

M AN INTEGRATED APPROACH

Main messages

Concentrations of dangerous chemicals and radionuclides in the environment generally declined in the decade up to 1998.

Relevance

Pollutants can move between soil, air and water. Dispersed releases are especially important when pollutants build up in the environment, either because they accumulate in plants, animals or people, or because they persist for long periods. We must ensure that we do not store up problems for the future.

The extent to which the key objectives identified in the Strategy are being achieved, as reflected by the indicators, is illustrated in the following table.

Key strategies

- *A better quality of life.* A strategy for sustainable development for the UK. (8.3-8.7)

Some other related indicators:

Expected years of healthy life (H6); Rivers of good or fair quality (H12); Hazardous waste (A7); Energy and water consumption by sector/Waste and hazardous emissions by sector (D3); Chemical releases to the environment (D19); Freshwater (Q1-Q6); Estuarine water quality, marine inputs (R1); Expenditure on pollution abatement (T5)

Objective	Ref no.	Indicator		Data used	Change since		Specific targets/goals
					1970	1990	
Must not store up pollutant problems for the future	M1	Concentrations of persistent organic pollutants		1991-1995 1991-1999	...	✓	
	M2	Dangerous substances in water	lindane	1995-1997	...	✓	
			cadmium	1995-1997	...	≈	
	M3	Radioactive waste stocks	High level	1986-1998	...	≈	
			Intermediate level	1986-1998	...	✗	
	M4	Discharges from the nuclear industry	Discharges to air	1983-1998	...	✓	OSPAR Strategy with regard to radioactive discharges to the marine environment in the UK
			Discharges to water	1983-1998	...	✓	

Key

✓ significant change, in direction of meeting objective

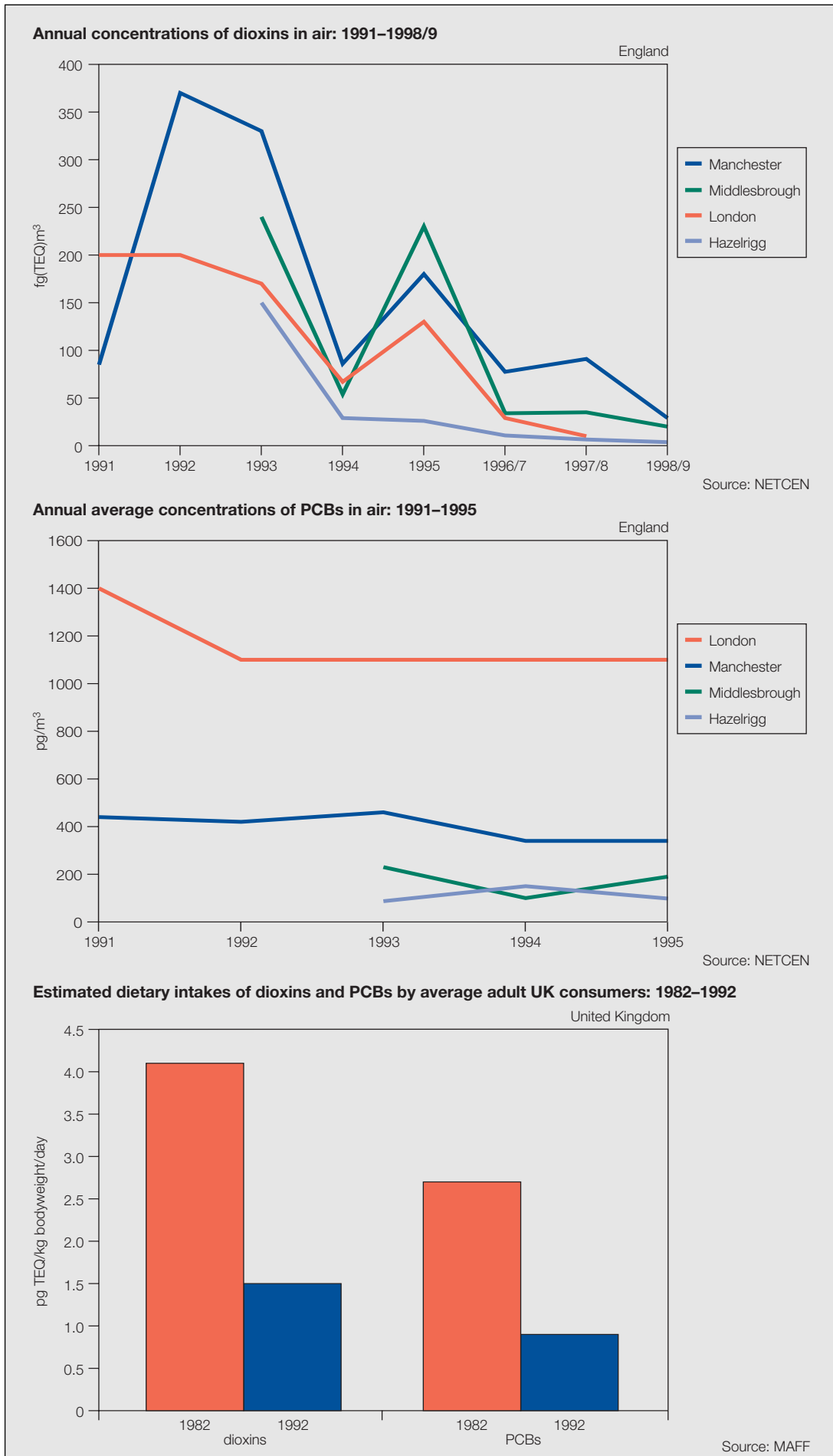
≈ no significant change

na not applicable, in cases where the indicator is for contextual purposes

✗ significant change, in direction away from meeting objective

... trend is uncertain or no quantitative data available

Objective	Must not store up pollutant problems for the future	
Indicator	<p>Concentrations of persistent organic pollutants</p> <p>Chart overleaf</p> <p>Two types of pollutants – polychlorinated dibenzo-p-dioxins (dioxins) and polychlorinated biphenyls (PCBs) found in air and in food – are illustrative of broader trends. Their presence in general has been declining.</p>	M1
<i>Relevance</i>	Pollutants can move between air, water and soil. Dispersed releases are especially important when pollutants build up in the environment, either because they are pervasive and accumulate in people, animals or plants, or because they persist for long periods.	
<i>Trends</i>	The presence of many, although not all, organic pollutants is declining in air, water, soil and food, especially those which have been the focus of policy in the past, either as the use of particular ones are prohibited or as a result of efforts to reduce the emission of substances containing them.	
<i>Background</i>	Pollutants can move between different parts of the environment and may be persistent and/or bioaccumulate and may cause adverse effects on ecosystems. The UNECE Protocol on Persistent Organic Pollutants requires production of a number of named substances to cease by 2005 and the control of many persistent by-products such as dioxins.	



Objective	Must not store up pollutant problems for the future	
Indicator	Dangerous substances in water	M2
	Chart – see separate page.	
	The List I substances which fail at the largest number of sites are mercury, cadmium, the organochlorine insecticide lindane and DDT.	
<i>Relevance</i>	A key sustainable development objective is to reduce the spread of persistent or diffuse pollutants such as pesticides and heavy metals because they accumulate in the bodies of people, or animals or in plants, or because they persist for long periods. Contaminants contained in discharges will eventually reach the sea – see indicator R1	
<i>Trends</i>	The number of monitoring sites reflecting discharge points where the EQS was exceeded for lindane fell from 10 in 1995 to 4 in 1997 in England, Wales and Northern Ireland. In 1997, exceedences for cadmium, mercury, and DDT were limited to one or two sites, with no exceedences of mercury at national network reference sites.	
<i>Background</i>	Standards for List I substances are set by the EC Dangerous Substances Directive. The List I substances shown in the indicator are those which most commonly exceed their Environmental Quality Standards. EQSs are concentrations of a given substance in receiving waters that do not have detrimental effects on the aquatic environment. Authorised consent limits are set with a view to ensuring that EQSs are met in the aquatic environment, and that a high level of water quality is achieved and maintained in receiving waters.	
	The number of national network reference sites monitoring List I substances is under review and was reduced between 1996 and 1997 by removing a number of sites where pollutant levels were below the limit of detection. There are no consented discharges of DDT because it is a banned substance. However, positive samples of DDT still occur at monitoring sites because of diffuse source pollution which may date back many years. For cadmium and lindane at National Network Reference sites the standards used in the charts are more stringent than the EQSs.	

Exceedences of Environmental Quality Standards for selected List 1 substances

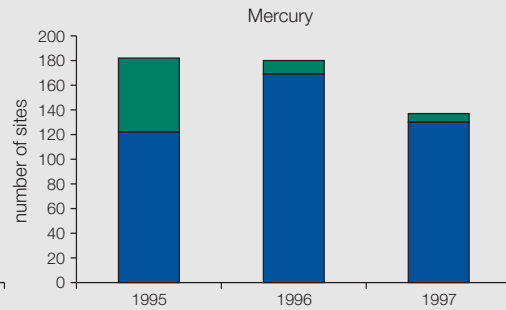
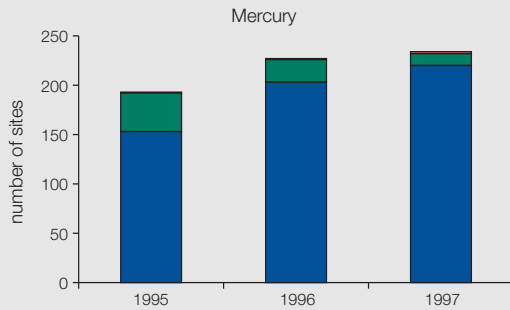
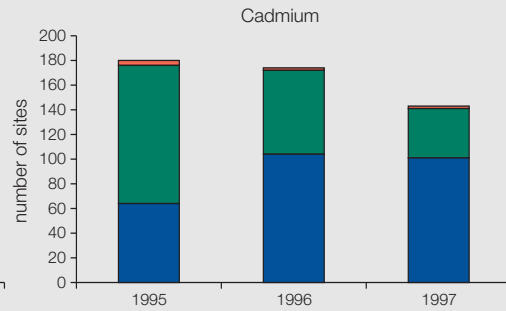
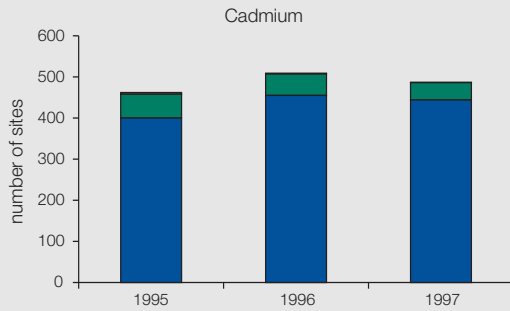
England, Wales and Northern Ireland

■ less than 10 per cent of the EQS ■ between 10 per cent of the EQS and the EQS ■ greater than the EQS

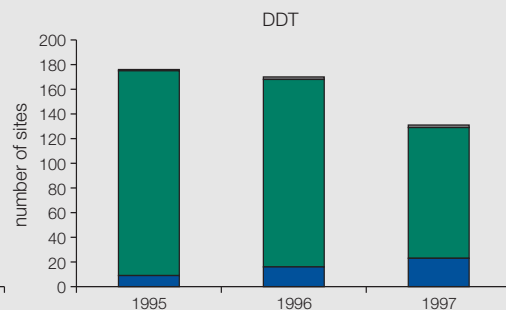
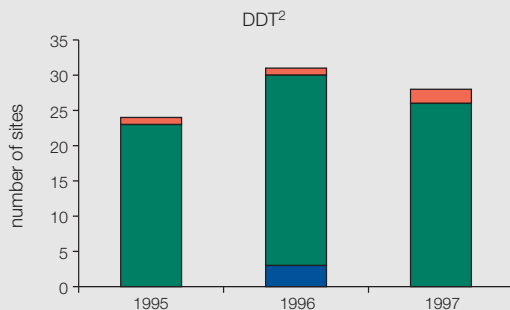
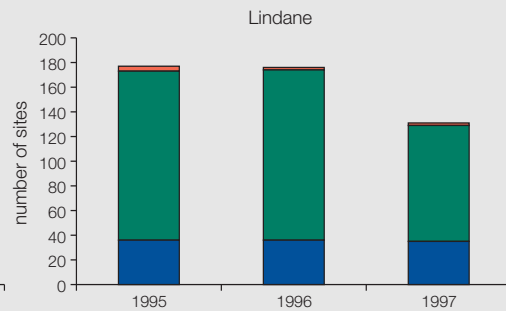
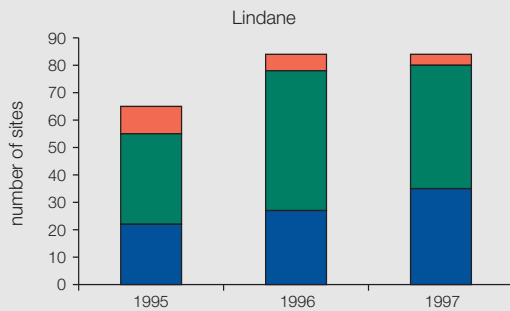
Sites below discharge points: 1995-97

National Network Reference sites: 1995-97¹

Heavy metals



Pesticides



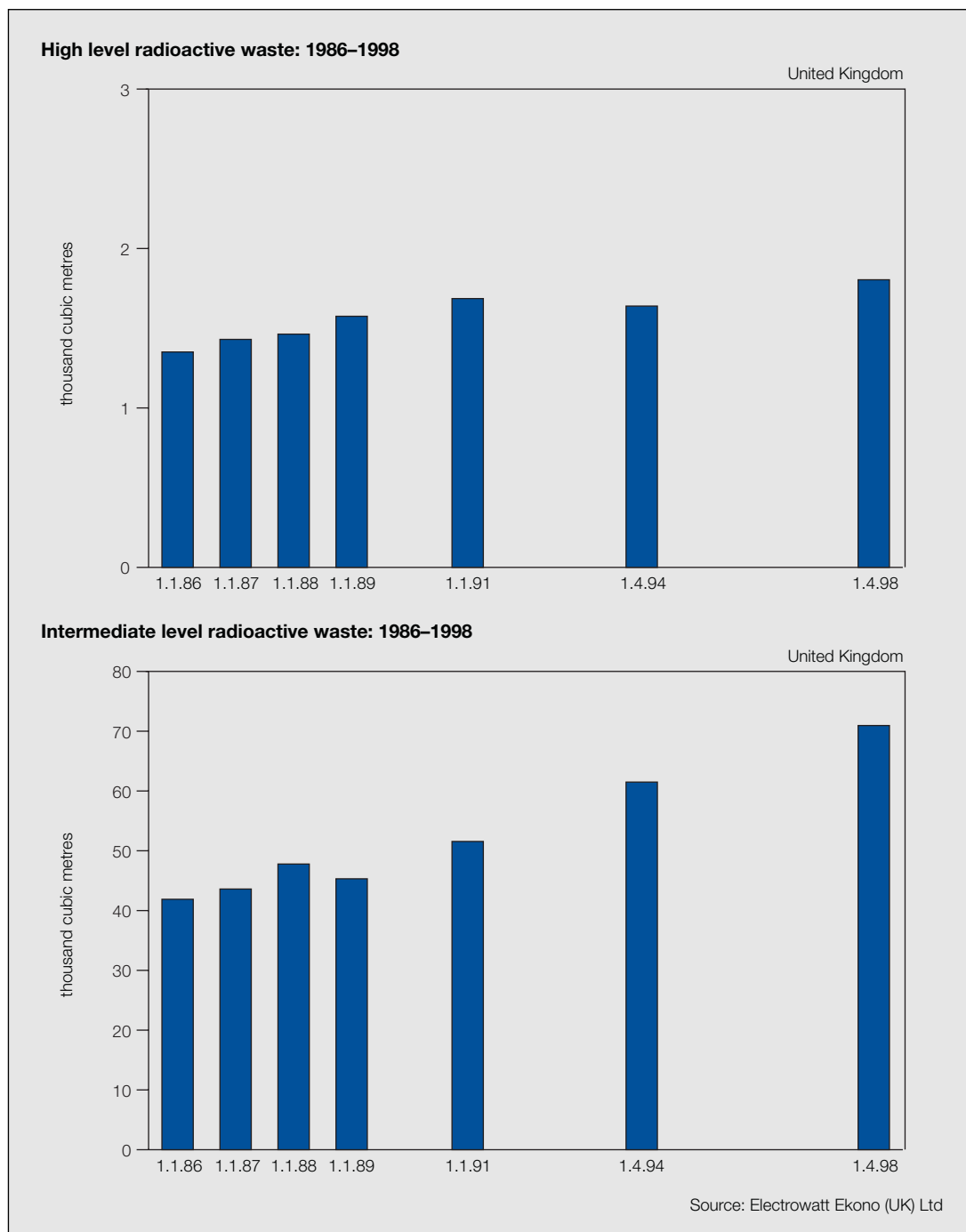
¹ at National Network Reference sites, cadmium and lindane are measured against more stringent standards than their EQSs
² the number of sites below discharge points for DDT is very small (31 or less)

Source: Environment Agency

Objective Must not store up pollutant problems for the future

Indicator Radioactive waste stocks

M3



UK stocks of high level radioactive wastes increased by 34 per cent between 1986 and 1998. Stocks of intermediate level wastes increased by 69 per cent in the same period.

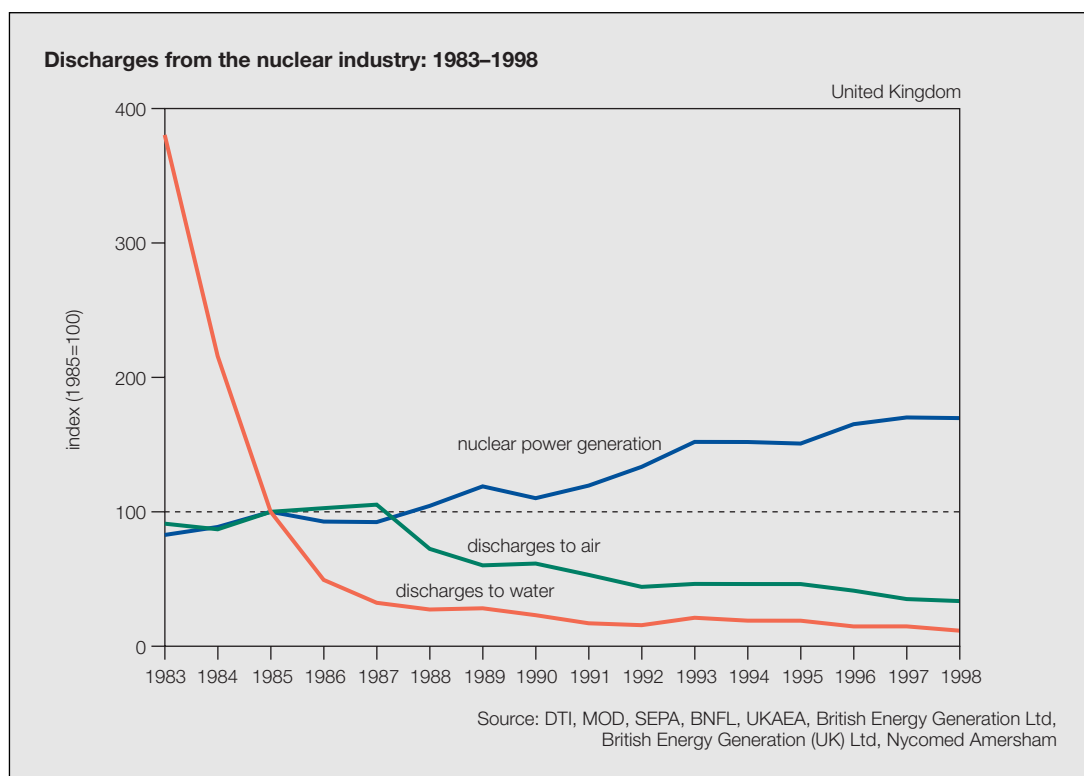
Relevance High level (HLW) and intermediate level radioactive wastes (ILW) will remain radioactive for many years and need careful management and storage to prevent danger/damage to humans and the environment. There is presently no disposal route for these wastes and so they have to be stored. Storage is limited to a number of sites. Low level wastes (LLW), such as nuclear workers’ clothing, are less toxic and can be disposed of in specially built shallow disposal facilities.

<i>Trends</i>	Stocks of HLW increased by a third between 1986 and 1998. ILW stocks increased by almost 70 per cent between 1986 and 1998.
<i>Background</i>	High and intermediate level stocks are the radioactive waste products from electricity generation, defence activities and the medical and scientific industries – which cannot be safely discharged, to air or water.

Objective Must not store up pollutant problems for the future

Indicator Discharges from the nuclear industry

M4



UK aerial radioactive emissions fell by 63 per cent between 1983 and 1998. Emissions to water fell by 97 per cent between 1983 and 1998. At the same time, electricity production from nuclear sources doubled.

Relevance Electricity is generated from nuclear fuel with only small emissions of carbon dioxide, (the largest contributor to global warming) and with no discharges of other air pollutants such as SO₂, NO_x. Radioactive substances are also used in medicine (radiotherapy, for example) and in the scientific industries. The 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. Exposure to radiation can be harmful to humans and animals, causing cancer for example.

Targets and goals The UK has signed up to the OSPAR Strategy with regard to Radioactive Substances, agreed in July 1998. Parties will, by the year 2000, work towards achieving further substantial reductions or elimination of discharges, emissions and losses of radioactive substances to certain marine environments. By the year 2020, parties will ensure that discharges, emissions and losses of radioactive substances are reduced to levels where the additional concentrations in the marine environment above historic levels are close to zero. Aerial discharges are to be maintained as low as reasonably practicable.

Background Use of nuclear power was boosted by support under the Non-Fossil Fuel Obligation (NFFO) in the 1990s and around 28 per cent of electricity generated came from nuclear sources in 1997. As existing capacity is retired and not replaced nuclear power's contribution to electricity generation will be reduced in the early decades of the next century.

N CLIMATE CHANGE AND ENERGY SUPPLY

Main messages

Some climate change is already occurring, and further change is inevitable. Large emissions reductions will be necessary to stabilise atmosphere greenhouse gas concentrations; Kyoto targets are only the first step.

The UK succeeded between 1970 and 1998 in reducing overall emissions of CO₂ and will be one of the few countries to meet the Rio commitment to reduce emissions to 1990 levels by 2000. However, CO₂ emissions are expected to start rising again after 2005 so in the longer term action will be needed to tackle this trend.

Only 2½ per cent of electricity was generated from renewable sources in 1998. Discovery of additional oil and gas reserves has matched increases in production.

Relevance

Climate change is a great threat to sustainable development. Globally, temperatures are rising and are forecast to increase by a further 1.5-3°C by the end of the next century. This is predicted to cause major adverse effects on the world's ecosystems, including increased incidence of extreme weather events (such as storms, droughts, floods), sea level rise affecting coastal and low lying areas, and loss of habitats and species.

Climate change is caused by emissions of greenhouse gases, particularly carbon dioxide which is mainly produced by burning fossil fuels to generate energy. It is a global problem requiring global solutions, and under the internationally agreed Kyoto protocol, the UK has a legally binding target to reduce emissions of the 'basket' of six greenhouse gases.

The extent to which the key objectives identified in the Strategy are being achieved, as reflected by the indicators, is illustrated in the following table.

Key strategies

- *A better quality of life. A strategy for sustainable development in the UK.* (8.8-8.17)
- Forthcoming UK Climate Change Programme

Some other related indicators:

Road traffic (H11); Energy efficiency of economy (A2); Energy use per household (A3); Thermal efficiency of housing stock (D8); Energy efficiency of new appliances (D11); Energy efficiency of road passenger travel/Average fuel consumption of new cars (D15); Travel (G1-G5); Fuel poverty (J6); Greening government operations (T1); Prices of key resources- fuel (T3); Real changes in the cost of transport (T4); International emissions of carbon dioxide per head (U6)

Objective	Ref no.	Indicator		Data used	Change since		Specific targets/goals
					1970	1990	
Climate change must be kept within limits which global society can accommodate	N1	Rise in global temperature*		1860-1999	X	X	
Assess vulnerability to changed weather patterns and higher sea levels and develop adaptation strategies	N2	Sea level rise*		1850-1997	X	X	
Continue to reduce our emissions of greenhouse gases now, and plan for greater reductions in the longer term	H9	Emissions of greenhouse gases (headline)		1990-1997	...	✓	12.5% reduction 1990 to 2008/2012 for the UK
	N3	Carbon dioxide emissions by end user	Transport	1970-1997	X	X	20% reduction in CO ₂ emissions 1990 to 2010 for the UK
Non-transport			✓		✓		
In the longer term more energy will have to come from new and renewable sources	N4	Electricity from renewable sources		1988-1998	...	✓	5% of UK electricity from renewables by 2003 and working towards 10% as soon as possible, hopefully by 2010
Fossil fuel resources managed in an environmentally acceptable way	N5	Depletion of fossil fuels		1980-1998	...	≈	

* Trends should be viewed as longer term than three decades

Key	
✓ significant change, in direction of meeting objective	X significant change, in direction away from meeting objective
≈ no significant change	... trend is uncertain or no quantitative data available
na not applicable, in cases where the indicator is for contextual purposes	