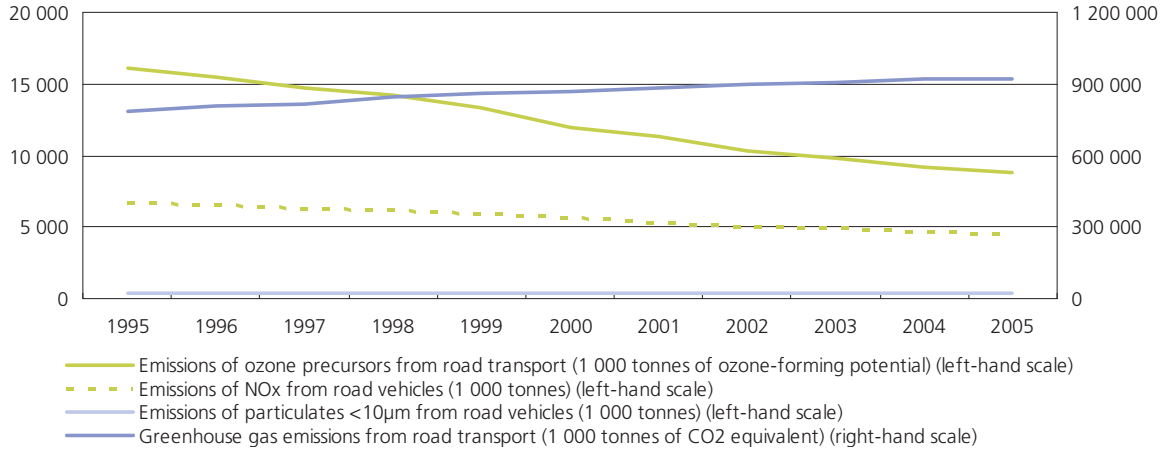
(kg per capita)



(1) Not available.

Source: Eurostat (ten00070 and tps00001)

Figure 10.9: Emissions associated with road vehicles, EU-27

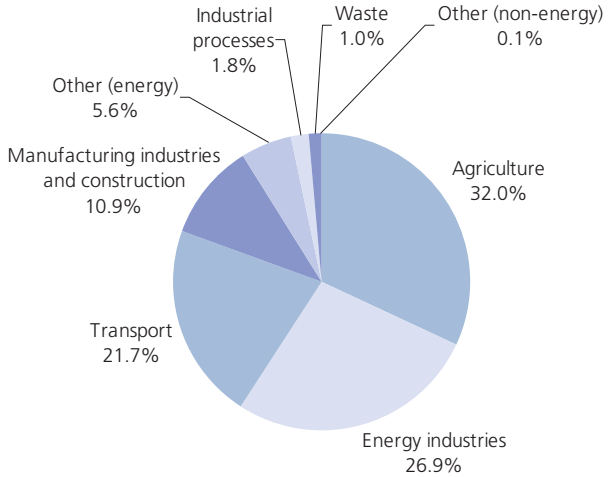


Source: Eurostat (tsdtr430, tsdtr440, tsdtr450 and tsdtr410), European Environment Agency, Topic Centre on Air and Climate

Ozone is a highly reactive gas causing or provoking respiratory problems in man and animals. It is also toxic to plants and can lead to leaf damage and defoliation. Tropospheric or ground-level ozone is a secondary pollutant. It forms when sufficient concentrations of precursor gases come into contact in the presence of sunlight. High concentrations of ozone result in the phenomenon known as summer smog. Tropospheric ozone is also a greenhouse gas. Reducing negative side-effects of transport is an important element of the sustainable development strategy. The precursors are principally volatile organic compounds, oxides of nitrogen, carbon monoxide and methane. With the exception of methane, these precursors are all produced in significant quantities by uncontrolled internal combustion engines. Weighting factors are used to combine the emissions of each individual gas, using their ozone formation potential. These factors are the following: nitrogen oxides = 1.22; volatile organic compounds without methane = 1; carbon monoxide = 0.11; methane = 0.014.

Figure 10.10: Weighted emissions of acidifying substances, by sector, EU-25, 2004 (1)

(%, based on data in 1 000 tonnes of acid equivalent)



(1) Estimates; transport, 2003; total emissions were 683 300 tonnes of acid equivalent.

Source: Eurostat (tsdpc260), European Environment Agency, Topic Centre on Air and Climate

This indicator tracks trends in anthropogenic atmospheric emissions of acidifying substances (sulphur dioxide, nitrogen oxides and ammonia) by source sector. Acidifying substance emissions are combined in terms of their acidifying effects, and expressed in acid equivalents.

10.3 WATER

INTRODUCTION

Water is essential for life, as well as an indispensable resource for the economy, while playing a fundamental role in the climate regulation cycle. The management and the protection of water resources, of fresh and salt water ecosystems, and of the water we drink and bathe in are therefore major concerns all around the world.

A study conducted for the European Commission estimates that water use efficiency could be improved by nearly 40 % through technological improvements alone and that changes in human behaviour or production patterns could increase such savings further. In a scenario without changes in practices it is estimated that water consumption by the public, industry and agriculture would increase by 16 % by 2030. Conversely, the use of water saving technologies and irrigation management in the industrial and agricultural sectors could reduce excesses by as much as 43 %, while water efficiency measures could decrease water wastage by up to a third.

In a Communication on water scarcity and droughts (91) adopted in July 2007, the European Commission identified an initial set of policy options to be taken at European, national and regional levels to address water scarcity within the EU. This set of proposed policies aims to move the EU towards a water-efficient and water-saving economy. Indeed, both the quality and availability of water are major concerns in many regions. While water resources are limited, water quality is affected by human activities such as industrial production, household discharges, or arable farming. The pollution of rivers, lakes and groundwater remains of worldwide concern.

The majority of the EU's population is connected to public water supplies, with the proportion rising close to 100 % in most Member States. Looking at the 'other end of the pipe', namely the treatment of wastewater, a number of countries reported that less than half of their population was connected to urban wastewater treatment.

(91) COM(2007) 414 final; for more information: http://eur-lex.europa.eu/LexUriServ/site/en/com/2007/com2007_0414en01.pdf.

DEFINITIONS AND DATA AVAILABILITY

Water statistics are collected through the inland waters section of a joint OECD/Eurostat questionnaire which is continuously adapted to the EU policy framework. It currently reports on the following:

- freshwater resources in groundwater and surface waters — these can be replenished by precipitation and by external inflows (water flowing in from other territories);
- water abstraction — a major pressure on resources, although a large part of the water abstracted for domestic, industrial (including energy production), or agricultural use is returned to the environment and its water bodies, but often as wastewater with impaired quality;
- water use, analysed by supply category and by industrial activities;
- treatment capacities of wastewater treatment plants and the share of the population connected to them — this gives an overview of the development status of the infrastructure, in terms of quantity and quality, that is available for the protection of the environment from pollution by wastewater;
- sewage sludge production and disposal — an inevitable product of wastewater treatment processes; its impact on the environment depends on the methods chosen for its processing and disposal;
- generation and discharge of wastewater — pollutants present in wastewater have different source profiles, and similarly the efficiency of treatment of any pollutant varies according to the method applied.

Statistics on water resources are usually calculated on the basis of long-term annual averages of at least 20 years, to take account of the fluctuations in rainfall and evaporation/transpiration from one year to the next.

Precipitation is defined as the total volume of atmospheric wet precipitation (mainly rain, snow and hail) and is usually measured by meteorological or hydrological institutes.

Evapotranspiration is the volume of water that is transported from the ground (including inland water surfaces – streams, rivers, freshwater lakes and glaciers) into the atmosphere by evaporation or by transpiration of plants.

Internal flow is defined as the total volume of river run-off and groundwater generated, in natural conditions, exclusively by precipitation into a territory. The internal flow is equal to precipitation less evapotranspiration and can be calculated or measured. If the river run-off and groundwater generation are measured separately, transfers between surface and groundwater should be netted out to avoid double counting. External inflow is the volume of inflow derived from rivers and groundwater that originate in a neighbouring territory. Freshwater resources refer to the volume of water resulting from internal flow and external inflow. Outflow is the volume of water that flows from rivers and groundwater into the sea and into neighbouring territories. Total additional freshwater resources available are calculated as the sum of internal and external flows.

Fresh surface water is defined as water which flows over, or rests on the surface of a land mass, natural watercourse – such as rivers, streams, brooks and lakes – as well as artificial watercourse – such as irrigation, industrial and navigation canals, drainage systems and artificial reservoirs.

Fresh groundwater is defined as freshwater which is being held in, and can usually be recovered from, or via, an underground formation. All permanent and temporary deposits of water, both artificially charged and naturally, in the subsoil, of sufficient quality for at least seasonal use.

Wastewater is defined as water which is of no further immediate value to the purpose for which it was used or in the pursuit of which it was produced because of its quality, quantity or time of occurrence. However, wastewater from one user can be a potential supply to another user elsewhere. Domestic wastewater is defined as wastewater from residential settlements and services which originates predominantly from the human metabolism and from household activities. Urban wastewater is domestic wastewater or the mixture of domestic wastewater with industrial wastewater and/or run-off rain water.

Urban wastewater treatment is all treatment of wastewater in urban wastewater treatment plants (UWWTPs). UWWTPs are usually operated by public authorities or by private enterprises working by order of public authorities. This includes wastewater delivered to treatment plants by trucks. This approach used in international water statistics is different to the concept applied in the EU Urban Wastewater Treatment Directive (91/271/EC) where only a system of conduits (sewage pipes) is taken into account for connection to the treatment plant.

The population connected to urban wastewater treatment relates to the proportion of persons who are connected to any kind of sewage treatment that is carried out in municipal treatment plants by public authorities or private enterprises on behalf of local authorities.

MAIN FINDINGS

Given the natural resources available, geographical characteristics and freshwater management, there are wide differences among the countries in terms of freshwater resources. On the basis of long-term annual averages of at least 20 years among the Member States, an overall picture shows that Finland and Sweden recorded the highest volume of freshwater resources per capita in 2006, while the Czech Republic and Poland recorded the lowest averages.

The population connected to urban wastewater treatment relates to the proportion of persons who are connected to any kind of sewage treatment (on behalf of local authorities). Although the data set is incomplete, only in eight of the 22 Member States with available data did the proportion of households connected to the urban wastewater treatment near or exceed 80 %, with the proportion almost reaching 100 % in the Netherlands. At the other end of the spectrum, household connection rates were less than 40 % in eight of the Member States, with a relatively low proportion in Greece, where this connection rate was around 11 %.

SOURCES

Pocketbooks

Energy, transport and environment indicators

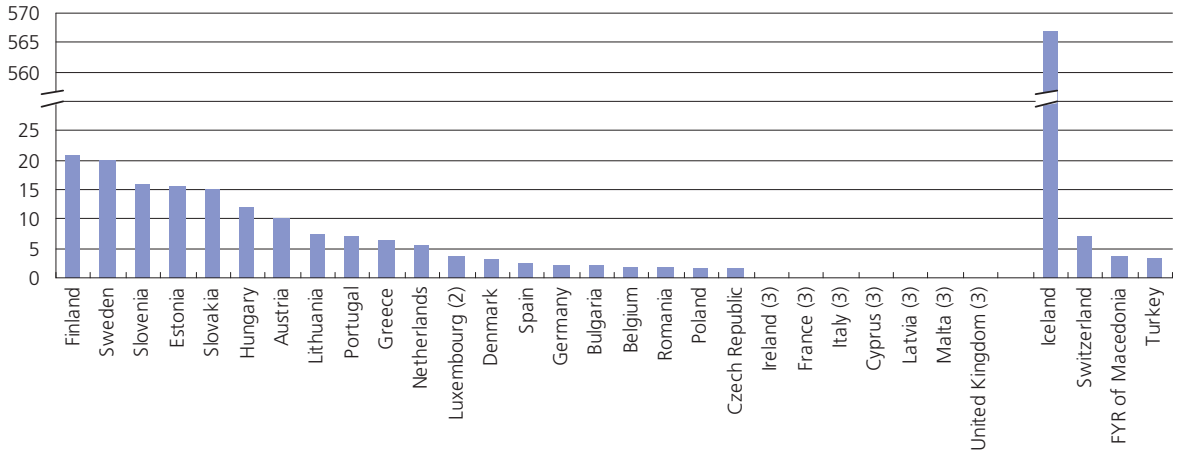
Website data

Environment

- Water
  - Water use balance
  - Renewable water resources
  - Annual water abstraction by source and by sector
  - Annual water abstraction by source and by sector per capita
  - Other sources of water
  - Other sources of water per capita
  - Water consumption by supply category and by sector
  - Water use by supply category per capita
  - National population connected to wastewater treatment plants
  - Treatment capacity of wastewater treatment plants
  - Sewage sludge production and disposal
  - Sewage sludge production and disposal per capita
  - Generation and discharge of waste water
  - Urban wastewater treatment with at least secondary treatment
  - Water use intensity

Figure 10.11: Freshwater resources per capita – long-term average (1)

(1 000 m³ per inhabitant)



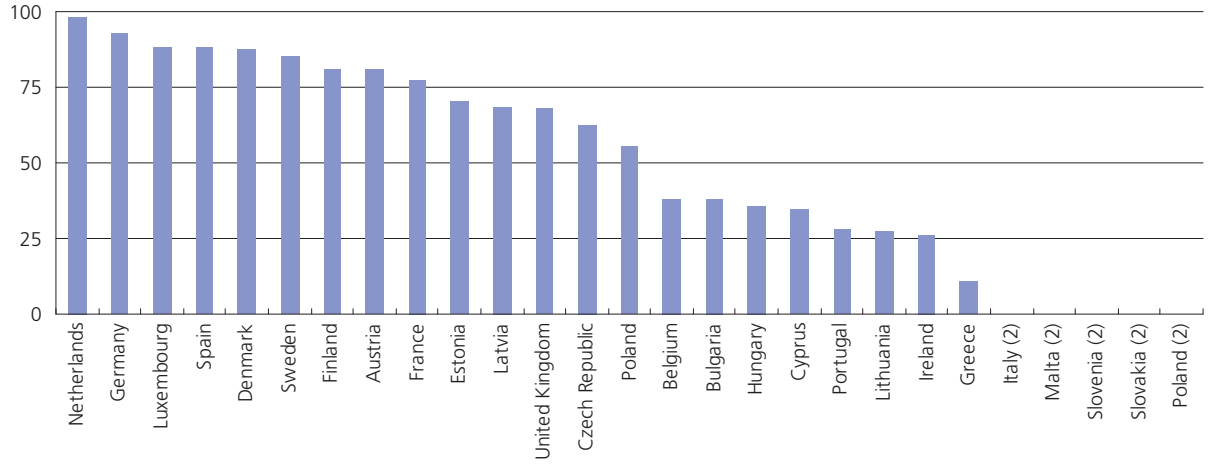
(1) The minimum period taken into account for the calculation of long term annual averages is 20 years; population data are as of 1 January 2006.
(2) Total freshwater resources, estimate.
(3) Not available.

Source: Eurostat (ten00001)

The minimum period taken into account for the calculation of long term annual averages is 20 years. Actual evapotranspiration is the volume of water transported from the ground (including inland water surfaces) into the atmosphere by evaporation and by transpiration of plants. Internal flow is the total volume of river run-off and groundwater renewal generated, in natural conditions, exclusively by precipitation into a territory. The internal flow is equal to precipitation less actual evapotranspiration. Actual external inflow is the total volume of actual inflow of rivers and groundwater coming from neighbouring territories. Total fresh water resources is the total volume of water that is additionally available due to internal flow and external inflow. Total actual outflow is the total actual outflow of rivers and groundwater into the sea and into neighbouring territories.

Figure 10.12: Population connected to urban wastewater treatment, 2003 (1)

(%)



(1) Estonia, Spain, Hungary, the Netherlands, Finland and Sweden, 2002; France and Germany, 2001; the Czech Republic and Ireland, 1999; Portugal, Belgium, Austria and Denmark, 1998; Greece, 1992; the United Kingdom, 1991.
(2) Not available.

Source: Eurostat (env_wat_urbww)

Table 10.3: Water resources

	Long-term annual averages, 20 years (million m³) (1)						Groundwater and surface water abstraction (% of available resources) (2)		
	Precipitation	Actual evapotranspiration	Internal flow	Actual external inflow	Total actual outflow	Total freshwater resources	1990	2000	2004
Belgium	28 547	16 146	12 401	8 347	17 785	20 748	:	:	:
Bulgaria	68 220	52 916	15 304	450	15 754	15 754	59.3	19.8	16.1
Czech Republic	54 653	39 416	15 237	740	15 977	15 977	62.4	41.4	40.3
Denmark	38 485	22 145	16 340	:	1 935	16 340	126.1	70.9	65.9
Germany	:	190 000	117 000	:	:	188 000	:	:	:
Estonia	30 647	18 603	12 044	9 070	11 920	21 114	:	:	:
Ireland	:	:	:	:	:	:	:	:	:
Greece	115 000	55 000	60 000	12 000	:	72 000	56.6	:	:
Spain	346 527	235 394	111 133	:	111 133	111 133	:	:	:
France	:	:	:	11 000	168 000	:	:	:	:
Italy	:	:	:	:	:	:	:	:	:
Cyprus	:	:	:	0	:	:	:	:	:
Latvia	42 197	:	:	17 415	33 532	:	:	23.7	20.8
Lithuania	44 010	28 500	15 510	8 990	25 897	24 500	:	:	:
Luxembourg	2 030	1 125	905	739	1 600	*1 644*	31.4	36.7	:
Hungary	58 000	52 000	6 000	114 000	120 400	120 000	:	11.0	10.8
Malta	:	:	:	:	:	:	:	:	:
Netherlands	29 770	21 290	8 480	81 200	86 300	89 680	55.2	49.6	:
Austria	98 000	43 000	55 000	29 000	84 000	84 000	4.0	3.6	:
Poland	193 100	138 300	54 800	8 300	63 100	63 100	:	:	:
Portugal	82 164	43 571	38 593	35 000	34 000	73 593	76.6	:	:
Romania	154 000	114 585	39 415	2 878	17 930	42 293	31.6	12.3	8.4
Slovenia	31 746	13 150	18 596	13 496	32 274	32 092	:	:	:
Slovakia	37 352	24 278	13 074	67 252	81 680	80 326	31.2	19.2	16.5
Finland	222 000	115 000	107 000	3 200	110 000	110 000	8.0	9.5	9.5
Sweden	335 600	:	170 000	:	179 000	179 000	17.6	18.4	18.2
United Kingdom	:	:	:	:	:	:	:	:	:
FYR of Macedonia	19 088	:	1 378	6 261	:	7 639	:	:	:
Turkey	501 000	273 600	227 400	6 900	178 000	234 300	:	:	:
Iceland	200 000	30 000	170 000	:	170 000	170 000	:	:	:
Switzerland	60 100	19 950	40 150	13 100	53 500	53 250	:	:	:

(1) The minimum period taken into account for the calculation of long-term annual averages is 20 years; population data are as of 1 January 2006.
(2) Bulgaria, 2003 instead of 2004; the Czech Republic and Hungary, 2002 instead of 2004; the Netherlands, 2001 instead of 2000; Luxembourg and Austria, 1999 instead of 2000; Luxembourg and Portugal, 1989 instead of 1990.

Source: Eurostat (ten00001 and env_watq2_1)

10.4 WASTE

INTRODUCTION

Waste refers to materials for which the generator has no further use for their own purpose of production, transformation or consumption; these materials are discarded. In some circumstances there may be statutory requirements on a producer to dispose of waste in a certain manner, for example, when waste materials are hazardous.

The EU's sustainable development strategy and the sixth environment action programme, which identifies waste prevention and management as one of four top priorities, underline the relationship between the efficiency of resources and waste generation and management. The objective is to decouple the use of resources and generation of waste from economic growth, while sustainable consumption should not exceed environmental capacity.

The EU's approach to waste management is based on three principles: waste prevention, recycling and reuse, and improving final disposal and monitoring. Waste prevention can be achieved through cleaner technologies, eco-design, or more eco-efficient production and consumption patterns. Waste prevention and recycling, focused on materials technology, can also reduce the environmental impact of resources that are used through limiting raw materials extraction and transformation during production processes. Where possible, waste that cannot be recycled or reused should be safely incinerated, with landfill only used as a last resort. Both these methods need close monitoring because of their potential for causing severe environmental damage.

The European Commission has defined several specific waste streams for priority attention, the aim being to reduce their overall environmental impact; this includes packaging waste, end-of-life vehicles, batteries, electrical and electronic waste. EU Directives now require Member States to introduce legislation on waste collection, reuse, recycling and disposal of these waste streams. Several Member States are already managing to recycle over 50 % of packaging waste. In 2006, Directives were adopted by the European Parliament and the Council on waste [92] and on shipments of waste [93], with the aim to strengthen, simplify and clarify the control procedures applicable to shipments of waste.

(92) Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 (text with EEA relevance); for more information: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_114/l_11420060427en00090021.pdf.

(93) Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006; for more information: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_190/l_19020060712en00010098.pdf.

DEFINITIONS AND DATA AVAILABILITY

In order to be able to monitor the implementation of waste policy, in particular compliance with the principles of recovery and safe disposal, reliable statistics on the production and management of waste from businesses and private households are needed. In 2002, Regulation No 2150/2002/EC on waste statistics [94] was adopted, creating a framework for harmonised Community statistics on waste.

Starting with the reference year 2004, the Regulation requires the EU Member States to provide data on the generation, recovery and disposal of waste every two years. Thus, the Regulation on waste statistics replaces the Eurostat/OECD Joint Questionnaire as the main source of European waste data. Whereas reporting by the Joint Questionnaire was voluntary, the provisions of the Regulation are binding in law.

The first delivery of data based on the Regulation on waste statistics for the reference year 2004 was due in June 2006; as data have to be provided every second year trends can be calculated from 2008 onwards.

The concept of 'municipal waste', a central waste category of the Joint Questionnaire is replaced in the new Regulation by the category 'waste generated by households'. The concept has always been disputed as its content is directly linked to different national or regional waste management systems. However, data on municipal waste is still collected annually from the countries, as it is part of the series of structural indicators on the environment.

Municipal waste consists of waste collected by or on behalf of municipal authorities and disposed of through the waste management system. The information presented on municipal waste includes waste generated by various branches of economic activity and households. For areas not covered by a municipal waste scheme, estimation has been made of the amount of waste generated. Data for waste recovery and recycling is not collected from countries but calculated as the difference between municipal waste generation and municipal waste incinerated and landfilled.

(94) Regulation (EC) No 2150/2002 of the European Parliament and of the Council of 25 November 2002; for more information: http://eur-lex.europa.eu/LexUriServ/site/en/consleg/2002/R/02002R2150-20050614-n.pdf.

Treatment of municipal waste can be classified into three principal categories:

- landfill, which is defined as the depositing of waste into or onto land, including specially engineered landfill, and temporary storage of over one year on permanent sites;
- incineration, which refers to the thermal treatment of waste in a specifically designed plant, and;
- recovery, which refers to any waste management operation that diverts a waste material from the waste stream and which results in a certain product with a potential economic or ecological benefit.

The disposal of waste can have a serious environmental impact: for example, landfill takes up land space, and may cause air, water and soil pollution. Incineration can also result in emissions of dangerous air pollutants, unless properly regulated.

MAIN FINDINGS

According to Eurostat statistics, about 1 300 million tonnes of waste is thrown away each year in the EU, of which some 40 million tonnes involve hazardous waste. Relative to population, this amounts to about 3.5 tonnes of solid waste per capita. Agricultural waste accounted for a further 700 million tonnes.

There have been visible efforts in waste prevention and management in the EU in recent years. Analysed relative to the size of the population in the EU-27, the data presented in this section show that total municipal waste generated grew by some 7 % between the years 1996 and 2006 to reach 517 kg per inhabitant; over the same period the growth of income and production was considerably higher (25 %).

A more significant change, however, was in the way waste was treated. Landfilling was the common option for a long time. About 60 % of municipal waste was landfilled in 1996, this proportion dropping to 41 % by 2006. Alternative ways of treatment, however, have become more important. About 14 % of municipal waste was incinerated in 1996 but this proportion had risen to 19 % by 2006 and the amount of waste recycled or composted more than doubled in the same period.

Turning to the EU-27's generation of waste by origin, and based on estimates for 2004, the largest volume of waste was generated by construction (including demolition) activities. The amount of non-hazardous waste was far larger than the amount of hazardous waste generated in manufacturing activities, in construction and by households. Manufacturing industries produced the majority of hazardous waste.

SOURCES

Statistical books

Waste generated and treated in Europe – data 1995-2003
Hazardous and industrial waste management in accession countries

Pocketbooks

Energy, transport and environment indicators

Methodologies and working papers

Ecological footprint and biocapacity: the world's ability to regenerate resources and absorb waste in a limited time period

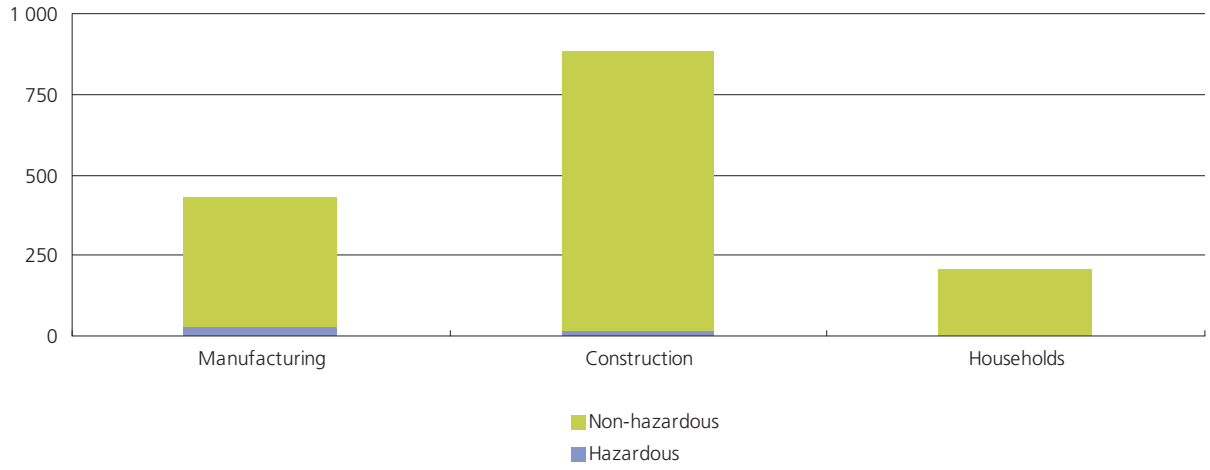
Website data

Environment

- Waste
  - Generation of waste by economic sector and households
  - Generation, shipment and recycling of selected waste streams
  - Generation of waste by selected waste streams
  - Generation, recovery and disposal of non-hazardous industrial waste
  - Generation, recovery and disposal of hazardous waste
  - Generation of hazardous waste by category
  - Generation and collection of municipal waste
  - Composition of municipal waste
  - Recovery and disposal of municipal waste
  - Waste recovery and disposal installations
- Waste statistics Regulation
  - Generation of waste
  - Treatment of waste

Figure 10.13: Generation of waste by origin, EU-27, 2004 (1)

(million tonnes)

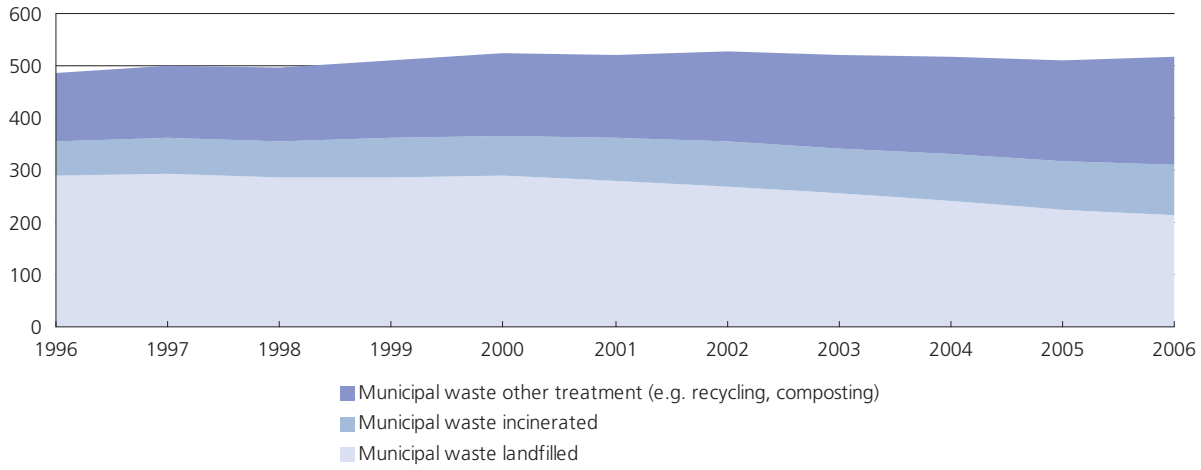


(1) Estimates.

Source: Eurostat (env_wasgen)

Figure 10.14: Municipal waste, EU-27

(kg per inhabitant)



Source: Eurostat (tsien051, tsien052 and tsien053)

This indicator presents the amount of municipal waste generated. It consists of waste collected by or on behalf of municipal authorities and disposed of through the waste management system. The bulk of this waste stream is from households, though similar wastes from sources such as commerce, offices and public institutions are included. For areas not covered by a municipal waste scheme an estimation has been made of the amount of waste generated. The quantity of waste generated is expressed in kg per person per year.

This indicator presents the amount of municipal waste disposed of through incineration. The bulk of this waste stream is from households, though similar wastes from sources such as commerce, offices and public institutions are included. Incineration means thermal treatment of waste in an incineration plant as defined in Article 3(4) or a co-incineration plant as defined in Article 3(5) of the Directive on the incineration of waste (Directive 2000/76/EC of 4 December 2000). The quantity of waste incinerated is expressed in kg per person per year.

This indicator presents the amount of municipal waste disposed of through landfill. The bulk of this waste stream is from households, though similar wastes from sources such as commerce, offices and public institutions are included. Landfill is defined as the depositing of waste into or onto land, including specially engineered landfill, and temporary storage of over one year on permanent sites. The definition covers both landfill in internal sites (i.e. where a generator of waste is carrying out its own waste disposal at the place of generation) and in external sites. The quantity of waste landfilled is expressed in kg per person per year.

Table 10.4: Municipal waste

(kg per capita)

	Municipal waste generated (1)			Municipal waste landfilled (2)			Municipal waste incinerated (3)		
	1996	2001	2006	1996	2001	2006	1996	2001	2006
EU-27	485	522	517	290	279	213	66	82	98
Belgium	451	467	475	189	54	24	152	160	155
Bulgaria	616	491	446	477	392	356	0	0	0
Czech Republic	310	273	296	310	214	234	0	35	29
Denmark	619	658	737	82	47	37	308	374	405
Germany	642	633	566	225	160	4	106	135	179
Estonia	396	372	466	396	295	278	0	1	1
Ireland	524	705	804	419	540	471	0	0	0
Greece	337	417	443	322	380	386	0	0	0
Spain	536	658	583	298	364	289	25	37	41
France	486	528	553	225	215	192	170	175	183
Italy	457	516	548	380	346	284	27	45	65
Cyprus	642	703	745	593	634	652	0	0	0
Latvia	263	302	411	247	285	292	0	4	2
Lithuania	400	377	390	400	335	356	0	0	0
Luxembourg	589	650	702	163	131	131	306	275	266
Hungary	468	451	468	367	375	376	32	35	39
Malta	344	542	652	317	494	562	0	0	0
Netherlands	563	615	625	115	50	12	171	199	213
Austria	517	578	617	186	192	59	54	65	181
Poland	301	290	259	295	278	236	0	0	1
Portugal	399	472	435	231	355	274	0	104	95
Romania	333	345	385	235	272	326	0	0	0
Slovenia	590	479	432	465	358	362	0	0	3
Slovakia	275	239	301	172	209	234	28	25	36
Finland	410	466	488	275	284	286	0	41	42
Sweden	385	442	497	126	99	25	147	169	233
United Kingdom	512	592	588	440	474	353	36	43	55
Turkey	471	457	434	345	360	364	0	0	0
Iceland	437	469	534	328	353	370	82	53	47
Norway	632	635	793	425	274	245	81	99	132
Switzerland	602	659	715	69	40	1	282	315	355

(1) Breaks in series for Estonia (2001), Latvia (2006), Lithuania (1999), Hungary (2000), Malta (1999), Portugal (2002), Slovenia (2002), Slovakia (2002), Turkey (2004) and Switzerland (2004).
(2) Breaks in series for Estonia (2001), Latvia (2006), Lithuania (1999), Hungary (2000), Malta (1999), Portugal (2002) and Turkey (2004).
(3) Break in series for Italy (2002).

Source: Eurostat (tsien051, tsien052 and tsien053)

Table 10.5: Waste treatment (non-hazardous), breakdown by type of treatment, 2004

(1 000 tonnes)

	Household and similar wastes			Mixed and undifferentiated materials			Sorting residues		
	Energy recovery	Inciner-ation	Deposit onto or into land	Energy recovery	Inciner-ation	Deposit onto or into land	Energy recovery	Inciner-ation	Deposit onto or into land
Belgium	*845*	*1 711*	*1 095*	*6*	*156*	*149*	*18*	*72*	*473*
Bulgaria	0	1	3 334	0	0	35	0	0	23
Czech Republic	388	0	2 456	:	0	186	:	0	119
Denmark	3 006	:	21	:	:	528	:	:	:
Germany	849	10 020	8 131	206	497	138	1 157	1 500	7 455
Estonia	0	0	373	2	0	5	0	0	15
Ireland	0	0	1 845	0	0	1	0	0	1
Greece	0	0	4 405	0	0	83	0	0	401
Spain	1 661	29	13 549	0	0	1 772	0	0	878
France	11 098	641	10 291	*1 071*	*30*	*8 099*	*184*	0	*1 411*
Italy	0	3 080	17 742	25	86	782	346	728	6 553
Cyprus	:	0	19	1	0	54	:	:	1
Latvia	:	:	594	:	:	2	:	:	:
Lithuania	0	0	1 135	0	0	1	0	0	26
Luxembourg	0	124	:	0	0	0	0	9	:
Hungary	142	0	2 974	2	0	47	0	0	81
Malta	0	:	220	0	:	11	0	:	2
Netherlands	142	5 861	649	11	29	11	45	102	297
Austria	:	1 183	400	0	:	0	156	:	182
Poland	0	44	9 240	3	12	59	26	1	387
Portugal	993	0	*3 297*	0	0	54	0	0	82
Romania	0	0	31	12	0	617	0	0	8
Slovenia	:	:	593	:	:	12	:	:	19
Slovakia	0	2	289	0	1	24	2	1	35
Finland	47	49	1 378	56	0	111	21	0	72
Sweden	1 959	0	348	643	0	386	204	0	478
United Kingdom	3 568	95	24 667	0	27	25 195	0	0	497
Croatia	10	10	1 882	0	0	10	0	0	8
Turkey	0	0	24 979	0	0	4	0	0	17
Iceland	10	10	72	*1*	*1*	*13*	:	:	0

Source: Eurostat (env_wastrt)

Table 10.6: Waste treatment (non-hazardous), recovery, 2004

(1 000 tonnes)

	Metallic waste	Glass waste	Paper and cardboard waste	Rubber waste	Plastic waste	Wood waste	Textile waste
Belgium	:	:	:	:	:	:	:
Bulgaria	1 180	5	169	2	8	0	4
Czech Republic	1 058	155	152	27	66	226	28
Denmark	606	140	677	76	54	721	:
Germany	6 990	2 162	6 054	179	518	2 221	109
Estonia	15	16	0	0	4	180	0
Ireland	11	3	118	0	10	155	11
Greece	2 324	64	263	3	4	24	4
Spain	4 953	1 335	2 217	332	2 646	279	127
France	*17 210*	*2 000*	*7 550*	*268*	*380*	*4 261*	*302*
Italy	6 981	1 429	3 335	49	959	4 248	244
Cyprus	20	0	6	0	10	0	0
Latvia	4	1	15	:	:	2	:
Lithuania	14	30	68	2	8	17	2
Luxembourg	:	0	0	0	:	:	0
Hungary	577	18	287	23	23	183	2
Malta	0	0	2	1	0	1	0
Netherlands	1 344	453	2 667	71	251	1 209	78
Austria	1 615	251	1 156	21	349	2 935	120
Poland	6 446	489	1 157	68	279	930	111
Portugal	558	237	345	43	98	1 109	56
Romania	4 077	76	344	2	12	80	4
Slovenia	163	:	:	3	12	:	:
Slovakia	910	19	45	9	24	126	10
Finland	1 108	165	424	37	1	3 472	0
Sweden	1 590	93	1 677	:	8	4 948	0
United Kingdom	4 397	1 931	6 891	142	1 479	2 715	284
Croatia	16	13	4	1	3	35	0
Turkey	1 995	27	417	2	135	78	212
Iceland	0	*6*	*8*	*4*	2	23	1
Norway	*728*	*70*	*531*	*38*	*25*	*384*	*11*

Source: Eurostat (env_wastrt)

10.5 RESOURCE USE

INTRODUCTION

Resources are the backbone of every economy. In using resources and transforming them, capital stocks are built up which add to the wealth of present and future generations. However, the dimensions of our current resource use are such that the chances of future generations – and the developing countries – to have access to their fair share of scarce resources are endangered. Moreover, the consequences of our resource use in terms of impacts on the environment may induce serious damages that go beyond the carrying capacity of the environment. These effects risk being aggravated once the developing world has taken up growth and resource use similar to the levels currently experienced in industrialised countries.

In December 2005, the European Commission proposed a Strategy on the Sustainable Use of Natural Resources [95] used in Europe, the objective being to reduce the environmental impacts associated with resource use and to do so in a growing economy. Focusing on the environmental impacts of resource use is one factor that will help the EU achieve sustainable development.

Eurostat is developing indicators that will monitor the environmental impacts of resource use, in order to support the implementation of the strategy.

(95) Thematic Strategy on the Sustainable Use of Natural Resources, COM(2005) 670 final; for more information: http://ec.europa.eu/environment/natres/index.htm.

DEFINITIONS AND DATA AVAILABILITY

Resource productivity measures the efficiency with which the economy uses energy and materials (the natural resource inputs needed to achieve a given economic output). If the definition of natural resources includes pollution sinks – the capacity of the atmosphere, the land area and the world's oceans and rivers to absorb waste and pollution – resource productivity also measures the economy's ability to produce goods and services relative to its environmental impacts. This wider measure is particularly useful to policy-makers, because there are pressing concerns regarding the way in which pollution sinks are being used up as a resource.

Resource productivity is defined as GDP divided by domestic material consumption (DMC). DMC is related to the consumption activities of the residents of a national economy (DMC = domestic extraction (DE) plus imports minus exports). The three main DMC material categories (biomass, fossil fuels and minerals) can be further disaggregated into different material categories.

MAIN FINDINGS

Although the wealth of the EU-15, as measured by GDP, increased on average by 2.3 % per annum between 1994 and 2004, the consumption activities of the EU-15's residents (domestic material consumption) remained stable over the same period of time.

SOURCES

Pocketbooks

Energy, transport and environment indicators.

Methodologies and working papers

Ecological footprint and biocapacity: the world's ability to regenerate resources and absorb waste in a limited time period.

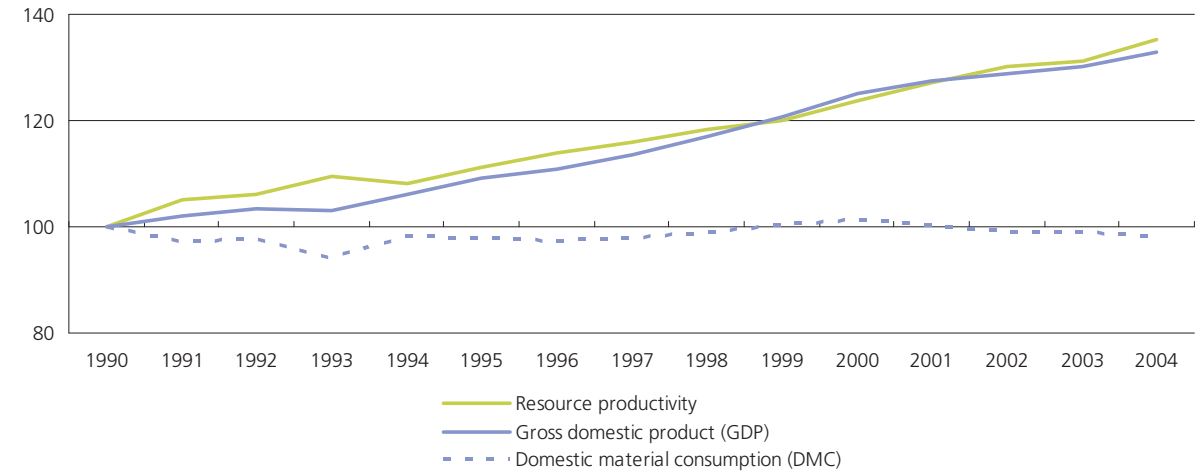
Website data

Environment

Environmental accounts

Figure 10.15: Resource productivity, EU-15

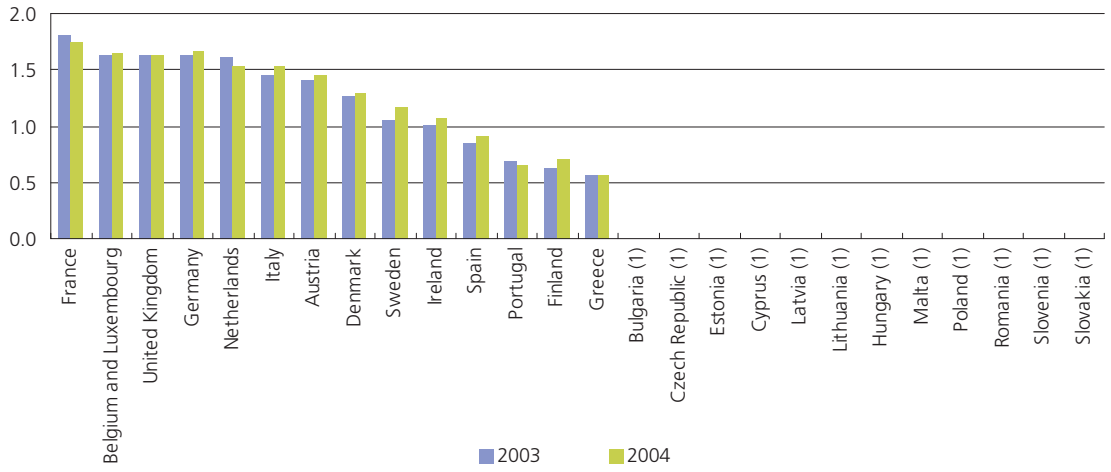
(1990=100)



Source: Eurostat (tsdpc100, tec00001 and tsdpc220)

Figure 10.16: Resource productivity (GDP per DMC)

(EUR/kg)



(1) Not available.

Source: Eurostat (tsdpc100)

10.6 CHEMICALS MANAGEMENT

INTRODUCTION

The sixth environment action programme (sixth EAP) requires a complete overhaul of EU policy on chemicals management. Since June 2007, REACH [96] – the new European Regulation on the Registration, Evaluation, Authorisation and restriction of Chemicals – is in force. The major objective of REACH is to ensure a high level of protection for human health and the environment, including promotion of alternative methods for the assessment of hazards of substances as well as the free circulation of substances on the internal market while enhancing competitiveness and innovation in the EU chemical industry.

REACH defines a new period of chemicals policy in Europe. It will increase knowledge in relation to the hazardous properties of chemicals. It is expected to enhance the communication and implementation of conditions of safe use in supply chains and the substitution of dangerous substances by less dangerous ones. Through different types of measures REACH is expected to lead to a decrease in risks to human health and the environment.

Eurostat is providing statistics and indicators for the assessment of the effectiveness of REACH.

(96) http://ec.europa.eu/environment/chemicals/index.htm.

DEFINITIONS AND DATA AVAILABILITY

Eurostat has developed a production index of toxic chemicals, broken down into five toxicity classes. The indicator presents the trend in aggregated production volumes of chemicals which have been classified as toxic substances according to EU legislation [97]. An important objective of REACH is to reduce risks by substitution of hazardous by less hazardous substances. This indicator monitors progress in shifting production from the most toxic chemicals to less toxic classes. The indicator does not provide information on the risk from the use of chemicals: production and consumption are not synonymous with exposure, as some chemicals are handled in closed systems, or as intermediates in controlled supply chains. The toxicity classes, beginning with the most dangerous, are: carcinogenic, mutagenic and reprotoxic (CMR-chemicals); chronic toxic chemicals; very toxic chemicals; toxic chemicals and chemicals classified as harmful. The indicator is also published as a sustainable development indicator within the theme of public health.

Production volumes are extracted from Prodcom (statistics on the production of manufactured goods) and are aggregated to the five classes according to their toxicity. EU-15 data covers the years from 1995 to 2006, for 2004 to 2006 data for EU-27 is available.

MAIN FINDINGS

Between 1996 and 2006 the total production of chemicals grew by 22 % (EU-15). The production of chemicals classified as toxic increased by 16 %, with 10 % growth for CMR chemicals. Over the period considered, there was steady growth in the production volume of toxic chemicals, with no decoupling from the growth of GDP observed.

(97) Directive on Dangerous Substances, http://ec.europa.eu/environment/dansub/home_en.htm.

SOURCES

Methodologies and working papers

The REACH baseline study, a monitoring instrument for the new European policy on chemicals

Website data

Sustainable development

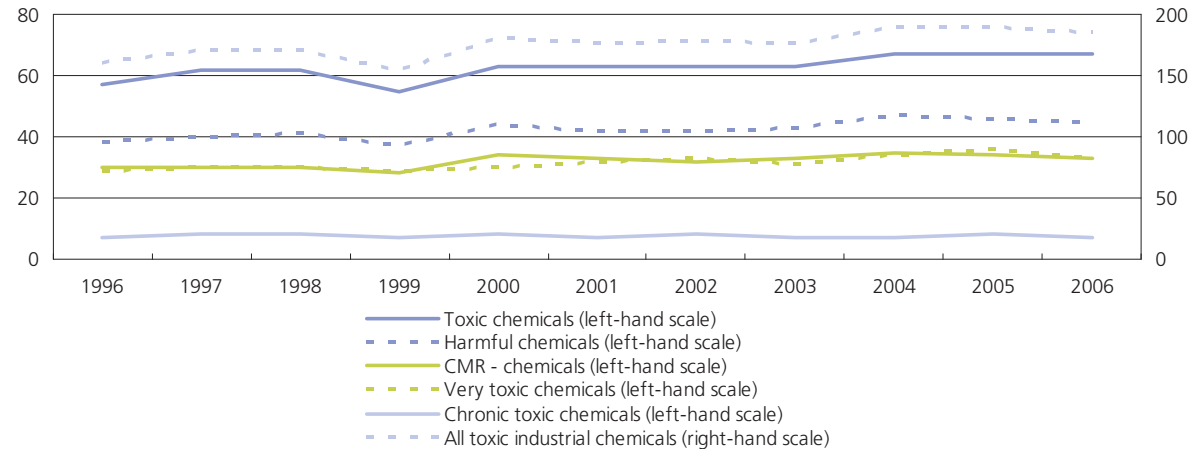
Public health

Determinants of health

Index of production of toxic chemicals, by toxicity class

Figure 10.17: Production volume of toxic chemicals, EU-15 (1)

(tonnes)



(1) In 2006, the volume of toxic industrial chemicals produced in the EU-25 was 207 million tonnes.

Source: Eurostat (tsdph320)

This indicator presents the trend in aggregated production volumes of toxic chemicals, broken down into five toxicity classes. The classes are derived from the Risk Phrases assigned to the individual substances in Annex 6 of the Dangerous Substance Directive (Council Directive 67/548/EEC as last amended in 2001). The chemicals are grouped into five toxicity classes: carcinogenic, mutagenic and reprotoxic (CMR-) chemicals; chronic toxic chemicals; very toxic chemicals; toxic chemicals; and harmful chemicals.

10.7 ENVIRONMENTAL PROTECTION EXPENDITURE

INTRODUCTION

In the absence of environmental policies, the costs resulting from pollution are met by society at large. As EU environmental protection policies fall into place, the financial burden is shifting to those enterprises or individuals at the source of the pollution; this is the polluter pays principle and is seen as a key tool for reducing overall pollution.

DEFINITIONS AND DATA AVAILABILITY

Data on environmental expenditure are collected from European countries through the joint OECD/Eurostat questionnaire on environmental protection expenditure and revenues. The questionnaire has been revised to have an accounting structure close to the environmental protection expenditure account (EPEA) which is a satellite account from national accounts [98].

(98) For more information: 'Environmental protection expenditure accounts – compilation guide'.

Environmental protection expenditure is defined as the money spent on all purposeful activities directly aimed at the prevention, reduction and elimination of pollution or nuisances resulting from the production processes or consumption of goods and services. Excluded are activities that, while beneficial to the environment, primarily satisfy technical needs or health and safety requirements. Environmental protection expenditure is classified into different economic sectors (public, agriculture, industries, and households), financial variables (treatment and prevention investments, current expenditure, subsidies, etc.) and environmental domains (of which nine areas – including air, water, waste, soil, noise, biodiversity and landscape – are distinguished in the European standard statistical classification of environmental protection activities (CEPA)).

Non-core expenditure consists of administrative costs such as labour costs associated with running environmental departments or government funded agencies. Investment expenditure includes outlays in a given year (purchases and own-account production) for machinery, equipment and land used for environmental protection purposes.

MAIN FINDINGS

An analysis of environmental protection expenditure shows that there are considerable differences between expenditure incurred by the public sector and that incurred by industry. Indeed, the share of total environmental protection expenditure incurred by the EU-25's public sector for non-core domains (administrative costs) in 2002 was 3.9 times as high as that incurred by industry. Industry spent almost equal shares on wastewater (30.5 %) and waste (29.9 %) as a proportion of total industrial environmental protection expenditure. A relatively low proportion (less than 2 %) of EU-25 public expenditure on environmental protection was devoted to air protection, while the share of environmental protection expenditure on air pollution made by industry reached almost one quarter (23.3 %).

An analysis of investment expenditure by industry for environmental protection is also available, and this shows that industry dedicated more than one third (35.9 %) of such investment to air protection, while wastewater accounted for just over one quarter (26.7 %) and waste for 15.2 %. The remaining share of investment for environmental protection by industry was used for none-core domains.

SOURCES

Pocketbooks

Energy, transport and environment indicators

Methodologies and working papers

Environmental expenditure statistics

OECD/Eurostat Environment Protection Expenditure and Revenue: Joint Questionnaire/SERIEE Environmental Protection Expenditure Accounts – Conversion Guidelines

SERIEE Environmental Protection Expenditure Accounts - Compilation Guide

Dedicated sections on the eurostat website

Environmental accounts

Website data

Environment

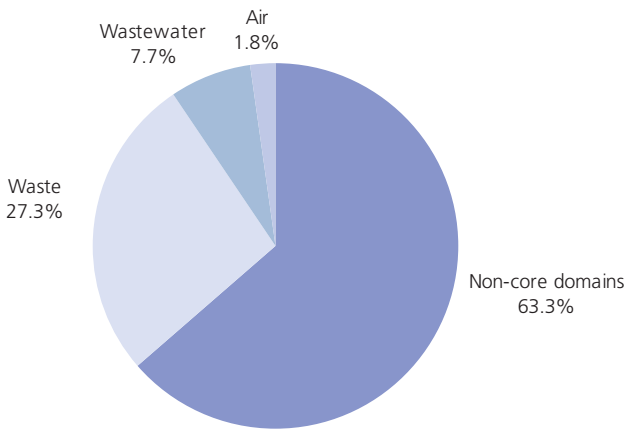
Environmental accounts

Environmental protection expenditure in Europe – detailed data

Environmental protection expenditure in Europe – indicators

Figure 10.18: Breakdown of environmental protection expenditure by the public sector, EU-25, 2002 (1)

(%)

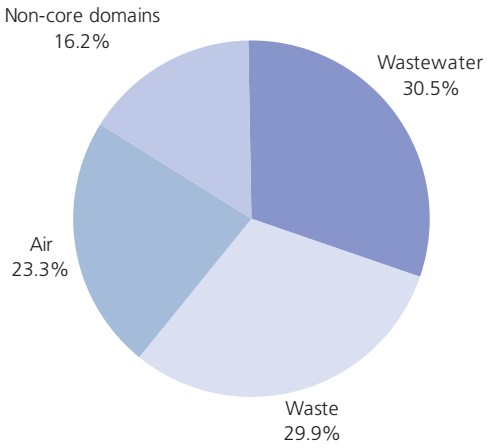


(1) Figures do not sum to 100 % due to rounding.

Source: Eurostat (ten00055)

The indicator presents environmental protection expenditure by environmental domain. It includes both investments and current expenditure.

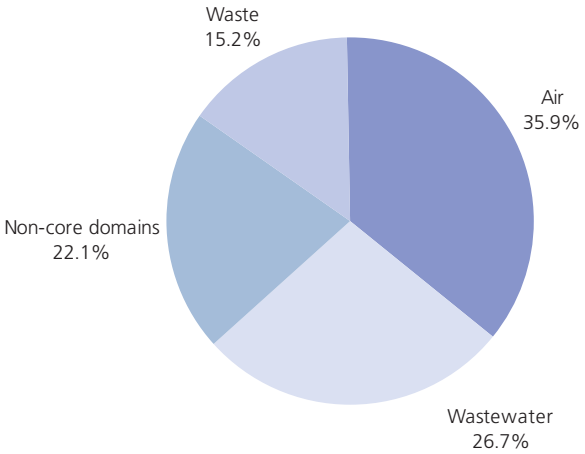
Figure 10.19: Breakdown of environmental protection expenditure by industry, EU-25, 2002 (1)
(%)



(1) Excluding the activities of the recycling sector (NACE Division 37); figures do not sum to 100 % due to rounding.

Source: Eurostat (ten00058)

Figure 10.20: Breakdown of environmental protection investment by industry, EU-25, 2002 (1)
(%)



(1) Excluding the activities of the recycling sector (NACE Division 37); figures do not sum to 100 % due to rounding.

Source: Eurostat (ten00059)

10.8 BIODIVERSITY

INTRODUCTION

A contraction of biological diversity, biodiversity reflects the number, variety and variability of living organisms, including mankind. The global scale of the biodiversity issue has led to international action within this domain, with the framework for action being the United Nations (UN) convention on biological diversity (CBD), which the EU ratified in 1993. In 1998, the EU adopted a biodiversity strategy. Four biodiversity action plans were adopted under this strategy in 2001 (conservation of natural resources, agriculture, fisheries, economic and development cooperation).

At the United Nations world summit on sustainable development in Johannesburg in 2002, governments committed themselves to significantly reducing the rate of biodiversity loss by 2010. The EU has also set itself the objective of halting the loss of biodiversity on its own territory by 2010. Today, nature and biodiversity are one of the four priorities of the EU's sixth environment action programme (2002-12), together with climate change, resource and waste management, and health in relation to the environment.

More recently, the European Commission adopted a proposal for a Directive on the contained use of genetically modified micro-organisms [99] in May 2006. Moreover, it adopted Decisions and presented to the Council [100] proposals for Decisions on the market release of certain genetically modified products (maize, oilseed rape and carnations) or, where applicable, on a temporary ban on the sale and use of such products (maize).

DEFINITIONS AND DATA AVAILABILITY

EU policy on nature conservation is part of the EU's biodiversity strategy. It is essentially based on the implementation of two Directives: Council Directive 92/43/EEC of 21 May 1992 (the habitats Directive) on the conservation of natural habitats and of wild fauna and flora [101] and Council Directive 79/409/EEC of 2 April 1979 (the birds Directive) on the conservation of wild birds, which includes the setting-up of a coherent European ecological network of sites under the title Natura 2000.

(99) For more information: http://europa.eu/scadplus/leg/en/lvb/l21157.htm.

(100) In accordance with Directive 2001/18/EC of the European Parliament and of the Council; for more information: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2001/l_106/l_10620010417en00010038.pdf.

(101) Council Directive 79/409/EEC of 2 April 1979 (birds Directive) and Council Directive 92/43/EEC of 21 May 1992 (habitat Directive); for more information: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31979L0409:EN:HTML.

Annual data are available on protected areas under the habitats Directive and these are presented as a percentage of total country area. The indicator on protected areas is based on territories proposed by countries to be designated for the protection of natural and semi-natural habitats, wild fauna and flora according to the habitats Directive.

Birds are considered as good proxies for biodiversity and the integrity of ecosystem. The population index of farmland birds is an aggregated index (with base year 1990 or the first year the Member State entered the scheme) of population trend estimates of a selected group of common bird species dependent on agricultural land for nesting or breeding. Indices are calculated for each species independently and are then combined using an unweighted geometric mean. Aggregated EU indices are calculated using population-dependent weighting factors for each country and species. The EU index is based on trend data from 18 Member States, derived from annually operated national breeding bird surveys spanning different periods obtained through the pan-European common bird monitoring scheme (PECBMS).

MAIN FINDINGS

Protected areas for biodiversity are based on areas proposed by countries under the habitats Directive reflecting the share of the total area of a country. Just over 12 % of the EU-25's territory was considered as a protected area in 2005, among the Member States the share rising to a little above 30 % in Slovenia.

There was a negative trend in the past 25 years for common bird species, in particular for common farmland birds, which are considered a good indicator of trends in farmland biodiversity; these have become more threatened during the period considered. Part of the decline may be explained by changes in land use and agricultural practices which affect birds' capacity for nesting or feeding. In 2005, there was a limited upturn in the population of farmland species back towards the levels recorded between 1996 and 2000.

SOURCES

Pocketbooks

Energy, transport and environment indicators

Website data

Environment

Biodiversity

Protected areas for biodiversity: habitats directive

Protection of natural resources – common bird index

Fish catches from stocks outside of safe biological limits

Table 10.7: Biodiversity

	Protected areas for biodiversity (% of total area) (1)				Farmland bird index (1990=100) (2)					
	2003	2004	2005	2006	1995	1997	1999	2001	2003	2005
EU-25	:	:	12.1	12.2	91.3	80.0	80.5	79.5	76.6	78.8
Belgium	9.9	10.0	10.0	10.0	94.6	87.5	83.6	72.5	63.9	67.6
Bulgaria	:	:	:	:	:	:	:	:	:	:
Czech Republic	:	:	9.2	9.2	118.5	86.4	71.3	78.9	70.0	65.8
Denmark	7.4	7.4	7.4	7.4	84.2	80.1	84.1	78.3	71.0	60.3
Germany	7.0	7.0	9.8	9.9	119.4	115.6	125.5	107.7	84.9	90.5
Estonia	:	:	15.9	15.9	57.4	77.2	77.2	:	:	:
Ireland	10.7	10.2	10.2	10.2	:	:	113.1	115.8	108.0	108.6
Greece	16.4	16.4	16.4	16.4	:	:	:	:	:	:
Spain	22.6	22.6	22.6	22.6	:	112.2	123.2	128.8	115.3	121.8
France	6.8	6.8	6.9	7.9	82.8	89.4	83.3	81.5	78.1	82.5
Italy	14.7	13.9	13.9	14.2	:	:	:	93.3	74.2	88.4
Cyprus	:	:	5.0	7.2	:	:	:	:	:	:
Latvia	:	:	11.0	11.0	100.0	109.7	111.0	127.7	118.6	117.0
Lithuania	:	:	10.0	10.0	:	:	:	:	:	:
Luxembourg	14.8	:	:	14.8	:	:	:	:	:	:
Hungary	:	:	15.0	15.0	:	:	:	:	:	:
Malta	:	:	12.5	12.6	:	:	:	:	:	:
Netherlands	9.5	9.5	9.5	8.4	79.4	82.2	79.5	75.2	73.2	76.6
Austria	10.6	10.6	10.6	10.6	:	:	:	:	:	:
Poland	:	:	4.2	4.2	:	:	:	95.0	84.9	90.5
Portugal	17.4	17.4	17.4	17.4	:	:	:	:	:	101.0
Romania	:	:	:	:	:	:	:	:	:	:
Slovenia	:	:	31.4	31.4	:	:	:	:	:	:
Slovakia	:	:	11.8	11.8	:	:	:	:	:	:
Finland	12.7	12.7	12.7	12.7	96.6	85.2	91.1	97.1	94.2	91.7
Sweden	13.9	13.6	13.6	13.7	90.5	81.1	72.9	73.6	70.7	61.1
United Kingdom	6.5	6.5	6.5	6.5	83.1	76.0	74.4	81.2	73.3	71.1
Norway	:	:	:	:	100.0	53.2	57.6	55.3	47.9	45.8
Switzerland	:	:	:	:	:	:	100.0	92.6	94.2	111.5

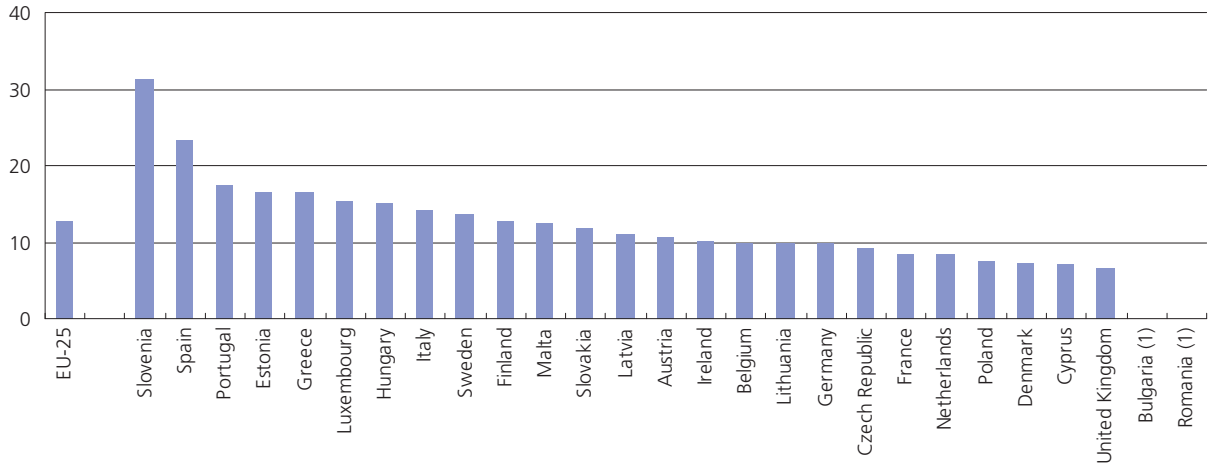
(1) Area proposed under the habitats Directive.
(2) Aggregated index of population estimates of a selected group of breeding bird species dependent on agricultural land for nesting or feeding; the EU index is based on trend data from 18 EU Member States which is derived from annually operated national breeding bird surveys spanning different periods, obtained through the Pan-European Common Bird Monitoring Scheme (PECBMS).

Source: Eurostat (env_bio1 and tsdnr100)

The farmland bird index is an aggregated index of population trend estimates of a selected group of breeding bird species dependent on agricultural land for nesting or breeding. It is indexed on the year 2000. Indices are calculated for each species independently and are weighted equally when combined in the aggregate index using a geometric mean. Aggregated EU indices are calculated using population-dependent weighting factors for each country and species.

Figure 10.21: Protected areas for biodiversity: habitats Directive, 2007

(area proposed under the habitats Directive as a % of total area)

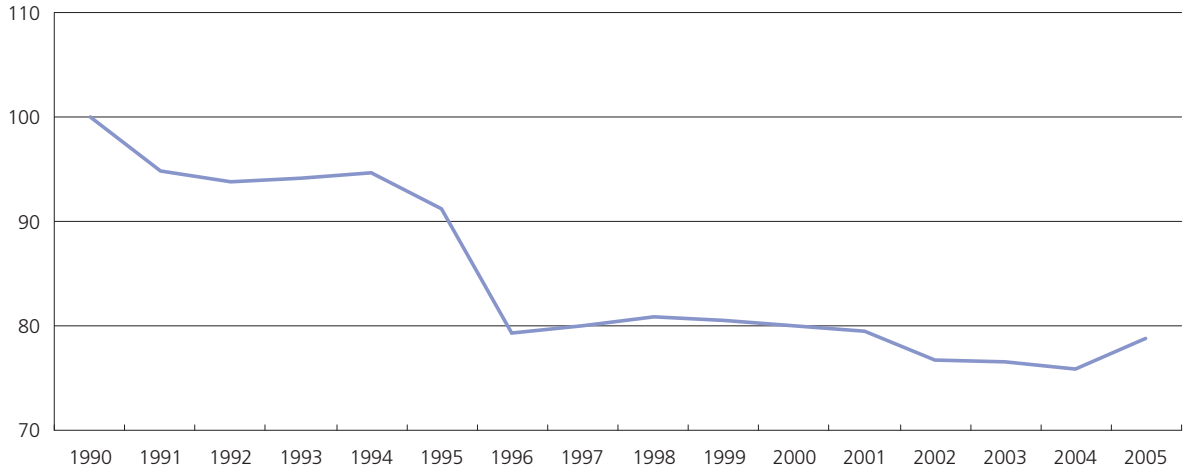


(1) Not available.

Source: Eurostat (env_bio1)

Figure 10.22: EU farmland bird index (1)

(aggregated index of population estimates of a selected group of breeding bird species dependent on agricultural land for nesting or feeding, 1990=100)



(1) The EU index is based on trend data from 18 Member States which is derived from annually operated national breeding bird surveys spanning different periods, obtained through the pan-European common bird monitoring scheme (PECBMS).

Source: Eurostat (tsien073)

10.9 CORPORATE RESPONSIBILITY

INTRODUCTION

The EU's eco-management and audit scheme (EMAS) is a management tool for enterprises and other organisations to evaluate, report and improve their environmental performance. Enterprises have been able to participate in the scheme since 1995 [102]. It was originally restricted to enterprises within the industrial economy, however, since 2001 EMAS has been open to all economic sectors including public and private services. In addition, EMAS was strengthened by the integration of the ISO 14001 international standard, which is primarily concerned with environmental management and aims to help organisations establish or improve an environmental management system, to minimise harmful effects on the environment caused by its activities, and continually improve their environmental performance [103]. Organisations participating in EMAS are committed to evaluate and improve their own environmental performance, comply with relevant environmental legislation, prevent pollution, and provide relevant information to the public (via verified environmental audits).

The Community eco-label is awarded to products and services with reduced environmental impacts. The existing scheme has been in operation since 1993.

The 1999 industry Council's report to the Helsinki European Council on environmental integration emphasised three pillars of sustainable development (immediate and longer-term needs; local and global needs; and the inseparability and interdependence of social, economic and environmental components of human progress) and addressed issues such as climate change, employment, enlargement, changing production and consumption patters, eco-efficiency and integrated product policy.

The industry Council of 6-7 June 2002 adopted conclusions on the contribution of enterprise policy to sustainable development. The Council considered economic growth as a prerequisite for achieving sustainable development, as it provides essential additional resources that are needed in order to tackle environmental pressures and reinforce social cohesion.

(102) Council Regulation (EEC) No 1836/93 of 29 June 1993; for more information: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31993R1836:EN:HTML.

(103) Commission Regulation (EC) No 196/2006 of 3 February 2006 amending Annex I to Regulation (EC) No 761/2001 of the European Parliament and of the Council to take account of the European Standard EN ISO 14001:2004, and repealing Decision 97/265/EC; for more information: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_032/l_03220060204en00040012.pdf.

DEFINITIONS AND DATA AVAILABILITY

The eco-management and audit scheme (EMAS) is an EU voluntary instrument which acknowledges organisations that improve their environmental performance on a continuous basis. EMAS registered organisations are legally compliant, run an environment management system and report on their environmental performance through the publication of an independently verified environmental statement. They are recognised by the EMAS logo, which guarantees the reliability of the information provided. To receive EMAS registration an organisation must comply with the following steps:

- conduct an environmental review;
- establish an effective environmental management system;
- carry out an environmental audit and;
- provide a statement of its environmental performance.

The EU eco-label scheme, as laid down in a Regulation of the European Commission [104] is now part of a wider approach on integrated product policy (IPP).

MAIN FINDINGS

From EMAS statistics, it is possible to report figures on the number of sites having implemented an eco-management and audit scheme or an ISO 14001 certification among the Member States, and to present these relative to the size of the population. Based on such an analysis Austria recorded the largest number of such sites in 2006, with 31.2 sites per million inhabitants, followed by Denmark (22.3), Germany (17.9) and Spain (13.2) the only Member States with more than 10 sites per million inhabitants. At the other end of the spectrum, there were no sites having implemented an EMAS or an ISO 14001 certification in Cyprus, Latvia, Lithuania or Romania.

The EU eco-label aims to encourage enterprises to produce products and services with reduced environmental impact. Danish enterprises had by far the largest number of awards in 2006, more than 1 000 per million inhabitants, compared with an EU average of a little less than 3. To a lesser extent, Malta (247), Ireland (214) and Slovenia (200) also received a relatively high number of awards, while the Baltic States, Luxembourg, Romania and Slovakia had no such awards.

An analysis by product group shows that a large majority of eco-label awards in the EU-25 in 2007 were granted to products related to chemicals and man-made fibres (41.9 % of the total), followed by hotel and restaurant services (27.8 %), and textiles (16.8 %).

(104) Regulation (EC) No 1980/2000 of the European Parliament and of the Council of 17 July 2000: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2000/l_237/l_23720000921en00010012.pdf.

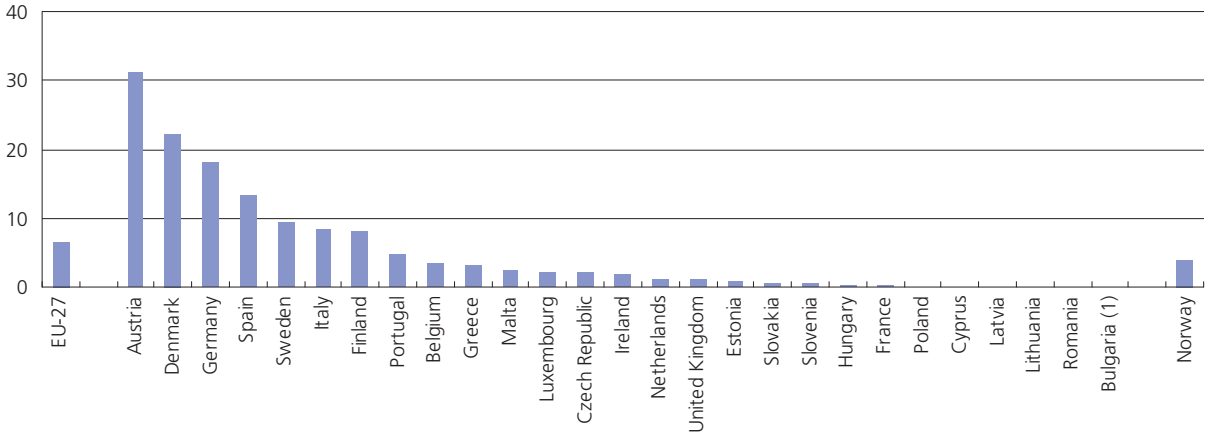
SOURCES

Pocketbooks

Energy, transport and environment indicators

Figure 10.23: Number of sites having implemented an eco-management and audit scheme (EMAS) or an ISO 14001 certification, 2006

(per million inhabitants)



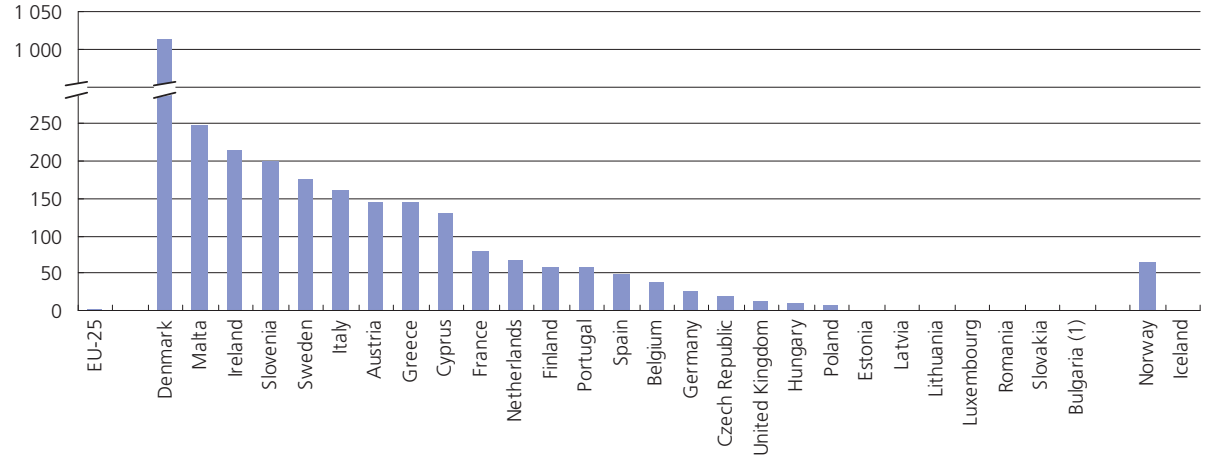
(1) Not available.

Source: Eurostat (tsdpc410 and tps00001), European Commission (EMAS)

This indicator is defined as the number of EMAS-registered organisations and sites. The EMAS (Eco-Management and Audit Scheme) is a voluntarily environmental management system implemented by companies and other organisations from all sectors of economic activity including local authorities, to evaluate, report on and improve their environmental performance. The scheme integrates ISO 14001 (International Standard for Environmental Management System) as its environmental management system element. Since April 2001, corporate registrations are possible, wherein organisations gather all their sites under one registration number. The European Commission started to collect numbers of sites in addition to number of organisations in March 2004 to give a more accurate picture of EMAS development.

Figure 10.24: Eco-label awards, 2006

(per million inhabitants)

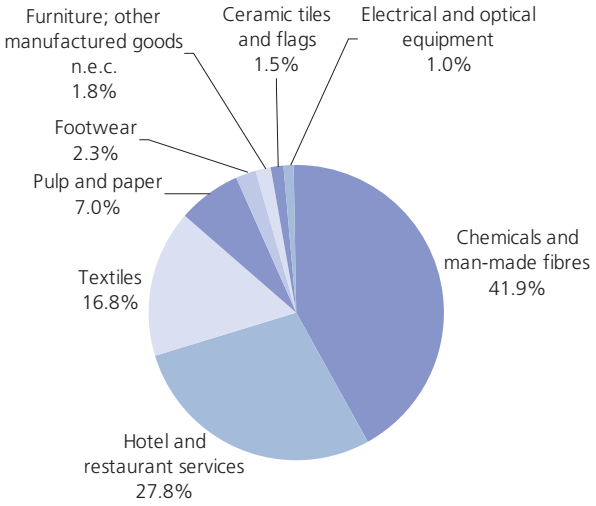


(1) Not available.

Source: Eurostat (tsdpc420 and tps00001), Directorate-General Environment

This indicator is defined as the number of eco-label or EU flower awards in EU Member States. The Community eco-label is awarded to products and services with reduced environmental impacts. It is administered by the European Eco-labelling Board (EUEB) and receives the support of the European Commission, all EU Member States and the European Economic Area (EEA). The Eco-labelling Board includes representatives such as industry, environment protection groups and consumer organisations.

Figure 10.25: Eco-label awards by product group, EU-25, 2007
(% of total)



Source: Directorate-General Environment