

The environment in your pocket 2003



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The environment in your pocket 2003

Key facts and figures on the
environment of the United Kingdom

Introduction

Welcome to the seventh edition of our annual booklet of key environmental statistics, which includes eight of the 15 Government headline indicators of sustainable development.

The Environment in your Pocket is intended to be an easily accessible, handily sized, reference booklet, which will be particularly useful for ministers and officials across Government, for students studying environmental topics and for members of the public with a general interest in environmental issues. It covers almost 60 key data series and focuses on providing trends over time, including performance against quantified targets and commitments set at the national and international level. The data in the booklet are based largely on the more detailed environmental statistics published in the e-Digest of Environmental Statistics (available on the internet, see below).

The contents of this edition are similar to previous editions. However, as with each previous edition, we have introduced some new items, including some items on greenhouse gas emissions in Europe in the global atmosphere section.

The booklet also draws upon the Government's set of indicators of sustainable development, published in December 1999 as Quality of life counts¹. All the environmental "headline" indicators have been included and they, and the other "headline" indicators are identified as such within the booklet. More information on these indicators is available on the Government's Sustainable Development website (see below).

The Environment in your Pocket 2003 is available free of charge from Defra Publications (from the address on the inside front cover). This booklet, similar "key facts" about the environment and the more detailed statistics in the e-Digest of Environmental Statistics are available in electronic format on Defra's website (see below). If you have found this booklet to be useful, please feel free to tell your friends or colleagues about it – extra copies are easy to obtain and we should very much like to enlarge the circle of readership.

Our aim is to produce user-friendly, useful and relevant presentations, building on the positive feedback we have received from readers of

¹ Quality of life counts – indicators for a strategy for sustainable development for the United Kingdom: a baseline assessment (DETR, 1999, ISBN 1 85112 343 1 and at: www.sustainable-development.gov.uk/indicators/index.htm)

previous editions. This year we have produced not only the traditional pocket-sized (A6) version, but also a larger (A4) size version. The larger version contains the same information but with larger print.

We are consulting our readers through a short survey/questionnaire included with copies of the booklet that are sent out. It would be helpful to us if you would complete the questionnaire and tell us what you think about the format of The Environment in your Pocket – whether you have found the A6 or A4 size, or both, useful – and its contents. If you want to send us any comments, including ideas for future editions, they would be most welcome.

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Global atmosphere

Climate change and greenhouse gases

The temperature of the earth is determined by a balance between energy coming in from the sun in the form of visible radiation (sunlight) and energy constantly being emitted from the earth to space. Some of the outgoing radiation is absorbed by naturally occurring greenhouse gases, including water vapour, creating a natural greenhouse effect which keeps the surface of the earth around 33°C warmer than it would otherwise be and helps to sustain life.

Since the beginning of the Industrial Revolution (around AD 1750), concentrations of the long-lived greenhouse gases in the atmosphere – carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) – have risen as a result of human activities. At the same time, changes in global climate have occurred and work by an international body of scientists to establish causal links has detected a strong human signal.

In 2001, the Intergovernmental Panel on Climate Change, reported that “there is new and stronger evidence that most of the warming over the last 50 years is attributable to human activities.” It also concluded from climate model predictions that we can expect a rise in global temperatures of between 1.4 and 5.8°C by the end of the 21st century. New climate change scenarios for the UK in 2002 suggest that the average temperature across the UK could increase by 2 to 3.5°C by the 2080s.

Although CO₂ is less potent than other greenhouse gases on an equal mass basis, the quantity of emissions is so large that it remains the main contributor to global warming. The UK contributes about 2 per cent to global man-made emissions of CO₂, which are currently estimated to range between 6.2 and 6.9 billion tonnes carbon per annum.

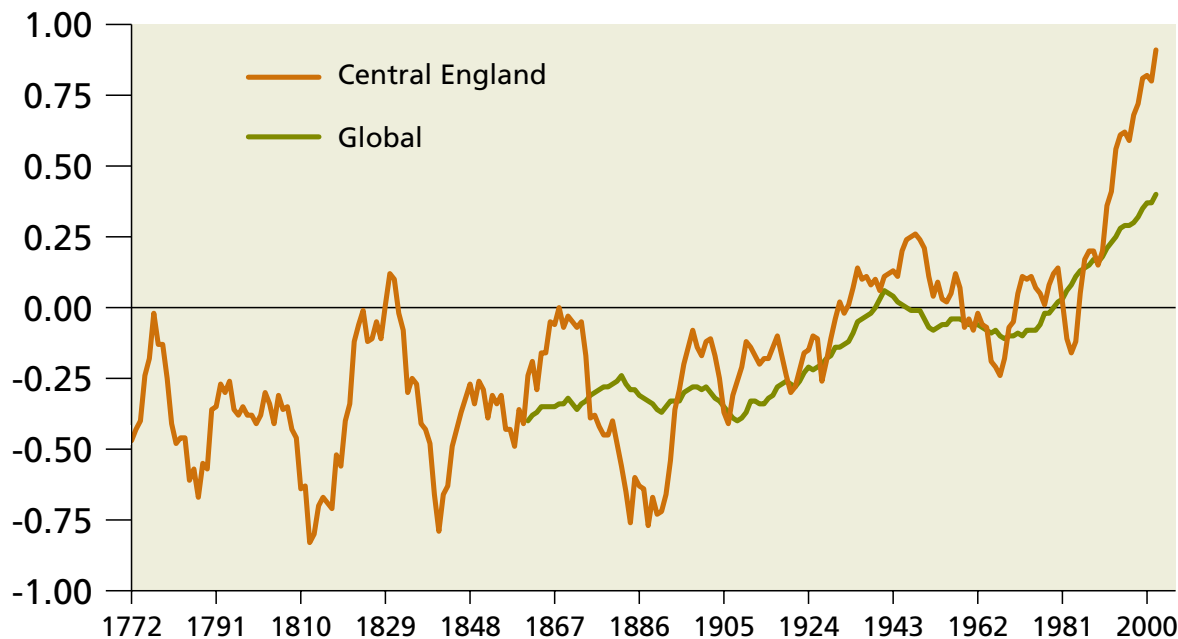
In December 1997, the Parties to the Framework Convention on Climate Change adopted the Kyoto Protocol. Under this Protocol, the EU has agreed to reduce emissions of a “basket” of six greenhouse gases – CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) – by 8 per cent below 1990 levels by the first commitment period of 2008-2012. This target was shared among EU member states according to their economic circumstances, with the UK agreeing to reduce emissions by 12.5 per cent over the same period. The UK Government also has a domestic goal to cut CO₂ emissions by 20 per cent below 1990 levels by 2010, and a longer term goal to put the UK on a path to reduce CO₂ emissions by 60 per cent by 2050.

Global atmosphere

Average surface temperature: 1772-2002 (compared to a 1961-1990 baseline)

Global and Central England

Anomaly in degrees C
(compared to 1961-1990 average)



Average global surface temperature has increased by 0.4 to 0.8°C since the late 19th century. 1998 was the hottest year since global records began in 1860, 2002 was the second warmest and 2001 the third warmest. Nine of the 10 hottest years on record have been during 1990-2002. Studies of this trend show that it is statistically significant and is unlikely to be entirely natural in origin. Current climate models predict that global temperatures will rise by a further 1.4 to 5.8°C by the end of the 21st century.

During the 20th century the annual average central England temperature warmed by about 1°C. The 1990s were exceptionally warm in Central England by historical standards (about 0.6°C warmer than the 1961-1990 average). Four of the 5 warmest years in central England since 1772 have been since 1990 and 2002 was the fourth warmest year on record.

Note: the chart shows smoothed figures, based on 10-year moving averages.

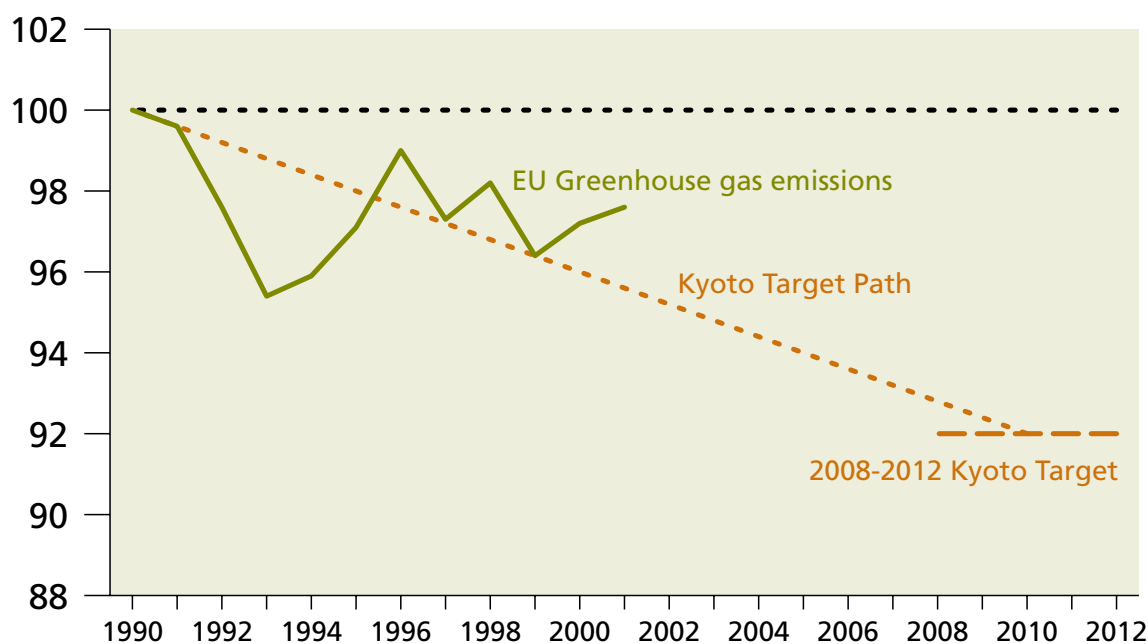
Source: Hadley Centre

Global atmosphere

EU emissions of greenhouse gases compared with Kyoto Protocol target: 1990-2012

EU-15

Index (1990 = 100)



Under the Kyoto Protocol, the EU has a target to reduce greenhouse gas emissions to 8 per cent below 1990 levels by 2008-2012. Total EU emissions fell by 2½ per cent between 1990 and 2001.

The fall between 1990 and 2001 was largely due to reductions in emissions of 19 per cent in Germany and 13 per cent in the UK. Together these two countries accounted for about 40 per cent of total EU greenhouse gas emissions in 2001.

About half of the reductions in both Germany and the UK were due to one-off factors. Economic restructuring following reunification in the case of Germany and energy liberalisation leading to increased use of gas for electricity generation in the UK.

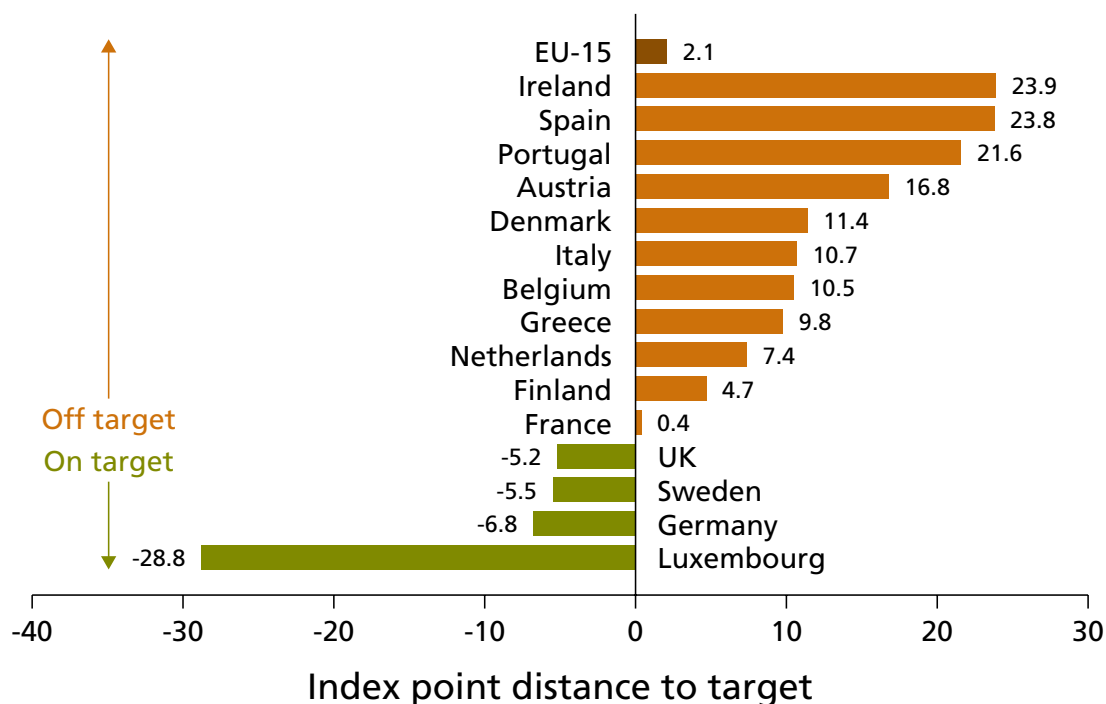
Emissions increased in ten Member States between 1990 and 2001.

Source: European Environment Agency (EEA)

Global atmosphere

EU greenhouse gas emissions distance to Kyoto Protocol target, by country: 2001

EU-15



EU Member States have agreed different greenhouse gas emission limits or reduction targets as their contribution to the overall EU Kyoto target, according to their own economic circumstances – the ‘burden-sharing’ agreement.

The distance-to-target measure gives an indication of progress to date by each Member State and by the EU as a whole towards these targets. It compares actual emissions with a straight line drawn from the “1990” baseline to the target level in 2010.

This measure shows that in 2001 more than two thirds of the EU-15 states were continuing to produce more emissions of greenhouse gases than they should if they are to meet their target in 2008-2012.

The states that had reduced emissions sufficiently to keep them on target in 2001 were Luxembourg, Germany, Sweden and the UK.

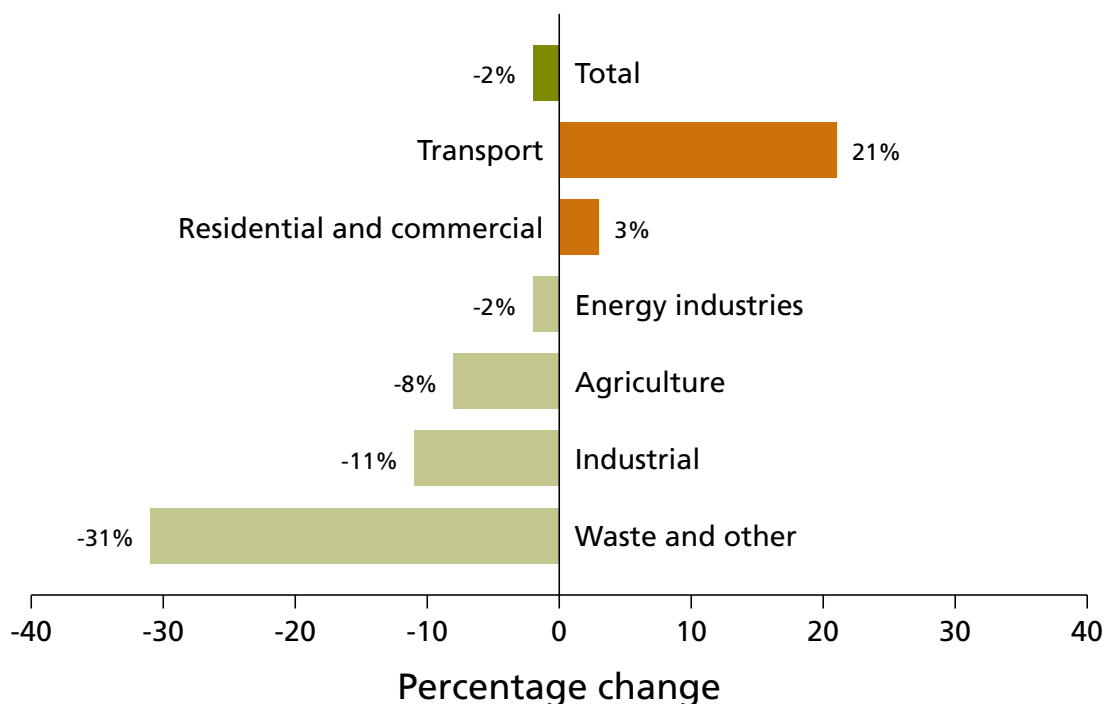
The distance-to-target indicator suggests that the EU-15 overall are just outside the level they should have achieved by 2001, if they were on a straight line path towards meeting the target in 2010.

Source: European Environment Agency (EEA)

Global atmosphere

Changes in EU emissions of greenhouse gases by sector: 1990-2001

EU-15



	Million tonnes (carbon)				
	1990	1995	1999	2000	2001
Energy industries	316	299	296	305	310
Transport	194	211	232	232	235
Industry	261	249	232	234	231
Other sectors	372	352	345	338	344

The energy industry was the source of over a quarter of all EU greenhouse gas emissions in 2001, while the transport sector and the industrial sector accounted for around a fifth each.

Greenhouse gas emissions in the EU from most sectors were lower in 2001 than in 1990.

Emissions from the transport sector increased in each year between 1990 and 2001 giving an increase of 21 per cent over the period. Emissions from residential and commercial sources also increased.

Source: European Environment Agency (EEA)

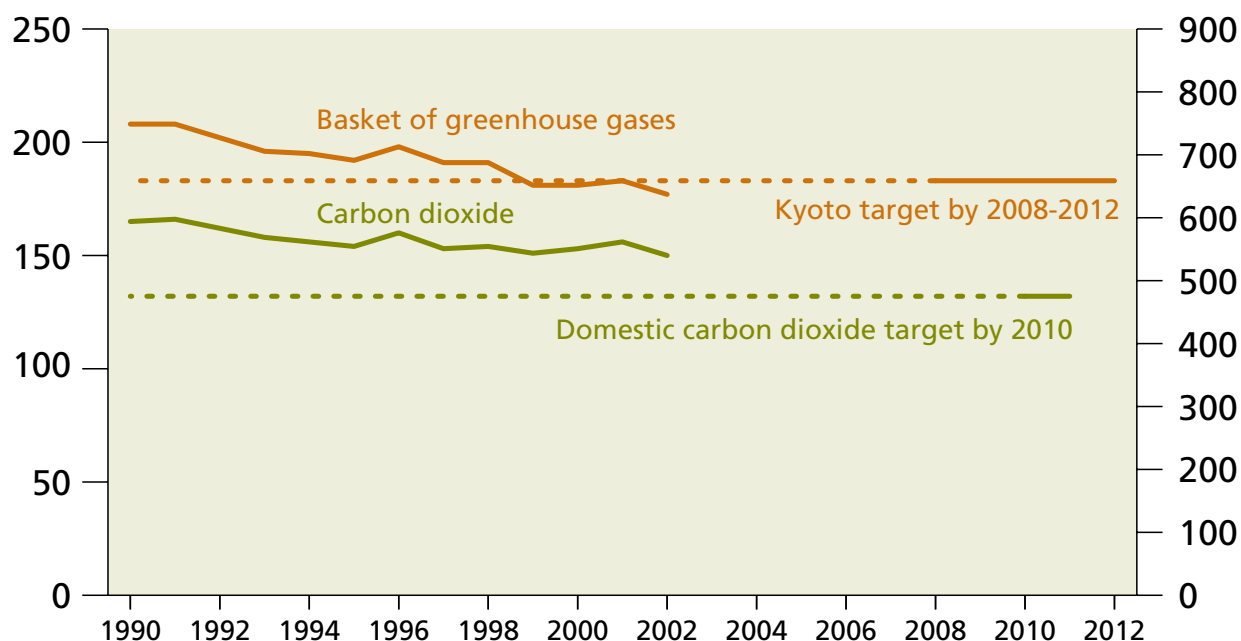
Global atmosphere

UK emissions of greenhouse gases: 1990-2002

United Kingdom

Million tonnes
(carbon equivalent)

Million tonnes
(carbon dioxide equivalent)



	Million tonnes (carbon)					
	1990	1995	1999	2000	2001	2002 (p)
Carbon dioxide	165	154	151	153	156	150
Basket of gases	208	192	181	181	183	177

This is a headline indicator of sustainable development for the UK

UK emissions of the "basket" of six greenhouse gases, weighted by global warming potential, fell by 12½ per cent between 1990 and 2001.

Emissions of carbon dioxide, the main greenhouse gas, fell by 5½ per cent between 1990 and 2001. The UK aims to move beyond the Kyoto target and reduce CO₂ emissions by 20 per cent below 1990 levels by 2010.

Provisional estimates of emissions for 2002 show a decrease of 8 to 9 per cent since 1990 for CO₂. Emissions are estimated to be lower than in 2001, mainly as a result of warmer weather, lower rates of energy consumption and less use of coal in power stations.

Source: NETCEN

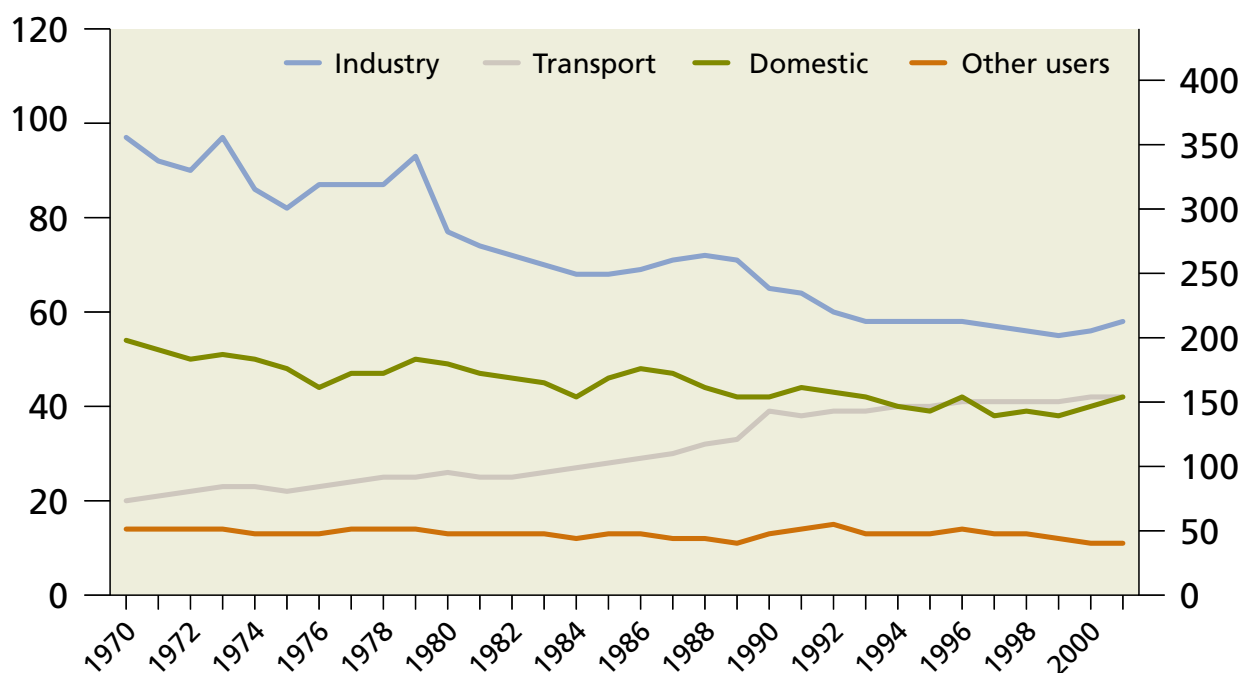
Global atmosphere

Carbon dioxide emissions, by end user: 1970-2001

United Kingdom

Million tonnes
(carbon equivalent)

Million tonnes
(carbon dioxide equivalent)



	Million tonnes (carbon)				
	1970	1980	1990	1995	2001
Industry	96.6	76.7	65.5	58.1	58.0
Transport	20.5	25.7	39.1	39.7	41.6
Domestic	54.3	48.7	41.8	38.6	41.6
Other end users	14.3	13.5	13.2	13.1	10.6

Carbon dioxide (CO₂) is the most important greenhouse gas accounting for 85 per cent of the UK's total emissions.

Between 1970 and 2001, total CO₂ emissions fell by 18 per cent. Emissions from industry and from households fell by 40 per cent and 23 per cent, respectively. Emissions attributed to transport more than doubled to account for 27 per cent of total emissions by 2001.

Figures for end users show emissions from power stations allocated to those using the electricity generated.

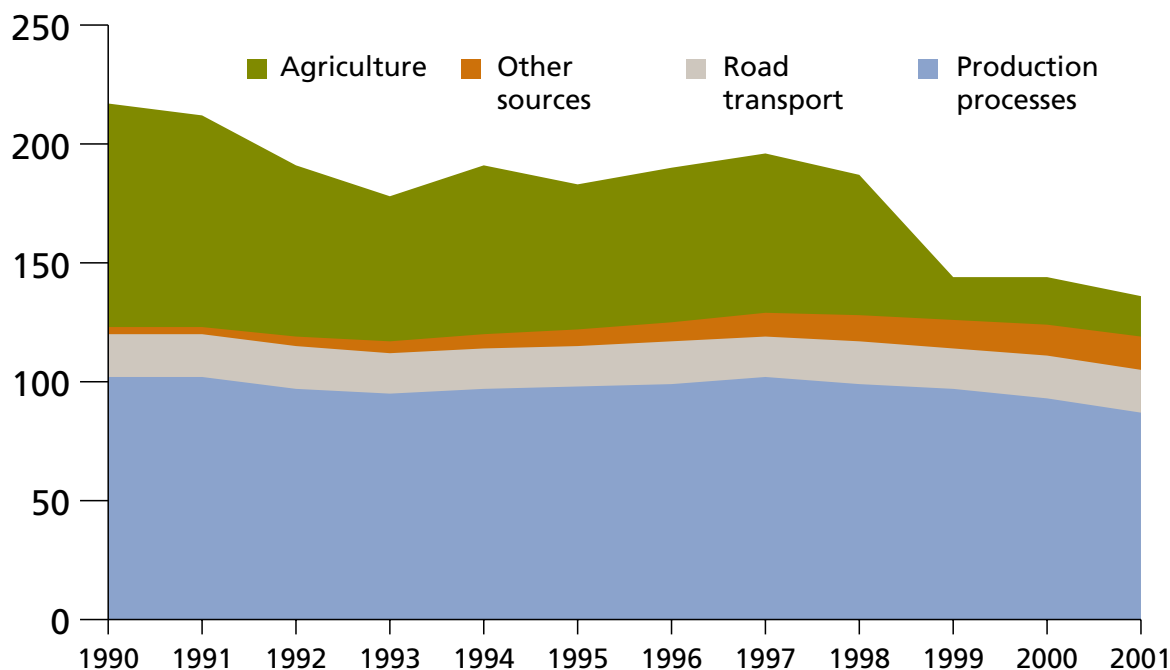
Source: NETCEN

Global atmosphere

Nitrous oxide emissions, by source: 1990-2001

United Kingdom

Thousand tonnes



	Thousand tonnes				
	1990	1995	1999	2000	2001
Agriculture	102	98	97	93	87
Production processes	94	61	18	20	17
Road transport	3	7	12	13	14
Other sources	18	17	17	18	18
Total emissions	218	184	144	144	136

Nitrous oxide (N₂O) is the third most important greenhouse gas, accounting for around 6 per cent of total UK emissions.

Between 1990 and 2001 UK emissions of N₂O fell by 38 per cent. The largest reductions came in 1999, when emissions from adipic acid production (used in the manufacture of nylons and polyesters) were cut to less than a third of the 1998 level. Agriculture is now the main source, accounting for around two-thirds of N₂O emissions.

Emissions from road transport increased threefold between 1990 and 2001, as a result of the introduction of three way catalytic converters. These significantly reduce the emissions of other harmful gases such as carbon monoxide, hydrocarbons and nitrogen oxides, but have the side-effect of producing higher emissions of N₂O.

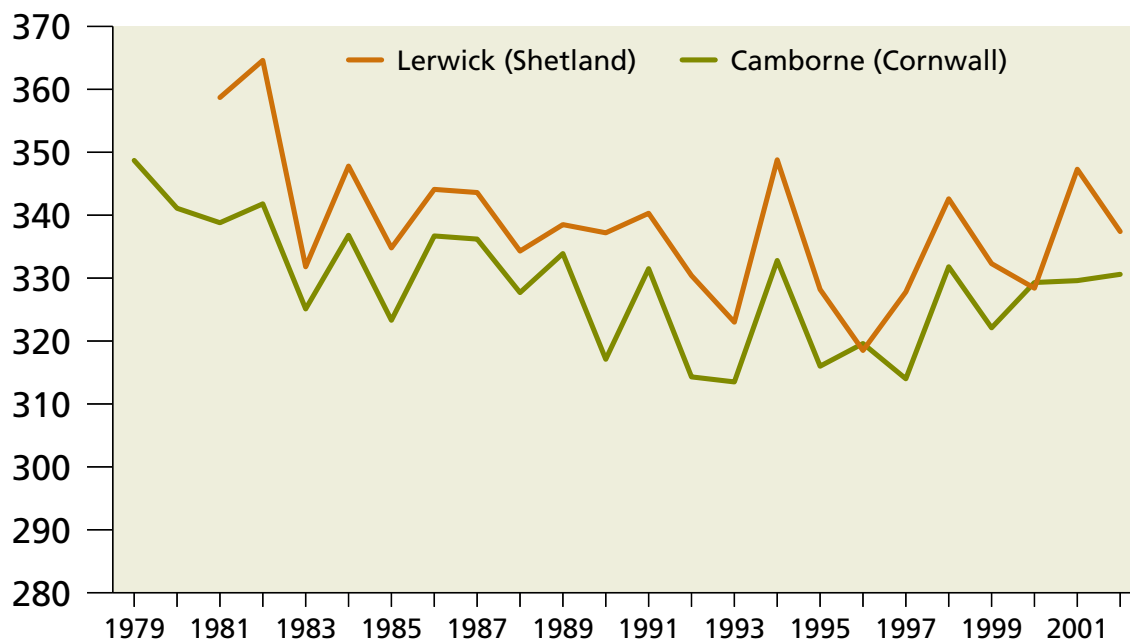
Source: NETCEN

Global atmosphere

Column ozone levels at Lerwick and at Camborne: 1979-2002

United Kingdom

Dobson units



There is now unequivocal evidence that man-made emissions of substances containing chlorine and bromine deplete the stratospheric ozone layer. In 1987, international agreement to limit the production and consumption of the most important of these substances was reached through the Montreal Protocol. Total levels of chlorofluorocarbons (CFCs) in the lower atmosphere peaked in the 1990s. However, these substances have long life in the atmosphere, and it is anticipated that recovery of the ozone layer will not occur until the middle of the 21st century.

Column ozone is the amount of ozone in the column between the Earth and the top of the atmosphere. Levels of column ozone measured above the UK have fluctuated, but generally decreased during the 1980s and 1990s. More recent trends suggest a levelling out, but it is too soon to be sure.

Source: Meteorological Office

Air quality

Air quality and some important air pollutants

For most air pollutants, the main sources of emissions are from fossil-fuel combustion (electricity generation, heating and vehicles).

Sulphur dioxide (SO_2) and nitrogen oxides (NO_x) emissions contribute to acidification and local air pollution. Sulphur dioxide is an acid gas and can affect health and vegetation. It affects the lining of the nose, throat and airways of the lung. Nitrogen oxides are acid gases and ozone precursors and can affect human health and vegetation. Nitrogen dioxide (NO_2) is thought to have both acute and chronic effects on airways and lung function.

Airborne particulate matter is very diverse and includes products of combustion, dust, grit, seasalt and biological particles. It has many sources, such as road traffic, construction work and chemical reactions in the atmosphere. Fine particles can be carried into the lungs and can be responsible for causing premature deaths among those with pre-existing lung and heart disease. The most commonly used method of measurement is based on the size of particles and collects mainly particles $10\mu\text{m}$ (10 thousandths of a millimetre) in diameter or smaller – small enough to penetrate deep into the lungs. The material is known as PM_{10} .

At ground level, ozone (O_3) occurs naturally but levels can be increased as a result of reactions between NO_x , oxygen and volatile organic compounds (VOCs) in the presence of sunlight. Once formed, O_3 can persist for several days and can be transported long distances. It can cause irritation to the eyes and nose and very high levels can cause damage to the airway lining. Ozone can also damage plants and crops.

Persistent organic pollutants (POPs) can accumulate in the tissues of man and animals. These include polycyclic aromatic hydrocarbons (PAHs), a class of hydrocarbons emitted by motor vehicles, industrial processes and processes where there is incomplete combustion, such as bonfires. They are toxic in high concentrations and some may cause cancer.

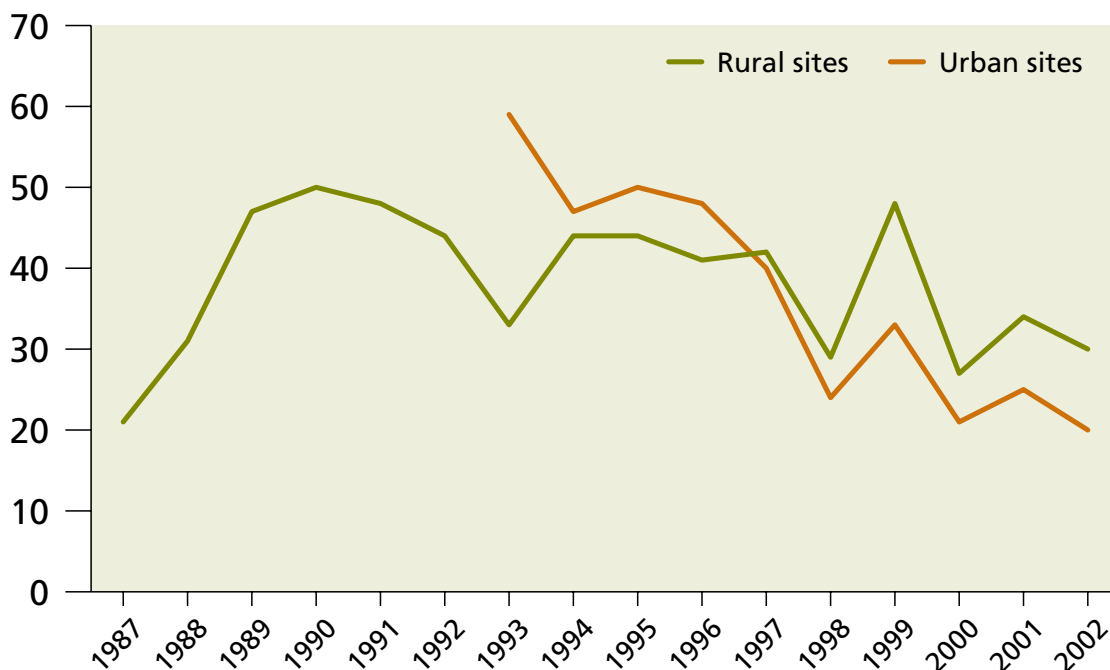
The UK has a National Air Quality Strategy aimed at reducing air pollution. The Strategy sets health-based standards for nine important pollutants, to be achieved by various dates between the end of 2003 and 2010.

Air quality

Days when air pollution is moderate or higher: 1987-2002

United Kingdom

Average number of days per site



Average number of days of moderate or higher air pollution per site

	1987	1993	2000	2001	2002
Urban sites	..	59	21	25	20
Rural sites	21	33	27	34	30

This is a headline indicator of sustainable development for the UK

In urban areas, the average number of days per site when air pollution was recorded as moderate or higher fell by almost two-thirds, from 59 days in 1993 to 20 days in 2002. The long-term decline in the number of pollution days is largely the result of a reduction in particles and sulphur dioxide.

In rural areas, the average number of days of moderate or higher pollution has fluctuated, between 21 days, in 1987, and 50 days in 1990, and there is no clear trend. There were 30 such days in 2002. This reflects variability in the levels of ozone, the main cause of pollution in rural areas, which is affected by the weather.

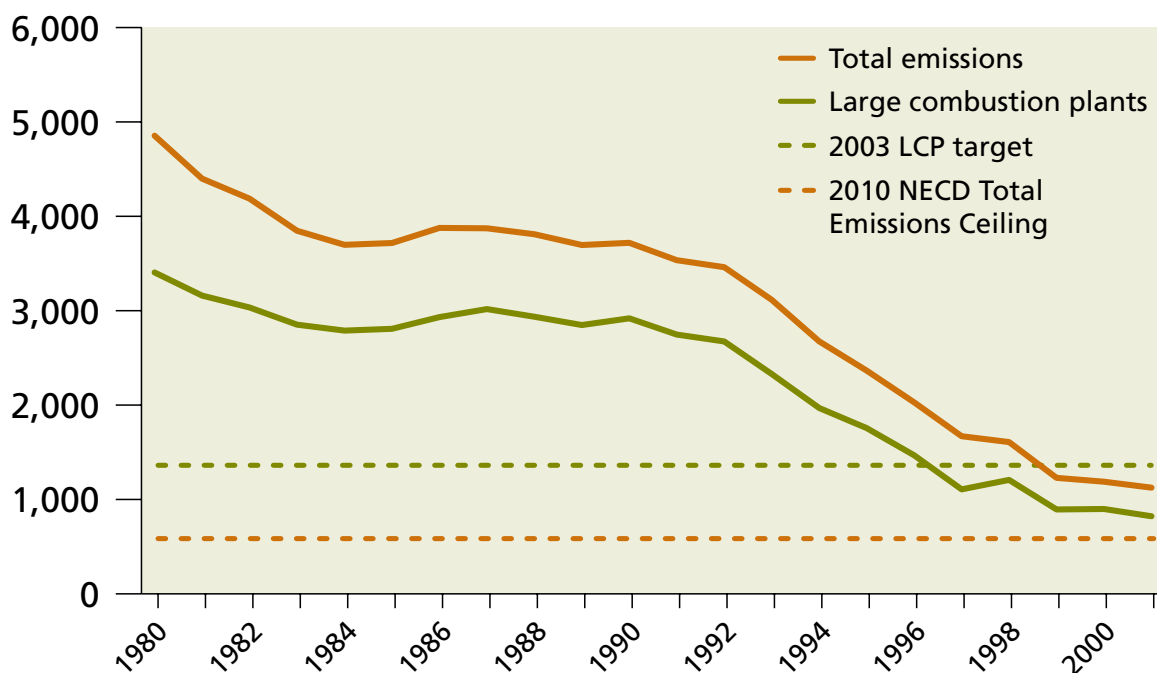
Source: Defra, NETCEN

Air quality

Sulphur dioxide emissions, by source, and targets: 1980-2001

United Kingdom

Thousand tonnes



	Thousand tonnes					
	1980	1990	1995	1998	2000	2001
Large combustion plants	3,405	2,919	1,756	1,207	899	822
Other sources	1,449	800	609	401	289	304
Total emissions	4,854	3,719	2,365	1,608	1,188	1,125

The burning of coal and fuel oil are the major sources of SO₂ emissions. Total SO₂ emissions fell by over three-quarters between 1980 and 2001 to 1,125 thousand tonnes. This compares with a target for 2010 of 585 thousand tonnes under the EU National Emissions Ceiling Directive (NECD). The EC Large Combustion Plants (LCP) Directive required the UK to reduce SO₂ emissions from LCPs by 40 per cent by the end of 1998 and to have reduced emissions by 60 per cent by 2003, taking 1980 as the baseline. The UK met the 1998 target; by 2001, LCP emissions were 76 per cent below the 1980 level.

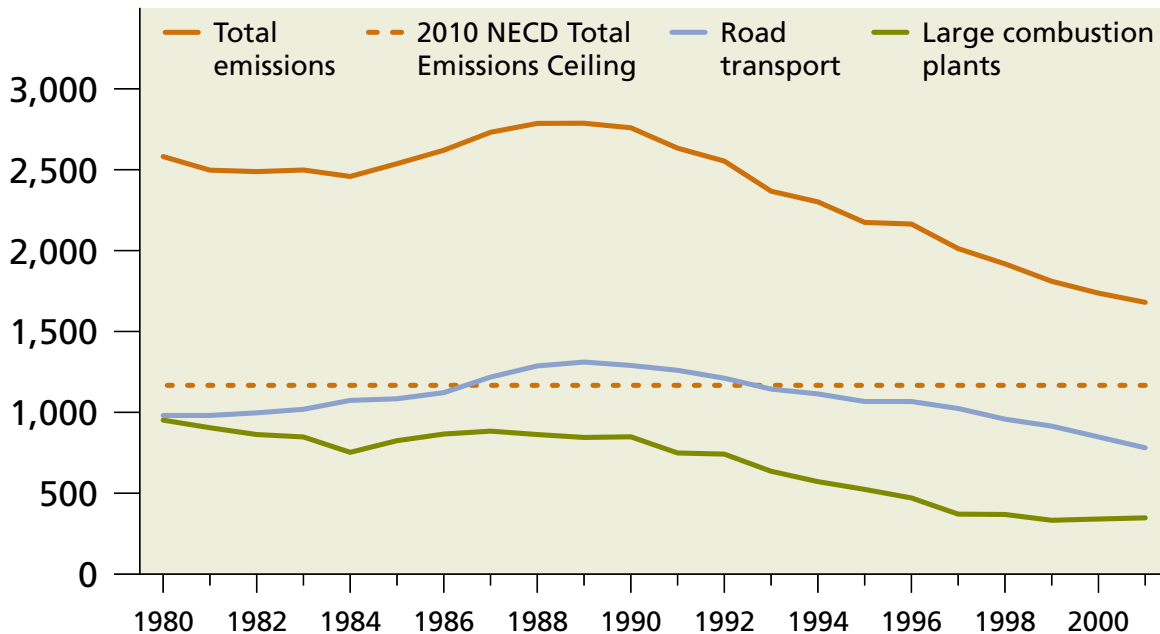
Source: NETCEN

Air quality

Nitrogen oxides emissions, by source, and targets: 1980-2001

United Kingdom

Thousand tonnes



	Thousand tonnes					
	1980	1990	1995	1998	2000	2001
Large combustion plants	952	849	524	369	341	348
Road transport	981	1,290	1,067	958	848	781
Other sources	648	620	583	591	548	551
Total emissions	2,581	2,759	2,174	1,918	1,737	1,680

The combustion of motor spirit, diesel and coal are the major sources of NO_x emissions. Total emissions of NO_x fell by 35 per cent between 1980 and 2001 to 1,680 tonnes. This compares with a target for 2010 of 1,167 thousand tonnes under the EU National Emissions Ceiling Directive (NECD). Emissions from road transport increased by a third during the 1980s but by 2001 had fallen to 20 per cent below the 1980 level.

The EC Large Combustion Plants (LCP) Directive required the UK to reduce NO_x emissions by 30 per cent by 1998 against a 1980 baseline. In 1998, LCP emissions were 61 per cent below the 1980 baseline.

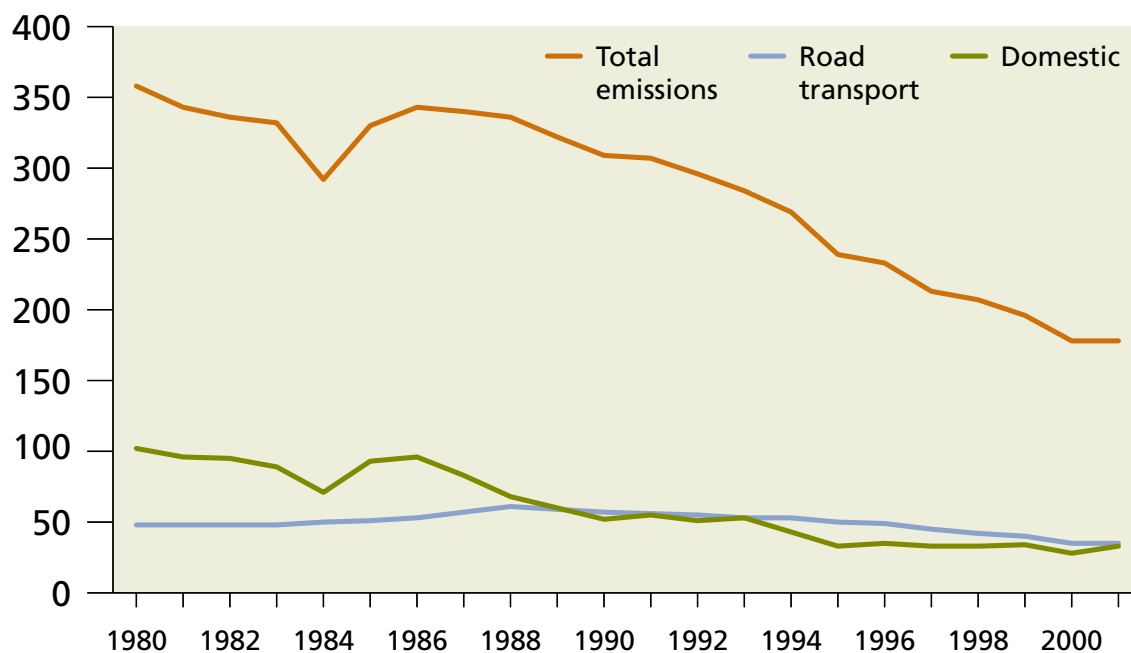
Source: NETCEN

Air quality

Particulate (PM₁₀) emissions, by source: 1980-2001

United Kingdom

Thousand tonnes



	Thousand tonnes					
	1980	1990	1995	1999	2000	2001
Domestic	102	52	33	34	28	33
Road transport	48	57	50	40	35	35
Other sources	208	200	155	121	115	111
Total emissions	358	309	239	196	178	178

Coal burning, diesel combustion, construction, mining and quarrying are the major sources of emissions. Total emissions of PM₁₀ fell by half (180 thousand tonnes) between 1980 and 2001. Over the same period, emissions from domestic sources fell by 68 per cent. Emissions from road transport increased by 28 per cent between 1980 and the peak year of 1988 but by 2001 had fallen to 28 per cent below the 1980 level.

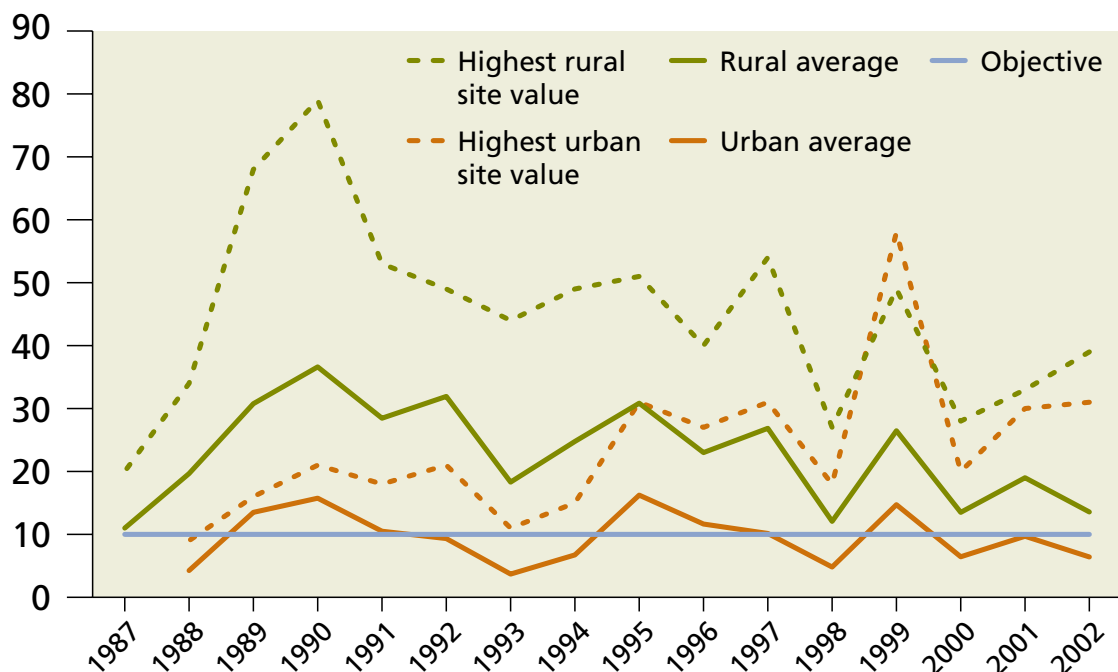
Source: NETCEN

Air quality

Ground level ozone exceedences: 1987-2002

United Kingdom

Number of days exceeding objective concentration ($100\mu\text{g}/\text{m}^3$)



	Average number of days exceedence per site				
	1987	1990	2000	2001	2002
Urban sites	..	16	6	9	6
Rural sites	11	37	14	18	14

There is evidence that background levels of near ground level ozone have doubled over the past 100 years.

The provisional health objective is that the daily maximum 8 hour running mean should not exceed a concentration of 100 micrograms per cubic metre on more than 10 days a year at any site by 2005. The objective was met at three quarters of the sites in 2002.

The series for the average number of days of exceedence per site can be volatile from one year to the next and there is no clear trend. Production of ozone is affected by the weather and by air pollutants blown over from Europe and North America. Ozone concentrations tend to be lower in urban areas where it is converted to NO_2 through chemical reaction with NO_x .

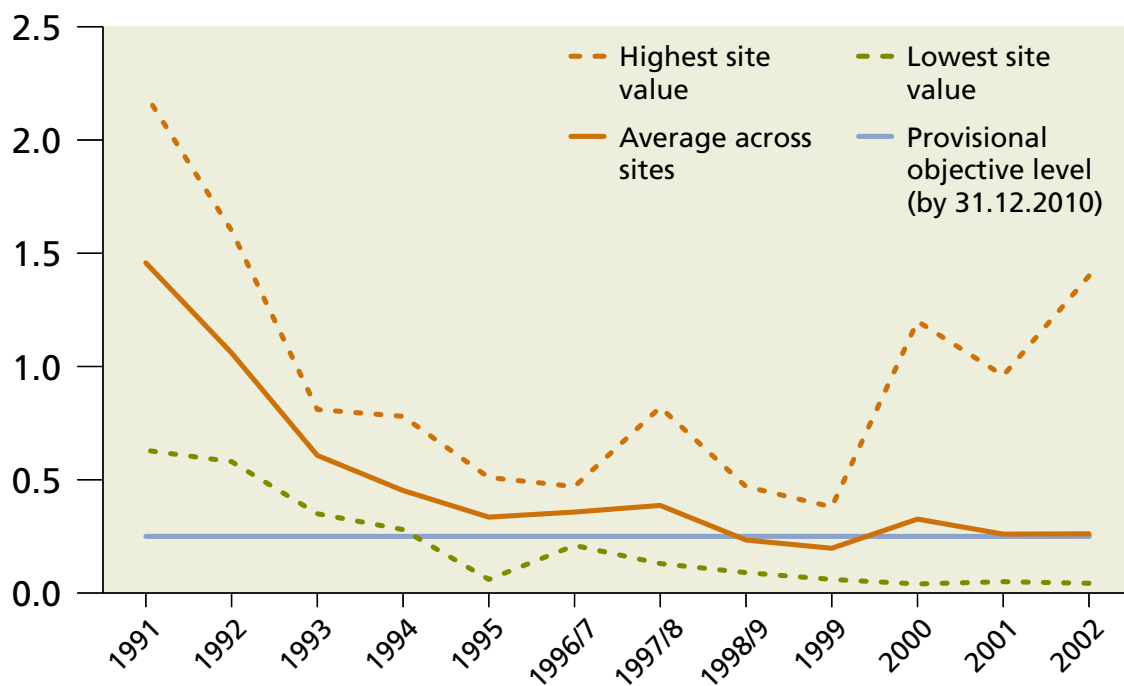
Source: NETCEN

Air quality

Average levels of Benzo[a]pyrene compared to provisional health objectives: 1991-2002

United Kingdom

Running annual mean (ng/m³)



	Nanograms per cubic metre				
	1991	1995	2000	2001	2002
Annual mean across sites	1.46	0.34	0.33	0.26	0.26

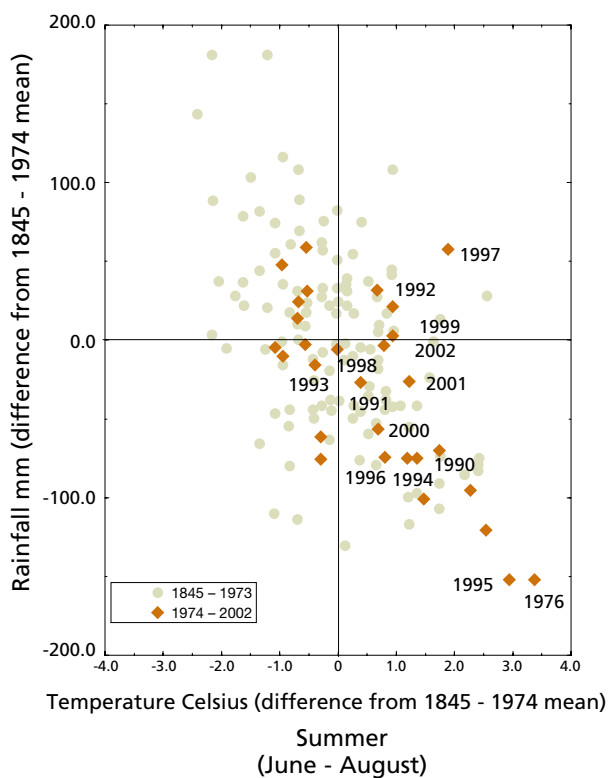
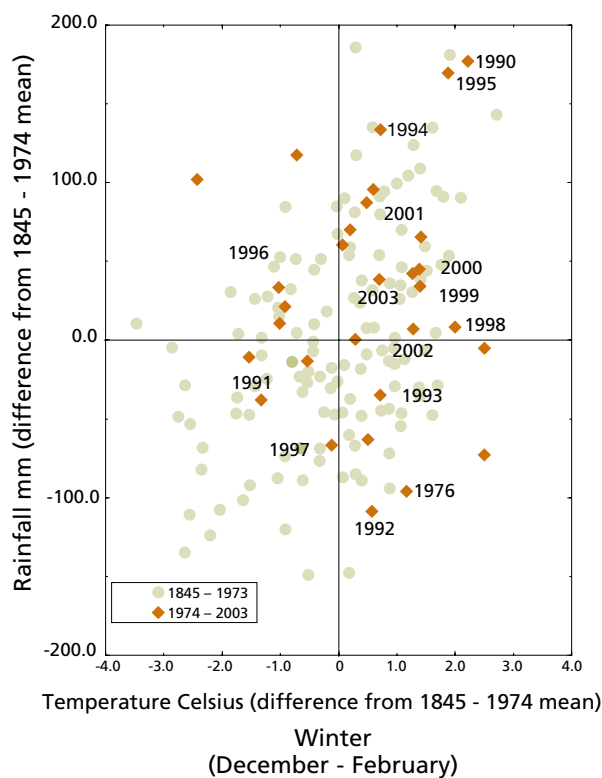
Exposure to polycyclic aromatic hydrocarbons (PAHs), emitted by motor vehicles, bonfires and industrial processes, can cause cancer. A new objective for reducing levels of PAH in the air was added to the National Air Quality Strategy in 2003. It uses one PAH, benzo[a]pyrene (B[a]P), as a marker for the total PAHs in the air. The objective is to reduce annual average concentrations to below 0.25 ng/m³ by the end of 2010. The objective level was exceeded at 5 of the 19 sites in 2001. The number of monitoring sites has increased greatly since 1998. This has increased the scope for extreme high and low values on the chart.

Note: the objective applies in England, Scotland and Wales. N Ireland intends to announce its objective in due course.

Source: NETCEN

Inland water

Rainfall and temperature in England and Wales: 1845-2003



These charts plot departures from average winter and summer rainfall and temperature for all the years since 1845. The last 30 years are shown as orange diamonds.

On the winter chart, the recent years tend to fall more in the top right quarter, corresponding to milder, wetter winters. On the summer chart, recent years tend to fall more in the bottom right quarter, corresponding to warmer, drier summers compared with earlier periods. This pattern is broadly consistent with recent climate change scenarios although any apparent short-term trends should be treated with caution as the climate is inherently variable.

Changes in seasonal weather patterns have important implications for the frequency and magnitude of flooding and for water resources.

Note: on the winter chart the year refers to the January/February year of that winter

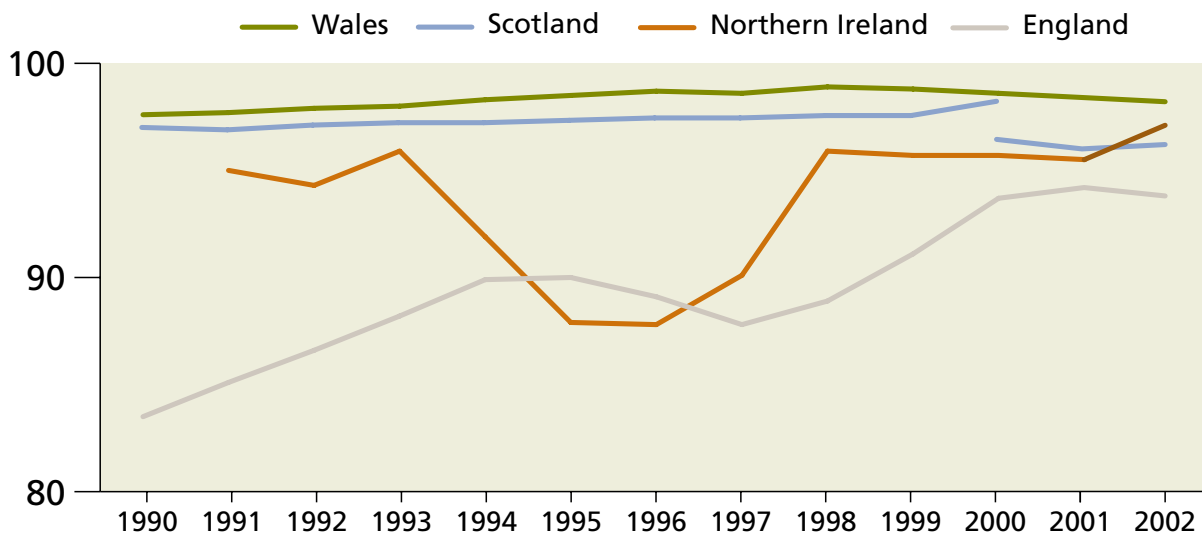
Source: Centre for Ecology and Hydrology (Wallingford), Meteorological Office

Inland water

Chemical river water quality: 1990-2002

United Kingdom

Percentage of classified river length of good or fair quality



2002	Percentage			Total river lengths classified (km)
	Good	Fair	Poor/Bad	
England	65	28	6	36,190
Wales	86	11	2	4,570
Northern Ireland	55	42	3	4,130
Scotland	86	10	4	25,440

This is a headline indicator of sustainable development for the UK

Rivers are a major source of water used for drinking and by industry, they also support a wide variety of wildlife and are used extensively for recreation.

It is estimated that in 2002, about 95 per cent of the river network in the UK was of good or fair chemical quality. In England 94 per cent of rivers were of good/fair quality in 2002 compared with 84 per cent in 1990. In Northern Ireland quality fell in the mid-1990s but recovered by 2002 to be higher than the 1991 level. In Wales and Scotland quality remained high.

Note: the basis of measurement changed in Scotland from 2000.

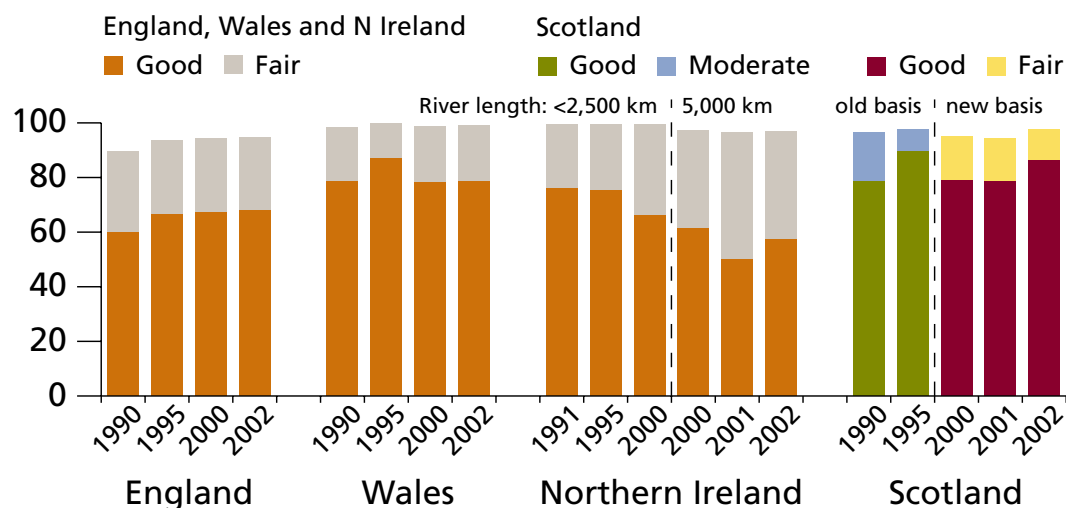
Source: Environment Agency, SEPA, Environment and Heritage Service

Inland water

Biological river water quality: 1990-2002

United Kingdom

Percentage of classified river length



2002	Percentage			Total river lengths
	Good	Fair	Poor/ Bad	Total river lengths classified (km)
England	68	27	5	33,500
Wales	79	21	1	4,380
Northern Ireland	57	40	3	5,140
Scotland	86	11	3	8,610

This is a headline indicator of sustainable development for the UK

Biological grading is based on the monitoring of small animals (invertebrates) which live in, or on the bed of, rivers and canals. In 2002, approximately 95 per cent of the UK's river network was classified as being of good or fair quality. Between 1990 and 2002, biological quality improved in England. In Wales almost all rivers are of good or fair quality. In Northern Ireland there was a fall in good quality rivers between 2000 and 2001 followed by a rise in 2002. The river length used for biological monitoring in Northern Ireland more than doubled between 1995 and 2000. There was a fall in river length of good quality in those rivers monitored in both years.

In Scotland biological quality is generally high, but changes in measurement methods and network definitions mean that it is difficult to draw conclusions about trends.

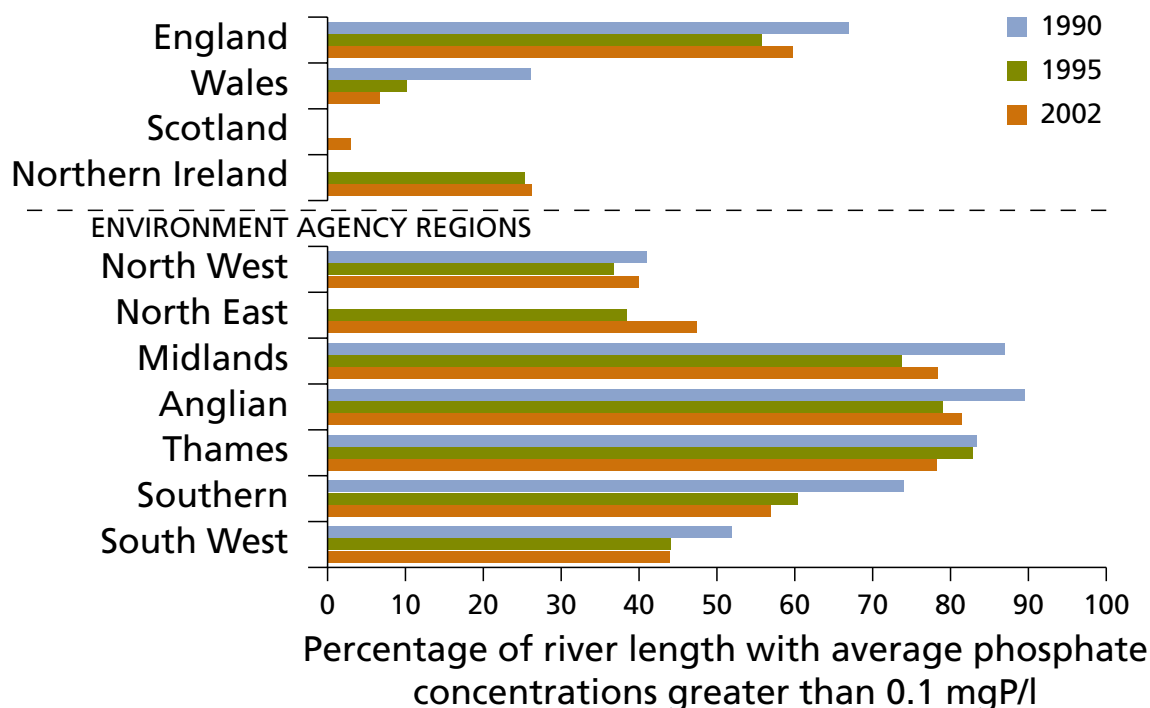
Note: In Scotland definitions and criteria for rivers included are different from the rest of the UK.

Source: Environment Agency, SEPA, Environment and Heritage Service

Inland water

Phosphate concentrations in rivers: 1990-2002

United Kingdom



Percentage of river lengths with concentrations greater than 0.1 mgP/l

	1990	1995	2002
England	67	56	60
Wales	26	10	7
Scotland	3
Northern Ireland	..	25	26

Phosphorus and nitrogen are naturally found in water, and plants require these nutrients to grow. Elevated levels of phosphorus in water, from inputs from sewage works, for example, can lead to eutrophication (excessive algal growth) in freshwater.

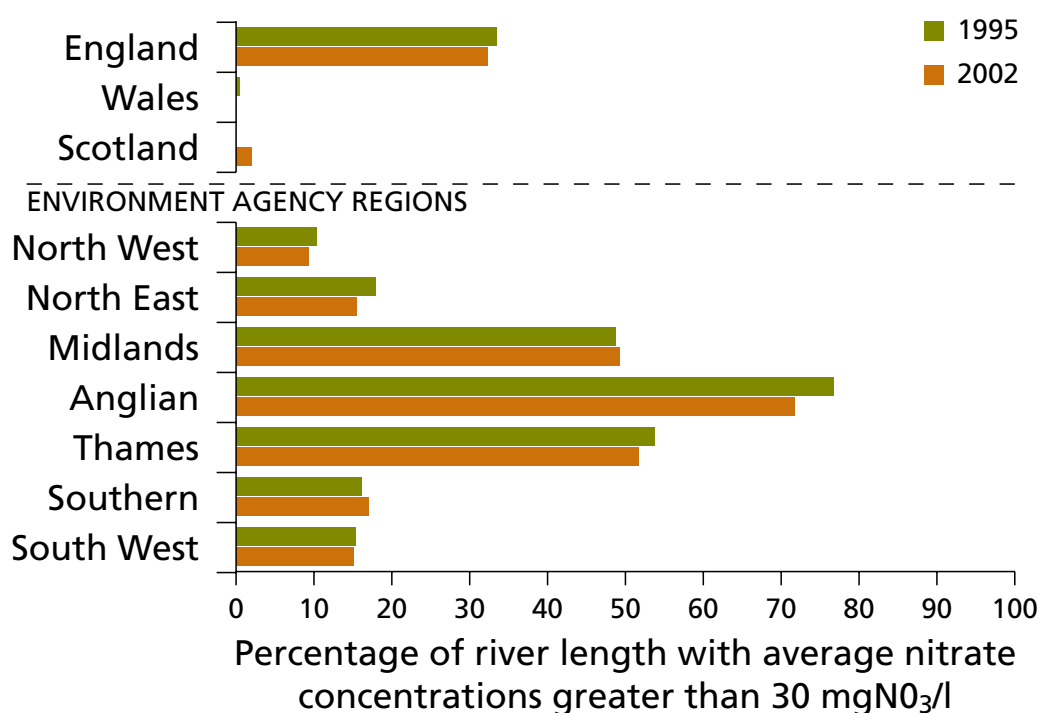
Rivers with the highest concentrations are mainly in central and eastern England, reflecting the geology and higher population. In 2002, around 80 per cent of river lengths in Thames, Anglian and Midlands regions had average phosphate concentrations greater than the guideline value of 0.1 mgP/l. Between 1995 and 2002 the percentage river length exceeding this value decreased in Southern and Thames regions and remained unchanged in the South West but increased in all other regions in England.

Source: Environment Agency, SEPA, Environment and Heritage Service

Inland water

Nitrate concentrations in rivers: 1995-2002

United Kingdom



Percentage of river lengths with concentrations greater than 30 mgNO₃/l

	1995	2002
England	33	32
Wales	1	0
Scotland	..	2
Northern Ireland	0	0

As with phosphorus, high levels of nitrate can lead to eutrophication in surface waters. High levels can also result in eutrophication in sea water.

Higher levels of nitrate concentrations tend to be in central and eastern England, reflecting inputs from agriculture, geology and sewage effluent. In 2002, almost three quarters of the river lengths in Anglian region, and about half in Midlands and in Thames regions had an average concentration greater than 30 mgNO₃/l. Overall, in 2002 32 per cent of river lengths in England had concentrations above this level, little different from 1995.

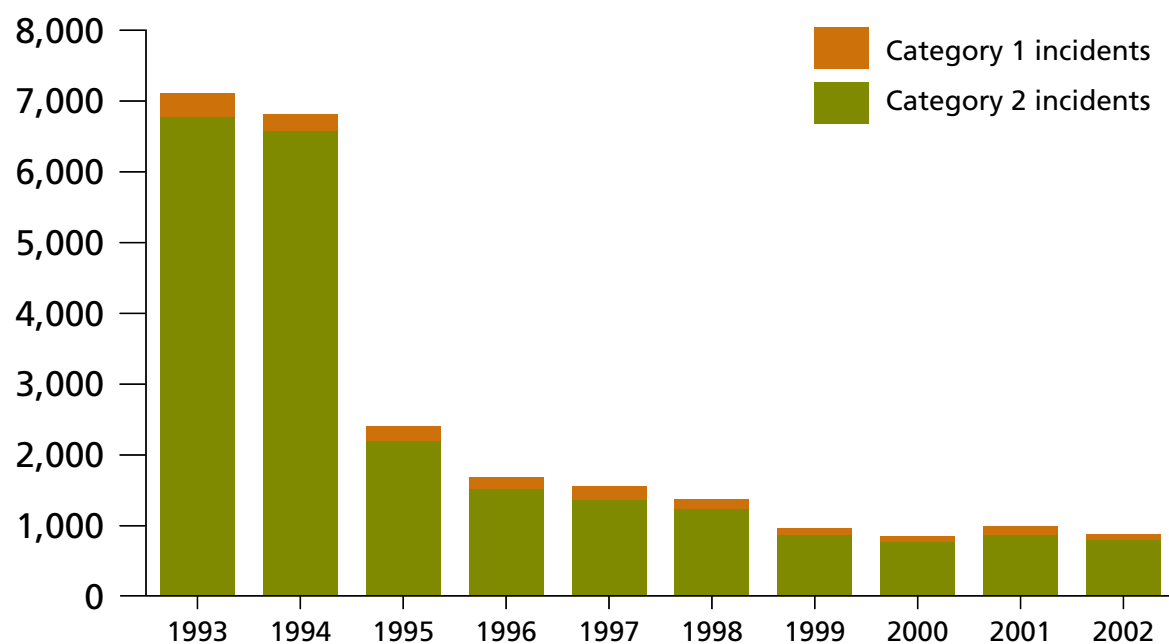
Source: Environment Agency, SEPA, Environment and Heritage Service

Inland water

Water pollution incidents: 1993-2002

England and Wales

Number of pollution incidents



	1993	1998	2000	2001	2002
Category 1 incidents	331	128	77	118	82
Category 2 incidents	6,768	1,238	758	860	784
Prosecutions	286	96	235	258	234

Category 1 and category 2 pollution incidents have the most serious impact on river water quality, the other two categories are those that are relatively minor or have no impact.

In 2002 there were 866 category 1 and 2 incidents in England and Wales 4 per cent more than in 2000 but fewer than in all other years and 88 per cent fewer than in 1993. The type of pollutant most involved was fuels and oils, which was involved in over a quarter of category 1 incidents in 2002.

The number of prosecutions for water pollution fell by 66 per cent between 1993 and 1998 but has risen since and in 2002 was 18 per cent lower than in 1993.

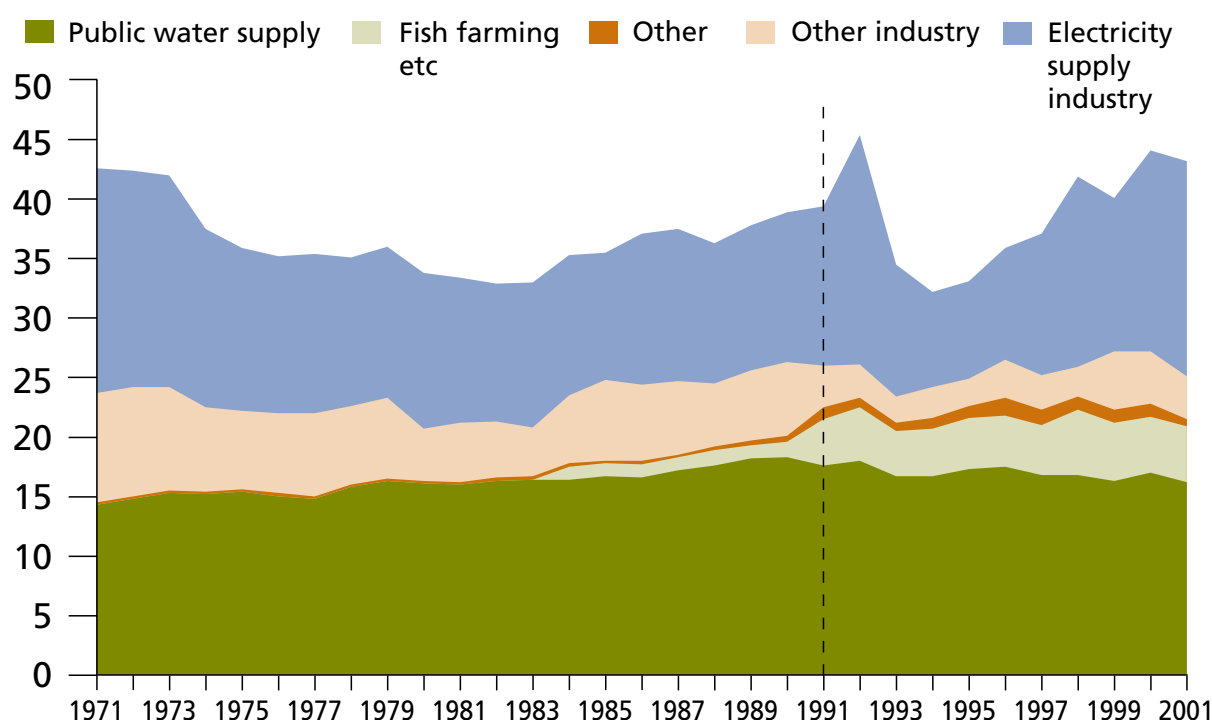
Source: Environment Agency

Inland water

Abstractions from non-tidal surface water and groundwater, by use: 1971-2001

England and Wales

Thousand megalitres per day



	Thousand megalitres/day				
	1991	1995	1999	2000	2001
Public water supply	17.6	17.3	16.3	17.0	16.2
Electricity supply industry	13.4	8.2	12.9	16.9	18.1
Other industry	3.5	2.3	4.9	4.4	3.6
Other purposes	4.9	5.3	5.8	5.8	5.2
Total	39.3	33.2	40.1	44.1	43.1

Water is abstracted under licences, granted on the basis of the reasonable needs of the public, industry and agriculture and availability of supplies. The amount abstracted has been generally rising since the mid-1990s. In 2001, in England and Wales total abstractions were slightly lower than in the peak year of 1992. In 2001, almost 80 per cent of water abstracted was for the public water supply and electricity supply industry.

Note: data collected before 1991 are not strictly comparable with later years.

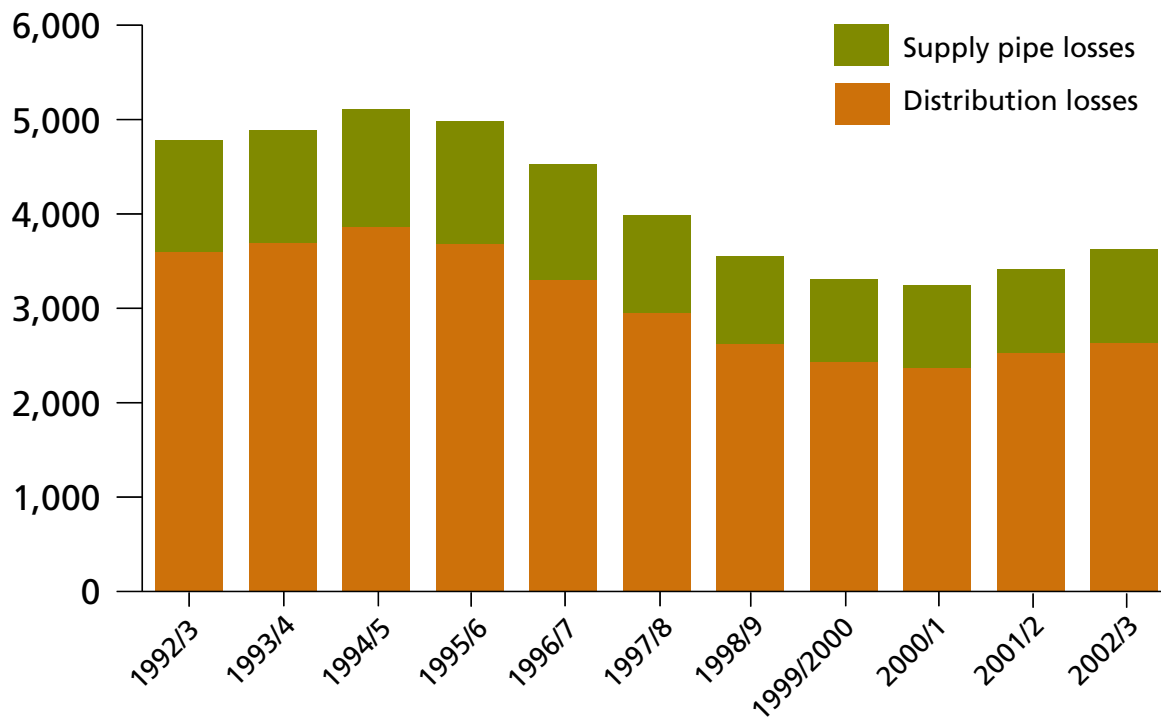
Source: Environment Agency

Inland water

Water leakage: 1992/3-2002/3

England and Wales

Megalitres (MI) per day



	Megalitres (MI) per day			
	1992/3	2000/1	2001/2	2002/3
Distribution losses	3,600	2,365	2,527	2,628
Supply pipe losses	1,181	878	888	995
Total leakage	4,781	3,243	3,415	3,623

Targets are set each year for water companies in England and Wales to reduce leakage. In 2002/3, 3,623 megalitres per day of water put into the supply in England and Wales was lost through leakage, 29 per cent lower than in the peak year 1994/5 but higher than in any of the four previous years.

Distribution losses include all losses between the treatment works and the highway boundary. Supply pipe losses are leakage from the customers' pipes between the highway boundary and the customers' stop tap.

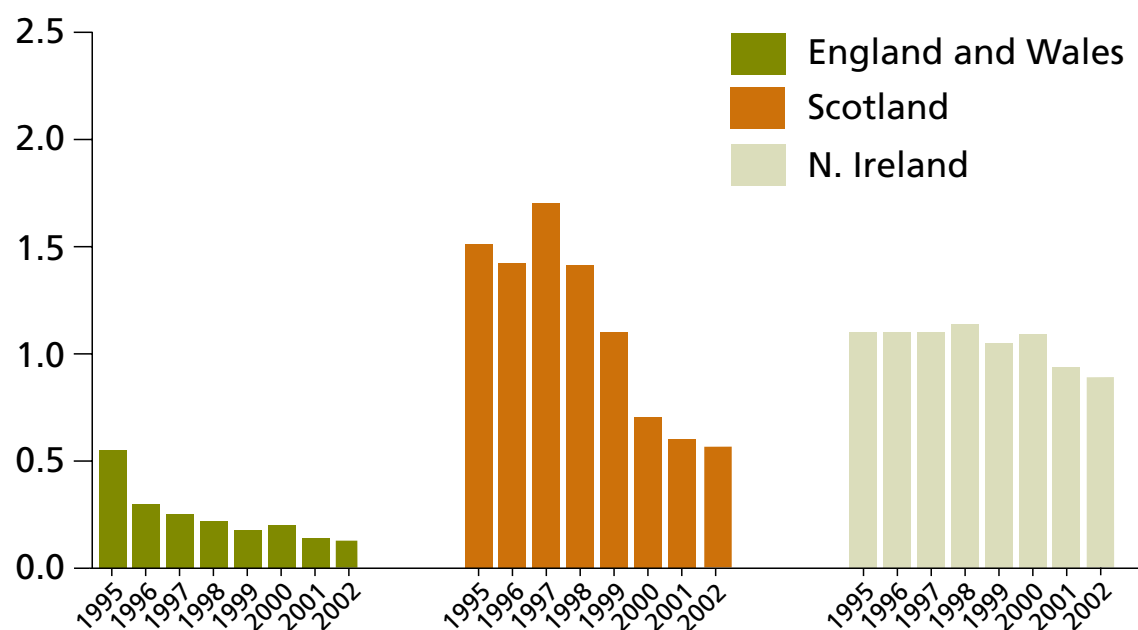
Source: Ofwat

Inland water

Drinking water quality: 1995-2002

United Kingdom

Percentage of determinations exceeding standard



	Percentage exceeding (ie failing to meet) standards				
	1995	1999	2000	2001	2002
England and Wales	0.55	0.18	0.20	0.14	0.13
Scotland	1.51	1.10	0.70	0.59	0.52
N Ireland	1.10	1.05	1.09	0.94	0.88

Water undertakers in the UK are required to supply wholesome water and are responsible for assessing its quality through regular sampling of water treatment works, service reservoirs and discrete water supply zones.

In 2002 in England and Wales, 2.97 million determinations were made and 0.13 per cent failed to meet the standards, compared with 0.55 per cent in 1995. In Scotland 344 thousand determinations were made in 2002 and 0.52 per cent failed, compared with 1.51 per cent in 1995. In Northern Ireland 106 thousand determinations were made in 2002, of which 0.88 per cent failed, compared with 1.1 per cent in 1995.

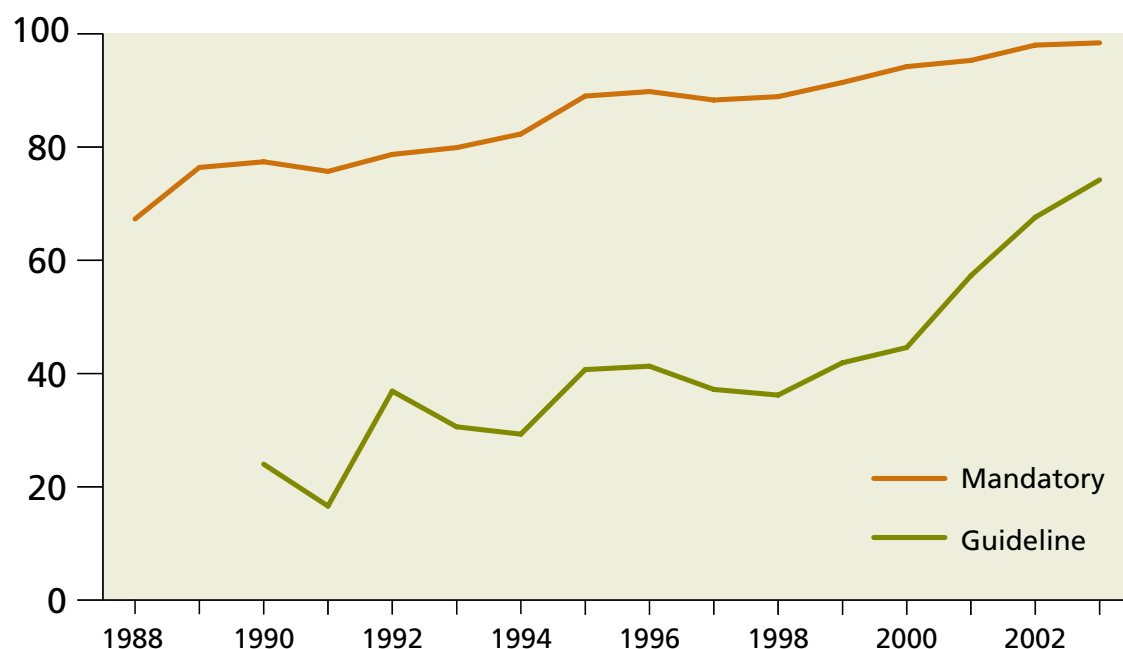
Source: DWI, The Scottish Executive, DRD(NI) Water Service

Coastal and marine waters

Compliance with the EC Bathing Water Directive mandatory and guideline standards: 1988-2003

United Kingdom

Percentage complying



	Percentage complying				
United Kingdom	1988	1995	2001	2002	2003
Mandatory standards	67	89	95	98	98
Guideline standards	..	41	57	68	74

Compliance of bathing waters in the UK with the mandatory standards of the European Bathing Water Directive was 98 per cent in 2003 compared with 67 per cent in 1988. Compliance with the more stringent guideline standards was 74 per cent in 2003.

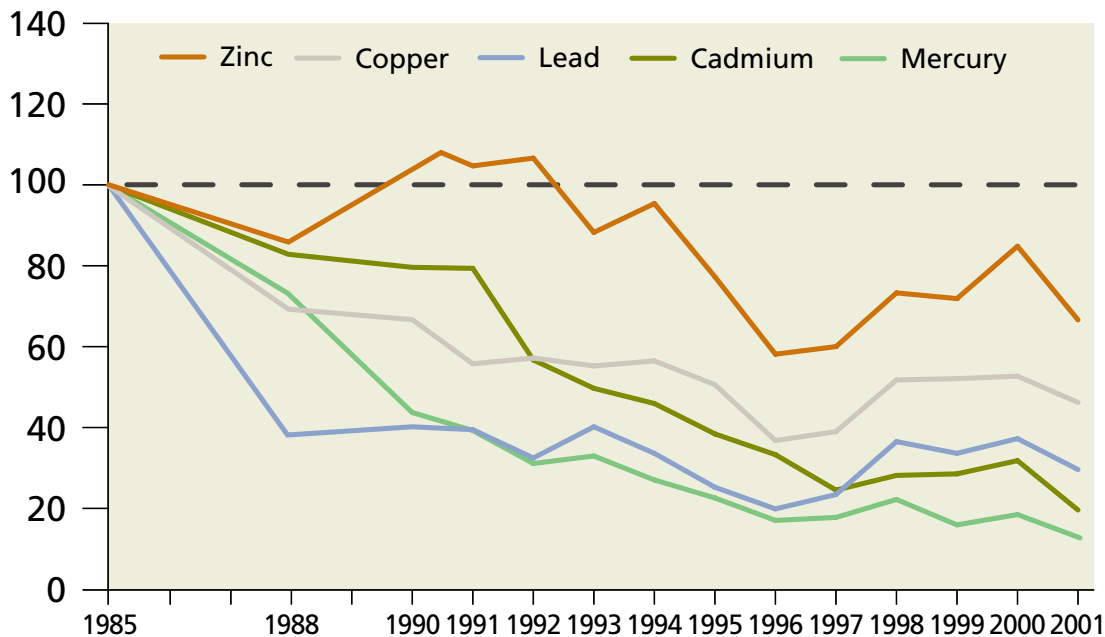
Overall, bathing water quality has improved in the United Kingdom. This trend is expected to continue as further improvements are made to discharges from the sewerage infrastructure, which affects coastal waters.

Source: Environment Agency, SEPA, Environment and Heritage Service

Coastal and marine waters

Riverine and direct inputs of metals from the UK to marine waters around the UK: 1985-2001

United Kingdom
Index (1985=100)



Total UK annual riverine flow rate										Thousand Megalitres/day	
1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	LTA	
290	279	305	261	223	237	314	309	365	290	284	

Over the last decade there have been substantial reductions in most inputs of metals via rivers and direct discharges to estuaries and coastal waters. The higher level of riverine inputs from 1998 to 2000 compared to earlier years reflects the corresponding increase in riverine flows. This highlights the importance of looking at the pattern of change in inputs over a long period rather than at year on year changes which can be misleading.

Note: based on upper estimates

Note: LTA = long term average flow rate

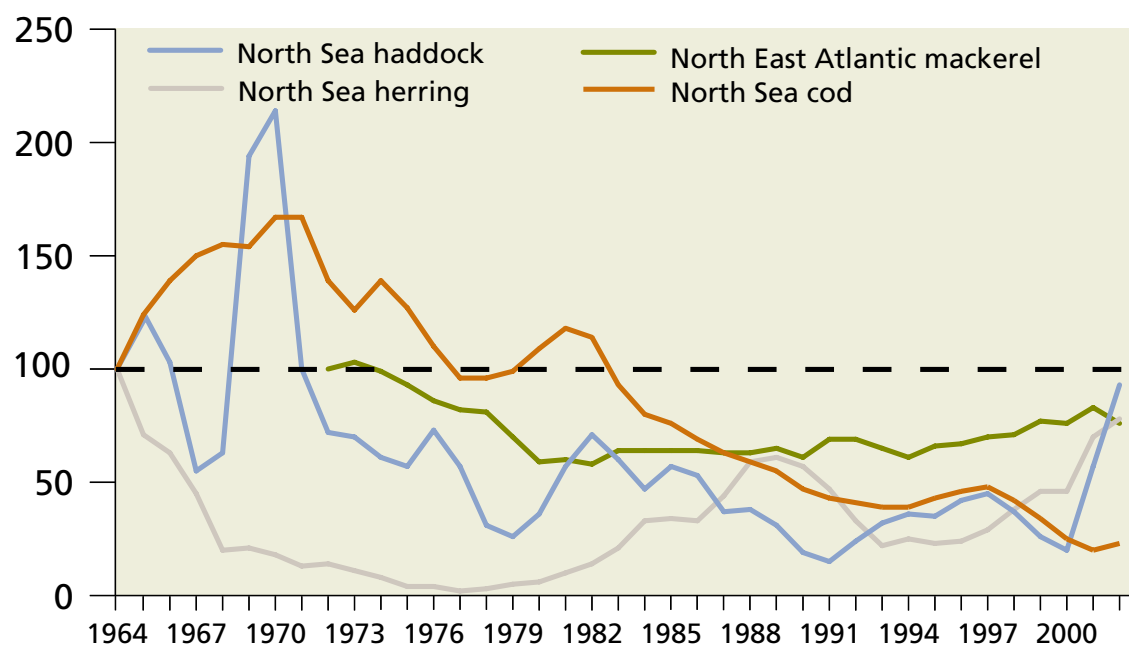
Source: Defra, Environment Agency, SEPA, DRD(NI)

Coastal and marine waters

North Sea fish stocks and stocks of North East Atlantic mackerel: 1964-2002

United Kingdom

Index (1964=100)
(mackerel: 1972=100)



Trends vary from species to species and stocks can fluctuate substantially over relatively short periods. Most stocks are over-exploited and some stocks are at historically low levels, especially North Sea cod. The North Sea herring population was seriously affected by over-fishing in the 1970s and the fishery was closed between 1978 and 1982, allowing stocks to recover. North East Atlantic mackerel, the other major pelagic fish stock, is also increasing.

The spawning stock biomass estimates are those produced in 2002 by the International Council for the Exploration of the Sea (ICES) based on mathematical models that use time series information on international catches and fishing activity and estimates of relative abundance from research vessel surveys.

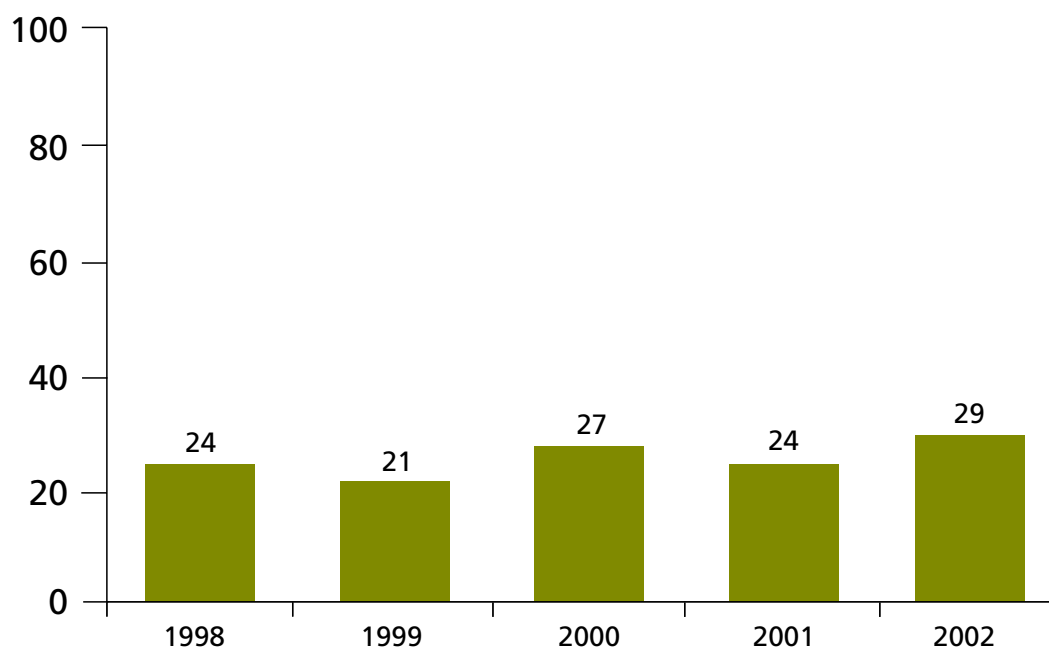
Source: ICES, CEFAS

Coastal and marine waters

Fish stocks around the UK within biological safe limits: 1998-2002

United Kingdom

Per cent



In 2002, 29 per cent of reported fish stocks around the UK were assessed to be within safe biological limits. These stocks had spawning levels which were sufficient to allow a good probability of stock replenishment.

There was a slight increase in the reported proportion of fish stocks considered to be within safe limits between 1998 and 2002, it is uncertain whether this represents a long term trend. Levels have fluctuated a little between 1998 and 2002 but in general around three-quarters of stocks have been outside safe limits as a result of insufficient spawning levels or exploitation rates that were too high. For many of these stocks the ICES scientific advice is that the fishing rate should be reduced substantially in order to permit the stocks to recover.

Note: figures relate to finfish stocks only.

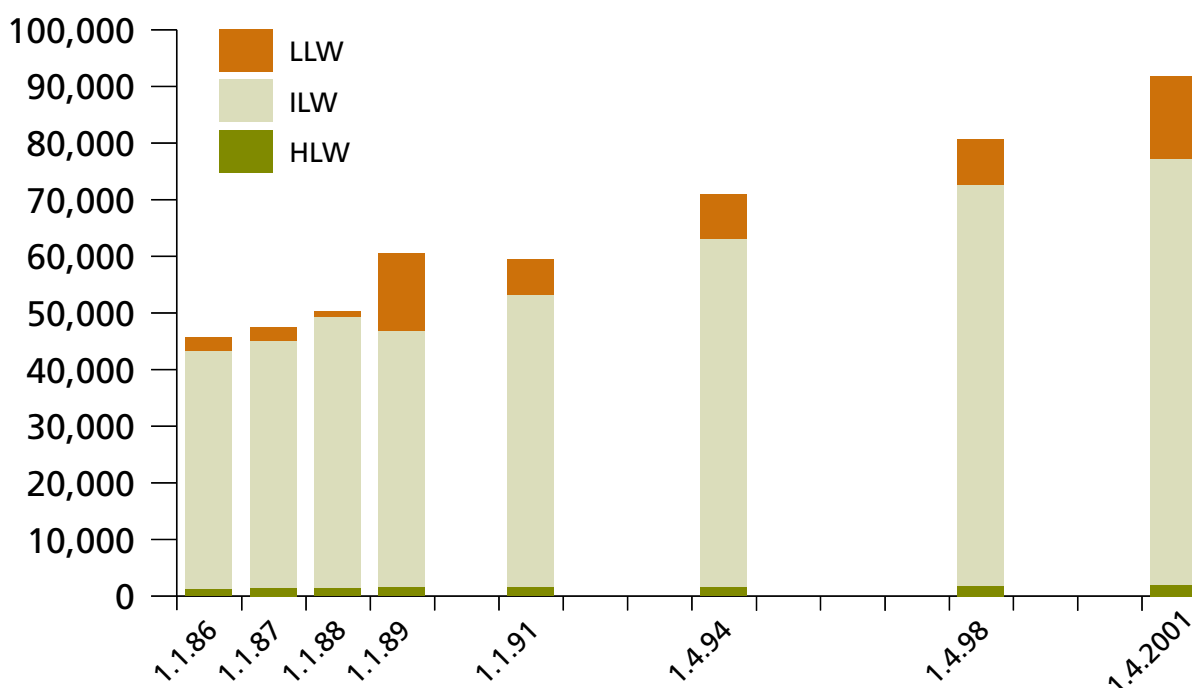
Source: Defra

Radioactivity

Radioactive waste stocks: 1986-2001

Great Britain

Cubic metres



	Cubic metres				
Type of waste	1986	1991	1994	1998	2001
High level (HLW)	1,350	1,690	1,640	1,800	1,960
Intermediate level (ILW)	41,890	51,560	61,490	70,950	75,400
Low level (LLW)	2,430	6,250	7,880	7,980	14,600

High level waste results from the reprocessing of nuclear fuel, and is highly radioactive. It exists mainly as a liquid before being turned into glass and stored. Stocks increased by 45 per cent between 1986 and 2001. **Intermediate level waste** includes, for example, nuclear reactor components and the irradiated metal cladding for nuclear reactor fuel. There is presently no disposal route for these two types of waste and they have to be stored. Stocks of such waste rose by 80 per cent between 1986 and 2001. **Low level waste** includes items such as worn out nuclear workers' clothing. This is usually disposed of in special facilities soon after production. Most of the volume of LLW is waste in interim storage awaiting disposal.

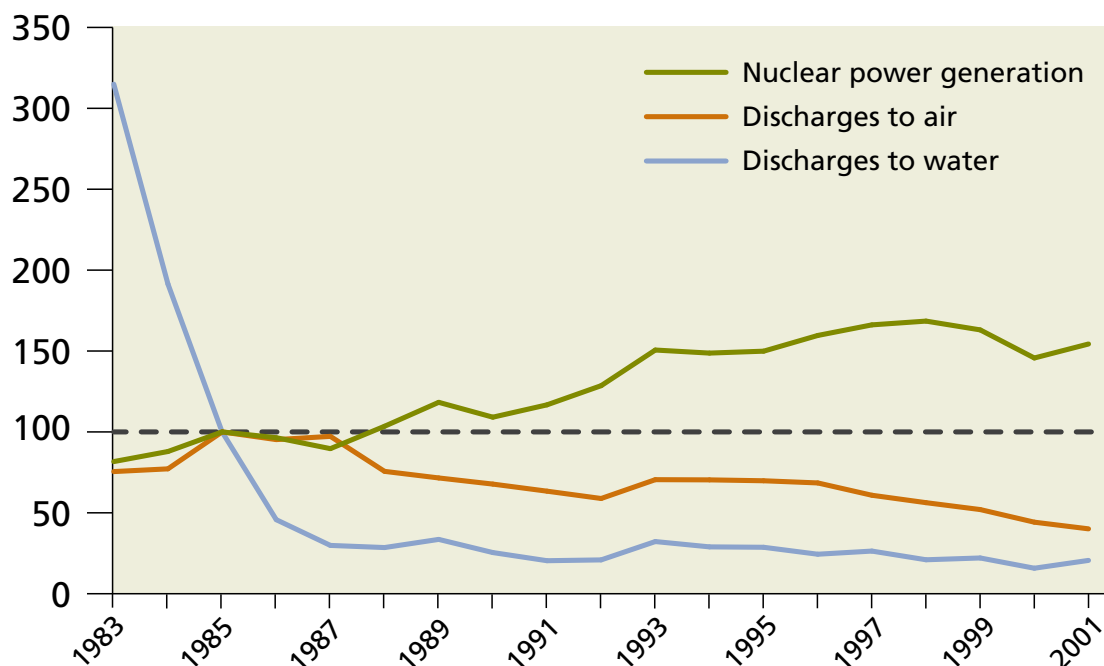
Source: Electrowatt Ekono (UK) Ltd

Radioactivity

Discharges from the nuclear industry: 1983-2001

United Kingdom

Index (1985=100)



Radioactive discharges are the less toxic waste products from electricity generation and the medical and scientific industries that are emitted, under authorisation, to air and water.

Radioactive emissions to air in the UK fell by around 60 per cent between 1985 and 2001 and emissions to water fell by 79 per cent. At the same time, electricity production from nuclear sources increased by 54 per cent. Around a quarter of overall UK electricity generated has come from nuclear sources in recent years.

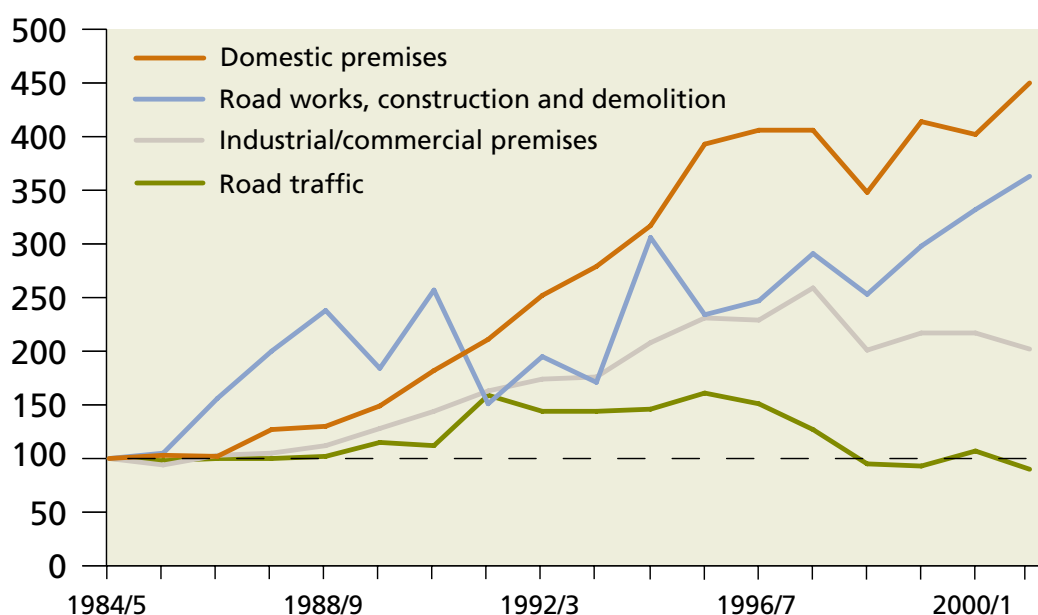
Source: DTI, MOD, SEPA, FSA, CEFAS, BNFL, UKAEA, British Energy Generation, Amersham plc

Noise

Noise complaints received by Environmental Health Officers: 1984/5-2001/2

England and Wales

Index 1984/5=100



	Number per million people			
	1984/5	1990/1	1995/6	2001/2
Domestic premises	1,244	2,264	4,895	5,593
Road works and construction	98	252	229	356
Industrial/commercial premises	636	913	1,466	1,287
Road traffic	41	46	66	37
Aircraft	15	34	48	101

Although noise complaints are increasing, this does not necessarily mean that there has been an increase in actual noise levels.

Domestic premises are the largest cause of complaints about noise, accounting for three quarters of all complaints in 2001/2. Between 1984/5 and 2001/2, complaints about noise from this source increased around four and a half times. Complaints about the other noise sources more than doubled over the same period, except for those about road traffic which rose by 61 per cent by 1995/6, but in the last three years were at a similar level to 1984/5.

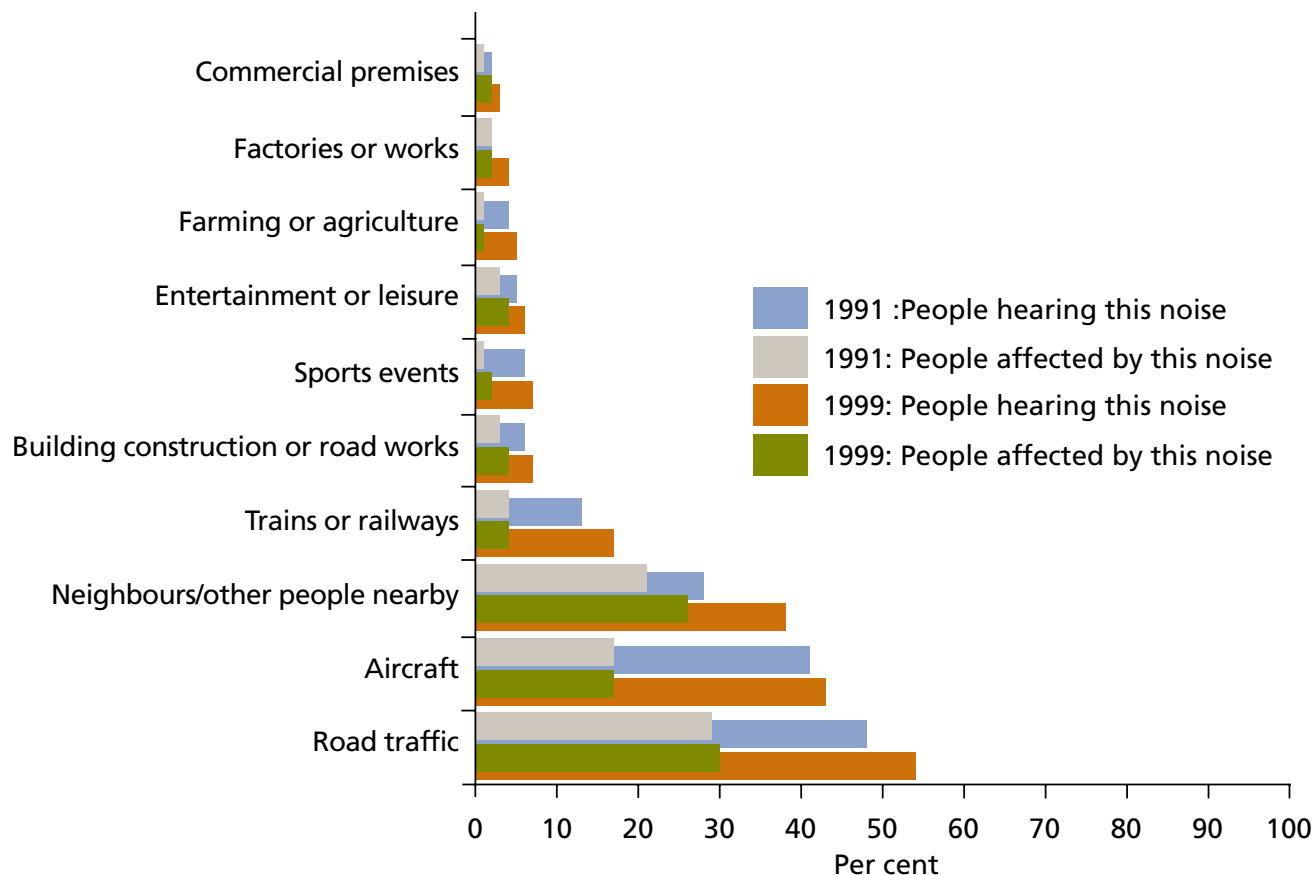
The information reported to the EHOs is considered to give, at best, only a very approximate indication of the trend in noise complaints from these sources.

Source: CIEH

Noise

Attitudes to noise: 1991-1999

England and Wales



In 1999, respondents to a national survey of attitudes to noise were asked if they had heard noise and if they were affected by it. For all types of noise a greater proportion of respondents reported both hearing and being affected by the noise than had respondents to a similar survey in 1991.

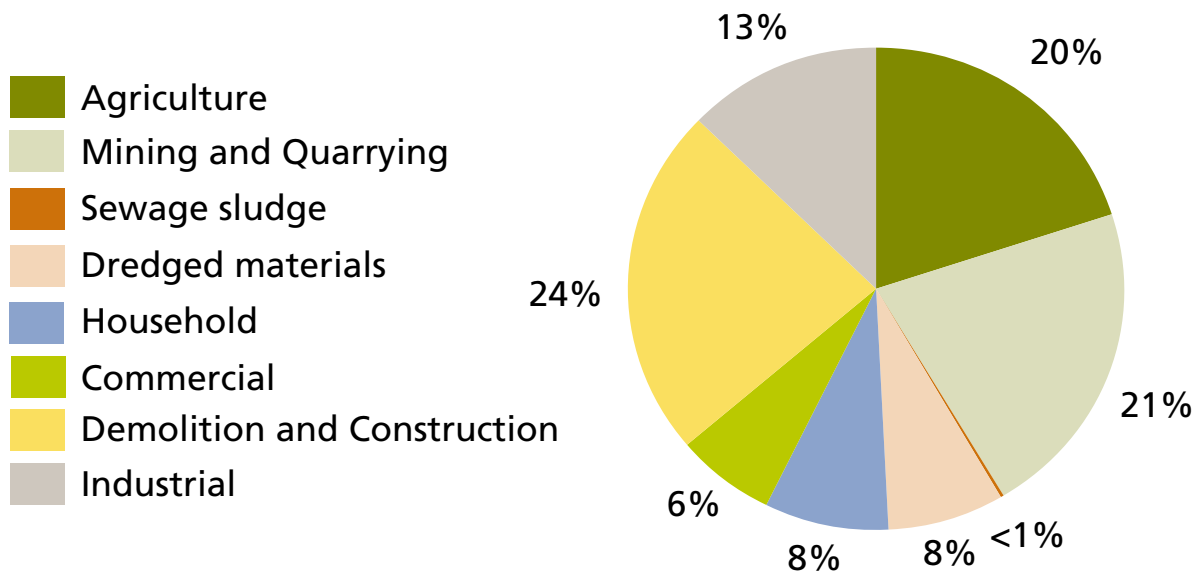
More than half the respondents in 1999 reported hearing road traffic noise and 30 per cent were affected by it, aircraft noise was heard by 43 per cent and neighbours by 38 per cent. Of those who had heard neighbour noise two thirds were affected by it, whereas 14 per cent of those who had heard noise from agriculture were affected by it and of those who had heard noise from railways a quarter were affected by it.

Source: BRE

Waste and recycling

Estimated total annual waste arisings, by sector

United Kingdom



Total = 430 million tonnes

The total waste produced in the UK is estimated to be around 430 million tonnes each year. About 250 million tonnes of this is controlled waste (household, industrial and commercial, construction and demolition wastes).

Estimates shown in the chart are for 2001/2 (demolition and construction and household), 2000 (mining and quarrying), 1999 (agriculture and dredged spoil) and 1998/9 (commercial, industrial and sewage sludge). Demolition and construction wastes include excavated soil and miscellaneous materials as well as hard materials, such as brick, concrete and road planings. Organic and animal by-products make up around 99 per cent of the figure for agriculture. The sewage sludge figure is an estimate of dry weight (wet weight is around 26.5 million tonnes).

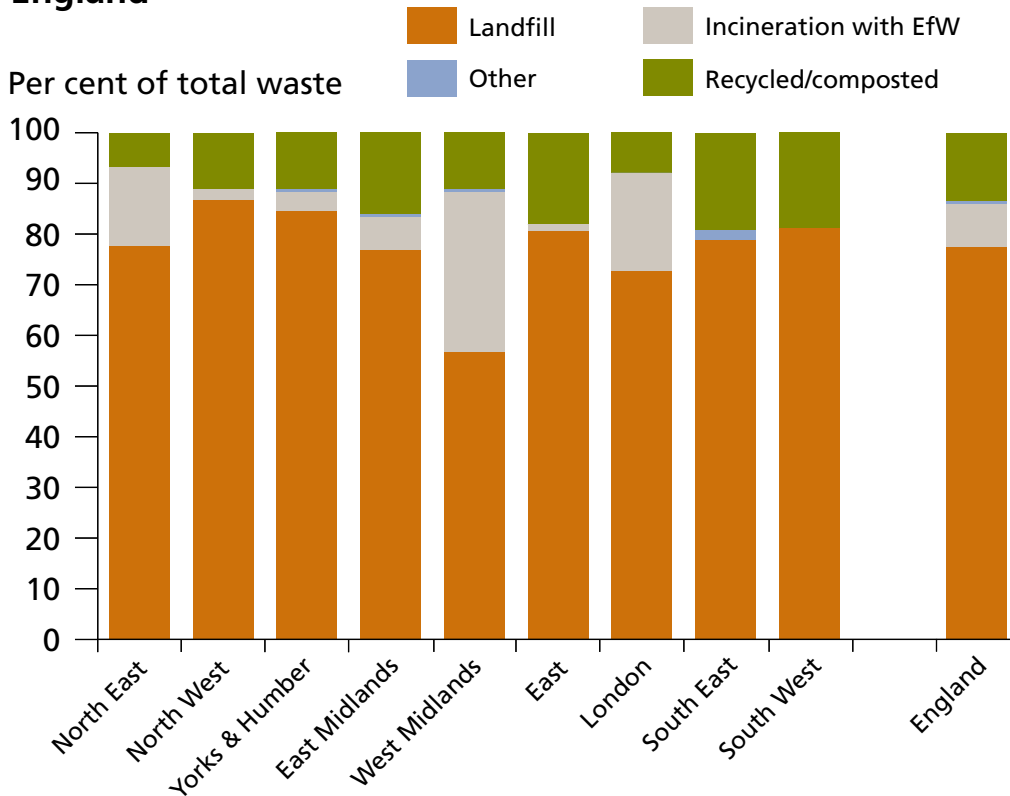
Estimates for household, commercial and industrial waste are based on information from surveys in England and Wales.

Source: Defra, Environment Agency, Water UK

Waste and recycling

Municipal waste management, by region: 2001/2

England



The majority of municipal waste – almost 90 per cent – is from households, the remainder is waste collected by local authorities from, for example, parks and gardens or commercial services. Landfill was the dominant method used for the disposal of municipal waste in 2001/2. Around 77 per cent of total municipal waste in England was sent to landfill (22.3 million tonnes).

An increasing amount of municipal waste is treated by methods that extract value. In 2001/2, around 22 per cent of total waste (6½ million tonnes) was recycled, composted or incinerated with energy recovery. Both the percentage and the amount of total waste treated using these methods has increased since 1996/7.

There are regional variations in methods of waste management. In the West Midlands almost a third of the municipal waste was incinerated with energy recovery, compared with the average for England of around 9 per cent, and none at all in the South West and South East. In the South East and South West, 19 per cent of waste was recycled or composted and in the East 18 per cent was recycled or composted, compared with 7 per cent in the North East and an average for England of 14 per cent.

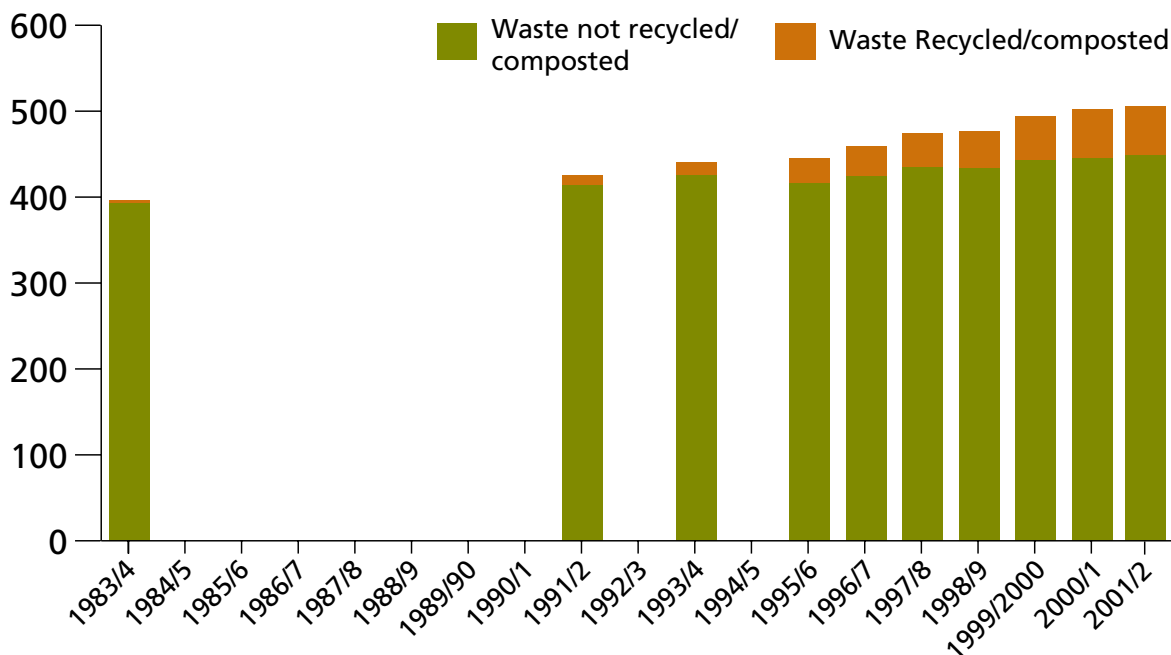
Source: Defra

Waste and recycling

Household waste and recycling: 1983/4-2001/2

England and Wales

Kilogrammes per person per year



	Kilogrammes per person per year				
	1983/4	1991/2	1999/2000	2000/1	2001/2
Waste not recycled	394	417	455	455	456
Waste recycled/ composted	3	11	52	58	65
Total waste	397	428	507	513	520

This is a headline indicator of sustainable development for the UK

Household waste includes household bin waste and also waste from civic amenity sites, other household collections and recycling sites.

In England, the amount of household waste increased by around 13½ per cent in total, and by 11½ per cent per person, between 1996/7 and 2001/2. During 2001/2 almost 26 million tonnes (an average of 520 kg per person) was collected by local authorities. Over 12 per cent of this waste is recycled or composted. Most recycling comes from "bring" sites such as bottle banks and civic amenity sites. An increasing proportion of recycled waste (around 30 per cent) is now from kerbside collection schemes. It is estimated that almost 60 per cent of the households in England are served by such schemes.

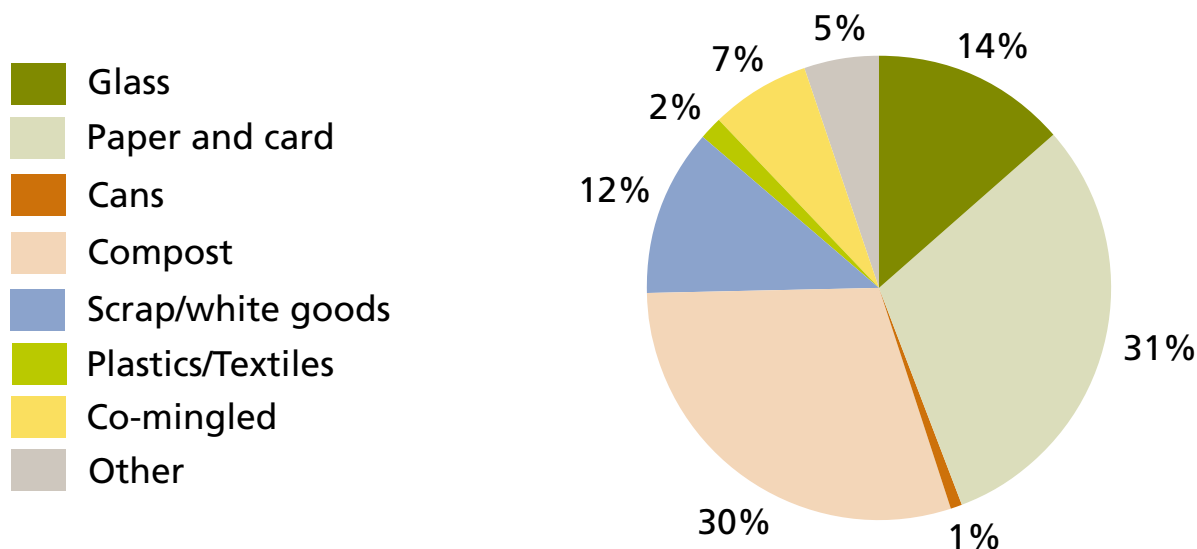
Note: data prior to 1996/7 are for England and Wales, data for 1996/7 onwards are for England only

Source: Defra, National Assembly for Wales, CIPFA

Waste and recycling

Materials collected from household sources for recycling through local authority schemes: 2001/2

England



Total = 3.180 million tonnes

A target to recycle or compost 25 per cent of household waste by 2005 was set in Waste Strategy 2000. In 2001/2 local authorities reported that around 3.2 million tonnes of household waste (over 12 per cent of total household waste) was diverted for recycling or composting through schemes run by local authorities or organisations working in partnership with them. Paper is the material recycled in the largest amount each year; around 960 thousand tonnes were collected for recycling in 2001/2. In the same year 940 thousand tonnes of kitchen and garden waste was collected for composting and it is the fastest growing component of recycled waste. The percentage of materials collected for recycling from the "kerbside" has increased from 19 per cent in 1996/7 to 30 per cent in 2001/2. The remainder is taken by households to civic amenity sites and recycling centres.

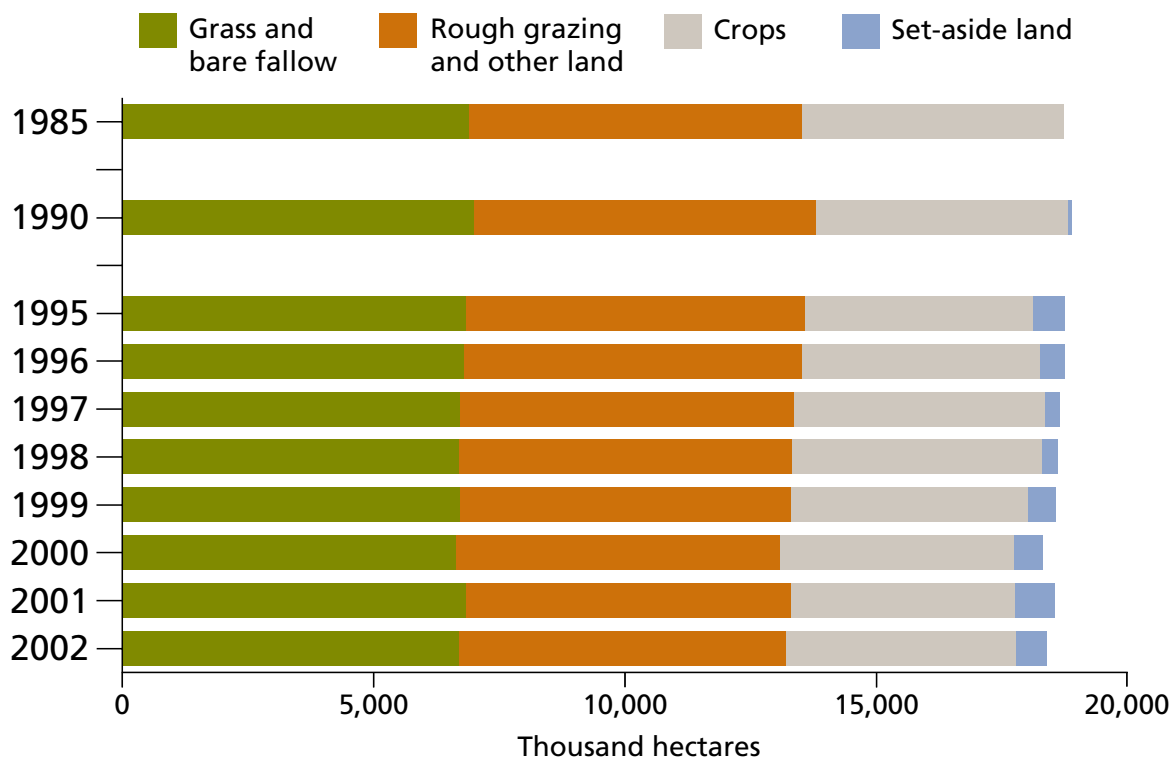
When asked in the 2001 survey of public attitudes to the environment which materials they recycled "on a regular basis", 52 per cent of respondents said that they recycled paper, 42 per cent recycled glass and 30 per cent recycled cans.

Source: Defra

Land

Agricultural land use: 1985-2002

United Kingdom



	Thousand hectares						
	1985	1990	1995	1999	2000	2001	2002
Grass and bare fallow	6,887	6,990	6,825	6,708	6,626	6,832	6,685
Grazing and other land	6,627	6,808	6,745	6,591	6,453	6,468	6,520
Crops	5,224	5,015	4,544	4,709	4,665	4,455	4,573
Set-aside land	0	72	633	572	567	800	611
Total	18,738	18,884	18,746	18,579	18,311	18,556	18,388

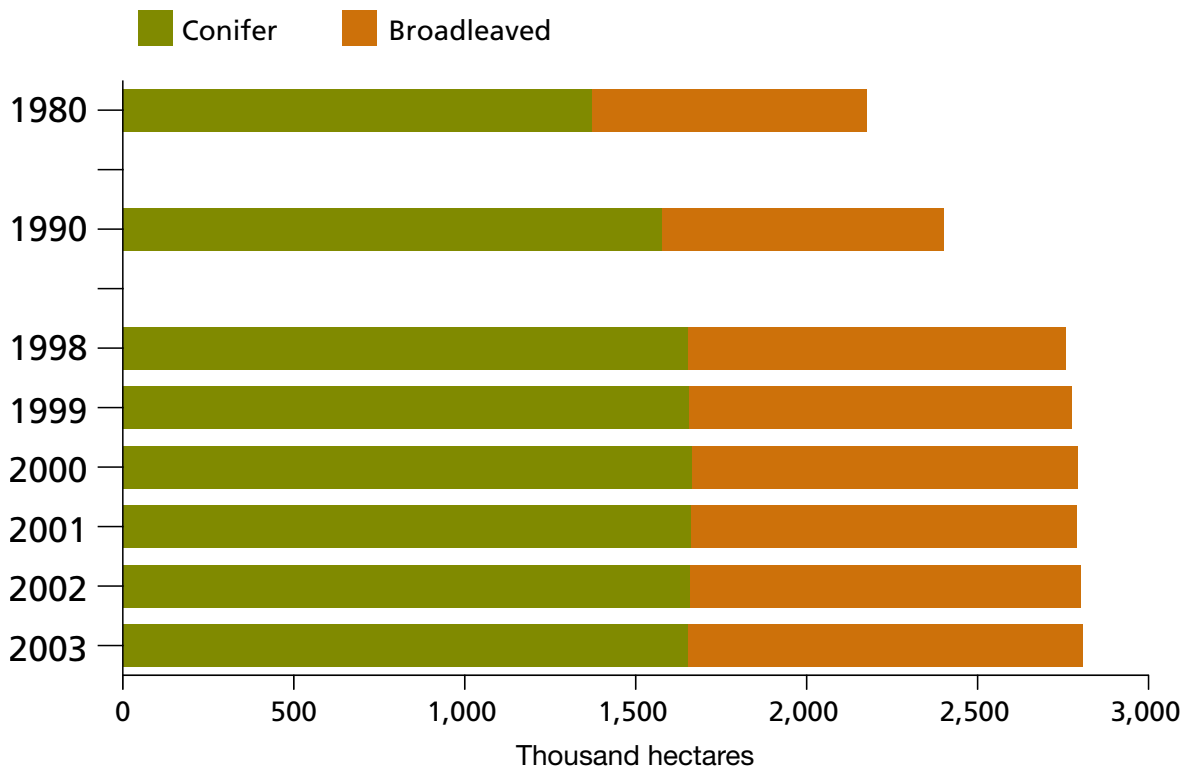
Over 70 per cent of the total UK land area is under agricultural uses. The total area of agricultural land fell by 2 per cent between 1985 and 2002. The area under crops fell by 9 per cent between 1992 and 1993, mainly as a result of EC Set Aside Schemes, and in 2002 was 12 per cent less than in 1985. Variation of the land area set-aside is generally attributed to end of 5-year schemes and introduction of new schemes, and also to optional and mandatory requirements.

Source: Defra

Land

Forest and woodland cover: 1980-2003

United Kingdom



	Thousand hectares					
	1980	1990	2000	2001	2002	2003
Conifer	1,372	1,576	1,663	1,660	1,658	1,652
Broad-leaved	804	824	1,131	1,130	1,143	1,155
Total	2,175	2,400	2,793	2,790	2,800	2,807

Approximately 12 per cent of the UK is covered by forest and woodland. The area covered by forest and woodland has increased by around 29 per cent since 1980. There was an increase in the area of broadleaved species of around 44 per cent between 1980 and 2003. Over 12 thousand hectares of new woodland were created in Great Britain in 2002/3, the majority of it broadleaved. There has been little change in conifer forest cover in recent years with a decline in new planting.

Note: Data are as at 31 March each year

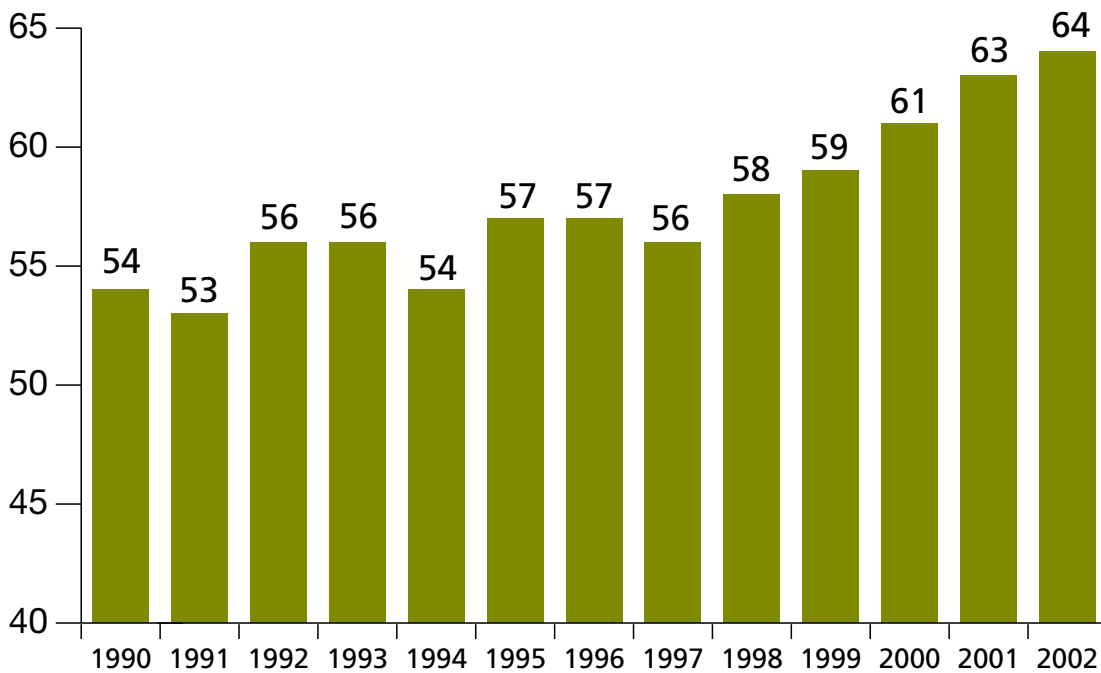
Source: Forestry Commission, DARDNI

Land

New homes built on previously developed land: 1990-2002

England

Per cent



This is a headline indicator of sustainable development for the UK

In England, provisional figures for 2002 indicate that 64 per cent of new homes (including the conversion of existing buildings, which are estimated to add about 3 percentage points to the national figure) were built on previously developed "brownfield" land. The Government has set a target of 60 per cent to be achieved by 2008.

The percentage is much higher in urban areas and there is also considerable regional variation. Over the period from 1998 to 2001, London had the highest rate at 90 per cent (excluding conversions) and the East Midlands and the South West had the lowest rates at 40 and 42 per cent respectively.

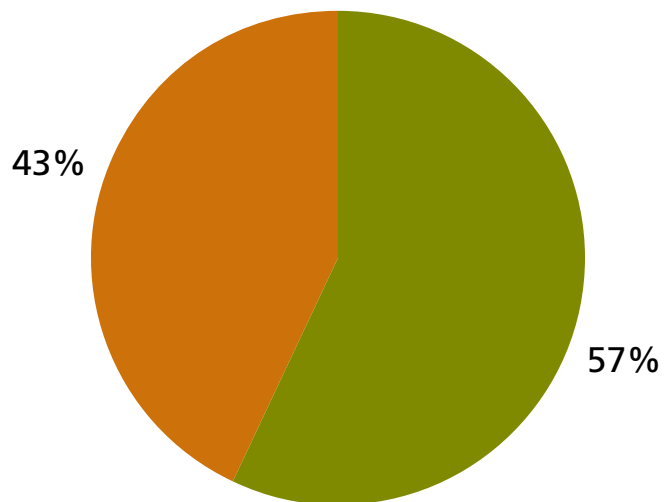
Source: ODPM

Land

Condition of SSSI habitats: 1997-2003

England

- Favourable or recovering
- Unfavourable



Sites of Special Scientific Interest (SSSIs) are intended to safeguard the best of England's wildlife and geology. In England, there are over 4,000 sites covering around 1 million hectares, around 7½ per cent of the total land area.

A programme to assess the condition of all SSSIs was started by English Nature in 1997. The baseline assessment was completed in March 2003. Around 57 per cent of the sites assessed were in a favourable or recovering condition. The Government has a Public Service Agreement target to bring 95 per cent of nationally important wildlife sites into favourable condition by 2010.

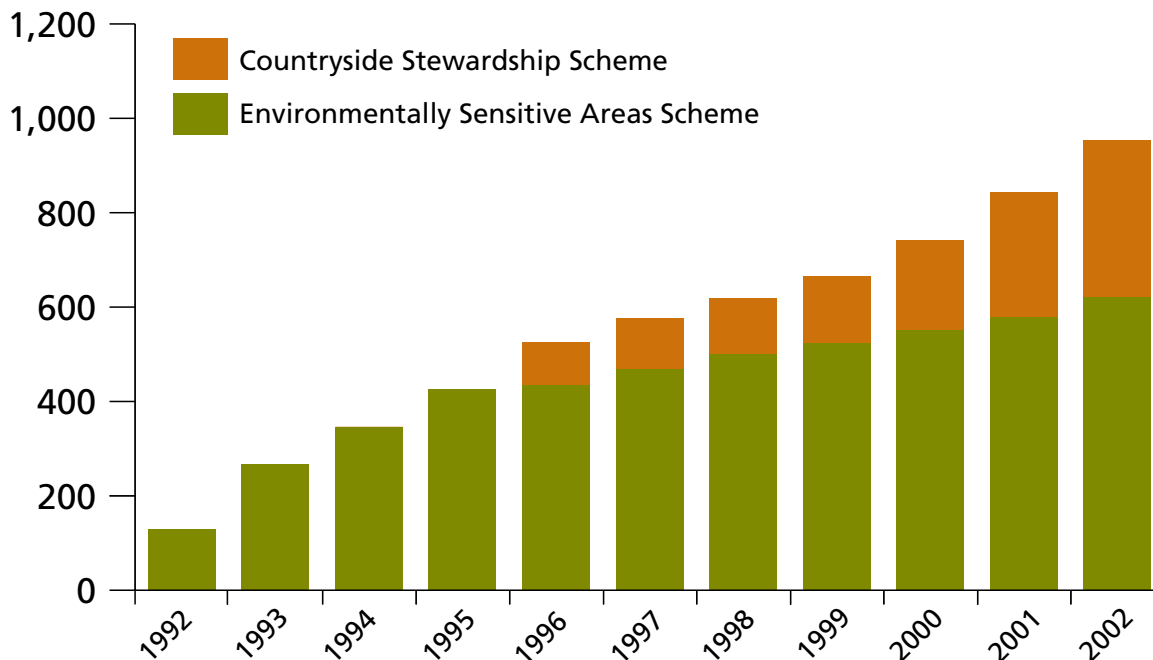
Source: English Nature

Land

Agri-environment schemes: 1992-2002

England

Thousand hectares



	Thousand hectares				
	1992	1996	2000	2001	2002
ESAs	129.4	434	550	579	620
Countryside Stewardship	..	91	192	263	334

Agri-environment schemes generally make payments for the management of land and adoption of agricultural practices to safeguard and conserve wildlife habitats, historic, geological and landscape features and to restore traditional aspects of the countryside.

The largest scheme, the Environmentally Sensitive Areas (ESA) scheme, was introduced in England in 1987 and covers 22 areas in England designated for their unique environmental features. The Countryside Stewardship Scheme, applies outside ESAs. Around 1 million hectares of land in England are managed through these agri-environmental schemes, nearly 10 per cent of the total agricultural area in England.

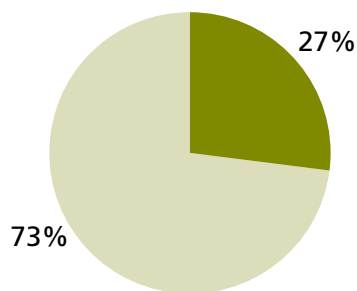
Source: Defra

Scarce and threatened native species: 1999

Great Britain

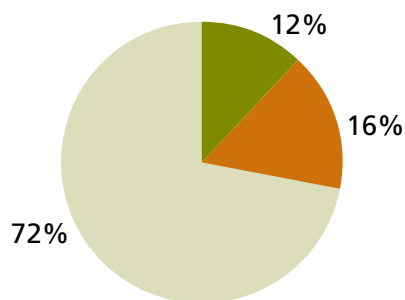
■ Threatened ■ Nationally scarce ■ Not at risk

Reptiles, amphibians and freshwater fish



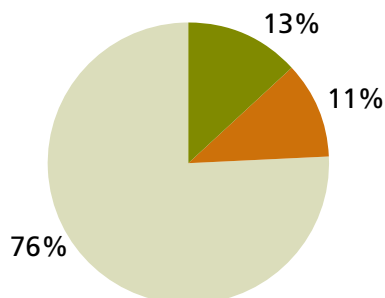
Species assessed: 51

Invertebrates



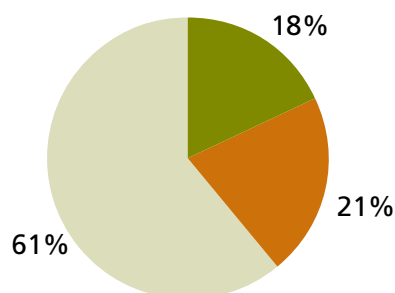
Species assessed: 15,000

Seed plants and ferns



Species assessed: 2,300

Lichens, mosses, liverworts and stoneworts



Species assessed: 23,000

Whilst many species native to GB are relatively common, over a quarter of fish, amphibians and reptiles which have been assessed are considered "threatened". Between 10 and 20 per cent of invertebrates, vascular plants and lichens and lower order plants (mosses, liverworts etc.) are threatened, with a similar proportion nationally scarce.

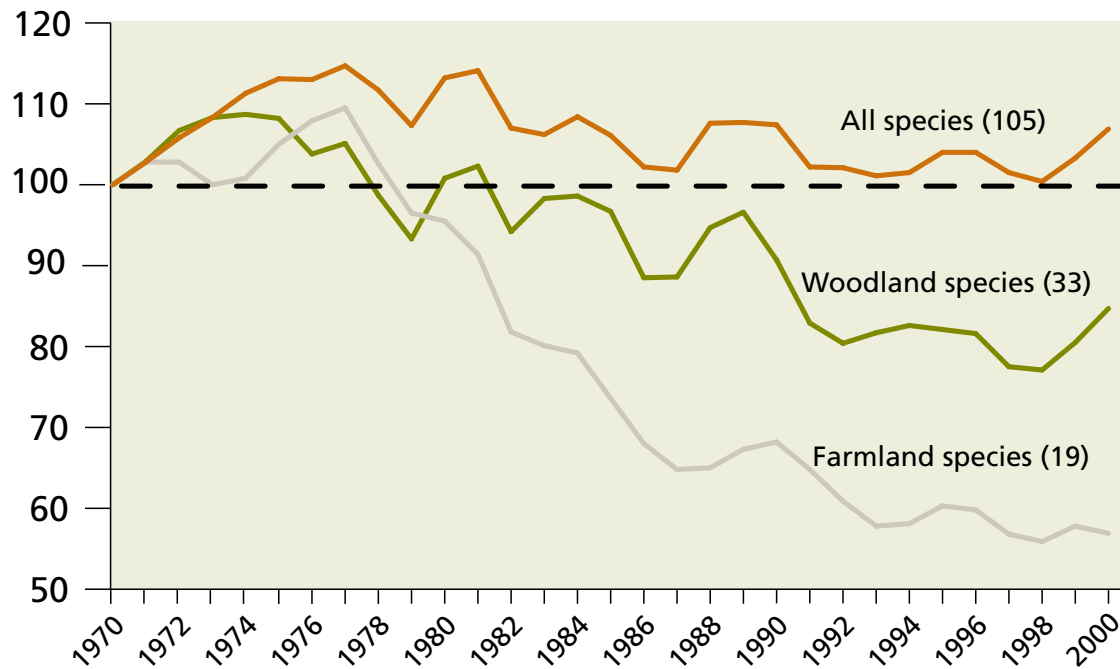
Comparable figures are not available for mammals and birds because their threat status is considered in the international rather than the national context. A large proportion of invertebrates, plants, and other organisms (e.g. parasitic animals, springtails, fungi, and micro-algae) have not been assessed and so are not included.

Source: JNCC

Population of wild birds: 1970-2000

United Kingdom

Index (1970-100)



This is a headline indicator of sustainable development for the UK

Wild bird populations are considered to be a good indicator of the broad state of the wildlife and countryside.

The overall index of populations of British breeding birds has been relatively stable over the last two decades. In 2000, the index of all native species increased by 3 per cent, to its highest level since 1990. The farmland birds index almost halved between 1977 and 1993, but has been relatively stable since. It decreased by 2 per cent in 2000, after a 3 per cent increase in 1999, to slightly below the level of 1993. The woodland bird index fell by around 30 per cent between 1974 and 1998 but increased by 4 per cent in 1999 and 5 per cent in 2000 to its highest level since 1990.

Although populations of the more common farmland and woodland birds have been declining, rare bird populations, which are not included in this index, have been stable or rising. This reflects conservation efforts focused on these species.

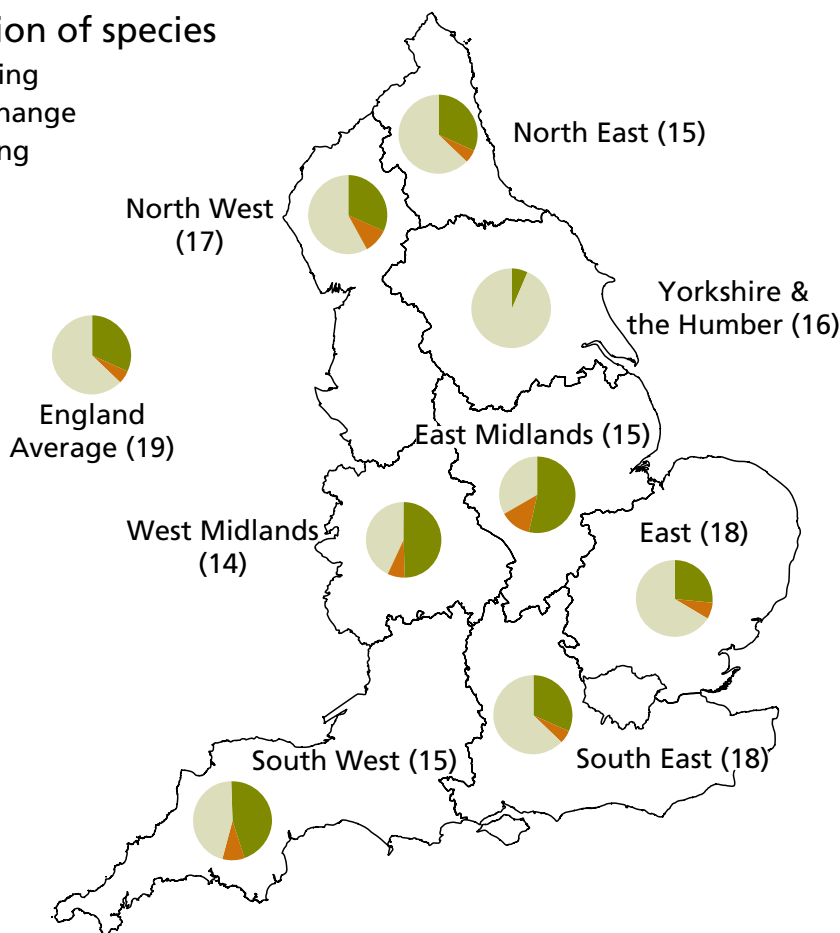
Source: Defra, RSPB, BTO

Changes in farmland bird populations, by region: 1970-2000

England

Proportion of species

- Increasing
- Little change
- Declining



Between 1970 and 2000, the index farmland wild birds for England fell by 45 per cent.

In 5 of the 8 regions shown on this map, more species of farmland birds declined than increased over that period.

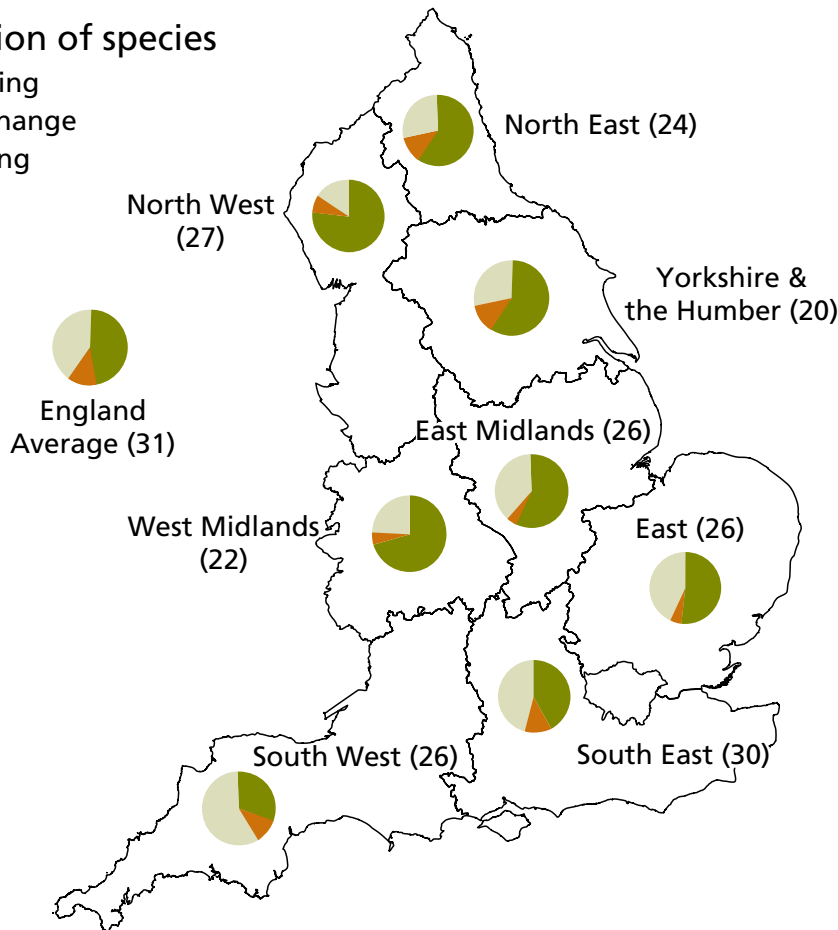
Note: numbers in brackets on the map indicate the number of species in the index.

Changes in woodland bird populations, by region: 1970-2000

England

Proportion of species

- Increasing
- Little change
- Declining



Between 1970 and 2000 the index of woodland birds for England fell by 18 per cent.

In 6 of the 8 regions shown on this map, more species of woodland birds increased than declined over that period. In the two regions with more species in decline than increasing were the South West and South East.

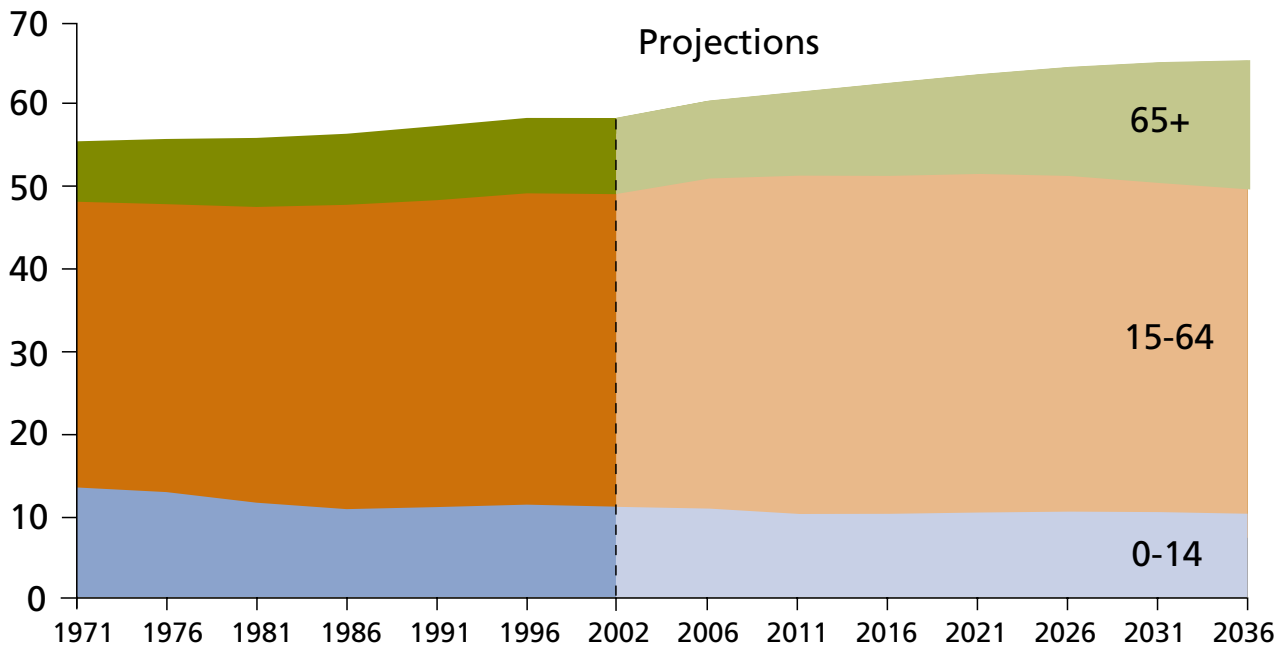
Note: numbers in brackets on the map indicate the number of species in the index.

General

Population estimates and projections, by age group: 1971-2036

United Kingdom

Million



	Millions					
	1971	1991	2002	2011	2021	2036
65+	7.41	9.06	9.43	10.31	12.25	15.87
15-64	35.05	37.37	38.79	41.41	41.44	39.68
0-14	13.47	11.01	10.99	10.23	10.41	10.26
Total	55.93	57.44	59.21	61.95	64.10	65.81

The overall population of the UK is estimated to have been 59.2 million in 2002, and is projected to increase by 11 per cent by 2036. The projection indicates an ageing population; those over 65 are projected to increase from 16 per cent of the total in 2002 to 24 per cent by 2036.

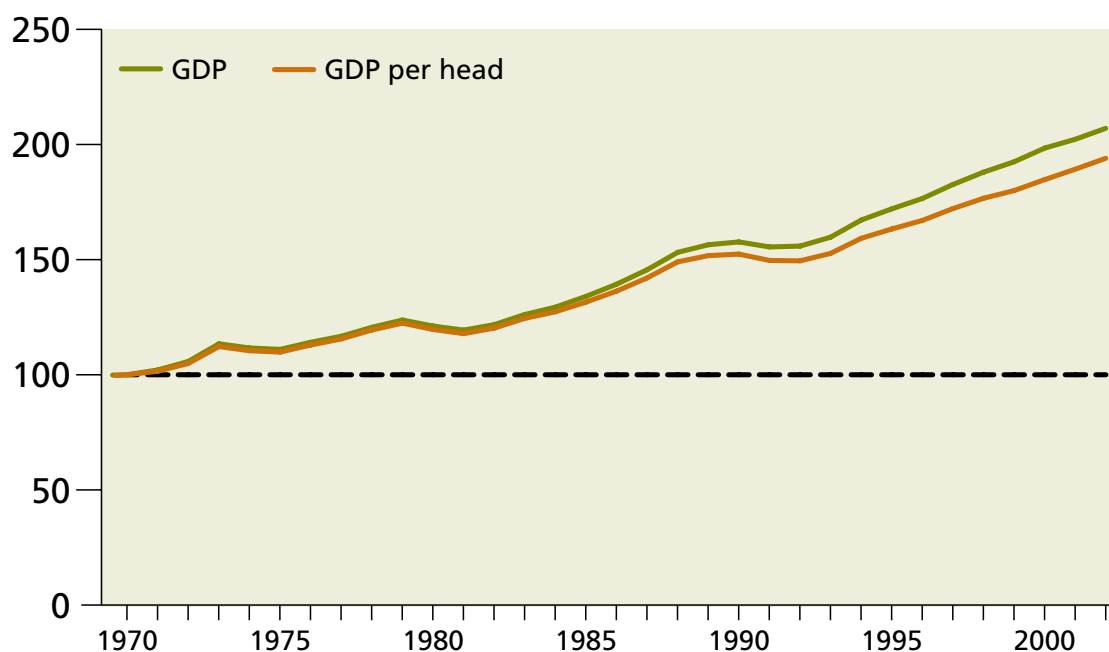
Source: Government Actuary's Department, ONS, GROS, NISRA

General

Gross Domestic Product (GDP) and GDP per head: 1970-2002

United Kingdom

(1970=100)



	1970	1980	1990	1995	2001	2002
GDP at 1995 constant prices (£bn)	418.0	506.5	659.2	719.2	847.0	863.6
GDP per head (Index 1970=100)	100	119.7	152.7	165.1	191.6	195.3

This is a headline indicator of sustainable development for the UK

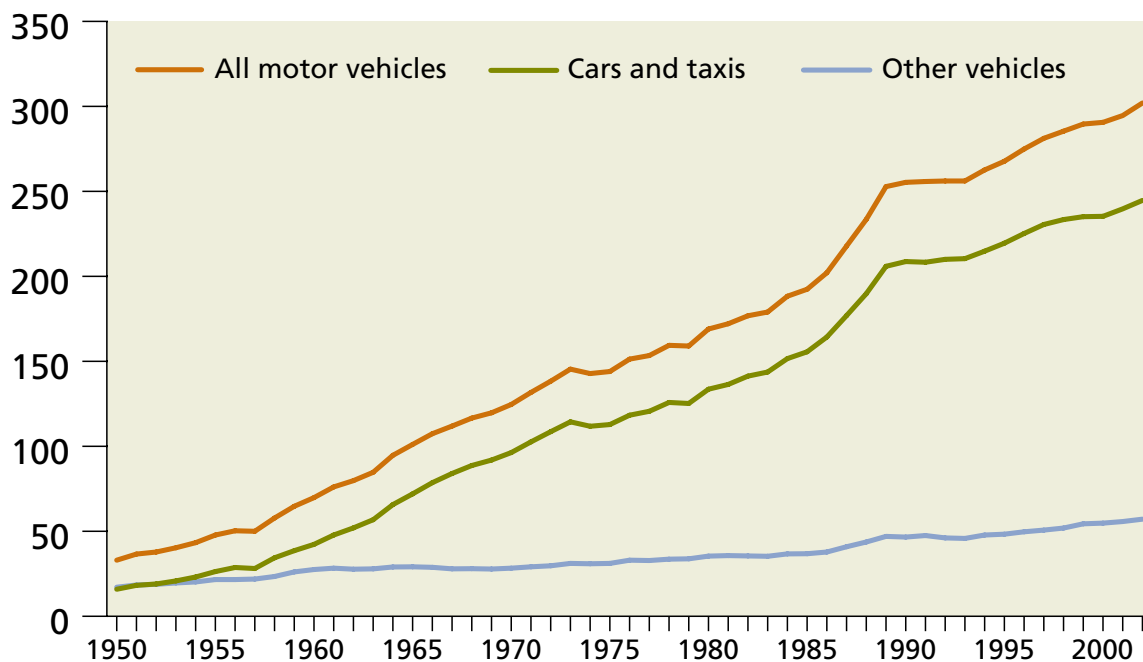
Between 1970 and 2002 the output of the economy grew by 107 per cent in real terms, around 2.3 per cent per year on average. The output of the economy increased in 2002 by 1.9 per cent.

Source: ONS

Road traffic, by type of vehicle: 1950-2002

Great Britain

Billion vehicle miles



	Billion vehicle miles					
	1950	1960	1970	1980	1990	2002
Car and taxis	15.9	42.3	96.3	133.6	208.7	243.8
Other vehicles	17.1	27.5	28.3	35.4	46.6	58.2
All motor vehicles	33.0	69.8	124.6	169.0	255.3	302.0

This is a headline indicator of sustainable development for the UK

Motor vehicle traffic in 2002 was over nine times that in 1950, and car traffic, in particular, has increased by more than fifteen times the 1950 level. Overall, traffic levels rose by 2.6 per cent between 2001 and 2002; car and taxis traffic was up by 2.6 per cent whilst other by vehicle traffic rose by 2.2 per cent between 2001 and 2002.

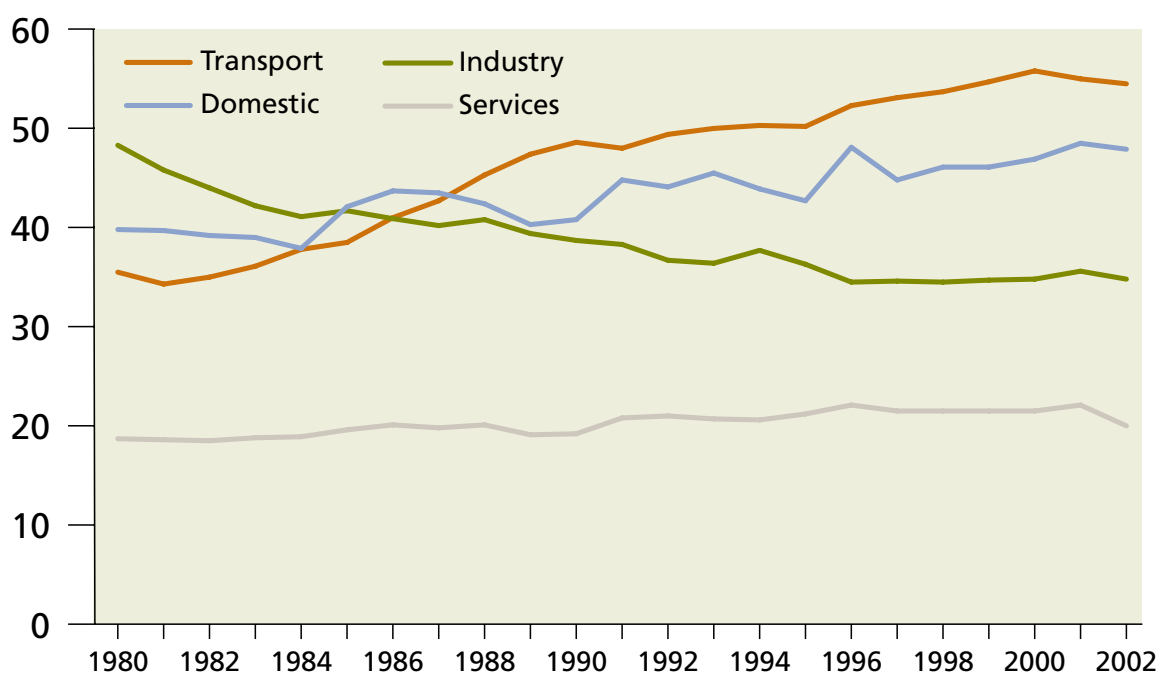
Source: DfT

General

Final energy consumption: 1980-2002

United Kingdom

Million tonnes of oil equivalent



Million tonnes of oil equivalent

	1980	1985	1990	1995	2000	2002
Transport	35.5	38.5	48.6	50.2	55.8	54.5
Domestic	39.8	42.1	40.8	42.7	46.9	47.9
Industry	48.3	41.7	38.7	36.3	34.8	34.8
Services	18.7	19.6	19.2	21.2	21.5	20.0
Total	142.4	141.9	147.3	150.4	159.0	157.2

Energy use by industry fell by 28 per cent between 1980 and 2002, whilst use by services increased by almost 7 per cent. These trends partly reflect the changing structure of the UK economy over this period. Energy use for transport increased by over 53 per cent, mainly as a result of a 79 per cent increase in road traffic over the same period.

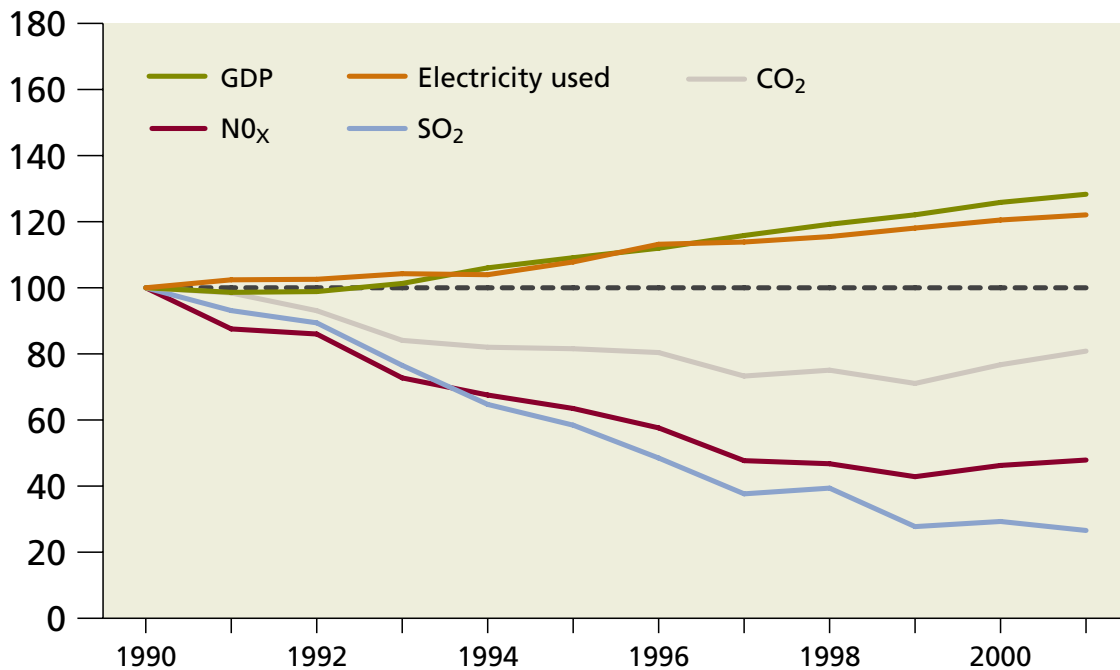
Note: Services includes agriculture.

Source: DTI

Uncoupling electricity use from economic growth and environmental impacts: 1990-2001

United Kingdom

Index (1990=100)



Electricity generation is the most significant source of emissions of greenhouse gases and also a source of emissions of air pollutants. Between 1990 and 2001 use of electricity in the UK increased by 22 per cent, whilst GDP increased by 28 per cent. This suggests that there has been no uncoupling of electricity use from the growth of the economy as a whole.

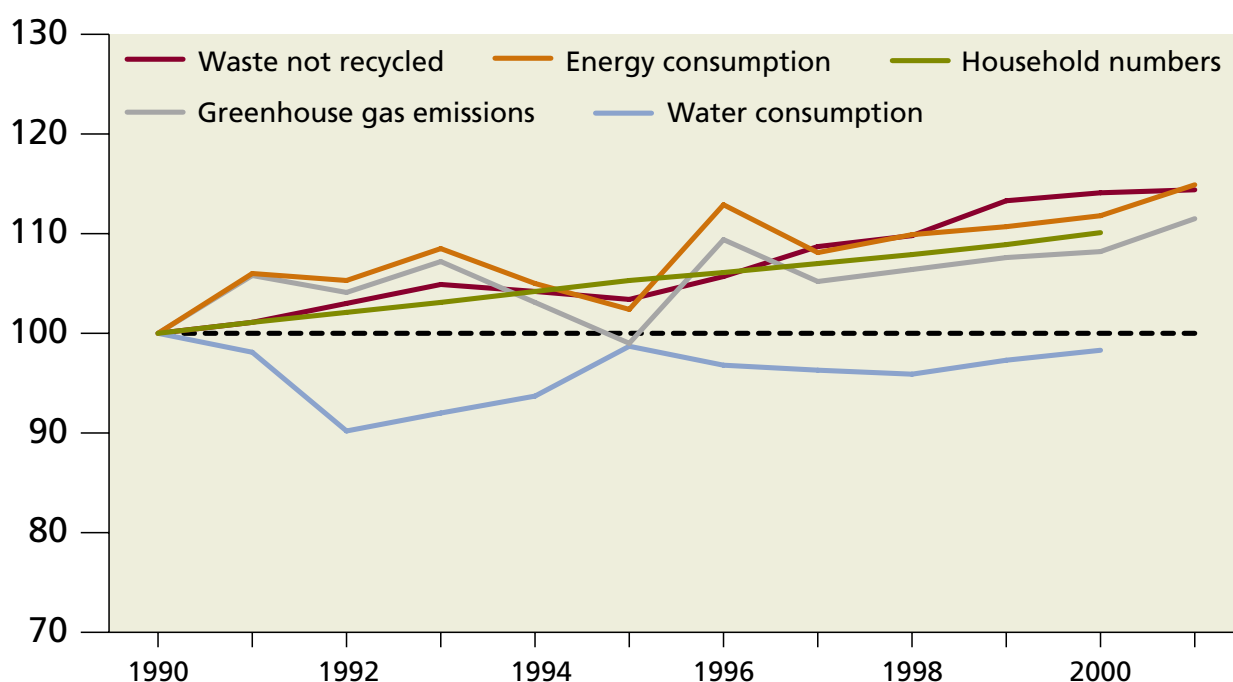
During the same period, total carbon dioxide (CO₂) emissions from electricity production fell by around 19 per cent. Emissions of nitrogen oxides (NO_x) fell by 52 per cent and emissions of sulphur dioxide (SO₂) by 73 per cent. This shows that there has been some uncoupling of carbon dioxide emissions and of those air pollutants from electricity consumption, mainly because of the switch from the use of coal to gas in power stations. A rise in emissions of CO₂ and NO_x from 1999 reflects an increase in the use of fossil fuels for electricity generation in those years.

Source: DTI, ONS, NETCEN

Environmental impacts of households: 1990-2001

United Kingdom

Index (1990=100)



Between 1990 and 2000, household numbers rose by 10 per cent. Households account for up to a quarter of energy consumption, around a fifth of greenhouse gas emissions and produce around one sixth of all controlled waste in the UK. Household energy consumption rose by 15 per cent between 1990 and 2001, emissions of greenhouse gases increased by 12 per cent and domestic waste not recycled grew by 14 per cent, all generally in line with household numbers.

Most of the energy consumed by households is for car use, heating and hot water and this accounts for most of the greenhouse gas emissions. Energy use has also risen because of an increasing number of appliances and computers in the home, which has broadly offset improvements in energy efficiency.

Household water consumption was fairly constant through the 1990s suggesting a relative uncoupling from household growth.

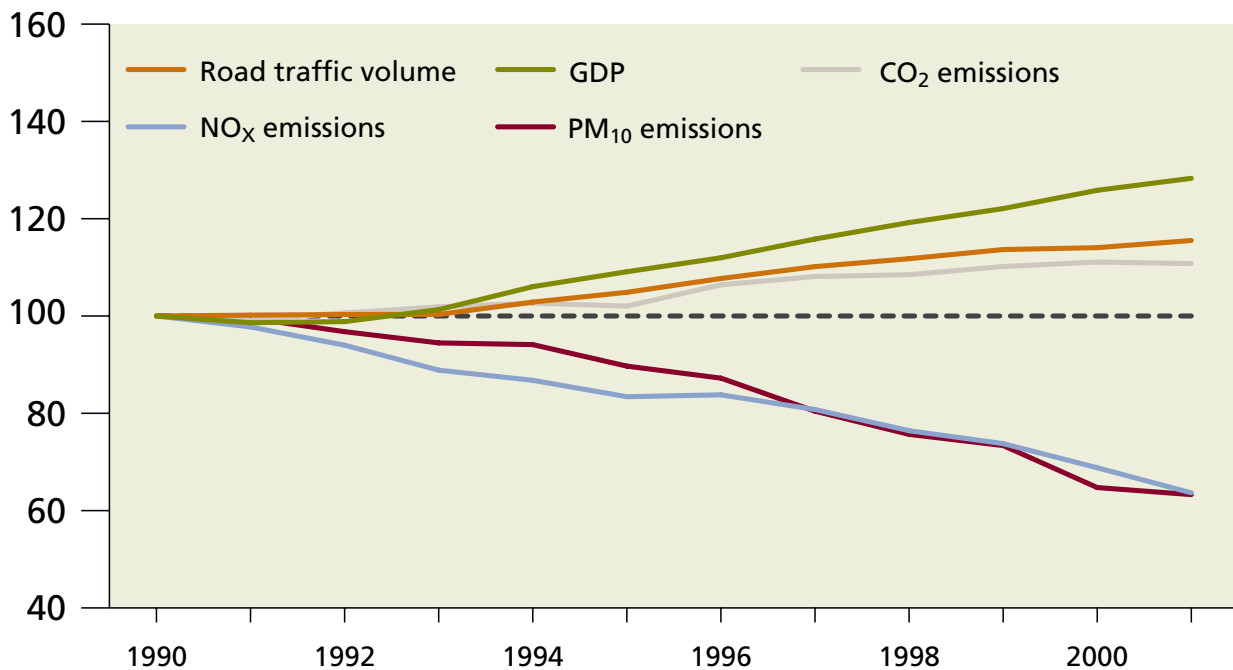
Note: the figures for household numbers and water consumption are for Great Britain.

Source: Defra, DTI, ODPM, Ofwat, NETCEN

Uncoupling road traffic from economic growth and environmental impacts: 1990-2001

United Kingdom

Index (1990=100)



Between 1990 and 2001, road traffic increased by 16 per cent. In the same period GDP grew by 28 per cent. This may indicate some uncoupling of road traffic growth from economic growth.

Road transport is a major source of carbon dioxide (CO₂) emissions and also of emissions of several air pollutants. There was little uncoupling of CO₂ emissions from growth in road traffic between 1990 and 2001. In that period CO₂ emissions from road transport increased by 11 per cent.

Since about 1990, technological improvements in vehicles have allowed significant uncoupling of emissions of pollutants, such as particulates and nitrogen oxides, from the growth in road traffic. Both NO_x emissions and particulate (PM₁₀) emissions declined by 40 per cent between 1990 and 2001.

Note: the figures for road traffic are for Great Britain.

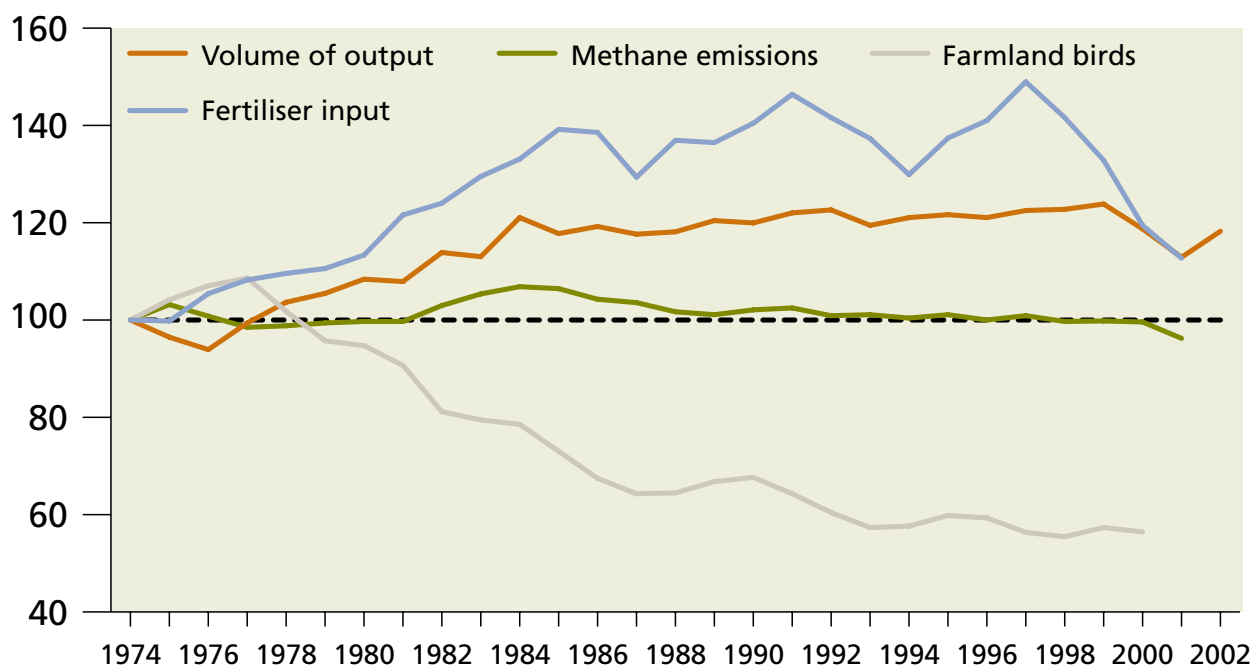
Source: DfT, ONS, NETCEN

General

Uncoupling agricultural production from environmental impacts: 1974-2002

United Kingdom

Index (1974=100)



Agriculture is the main user of rural land in the UK. Between 1974 and 2002 the output volume from UK agriculture rose by 18 per cent; most of this increase occurred prior to the mid 1980s and there has been a levelling off since. The use of fertilisers in agriculture increased by almost a half between 1974 and 1997, but has fallen since and in 2001 input was 12 per cent higher than in 1974.

Agricultural emissions of methane, one of the main greenhouse gases, have remained fairly constant throughout the period.

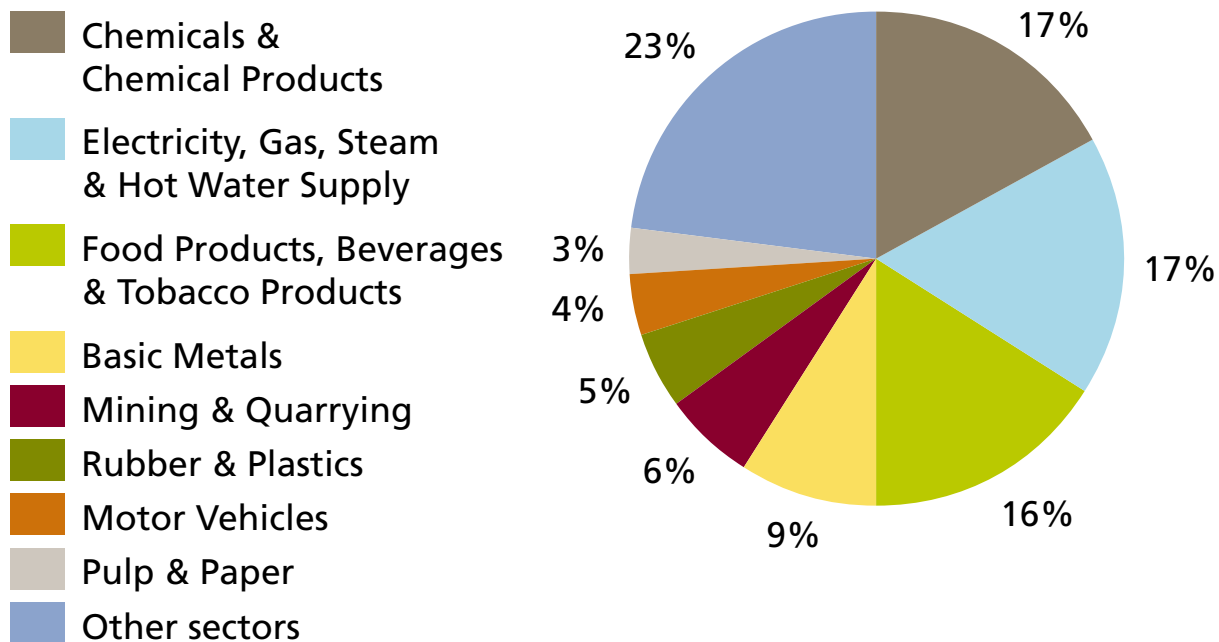
Birds are regarded as a good indicator of the broad state of the environment and countryside land quality. The numbers of farmland birds in the national index fell by 44 per cent between 1974 and 2002. This indicates that the productivity of agriculture has not been uncoupled from its environmental impacts.

Source: Defra

General

Environmental protection expenditure by industry: 2001

United Kingdom



Environmental protection expenditure is spending by companies where the primary aim is to reduce environmental pollution. This includes expenditure to reduce or prevent emission to air or water, to dispose of waste materials, to protect soil and groundwater, to prevent noise and vibration, or to protect the natural environment.

Based on a survey, in 2001, UK industry spent an estimated £3.9 billion on environmental protection expenditure. The single largest spending industry sector was *chemicals and chemical products sector*, followed by *energy supply industries* and *food products, beverages and tobacco products*. In the previous survey in 2000, *chemicals and chemical products sector* was also identified as having the largest expenditure.

Source: Defra

Explanatory notes

Pages 12,13, 14, 18, 19, 20: Emissions

Emissions estimates for the UK are updated annually to reflect revisions in methodology and the availability of new information. These adjustments are applied retrospectively to earlier years and hence there are differences from the data published in previous editions of the booklet.

Pages 9, 10, 11,12: Greenhouse gas emissions

Emissions of the basket of greenhouse gases (CO₂, CH₄, N₂O, HFCs, PFCs and SF₆) are presented based on their global warming potential, that is their relative contribution to global warming. This is the format required for reporting of greenhouse gas emissions to the Framework Convention on Climate Change. The figures for EU-15 greenhouse gas emissions are on a slightly different basis from those showing emissions for the UK only. The EU-15 figures exclude emissions from 'land use change and forestry', since this can currently be treated differently between countries. The UK totals on the pages showing UK results only, include land use change and forestry.

Other emissions estimates shown in the booklet are presented on the basis defined by the United Nations Economic Commission for Europe (UNECE).

Page 18: SO₂ emissions; page 19: NO_x emissions

Emissions from large combustion plants (LCPs) include emissions from all power stations and refineries and from some industrial sources. From 1991 actual emissions have been assessed for individual large plants. Up to 1990 estimates have been made based on the estimated proportions from the relevant sources: power stations, refineries, iron and steel and other industrial sources.

Page 20: Particulate emissions

Particulate matter is now increasingly measured by a method that determines the mass of a fraction of the particles in the air that are most likely to be deposited in the lungs. PM₁₀ is the particulate matter which passes through a size-selective filter set to preferentially collect smaller particles: collecting 50 per cent of particles 10 microns (10 thousandths of a millimetre) in diameter and 95 per cent of particles of 5 microns.

Page 21: Ozone exceedences

At ground level, Ozone (O₃) occurs naturally but levels can be increased as a result of the presence of other pollutants. As a secondary pollutant, it is formed by a series of reactions between NO_x, oxygen and VOCs in

Explanatory notes

the presence of sunlight. Production of ozone is affected by the weather, which can lead to ozone, and the pollutants that cause it, being blown over from mainland Europe and North America. O₃ episodes, in which concentrations rise substantially above background levels, occur in the summer months when there are long hours of bright sunlight, temperatures above 20°C, and light, or no winds. Ozone reacts with NO_x to form NO₂ and, as urban areas tend to have higher levels of NO_x than rural areas, ozone concentrations recorded at urban sites are generally lower than at rural ones.

Page 24, 25: River water quality

In Scotland, since 1996, an overall classification has been used combining chemical, biological, nutrient and aesthetic quality. The Scottish classification system and criteria for determining which river lengths should be monitored is different from the other countries. Comparisons between Scotland and other countries should therefore be treated with caution.

In Scotland a new digitised river network was introduced in 2000. Data for chemical quality for 2000 are shown using the combined classification on the old network basis to be consistent with data for 1996-1999. Data for biological quality for 2000 are only available for the new network. As a result of these changes, a series for the UK has not been produced.

Page 27: Nitrate concentrations

Rivers with an average nitrate concentration level greater than 30 mgNO₃/l are classified as having high concentrations in the General Quality Assessment (GQA) for nitrate. This measure enables trends and regional differences in nitrate concentrations to be shown. Average concentrations cannot be directly compared with the EU maximum admissible concentration for drinking water of 50 mgNO₃/l to be met by 95 per cent of samples, which is also the threshold established by the World Health Organisation.

Page 28: Water pollution incidents

From 1999, a new system for recording pollution incidents was introduced by the Environment Agency, covering incidents to air and land as well as water. The incidents were classified into four categories by their severity of impact. Only incidents classified as having an impact on the water environment and only those incidents in categories 1 and 2 – the two more severe categories – are shown in this booklet to maintain consistency with earlier years.

Explanatory notes

The numbers of these more severe incidents are thought to be less influenced by changes in reporting and thus provide a more meaningful indication of actual trends in pollution incidents than the total number of reported incidents.

Prosecutions are for cases taken before 31 December in that year, apart from 1994 where figures include cases taken before 30 April 1995.

Page 32: Bathing waters

Under the EC Bathing Water Directive (76/160/EEC), eleven physical, chemical and microbiological parameters are measured including total and faecal coliforms, which are generally considered to be the most important indicators of the extent to which water is contaminated by faecal material. Samples of bathing water are taken at regular intervals two weeks before and then during the bathing season, which usually covers the period from mid-May to end-September in England and Wales, and from the beginning of June to mid-September in Scotland and Northern Ireland. In the UK a minimum of 20 samples are normally taken at each site. The Directive gives both mandatory and more stringent guideline values for a number of the parameters.

Page 34: Riverine and direct inputs

Riverine inputs are the loads conveyed by rivers based on sampling points just upstream of the zone of tidal influence. They reflect all point sources and diffuse losses upstream of these points.

Direct inputs are those reaching the marine environment via discharges downstream of the riverine monitoring points. Typically, inputs are estimated from 12 samples taken each year. Some samples are taken that contain substances below the limits of detection and where this occurs two estimates are made: an upper and a lower. The upper estimate assumes that the substance is present at the level of detection and the lower assumes that concentrations are zero. Upper (worst case) estimates are used on this page.

Page 49: Native species at risk

Threatened species have been assessed and found to be at risk of extinction over all, or a major part, of the country. The criteria used are based on those established by the International Union for the Conservation of Nature (IUCN) and have been published in a series of Red data books and lists. Scarce species are defined solely in terms of their limited distribution.

Explanatory notes

Estimates for the number of species at risk are based on the best available scientific evidence. Overall changes in these estimates in recent years may reflect not only some genuine changes in species at risk but also improvements in the available evidence, e.g. through work on new Red Data Lists.

Pages 50-52: Bird populations

Wild bird populations are considered to be a good indicator of the broad state of the wildlife and countryside because they occupy a wide range of habitats, they tend to be near or at the top of the food chain and considerable long-term data have been collected

Species included in these indices are native to the UK and have more than 500 breeding pairs across the UK. At national level this gives 105 native species, of which 33 are woodland and 19 are farmland species. The indices portray the annual changes in abundance of all species since 1970. Individual species populations within the indices may be increasing or decreasing, irrespective of the overall trends. The indicators are considered to give reliable medium to long term trends.

It was not possible to update the national indicator for 2001 because of restrictions on those collecting the data caused by the outbreak of foot and mouth disease.

Pages 51-52: Regional bird indices

These indices, based on recent research, are considered to be provisional. Although the indices are consistent with the national wild bird population indicator, they should be used with caution as they are subject to quite large sampling uncertainties.

Some conversion factors

metric		to metric		to imperial
1 tonne	=	1,000 kilograms	=	<i>0.984 tons</i>
1 hectare	=	10,000 sq metres	=	<i>2.47 acres</i>
1 sq kilometre	=	100 hectares	=	<i>0.386 sq miles</i>
1 kilometre	=	1,000 metres	=	<i>0.621 miles (1,094 yards)</i>
1 litre	=	0.001 cubic metres	=	<i>1.76 pints (0.22 gallons)</i>

Symbols used in this booklet

.. = data not available

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