Environmental protection expenditure by the UK general government sector 1996/97 to 2000/01

Report by the

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Abstract:

The objective of this project is to determine the level of and changes in environmental protection expenditure by the UK general government sector. The estimates are to be seen as part of a wider account of environmental protection expenditure in the UK, and hence consistent definitions to those used in surveys of expenditure by other sectors have been applied.

The estimates cover the period 1996/97 to 2000/01. They show that spending has risen steadily over the period, from £3.2 billion in 1996/97 to £4.2 billion in 2000/01. The main changes have been a relative decline in spending on waste water, offset by relative increases in spending on conservation and waste management. Overall spending has increased marginally as a proportion of Gross Domestic Product (GDP).

The estimates are based on detailed research into the budgets of each of the relevant Governmental organisations. There is no systematic source from which figures can be taken, and in some cases assumptions have had to be made about the purpose of and type of expenditure involved. The totals given are therefore rough orders of magnitude only, although changes in the levels will generally be more reliable. The available sources do allow an estimate to be made of the extent to which the expenditure finances capital investment either directly through payments for goods and services or indirectly through grants and subsidies to non-Government bodies. This shows that about 15% of general government spending on environmental protection is directed at capital investment.

The results can be used to feed into an account of environmental protection activities in the UK, if they are combined with the results of the survey of expenditure by the manufacturing and other sectors sponsored by the Department for Environment, Food and Rural Affairs. However, a complete account will require more work to be carried out on the activities of specialised producers of environmental services (such as sewerage companies), households and non-profit making organisations.

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Contents

1. Introduction

The need to protect the environment against pressure from pollution and waste from the production and consumption activities of the economy has become a major policy concern within the UK over the last decade. Environmental protection is now being integrated into all policy fields with the general aim to ensure the sustainable development of the economy. The government sector has one of the most significant roles, by encouraging firms and private households to protect the environment, by regulating and monitoring environmental performance, by providing grants and subsidies to reduce the cost of environmentally sensitive behaviour, by funding research and development, by managing some of the nation's natural resources and by mounting publicity campaigns. The government sector is also responsible for providing services which reduce pollution and waste, such as the waste collection and disposal duties carried out by local authorities and (in rural areas of England and Wales) the provision of funding for waste water treatment.

In this way the Government is both a provider of environmental protection services and a major source of funding for environmental protection activities carried out by firms and households. The objective of this study is to assess how much these activities cost in terms of public sector funding, and how the cost has changed between 1996/97 and 2000/01. The results of the study will contribute towards a more complete understanding of the level of environmental protection expenditure and its financing in the UK.

This is the first time that a systematic survey has been carried out for the UK. An initial assessment for 1990/91 was conducted by Ecotec for the Department of the Environment in 1993, on the basis of information that was readily available at that time. Increasing awareness of environmental issues has meant that information about the relevant activities of public sector organisations is now more readily available and a more comprehensive study is feasible. A number of similar studies have been carried out in other countries, including most European Union member states and a number of other OECD[1] countries. A comparison between the results from this survey and those from other studies is given in Section 5.

The results of this study provide an immediate assessment of the extent of Government funding of environmental protection activities in the UK. They

[1] Organisation for Economic Co-operation and Development.

can also feed into a more formal system of environmental protection expenditure accounts, which can provide indicators of the efforts made by society to reduce pollution. Potentially the full accounts are the basis for analyses of the "polluter pays" principle and the effects on enterprise competitiveness, for cost-benefit analysis of proposed new regulations and policies, and for estimates of the size of the environmental goods and services industry. Effective interpretation of the results does, however, need to take careful account of how the definition of environmental protection expenditure has been applied in practice, and of the reasons for the associated changes in the physical data (eg the amounts of emissions generated or waste produced).

The next section therefore sets out the key definitions used in the study. Section 3 gives information on some aspects of UK environmental policy and on the split of responsibilities in terms of implementation. Section 4 describes the data collection process and section 5 analyses the results of the project. Section 6 discusses the formal framework used for environmental protection accounts and demonstrates how the results from this study feed into such accounts, while section 7 concludes and makes recommendations for further work.

2. Definitions

2.1 Environmental protection expenditure

Environmental protection expenditure in this study is defined as general government expenditure on activities that **primarily** serve the purpose of prevention, reduction, and elimination of any degradation of the environment caused by economic processes. Activities that, while beneficial to the environment, primarily satisfy technical needs or health and safety standards are excluded. Furthermore, this definition does not cover the management and supply of natural resources into the economy (such as water supply, timber or marketable fish) or the prevention of natural hazards (e.g. flood prevention). Hence expenditures on fisheries management, water resource management (including enforcement actions), forestry management (except of protected forests), and research into management, monitoring, control and surveillance, data collection and statistics etc on natural resources, are excluded, even though they may result in associated, secondary, environmental benefits such as the protection and restoration of wildlife and natural habitats.

Also excluded from this definition are measures taken to satisfy the economic needs of the organisation making the expenditure. In general this will mean that, for instance, money spent on the UK's "Greening Government" initiative will be excluded because the significant investments made in energy savings are expected to have a direct economic benefit as well as an environmental purpose[2].

This example illustrates the difficulty in applying this definition to government spending, which may often have more than one policy objective in mind. In practice, the application of this definition involves a considerable element of judgement. Potentially difficult areas include

- the reduction of air pollution through energy efficiency measures which, as discussed above, may also have a beneficial economic impact. The approach taken in this study is to include only measures which reduce the energy consumption of other people or organisations and hence can be termed unrequited payments;

[2] It should be noted that the revised United Nations handbook on environmental accounts (the SEEA 2000) makes provision for other environmental activities, such as natural resource management and exploitation, environmentally beneficial activities, and the minimisation of natural hazards, to be recorded in the accounts.

- the control of waste, which clearly includes expenditure on the collection and disposal of waste, and which by extension includes expenditure on street cleaning even though some of this expenditure e.g. use of disinfectants, may be more properly classified as expenditure on the protection of human health (this issue raises the whole question of whether protection of the environment is not, in one form or another, completely interwoven with the desire to protect human health and welfare;
- the protection of soil and groundwater, which has been taken to include expenditure on derelict land. Some of this expenditure relates to the restoration of contaminated land, but equally some of the expenditure may simply be viewed as being directed at the preparation of sites for further building development;
- expenditure on noise and vibration abatement. This clearly includes the provision of grants to those affected by noise, but activities aimed at reducing the noise produced by vehicles or that element of road construction expenditure which is geared towards reducing noise and vibration have been excluded because no estimates were readily available;
- the protection of biodiversity and landscape, which in this study is taken to include the creation and maintenance of National and Country Parks, and government sector expenditure on forestry protection, but not expenditure on urban parks and open spaces (even though these may often form local wildlife havens), expenditure (where separately identifiable) on the provision of access or amenities within the parks, expenditure on the protection of buildings and historic monuments, or expenditure on improvements to the urban environment such as those financed under the Single Regeneration Budget;
- expenditure on education and training, which has been limited to direct departmental expenditures and does not include government expenditure in support of environmental science degrees. In practice it would not in any case be possible to identify the extent to which the cost of these course fees were funded by student loans or top-up fees;
- administration costs, which should in principle cover the departmental overheads associated with all the environmental activities included in the study, but which have in this study, because of data availability, been limited to those for the main organisations involved.

Because it is necessary to apply a substantial degree of judgement when identifying environmental protection expenditures, comparisons with other studies or with other countries are often extremely problematic. For this

reason it is best to document as fully as possible the individual expenditure programmes which have been included within the scope of the study. Annex 2 provides more detail on the programmes covered and the net expenditures included.

2.2 Environmental protection activities

Environmental protection expenditures are classified by their environmental objectives (technically known as *domains*) within the Classification of Environmental Protection Activities, or CEPA 2000, framework. This classification was developed by Eurostat for the analysis of environmental protection activities by their main purpose.

CEPA 2000 has 9 classes of environmental issue defined at the 1-digit level, which can be further disaggregated to 2- and 3-digit levels. This study has adopted the structure of the 1-digit CEPA classifications, with the minor adjustment that category 9 (other environmental protection activities) has been split between education/administration and "other activities". Table 2.1 sets out the (1-digit) categories used.

Due to the lack of detail in the available data, it was not attempted to classify activities at the 2-digit level.

Table 2.1: Classification of Environmental Protection Activities

1	Protection of ambient air and climate
2	Waste water management
3	Waste management
4	Protection of soil and groundwater
5	Noise and vibration abatement
6	Protection of biodiversity and landscape
7	Protection against radiation
8	R&D on environmental protection
9	Other environmental protection activities (part of CEPA 9)

Annex 3 sets out a more complete description of the activities included in the CEPA categories.

2.3 Types of expenditure

In order to assess the level of government sector environmental protection activities, as well as the net cost of financing these activities, the survey needed to distinguish between several types of transactions:

- on-going, or current, expenditure on purchases of goods and services including rents, energy and maintenance expenditure and other intermediate inputs and environmental services and specific goods bought in from the market;
- staff costs, essentially the compensation of employees, which includes wages, salaries and social security contributions for employees that are involved with the provision of environmental protection services. This can be difficult to identify when only part of an organisation's work is directly related to environmental protection;
- capital expenditure or investment including outlays on land and on additions of new durable goods to the stock of fixed assets for environmental protection;
- current and capital transfers to other sectors of the economy. These are defined as unrequited payments that contribute to the financing of environmental protection activities or constitute a compensation for losses related to environmental protection. Current transfers will either be subsidies on production or payments to any other organisation or household, earmarked for environmental protection purposes. Capital transfers can be investment grants to finance the cost of the acquisition of fixed assets intended for environmental protection purposes or transfers to cover capital losses or accumulated deficits. Ideally information about the industrial sectors of the recipients of the transfers is required in order to complete the full accounts;
- income from sales, fees and charges for the provision of capital goods or current goods and services, such as fees for waste removal. This item excludes taxes which are compulsory and unrequited payments ;
- grant income from the EU.

It is especially important to identify transfers between general government sector institutions separately from those to other sectors of the economy, as failure to do so could lead to double-counting of expenditure.

2.4 Definition of the general government sector

In order to record expenditure consistently, a definition of what is included in the general government sector is required. The System of National Accounts defines the general government sector as "the grouping of all institutions which provide services delivered free or at a price not economically significant for individual and collective consumption and which are mainly financed by compulsory payments made by units belonging to other sectors".

The general government sector includes central government departments and local authorities, government agencies and other public bodies providing environmental protection services. Public corporations such as the Scottish Water Authorities, which are financed by fees and charges but under the control of Scottish ministers, are not part of the general government sector of the National Accounts although they are included under the definition of the public sector. As far as this study is concerned, expenditures by the Scottish Water Authorities are excluded, as they are financed by charges to customers, and expenditures by the Water Services Agency for Northern Ireland are also excluded, although the investment grant from the Northern Ireland Department of Environment is included.

On the other hand, public expenditure on waste collection and disposal funded by local authorities is funded mainly from local taxation and central government grants, together with income from fees and charges from domestic and non-domestic customers. Local authority activities are therefore defined to be part of the general government sector and are included in the study, whether or not the actual service is contracted out to the private sector.

3. The organisation of general government sector environmental protection activities in the UK

The starting point in the assessment of general government sector expenditure in the UK is an understanding of the organisation of the environmental protection activities undertaken by the public sector. This requires the identification of the responsibilities of the public bodies involved and distinguishing between the organisations that provide the services and those that finance them.

In the UK, as in most countries, the legislation, regulation and control of environmental affairs is the responsibility of public administrations. Although some of the services historically provided by local authorities are now carried out by the private sector, the government sector retains a key role in ensuring the provision of environmental protection services.

In 1990, the UK's political priorities in terms of environmental protection were published in a White Paper termed "This Common Inheritance". The UK's Sustainable Development Strategy, *A Better Quality of Life*, was published in 1999 and sets out a strategy to achieve these objectives.

The main concerns are the prudent and efficient use of energy and other resources, controlling air pollution and waste, and meeting the UK's commitments for reducing global warming, ozone depletion, and acid rain. In addition, it is a priority to encourage greater awareness of the environment and a greater sense of responsibility for it among UK citizens.

In England, the main administrative responsibility for environmental protection activities rests with the Department for Environment, Food, and Rural Affairs (DEFRA). In the three devolved areas of the UK, this role is taken by the respective central governing bodies, the National Assembly for Wales, the Northern Ireland Executive (more specifically, the Department of Environment), and the Scottish Executive.

Responsibility for the regulation of major pollution risks to air, water and land rests with the Environment Agency in England and Wales, the Scottish Environmental Protection Agency (SEPA), and the Environment and Heritage Service (EHS) in Northern Ireland.

Local authorities have responsibility for the collection and disposal of household and industrial wastes and street cleaning, for the assessment and

management of local noise and vibration nuisance, for the provision and maintenance (in England and Wales) of rural sewerage services and National and Country Parks, and for the reclamation of derelict land.

In terms of conservation, the government's strategy is laid out in the Biodiversity Action Plan, the overarching framework for conservation work in the UK. The central government bodies act as administrators, delegating many of the conservation functions to agencies that are funded partly by fees and partly by a parliamentary budget. The agencies primarily involved are the Countryside Agency (formerly the Countryside Commission), English Nature, the Environment Agency (in addition to their responsibility for the management of water resources), the Countryside Council for Wales, Scottish Natural Heritage, and the Environment and Heritage Service in Northern Ireland.

There are a number of other ministerial departments that promote environmental protection activity, although their main policy focus may be elsewhere. The most important departments are the agricultural departments (the Ministry for Agriculture, Fisheries and Food, now part of DEFRA, the National Assembly for Wales, the Scottish Executive and the Department of Agriculture and Rural Development Northern Ireland), the Department of Energy (part of the Department of Trade and Industry) and the Department of Transport (now part of the Department of Transport, Local Government and the Regions).

The UK also makes contributions to environmental protection activities in other parts of the world - these are primarily the responsibility of the Department for International Development and to a lesser extent the Foreign and Commonwealth Office.

Table 3.1 summarises the division of environmental protection responsibilities between central government, other government agencies and local authorities in the UK.

Table 3.1: Allocation of environmental protection responsibilities between central and local government

	Central Govern-ment	***Govt Agencies***	***Local Govern-ment***
1. Protection of ambient air and climate	x	x	x[3]
2. Waste water management	x	x	x
3. Waste management	x	x	x
4. Protection of soil and groundwater	x	x	x
5. Noise and vibration abatement	x	x	x
6. Protection of biodiversity and landscape	x	x	x
7. Protection against radiation	x	x	
8. R & D for environmental protection	x	x	
9. Other environmental protection activities	x	x	x
10. Education and administration	x		

[3] Local authorities have responsibility for the control of local air pollution under the Clean Air Act 1995.

4. Data sources, assumptions and adjustments

4.1 National Accounts data - COFOG

Data from the National Accounts is based on a system of classification known as the Classification of Function of Government (COFOG). Within COFOG there is a category for environmental protection. In practice this has been defined to cover the expenditure on all activities by the Environment Protection Group at the Department for Environment, Food and Rural Affairs (DEFRA). Hence the environmental protection activities of other departments are excluded by definition and any activities of the Environmental Protection Group at DEFRA are included whether or not they fall within the definition of environmental protection outlined above.

Furthermore, the current COFOG classification in use in the UK does not provide any detail about the environmental issue that the expenditure is aimed at. In principle the COFOG classification provides for more detail on a basis which is more closely linked to the CEPA classification, but there are at present no plans to implement this classification for the UK.

4.2 Government budgets and accounts

The main sources of more detailed information are, therefore, the annual reports and accounts of the departments and agencies concerned, together with statistical information on the budgets of local authorities. This is augmented by policy documents describing the objectives of spending programmes, detailed budgets from some accounting divisions, and personal communications with experts within the relevant organisations.

Problems encountered at this stage of the project were mainly related to the definition of environmental protection itself and the divisibility of expenditures. Frequently, expenditure items cover non-environmental as well as environmental objectives, and it is not immediately evident what proportion of the expenditure should be allocated to the environmental protection objective. This requires either more detailed information directly from the appropriate government department or estimation of the relevant part of the expenditure.

In many cases it was only possible to obtain some of the relevant information directly from departments. Estimates were made where data was not available for the whole period surveyed and had to be extrapolated back- or

forward. Estimates were also made for some of the devolved administrations by reference to the costs of similar services elsewhere in the UK.

A further difficulty was the level of detail available on the types of expenditure. Data on staff costs could at times be estimated from information on staff effort, but was generally not available for activities which only formed a minor part of a department's responsibilities, or for government funding of activities carried out by the smaller agencies which receive a substantial proportion of their income through fees and charges. Assumptions also needed to be made about whether some of the payments recorded in the survey were current or capital expenditures.

The following section summarises the assumptions and adjustments made for each of the sources.

4.3 Assumptions and adjustments made to the data

Information on the expenditure of the Environmental Protection Group and the Countryside and Wildlife Divisions of the Department of the Environment, Transport and the Regions (DETR)[4] was based on the detailed accounts provided by the Department, as well as on the descriptions and amounts recorded in the Department's Annual Reports. Assumptions had at times to be made about the environmental objective of the expenditure and about some of the proportions of running costs that related to staff costs. Transfers to other general government bodies such as the Environment Agency, local authorities and National Park authorities were excluded in order to avoid double-counting. An adjustment was also made to estimated expenditure by the Countryside Commission/Countryside Agency, since an inspection of the expenditure plans suggested that two thirds of the planned expenditure related to providing access to the countryside and other social rather than environmental objectives.

The other relevant policy area of DETR is the Transport Group[5]. Here, information on specific budgets such as the Cleaner Vehicles Programme and the Freight Grants scheme was obtained from the Department's accounts and the Annual Reports.

[4] The Department was reorganised in June 2001. The Environmental Protection Group and the Countryside and Wildlife Divisions were combined with the Ministry of Agriculture, Fisheries and Food to form a new Department for Environment, Food and Rural Affairs (DEFRA).
[5] The Transport Group is now part of a new Department of Transport, Local Government and the Regions (DTLR).

Estimates for the Ministry of Agriculture, Fisheries and Food (MAFF) were taken from information provided by the Department, along with information from the Annual Reports and from the Forestry Commission. Much of the Ministry's apparent environmental spending relates to the management of natural resources such as forestry and fishing, which falls outside the definition of environmental protection activities. A further element relates to countryside management but is not specifically geared towards environmental protection. There is also of course significant economic support for farmers, most of which does not have any environmental objective. Once these elements are separated out the remaining "Agri-environment" programme can be identified. The estimates exclude most of the activities of Forest Enterprise, but include some forestry and woodland grants which have been assumed to relate to the protection of habitat and landscape.

The Department of Trade and Industry's expenditure mainly relates to the promotion of renewable energy, research and development, and protection from radiation. Information on the main programme spending was readily available but there was little information on the associated Departmental costs.

The Department for International Development and the Foreign and Commonwealth Office together account for general government expenditure on transfers to the Rest of the World. Again, a breakdown of the programme by environmental objective was readily available but not the associated Departmental costs.

Information about the activities of the devolved administrations (the National Assembly for Wales, the Scottish Executive - together with Scottish Natural Heritage and the Scottish Environmental Protection Agency - and the Northern Ireland Department of the Environment and Department of Agriculture and Rural Development) was in general obtained from Departmental Reports. In addition, the Scottish Executive and the DoENI provided detailed figures for some of the main programmes. A breakdown of Scottish Executive spending on "agri-environment" programmes was estimated using the proportions from MAFF reports.

The Environment Agency annual reports and corporate plans provide considerable detail about the Agency's spending on different environmental issues and the associated staff resources. By applying Agency-wide estimates of the cost of staff input, it was possible to obtain a breakdown of the running costs on each programme. Estimates of spending on flood

defence and on natural resource management (in particular water resources and fisheries) were excluded from the estimates.

As far as information about the activities of local authorities is concerned, the data were taken from the published summaries of revenue and capital expenditure in the four countries, supplemented by additional unpublished details from the Departments responsible for data collection. Data on the revenue and capital costs of waste collection and disposal was readily available for all but the latest year, but there were no separate estimates available for capital expenditure on street sweeping and cleaning or rural sewerage in England and Wales. This may have led to a slight understatement of capital expenditure on environmental protection. The availability of information on expenditure on National and Country Parks varied across the years and the countries concerned, and information for earlier years had to be used to estimate missing components. Information on other local government spending programmes, such as the Clean Air Act and derelict land, was also only available for the earlier years.

Information drawn from from local authority financial returns indicates that there are substantial sums spent on environmental health, but it was not possible to identify how much of this relates to environmental protection activities such as noise prevention.

5. Analysis of the results

This section presents the results of the current study in terms of the net expenditure by the general government sector on environmental protection activities, distinguishing between the different elements of the expenditure.

5.1 Total environmental protection expenditure

Table 5.1 below presents estimates of the aggregate net expenditure on environmental protection by the UK government sector for the financial years 1996/97 to 2000/01.

Table 5.1: Net government sector expenditure on environmental protection in the UK, 1996/97 to 2000/01

	Total net expenditure £ million, current prices	Increase on previous year (%)	Increase in GDP (%)
1996/97	3,210		
1997/98	3,535	10.1	6.6
1998/99	3,630	2.7	5.5
1999/00	3,910	7.8	4.9
2000/01[6]	4,185	7.0	4.8

It is estimated that environmental protection expenditure by the UK government sector increased from £3.2 billion in 1996/97 to £4.2 billion in 2000/01.

The average annual growth rate over the period, at 7.0%, was slightly higher than for other aggregates in the economy. As a result, expenditure increased marginally as a percentage of general government final consumption expenditure (from 2.2% to 2.3%) and as a percentage of gross domestic product (from 0.42% to 0.44%).

[6] data for 2000/01 is provisional

5.2 Types of expenditure

Table 5.2 presents a breakdown of the components of the aggregate net expenditure on environmental protection activities.

Table 5.2: Environmental protection expenditure by the UK general government sector by type of expenditure, 1996/97 to 2000,01

£ million

	1996/97	1997/98	1998/99	1999/00	2000/01
1. Staff costs	380	395	430	490	580
2. Other running costs	2,630	2,860	3,010	3,275	3,400
3. Operating expenditure (row 1+ row 2)	3,010	3,255	3,440	3,770	3,980
4. Subsidies and other current transfers	270	300	320	305	320
5. Capital expenditure	245	245	210	220	200
6. Capital transfers	300	345	355	350	465
7. Total outlays (rows 3+4+5+6)	3,830	4,145	4,320	4,645	4,965
8. Sales fees and charges #	-590	-575	-650	-675	-725
9. Grant income received	-25	-35	-40	-55	-55
10. Total income (row 8 + row 9)	-615	-610	-690	-735	-780
Net government expenditure (row 7 + row 10)	3,210	3,535	3,630	3,910	4,185
of which, net operating plus net capital expenditure (rows 3+5+8)	2,695	2,960	3,020	3,335	3,480

Note: # includes both current and capital receipts

The estimates of staff costs are based on estimates of spending by government departments and local authorities. The proportion of operating costs accounted for by staff costs is only 15%, which is considerably less than estimates reported in other EU member states. Some differences would be expected, as the figures are intended to exclude the staff costs of services

which are contracted out to the private sector (these are shown as part of the 'other running costs'). However, it is likely that the estimates do understate to some extent the general government staff effort, since they relate only to the staff of the Departments and agencies covered in the survey and will not include those of the smaller agencies and other public bodies involved in the provision of environmental protection services. Furthermore, some Departments were unable to provide any estimates of Departmental running costs in support of programme spending.

The split of expenditure between current and capital has been approximately constant over the past 5 years. Direct capital investments made up between 6% and 8% of direct general government sector expenditure on environmental protection, while net capital outlays (including capital grants and other transfers) made up about 16% of total net expenditure.

5.3 Expenditure on different environmental issues

Table 5.3 presents the results of the current study in terms of the environmental objective of the expenditure.

Table 5.3: Net UK general government sector expenditure on environmental protection by environmental issue, 1996/97 to 2000/01

£ million

	1996/97	1997/98	1998/99	1999/00	2000/01
1. Protection of ambient air and climate	245	260	260	225	290
2. Waste water management	105	105	100	100	110
3. Waste management	1,820	2,025	2,110	2,320	2,425
4. Protection of soil and groundwater	150	150	150	160	145
5. Noise and vibration abatement	2	3	2	3	3
6. Protection of biodiversity & landscape	360	400	405	480	510
7. Protection against radiation	125	160	165	155	200
8. R & D for environmental protection	240	245	245	255	265
9. Other environmental protection activities	60	80	85	95	110
10. Education and administration	100	105	110	120	130
Total general government net expenditure	3,210	3,535	3,630	3,910	4,185

As table 5.3 shows, expenditure on the main environmental objectives has been increasing steadily over the 5 years examined in this study. Waste management expenditure, the bulk of which is incurred by local authorities, is by far the largest part of the outlays and made up 60% of general government sector net environmental protection expenditure in 2000/01.

Other major areas of expenditure are air protection, through the home energy efficiency and renewable energy schemes, spending on National and Country parks, and research and development. Waste water treatment expenditure is relatively low and declining in importance: it relates only to the rural sewerage schemes operating in England and Wales, and to the grant from DoENI to Water Services in Northern Ireland. Some decline would be expected as the sewerage companies are increasingly expected to meet their costs from direct charges.

Pearce and Palmer (2001) hypothesised that there might be a rise in the relative burden of expenditure being borne by the private sector because of (a) increased private spending due to regulation based on standard setting, (b) growth in fiscal ideologies favouring reduction in public expenditure and (c) increased privatisation. Some of the reason why they found no evidence for such a rise in the private sector share might lie in the way in which general government sector spending has developed over the period, with the highest increases being in the miscellaneous category of 'other environmental protection activities', suggesting that spending is increasingly being directed at more general and broader policy objectives.

Pearce and Palmer also anticipated that higher incomes would translate into higher environmental protection expenditure. The evidence from this study that environmental spending has grown by 7.0% a year over the period, compared with an average GDP increase of 5.5% a year, lends some support to this hypothesis.

5.4 Comparison with 1990/91 study

This study is the first to investigate systematically the level of public sector environmental expenditure in the UK. An initial study for 1990/91 was carried out by Ecotec in 1993, but there are a large number of differences in the approach of the two studies and the results are not immediately comparable.

The Ecotec study found that, on a broad definition of environmental protection, UK general government sector spending amounted to £4.8 billion in 1990/91. The estimate included £200 million on flood defence, £300 million on water supply in Scotland and Northern Ireland, £400 million local government spending on environmental health, and £600 million on urban parks and open spaces, but excluded spending on forestry, nuclear decommissioning and renewable energy sources. Adjusting for these items and a number of smaller differences produces an estimate of £2.8 billion expenditure in 1990/91. This represents 0.49% of GDP and suggests that environmental protection expenditure has fallen slightly in relative terms since the early 1990s. However, the methodology and assumptions used in the two studies are very different and even after adjustment the two figures cannot be reliably compared.

For the record, approximate estimates of Government spending by environmental issue for 1990/91, taking into account these adjustments, is given in Table 5.4.

Table 5.4: UK general government sector net environmental protection expenditure in 1990/91, adjusted on to a broadly consistent basis with the current study

£ million

	1990/91
Protection of ambient air and climate	110
Waste water management	370
Waste management	1,500
Protection of soil and groundwater	160
Noise and vibration abatement	30
Protection of biodiversity and landscape	170
Protection against radiation	100
Research and Development for environmental protection	190
Other environmental protection activities	10
Education and administration	130
Net general government expenditure on environmental protection	2,800

Source ONS, based on estimates made by Ecotec

The breakdown of spending by environmental issue suggests that one of the main changes might be in the control and reduction of air pollution, following the implementation of Integrated Pollution Control from 1990 and the increased emphasis on climate change following the Rio summit in 1992. Another notable difference relates to expenditure on waste water management, which appears to have declined markedly as costs are progressively met from direct charges. Some of the other differences are more difficult to explain, and may merely reflect the different approaches of the two studies rather than real changes in expenditure.

The Ecotec study also enables some estimates to be made of the proportion of expenditure in 1990/91 that related to investment. These estimates suggest that £470 million, or 15% of net expenditure, was devoted to capital projects in that year, a very similar proportion to those estimated for 1996/97 to 2000/01.

5.5 Comparisons with other countries

The Eurostat publication "Environmental Protection Expenditure in Europe" gives data, where available, for the years 1990 – 1999 for all European countries and for the United States and Japan.

The environmental protection spending levels of each country are shown both in terms of net direct spending (the sum of current expenditure and investment, net of receipts of sales, fees and charges) and in terms of the net expenditure (spending plus subsidies, net of receipts of grants) falling on the taxpayer. Estimates are published as shares of GDP, in order to bring them onto a common basis.

Table 5.5 below shows net environmental protection expenditure by each of the 15 EU member states and the United States, as a percentage of GDP. The second column indicates which year the data refers to, as this data is not available on an annual basis for most countries.

Table 5.5: International comparisons of public sector[7] environmental protection expenditure as a percentage of GDP, various years

Country	Year to which latest data relates	Direct expenditure as a % of GDP		Tax-borne expenditure as a % of GDP	
Belgium	1997	0.39		0.55	
Denmark	1999	0.19		0.34	
Germany	1997	0.60	#		
Greece	1999	0.21			
Spain	1996	0.93	#	1.13	#
France	1998	0.32		0.37	
Ireland	1999	0.43		0.69	
Italy	1992	0.16	#	0.28	#
Luxembourg	1997	0.43		0.43	
Netherlands	1997	0.61		0.65	
Austria	1998	0.53		1.18	
Portugal	1998	0.66		0.66	
Finland	1998	0.19		0.41	
Sweden	1991	0.33			
United Kingdom	2000	0.36		0.44	
United States	1994	0.65	#		

Source: Eurostat (2001), ONS

Notes: # gross of receipts of sales, fees and charges.

It is important to note that, in addition to the variety of years to which the data for different countries relates, the methodologies and assumptions used in generating these estimates vary greatly from country to country. Hence it is only possible to draw some very broad conclusions.

In terms of net direct spending as a proportion of GDP, the UK at 0.36% is about average for the EU, with the other countries ranging from 0.19% (Denmark and Finland) to about 0.66% (Portugal). The comparison in terms of tax-borne spending is much the same, with the UK ranking 6th out of the 10 nations for which figures are available.

[7] Note that the figures for the other countries may include expenditures by public corporations. The figures for the UK are taken from this study, and relate to expenditure by the general government sector in 2000/01.

Eurostat also publish international comparisons of direct expenditure on investment by the public sector. Incorporating this study's results, the UK shows by far the lowest figure for spending on investments, at only 6% of direct expenditure - the average for the EU countries for which comparable figures are available is about 38%. If capital grants and other transfers are included in the calculation the figure for the UK rises to about 15%, but no information is available on how this compares with the levels of investment from tax-borne spending in the other countries.

The explanation for these differences is believed to lie partly in the differing extent to which waste management and sewerage treatment have been privatised across the European Union. The comparisons are particularly sensitive to the inclusion of waste water management services in the estimates. Table 5.6 shows the results for EU member states and the United States if expenditure on waste water treatment is excluded from the analysis.

Table 5.6: International comparisons of public sector[8] net environmental protection expenditure excluding waste water treatment, as a percentage of GDP, various years

Country	Year to which latest data relates	Direct expenditure as a % of GDP		Tax-borne expenditure as a % of GDP	
Belgium	1997	0.34		0.38	
Denmark	1999	0.21		0.36	
Germany	1997	0.26	#		
Greece	1999	0.25			
Spain	1996	0.75	#	0.91	#
France	1998	0.19		0.24	
Ireland	1999	0.20	#	0.45	#
Italy	1992	0.13	#	0.20	#
Luxembourg	1997	0.20		0.21	
Netherlands	1997	0.56		0.60	
Austria	1998	0.46		1.04	
Portugal	1998	0.42		0.42	
Finland	1998	0.22		0.34	
Sweden	1991	0.28			
United Kingdom	2000	0.35		0.43	
United States	1994	0.26	#		

Source: Eurostat (2001), ONS

Notes: # gross of receipts of sales, fees and charges.

Excluding expenditure on waste water management, the UK ranks 4th out of 11 nations in terms of direct expenditure and 3rd out of 9 nations in terms of tax-borne spending. The level of investment spending in the UK is also closer to the EU average: although the UK only spends 5% of (non-waste water management) direct expenditure on investment, the average for those EU countries for which figures are available is estimated to be 15%.

[8] Note that the figures for the other countries may include expenditures by public corporations. The figures for the UK are taken from this study, and relate to expenditure by the general government sector in 2000/01.

6. The accounting framework and the environmental protection expenditure account for the general government sector

The environmental protection expenditure account (EPEA) is a formal framework for the collection and compilation of data on environmental protection expenditure that is closely linked to the National Accounts. It is part of the wider conceptual structure for a harmonised monetary description of environmental protection activities developed by Eurostat in the early 1990s, known as the European System for the Collection of Economic Information on the Environment (SERIEE). The aim of this section is to transform the expenditure data collected in this study into a format consistent with the EPEA and to examine the assumptions involved.

6.1 The environmental protection expenditure account

The EPEA itself contains three separate accounts. The first account relates to the production of environmental services, and describes the organisations actually carrying out environmental protection activities (eg specialised private environmental service companies, general government, industry) and the resources involved (e.g. intermediate consumption, consumption of fixed capital, compensation of employees).

The second account, "National expenditure on environmental protection", shows the resources a nation spends on the environment, characterised by type of expenditure (eg final consumption, capital formation) and type of spender (eg government, industry, households). The third account then presents the ways that this expenditure is financed and where the financial burden falls.

All SERIEE accounts are comprehensive and exhaustive. Each item of expenditure has a unique place in the accounts and double-counting is avoided. They are also directly compatible with the National Accounts, and hence the results can be interpreted in exactly the same way as other macro-economic indicators such as GDP or capital formation.

After the raw data has been compiled from the main data sources, as described in the earlier sections, the first step is to transform the data on the outlays of producers or of those funding the activity to the output of environmental protection services in general, then from output to uses and finally from uses to financing. The results shown here relate only to the

activities of the general government sector, and will need to be combined with information about the activities of private sector producers and the household and voluntary sector before a full account of environmental protection expenditure in the UK can be obtained.

6.2 The environmental protection production account

In order to arrive at an estimate of the general government sector output of environmental protection services, the available data must be converted into the main components of a national accounts production account. These include intermediate consumption (inputs into the production process), compensation of employees (salaries and social security contributions) and consumption of fixed capital. The last of these components has to be estimated using national accounts methods and assumptions.

The National Accounts treatment of services produced by government institutions raises a number of technical issues. First, in principle, a distinction is made between specialised producers of environmental protection services (ie those government institutions which produce environmental protection services as their principal activity) and other producers. Some agencies, such as the Environment Agency, would clearly fall within the first category, but for many Government Departments and local authorities it is not clear what activity would count as the main activity. For the sake of simplicity, therefore, in the present context all environmental protection activities carried out by general government are considered to be the main activity of general government as a whole.

Second, a general distinction is made between market producers and non-market producers. By convention the general government sector is defined as a non-market producer because the major part of its output is non-market output ie sales cover less than 50% of the costs. However, this may not be true for some individual units (refuse collection in certain London boroughs, for example). The approach taken in this paper is to classify the production of those products and services which are sold to the private sector as market production, with the remainder being treated as non-market production.

6.3 The calculation of general government sector output

The total output of environmental protection services is calculated as the sum of operating costs (compensation of employees plus other running costs), an allowance for the consumption of fixed capital, taxes on production less

subsidies on production, and net operating surplus (which for the general government sector is taken as zero).

The allowance for the consumption of fixed capital (CFC) is a National Accounts concept which is not shown in the annual reports and published accounts of Government Departments and Agencies. It can in theory be based upon estimates of the stock of fixed capital and assumptions about the use of that capital. In the absence of such data the estimate of CFC, for the purposes of this study, is assumed to be equivalent to a proportion of the operating costs of the services. A separate calculation is made for rural sewerage services, waste management by local authorities, and other environmental protection activities.

For sewerage services, which are relatively capital intensive, CFC is assumed to be 30% of operating costs (compensation of employees and other current costs) - this is in line with the ratios experienced in other EU member states. For local authority waste management services, CFC is assumed to be 15% of operating costs, while for the remaining environmental protection activities, CFC is taken to be equivalent to only 5% of operating costs, in line with National Accounts estimates for the analysis of general government total outlays on environmental protection[9].

Taxes on production and subsidies on production are usually assumed to be zero for the general government sector. However, the case of waste management and rural sewerage services requires special consideration. These services are regarded as market products which could equally well be provided by private sector organisations at market prices. Where the costs of providing the services are not met by direct payments from the users, it might be possible to conclude that there is an implicit subsidy going to service users, which would need to be recognised in the accounts.

In the case of local authority waste management services, it is felt that the charges raised by service providers can be assumed to meet the costs of providing the service, since waste collection and disposal is either contracted out by the authorities or carried out by in-house teams under similar financial constraints. It can also be assumed that market production is equivalent to the value of current receipts of fees and charges, while non-market production is represented by the remaining operating costs not covered by these

[9] see for example Table 11.2 of the National Accounts Blue Book, 2001

receipts. This non-market production is treated as collective consumption and assigned to the general government sector.

The provision of rural sewerage services by local authorities in England and Wales does not appear to be subject to the same financial regime, in that the financial returns show that receipts do not balance costs. The assumption made in this survey is, therefore, that the gap is made up by an implicit subsidy of household consumption, which is treated in the accounts as a subsidy on production.

Table 6.1 shows the resulting production account for environmental protection services carried out by the general government sector.

Table 6.1 Production of environmental protection services by the UK general government sector, 1996/97 to 2000/01

£ million

	1996/97	1997/98	1998/99	1999/00	2000/01
CURRENT TRANSACTIONS					
1. Current uses	3,340	3,615	3,825	4,195	4,420
Intermediate consumptiom	2,630	2,860	3,010	3,275	3,400
Compensation of employees	380	395	430	490	580
Consumption of fixed capital	375	405	430	470	490
Net operating surplus	0	0	0	0	0
Subsidies on production	45	45	45	45	50
2. Output	3,340	3,615	3,825	4,195	4,420
- non-market	2,795	3,055	3,205	3,525	3,705
- market #	545	560	620	670	720
3. Current environmental protection resources					
- market output	545	560	620	670	720
4. CAPITAL TRANSACTIONS	175	195	140	155	135
Capital formation and purchases of land, net of capital receipts	200	225	180	210	190
Investment grants received	25	35	40	55	55
Financing by producers	2,970	3,250	3,345	3,680	3,840

Note: # defined as being equivalent to current receipts of fees and charges.

Items 1 to 3 of this table relate to current spending and receipts. As described above, output is calculated as the sum of intermediate consumption, compensation of employees and the allowance for consumption of fixed capital, less estimated subsidies on production. The total is split between market and non-market output in Item 2, depending upon the source of finance: market output is calculated as current receipts of fees and charges. The income relates mainly to waste management, rural sewerage and research and development, and constitutes the whole of the current environmental protection resources (Item 3) of the general government sector (there being no current transfers to the general government sector recorded in the survey).

Item 4 covers capital transactions. In principle capital formation should distinguish between gross fixed capital formation and other capital uses such as the acquisition of land, but this information was not available from the survey. The amounts are recorded net of receipts from the sale of capital assets. The total of capital transactions is calculated as capital formation net of investment grants received from the EU (there may also be a small element of national lottery funding included in the latter figure).

The final row of the table shows financing by the general government sector, and is calculated as the sum of current uses and capital transactions, less current resources.

6.4 National expenditure on environmental protection

The non-market output taken from Table 6.1 represents an element of the amount of environmental protection expenditure which the general government sector produces and finances itself. The sector also makes and finances some direct capital formation (shown in item 4 in Table 6.1). The sum of these two elements represents the general government component of national expenditure on environmental protection. In addition, the general government sector finances spending by other sectors: these elements can be identified in the summary table but (in order to avoid double-counting) score as expenditure by the relevant sectors.

Table 6.2 shows a summary of the general government sector elements of national expenditure on environmental protection.

Table 6.2: National expenditure on environmental protection - government sector elemen, 1996/97 to 2000/01t

£ million

	1996/97	1997/98	1998/99	1999/00	2000/01
General government expenditure	2,995	3,285	3,385	3,735	3,895
- final consumption (non-market)	2,795	3,055	3,205	3,525	3,705
- capital formation and land acquisition	200	225	180	210	190
National expenditure on environmental protection by general government	2,995	3,285	3,385	3,735	3,895
Specific transfers (expenditure by other resident units but recorded in this survey) #					
- to producers	415	475	490	460	555
- current grants and subsidies	220	250	260	235	265
- capital transfers	190	225	230	220	290
- to households	140	135	140	140	190
- subsidies on connected products	75	75	75	75	125
- implicit subsidy re rural sewerage	45	45	45	45	50
- other current transfers	15	15	15	15	15
- capital transfers	1	1	1	1	1
Total uses of resident units recorded in this survey #	3,550	3,895	4,010	4,330	4,645
less uses financed by the Rest of the World	25	35	40	55	55
plus uses in the Rest of the World	65	75	90	105	85
- current transfers	35	35	45	50	40
- capital transfers	35	40	45	55	45
National expenditure on environmental protection recorded in this survey #	3,585	3,940	4,060	4,380	4,675

Note: # the expenditures financed by transfers would need to be excluded from a complete account of national expenditure on environmental protection, in order to avoid double-counting.

The main difference between this definition of expenditure and that used in section 5 is that these estimates include an allowance for consumption of fixed capital.

As far as the transfers to other sectors is concerned, the accounts provide for a distinction between subsidies to specialised producers of environmental protection products, and those to other producers. This distinction is however not readily available from the survey results, as there is only limited information about the recipient of the grant or subsidy.

The accounts also provide for a distinction between grants for the purchase of adapted and connected products by households and those for the consumption of environmental protection services. For this report it has been assumed that transfers in respect of home efficiency are earmarked for the purchase of adapted or connected products.

6.5 Financing environmental protection expenditure

The final table in the accounts sets out how national expenditure on environmental protection is financed. In practice for the general government sector this table is very similar to the expenditure table, as it identifies general government spending on collective consumption (as the sum of general government final consumption and capital formation) and the transfers to other sectors already set out in Table 6.2. The main difference is that financing from the EU, in relation to grants to farmers, is netted off the figure for transfers to private sector producers.

Table 6.3 Financing of national expenditure on environmental protection - government sector element, 1996/97 to 2000/01

£ million

	1996/97	1997/98	1998/99	1999/00	2000/01
Government financing of					
- private sector producers	385	440	450	400	505
- household consumers	140	135	140	140	190
- government consumption	2,995	3,285	3,385	3,735	3,895
- Rest of the World	65	75	90	105	85
National expenditure on environmental protection	3,585	3,940	4,060	4,380	4,675
less Rest of the World financing	25	35	40	55	55
Uses of resident units and the Rest of the World	3,615	3,970	4,100	4,435	4,730

In principle, the table makes provision for a distinction between expenditure which is financed by central government and that which is financed by local government. Although information on the expenditure by different government sectors is available from the survey, the emphasis has been on ensuring that transfers between central and local government are not double-counted, and information on these flows has not been collected systematically.

7. Conclusions and recommendations

The study published by ECOTEC in 1993 highlighted problems with data availability for this type of analysis in the UK. Since then, more suitable data is more readily available from the annual reports and accounts of the organisations concerned. However, compilation of the accounts still requires a considerable degree of judgement and extensive research.

Although the figures given in this report are based on a prudent estimate of the extent of activity undertaken by the general government sector and may omit some integrated environmental expenditure that was indivisible from other activities, the time series was compiled in a consistent manner. This means that the nominal increase in expenditure is believed to be realistic and is unlikely to have been caused by inconsistencies in approach.

The central system for the classification of government expenditure in the UK, COFOG, is of limited use for this analysis at the moment. Ideally, COFOG should collect environmental protection expenditure by every department and not merely by DEFRA. Suitable improvements to the COFOG system could lead to significant advances in the development of a full environmental protection expenditure account for the UK.

However, updating the data given in the current study should be a relatively easy task, as long as expenditure programmes remain approximately similar to current ones. It will nevertheless be important to track changes in political priorities, as these changes translate into the adoption of new legislation, the creation of new government agencies and new patterns of environmental spending.

When carrying out the update, it should be possible to collect more information about the recipient of transfers to the private sector, and to track more carefully transfers between central and local government, but new research will be needed if the estimates of the allowance for the consumption of fixed capital are to be improved.

Integration of these results into the full account of environmental protection expenditure in the UK should be reasonably straightforward, but will require improved estimates of the activity of the manufacturing and other sectors and new research into the activities of the household and non-profit-making sectors.

Ultimately, effective interpretation of the expenditure data will need to take into account also the associated physical data (e.g. amounts of emissions or waste generated). This will in practice require more detail about the types of activity carried out by the relevant sectors.

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Annex 1 Departments and Agencies included in the survey

DETR	Department of the Environment, Transport, and the Regions. Information was collected for three groups: the Environmental Protection Group, the Countryside and Wildlife Group, and the Transport Group. The Department was reorganised in 2001, with Transport functions going to the Department of Transport, Local Government and the Regions (DTLR), and the Environment and Countryside Groups going to the Department for Environment, Food and Rural Affairs (DEFRA).
MAFF	Ministry of Agriculture, Food and Fisheries. The MAFF functions were transferred to DEFRA in 2001.
DTI	Department of Trade and Industry.
FCO	Foreign & Commonwealth Office.
DFID	Department for International Development.
NAW	National Assembly for Wales (includes expenditure on Countryside Council Wales).
EA	Environment Agency England and Wales.
Scotexec	Scottish Executive.
SEPA	Scottish Environment Protection Agency.
SNH	Scottish Natural Heritage.
DoENI	Department of Environment, Northern Ireland. Includes expenditure on Environment & Heritage Service.
DARDNI	Department of Agriculture and Rural Development, Northern Ireland.
Local government	Financial returns from local authorities in all four countries.

Annex 2

Net general government sector expenditure on environmental protection

£ million (unrounded figures)

Breakdown of main programmes	1996/97	1997/98	1998/99	1999/00	2000/01
1. Protection of ambient air and climate					
Energy Efficiency Best Practice	16	16	14	16	18
Energy Saving Trust	25	20	19	23	22
Home Energy Efficiency Scheme	75	75	75	75	122
Smoke control	0	4	5	4	3
Process Industries Regulation (PIR)	9	7	3	4	4
Cleaner Vehicles Programmes	1	1	2	4	15
Energy Efficiency overseas	2	3	4	4	3
Non-fossil fuel obligation	99	118	114	73	81
Integrated pollution control etc	4	5	6	7	4
Clean Air Act	4	4	8	2	5
Allocated departmental costs	9	8	6	8	8
Miscellaneous programme expenditure	1	1	1	2	2
Total protection of ambient air and climate	245	262	258	223	289
2. Waste water management					
Water Grants	7	5	4	5	4
British Waterways pollution control	4	4	4	4	4
Water quality monitoring	39	35	39	39	38
Waste water treatment (N Ireland)	28	36	24	25	28
Rural sewerage	22	25	23	24	35
Allocated departmental costs	4	3	3	3	3
Total waste water management	104	107	98	99	112
3. Waste management					
Waste monitoring	30	30	33	34	34
Waste collection and disposal	1,775	1,989	2,073	2,282	2,381
Allocated departmental costs	3	3	4	4	4
Other programme expenditure	10	3	1	1	5
Total waste management	1,819	2,026	2,110	2,321	2,424

Annex 2 continued

Main Programme net expenditure

	1996/97	1997/98	1998/99	1999/00	2000/01
4. Protection of soil and groundwater					
Contaminated land	14	14	13	13	16
Organic farming	1	1	1	6	8
Land Quality	1	1	2	3	5
Derelict land	103	95	87	87	73
International programmes	19	24	31	37	26
Miscellaneous programmes	14	14	13	16	16
Total protection of soil and groundwater	152	149	148	162	143
5. Noise and vibration abatement					
Programme and Departmental expenditure	2	3	2	3	3
6. Protection of biodiversity and landscape					
National and country parks	89	94	91	103	98
Water resource conservation	69	70	71	77	87
Fisheries conservation	1	3	2	4	4
Environmentally Sensitive Areas	25	31	27	35	35
Countryside conservation	37	36	43	56	67
Natural heritage	44	44	45	52	57
Forests conseration	43	50	53	70	76
International conservation	6	7	9	11	7
Other programme spend	48	64	64	71	77
Total protection of biodiversity and landscape	362	400	406	478	509
7. Protection against radiation					
Nuclear decommissioning (UKAEA)	116	142	151	142	187
Other programme and Departmental spending	11	16	12	13	14
Total protection against radiation	126	158	163	155	201

Annex 2 continued

Main Programme net expenditure

	199697	1997/98	1998/99	1999/00	2000/01
8. R & D for environmental protection					
Environmental Research and Monitoring	242	246	246	257	265
9. Other environmental protection activities					
International support	24	28	30	36	35
Freight grants	15	29	30	29	33
Other Departmental and Programme spend	21	22	26	28	29
Total other environmental protection activities	60	79	86	93	110
10. Education and administration					
Education	34	33	36	42	49
Administration	63	71	74	77	79
Total education and administration	97	104	110	120	127
Total government sector net environmental expenditure	3,211	3,534	3,628	4,911	4,183

Annex 3

The Classification of Environmental Protection Activities and expenditure (CEPA 2000)

1 PROTECTION OF AMBIENT AIR AND CLIMATE
1.1 Prevention of pollution through in-process modifications
1.2 Treatment of exhaust gases and ventilation air
1.3 Measurement, control, laboratories and the like
1.4 Other activities

2 WASTEWATER MANAGEMENT
2.1 Prevention of pollution through in-process modifications
2.2 Sewerage networks
2.3 Wastewater treatment
2.4 Treatment of cooling water
2.5 Measurement, control, laboratories and the like
2.6 Other activities

3 WASTE MANAGEMENT
3.1 Prevention of pollution through in-process modifications
3.2 Collection and transport
3.3 Treatment and disposal of hazardous waste
3.4 Treatment and disposal of non-hazardous waste
3.5 Measurement, control, laboratories and the like
3.6 Other activities

4 PROTECTION AND REMEDIATION OF SOIL, GROUNDWATER AND SURFACE WATER
4.1 Prevention of pollutant infiltration
4.2 Cleaning up of soil and water bodies
4.3 Protection of soil from erosion and other physical degradation
4.4 Prevention and remediation of soil salinity
4.5 Measurement, control, laboratories and the like
4.6 Other activities

5 NOISE AND VIBRATION ABATEMENT (excluding workplace protection)
5.1 Preventive in-process modifications at the source
5.2 Construction of anti-noise/vibration facilities
5.3 Measurement, control, laboratories and the like
5.4 Other activities

6 PROTECTION OF BIODIVERSITY AND LANDSCAPES
6.1 Protection and rehabilitation of species and habitats
6.2 Protection of natural and semi-natural landscapes
6.3 Measurement, control, laboratories and the like
6.4 Other activities

7 PROTECTION AGAINST RADIATION (excluding external safety)
7.1 Protection of ambient media
7.2 Transport and treatment of high-level radioactive waste
7.3 Measurement, control, laboratories and the like
7.4 Other activities

8 RESEARCH AND DEVELOPMENT
8.1 Protection of ambient air and climate
8.2 Protection of water
8.3 Waste
8.4 Protection of soil and groundwater
8.5 Abatement of noise and vibration
8.6 Protection of species and habitats
8.7 Protection against radiation
8.8 Other research on the environment

9 OTHER ENVIRONMENTAL PROTECTION ACTIVITIES
9.1 General environmental administration and management
9.2 Education, training and information
9.3 Acitiivities leading to indivisible expenditure
9.4 Activities not elsewhere classified

Summary of explanatory notes and definitions

1 PROTECTION OF AMBIENT AIR AND CLIMATE
Protection of ambient air and climate comprises measures and activities aimed at the reduction of emissions into the ambient air or ambient concentrations of air pollutants as well as measures and activities aimed at the control of emissions of greenhouse gases and gases that adversely affect the stratospheric ozone layer. Excluded are measures undertaken for cost saving reasons (e.g. energy saving).

1.1 *Prevention of pollution through in-process modifications*
Activities and measures aimed at the elimination or reduction of the generation of air pollutants through in-process modifications related to cleaner and more efficient production processes and other technologies (cleaner technologies) or the consumption or use of 'cleaner' (adapted) products.

1.2 *Treatment of exhaust gases and ventilation air*
Activities involving the installation, maintenance and operation of end-of-pipe equipment for the removal and reduction of emissions of particulate matter or other air-polluting substances either from the combustion of fuels or from processes: filters, dedusting equipment, catalytic converters, post-combustion and other techniques.

1.3 *Measurement, control, laboratories and the like*
Activities aimed at monitoring the concentrations of pollutants in exhaust gases, the quality of air, etc. Included are measurement services of exhaust gases from vehicles and heating systems and the monitoring related to ozone layer, greenhouse gases and climate change. Weather stations are excluded.

1.4 *Other activities*
All other activities and measures aimed at the protection of ambient air and climate. Includes regulation, administration, management, training, information and education activities specific to CEPA 1, where separable.

2 WASTEWATER MANAGEMENT
Wastewater management comprises activities and measures aimed at the prevention of pollution of surface water through the reduction of the release of wastewater into inland surface water and seawater. It includes the collection and treatment of wastewater including monitoring and regulation activities. Septic tanks are also included. Excluded are actions and activities aimed at the protection of groundwater

from pollutant infiltration and the cleaning up of water bodies after pollution (see CEPA 4). Wastewater is defined as water that is of no further immediate value for the purpose for which it was used or in the pursuit of which it was produced because of quality, quantity, or time of its occurrence.

2.1 *Prevention of pollution through in-process modifications*
Activities and measures aimed at reducing the generation of surface water pollutants and wastewater through in-process modifications related to cleaner and more efficient production processes and other technologies (cleaner technologies) or the consumption or use of 'cleaner' (adapted) products.

2.2 *Sewerage networks*
Activities aimed at the operation of sewerage networks, i.e. the collection and transport of wastewater from one or several users, as well as rainwater, by means of sewerage networks, collectors, tanks and other means of transport (sewage vehicles, etc.), including maintenance and repair. Sewerage networks are the systems of collectors, pipelines, conduits and pumps to evacuate any wastewater (rainwater, domestic and other wastewater) from the points of generation to either a sewage treatment plant or to a point where wastewater is discharged into surface water.

2.3 *Wastewater treatment*
Wastewater treatment designates any process to render wastewater fit to meet applicable environmental standards or other quality norms. Three broad types of treatment (mechanical, biological, and advanced treatment) are specified. Maintenance services of septic tanks (emptying etc.) and other products for septic tanks (biological activators, etc.) are included.

2.4 *Treatment of cooling water*
Processes which are used to treat cooling water to meet applicable environmental standards before releasing it into the environment.

2.5 *Measurement, control, laboratories and the like*
Activities aimed at monitoring and controlling the concentration of pollutants in wastewater and the quality of inland surface water and marine water at the place wastewater is discharged (analysis and measurement of pollutants, etc.).

2.6 *Other activities*
All other activities and measures aimed at wastewater management. Includes regulation, administration, management, training, information and education activities specific to CEPA 2, where separable.

3 WASTE MANAGEMENT
Waste management refers to activities and measures aimed at the prevention of the generation of waste and the reduction of its harmful effect on the environment. Includes the collection and treatment of waste, including monitoring and regulation activities. It also includes recycling and composting, the collection and treatment of low level radioactive waste, street cleaning and the collection of public litter.

Wastes are materials that are not prime products (that is, products made for the market) for which the generator has no further use for own purposes of production, transformation, or consumption, and which he wants to dispose of. Wastes may be generated during the extraction of raw materials, during the processing of raw materials to intermediate and final products, during the consumption of final products, and during any other human activity. Residuals recycled or reused at the place of

generation are excluded. Also excluded are waste materials that are directly discharged into ambient water or air.

Hazardous waste is waste that, due to its toxic, infectious, radioactive, flammable or other character defined by the legislator, poses a substantial actual or potential hazard to human health or living organisms. For the purposes of this definition, "hazardous waste" comprises for each country all those materials and products which are considered to be hazardous in accordance with that country's practices. Low level radioactive waste is included (other radioactive waste is included in CEPA 7).

Treatment of waste refers to any process designed to change the physical, chemical, or biological character or composition of any waste to neutralise it, render it non-hazardous, safer for transport, amenable for recovery or storage, or to reduce it in volume. A particular waste may undergo more than one treatment process.

Disposal of waste is the final deposition of waste on or underground in a controlled or uncontrolled way, according to sanitary, environmental or security requirements.

3.1 *Prevention of pollution through in-process modifications*
Activities and measures aimed at eliminating or reducing the generation of solid waste through in-process modifications related to cleaner and more efficient production processes and other technologies (cleaner technologies) or the consumption or use of ‘cleaner’ (adapted) products.

3.2 *Collection and transport*
The collection of waste, either by municipal services or similar institutions or by public or private corporations, and their transport to the place of treatment or disposal. It includes the separate collection and transport of waste fractions so as to facilitate recycling and the collection and transport of hazardous waste. Street cleaning is included for the part referring to public litter and collection of garbage from the streets. Excluded are winter services.

3.3 *Treatment and disposal of hazardous waste*
Treatment comprises the processes of physical/chemical, thermal or biological treatment, conditioning of wastes, and any other relevant treatment method. Disposal comprises landfill, containment, underground disposal and any other relevant disposal method.

3.4 *Treatment and disposal of non-hazardous waste*
Treatment comprises the processes of physical/chemical or biological treatment, incineration of waste and any other treatment method (composting, recycling, etc.). Incineration is the thermal treatment of waste during which chemically fixed energy of combusted matters is transformed into thermal energy. Disposal comprises landfill, dumping at sea, and any other disposal method.

3.5 *Measurement, control, laboratories and the like*
Activities and measures aimed at controlling and measuring the generation and storage of waste, their toxicity, etc.

3.6 *Other activities*
All other activities and measures aimed at waste management. It includes administration, management, training, information and education activities specific to the class, where separable.

4 PROTECTION AND REMEDIATION OF SOIL, GROUNDWATER AND SURFACE WATER

Measures and activities aimed at the prevention of pollutant infiltration, cleaning up of soils and water bodies and the protection of soil from erosion and other physical degradation. Monitoring and control of soil and groundwater pollution is included.

4.1 *Prevention of pollutant infiltration*

Activities and measures aimed at the reduction or elimination of polluting substances that may be applied to soil, percolate into groundwater or run-off to surface water.

4.2 *Cleaning up of soil and water bodies*

Processes to reduce the quantity of polluting materials in soil and water bodies either in situ or in appropriate installations. It includes soil decontamination at former industrial sites, landfills and other black spots, dredging of pollutants from water bodies (rivers, lakes, estuaries, etc.), the decontamination and cleaning up of surface water following accidental pollution, as well as the cleaning up of oil spills on land, inland surface waters and seas. Excludes civil protection services.

4.3 *Protection of soil from erosion and other physical degradation*

Activities and measures aimed at the protection of soil from erosion and other physical degradation (compacting, encrusting, etc.). They may consist of programmes intended to restore the protective vegetal cover of soils, construction of anti-erosion walls, etc. Measures may also consist in subsidising agricultural and grazing practices less harmful for soils and water bodies. Excluded are activities carried out for economic reasons (e.g. agricultural production or protection of settlements against natural hazards such as landslides).

4.4 *Prevention and remediation of soil salinity*

Activities and measures aimed at the prevention and remediation of soil salinity. Excluded are measures that respond to economic purposes (agricultural production, reclamation of land from the sea, etc.).

4.5 *Measurement, control, laboratories and the like*

All activities and measures aimed at controlling and measuring the quality and pollution of soils, groundwater and surface water, measuring the extent of soil erosion and salinisation etc. Includes the operation of monitoring systems, inventories of "black spots", maps and databases of groundwater and surface water quality, of soil pollution, erosion and salinity, etc.

4.6 *Other activities*

All other activities and measures aimed at the protection and remediation of soil, groundwater and surface water. It includes administration, management, training, information and education activities specific to the class, where separable.

5 NOISE AND VIBRATION ABATEMENT (excluding workplace protection)

Measures and activities aimed at the control, reduction and abatement of industrial and transport noise and vibration. Activities for the abatement of neighbourhood noise (soundproofing of dancing halls, etc.) as well as activities for the abatement of noise in places frequented by the public (swimming pools, etc.), in schools, etc., are included. Excluded is the abatement of noise and vibration for purposes of protection at the workplace.

5.1 *Preventive in-process modifications at the source*

Activities and measures aimed at the reduction of noise and vibration from industrial equipment, vehicle motors, aircraft and ships engines, exhaust systems and brakes,

or noise level due to tyre/road or wheel/rail surface contact. Includes the adaptation of equipment, vehicles (buses, trucks, or train and power units in the case of rail transport, aircraft and ships) in order to make them less noisy: soundproofing of hoods, brakes, exhaust systems, etc. Includes also plant modifications, specially conceived foundations to absorb vibrations, extra cost for regrouping of buildings and/or of facilities in the interest of noise abatement, special facilities in building construction or reconstruction, equipment and machines conceived or constructed for low noise or vibrations, low noise level flares and burners, etc. Other preventive activities consist of noise abatement through the modification of surfaces. As noise emissions from motors, engines, exhaust systems and brakes are lowered, those from other sources becomes more important and in particular noise that originates from the contact between tyres and road surfaces. Activities consist of substituting concrete by silent asphalt, multi-layered surfaces, etc.

5.2 *Construction of anti noise/vibration facilities*
Activities and measures aimed at the installation and management of anti-noise facilities. These may be screens, embankments or hedges. They may consist of covering sections of urban motor ways or railroads. As concerns industrial and vicinity noise they also consist of add-on facilities, covering and soundproofing of machines and piping, fuel regulation systems and sound absorption, noise screens, barriers, soundproofing of buildings, noise protective windows, etc., in order to limit noise perception.

5.3 *Measurement, control, laboratories and the like*
Activities and measures aimed at controlling the level of noise and vibration: installation and operation of equipment in urban areas, observation networks, etc.

5.4 *Other activities*
All other activities and measures aimed at noise and vibration abatement. It includes administration, management, training, information and education activities specific to the class, where separable. It also includes, when separable, traffic management with noise abatement purposes (for example, lowering of speed limits, improvement of traffic flows), introduction of time and geographical restrictions for noisy vehicles, traffic detours at a distance from residential areas, creation of pedestrian areas, creation of construction-free buffer zones, restructuring of modal split (improvement of public transportation, use of bicycles).

This class covers a potentially large set of administrative measures which raise serious identification problems given their incorporation in integrated programmes of traffic control and urban planning and the difficulty of separating that part of measures and expenditure that, in these programmes, concern noise and vibration abatement from expenditure related to air pollution control, improvement of the living environment or traffic security.

In addition to regulation, other measures may consist of: financial incentives for the production and use of low-noise vehicles, labelling or information programmes for consumers so as to encourage the use of low-noise vehicles and the adoption of quiet driving behaviour.

6 PROTECTION OF BIODIVERSITY AND LANDSCAPES

Measures and activities aimed at the protection and rehabilitation of fauna and flora species, ecosystems and habitats as well as the protection and rehabilitation of natural and semi-natural landscapes. The separation between ‘biodiversity’ and ‘landscape’ protection may not always be practical.

Excluded is the protection and rehabilitation of historic monuments or predominantly built-up landscapes, the control of weed for agricultural purposes and the protection of forests against forests fire when this predominantly responds to economic reasons. The establishment and maintenance of green spaces along roads and recreational structures (e.g. golf courses, other sports facilities) are also excluded.

Actions and expenditure related to urban parks and gardens would not normally be included but may be related in some cases to biodiversity – in such cases the activities and expenditure should be included.

6.1 *Protection and rehabilitation of species and habitats*
Activities and measures aimed at the conservation, reintroduction or recovery of fauna and flora species, as well as the restoration, rehabilitation and reshaping of damaged habitats for the purpose of strengthening their natural functions. Includes conserving the genetic heritage, re-colonising destroyed ecosystems, placing bans on exploitation, trade, etc. of specific animal and plant species, for protection purposes. Also includes censuses, inventories, databases, creation of gene reserves or banks, improvement of linear infrastructures (e.g., underground passages or bridges for animals at highways or railways, etc.), feeding of the young, management of special natural reserves (botany conservation areas, etc.). Activities may also include the control of fauna and flora to maintain natural balances, including re-introduction of predator species and control of exotic fauna and flora that pose a threat to native fauna, flora and habitats.

Main activities are the management and development of protected areas, whatever the denomination they receive, i.e. areas protected from any economic exploitation or in which the latter is subject to restrictive regulations whose explicit goal is the conservation and protection of habitats. Also included are activities for the restoration of water bodies as aquatic habitats: artificial oxygenation and lime-neutralisation actions. When they have a clear protection of biodiversity purpose, measures and activities related to urban parks and gardens are to be included. Purchase of land for protection of species and habitats purpose is included.

6.2 *Protection of natural and semi-natural landscapes*
Activities and measures aimed at the protection of natural and semi-natural landscapes to maintain and increase their aesthetic value and their role in biodiversity preservation. Included is the preservation of legally protected natural objects, expenditures incurred for the rehabilitation of abandoned mining and quarrying sites, renaturalisation of river banks, burying of electric lines, maintenance of landscapes that are the result of traditional agricultural practices threatened by prevailing economic conditions, etc. For biodiversity and landscape protection related to agriculture, the identification of specific state aid programmes to farmers may be the only data source available. Protection of forests against forest fires for landscape protection purpose is included.

Excluded are measures taken in order to protect historic monuments, measures to increase aesthetic values for economic purposes (e.g., re-landscaping to increase the value of real estates) as well as protection of predominantly built-up landscapes.

6.3 *Measurement, control, laboratories and the like*
Measurement, monitoring, analysis activities which are not classified under the preceding items. In principle, inventories of fauna and flora are not covered since they are classified under protection of species.

6.4 *Other activities*
All other activities and measures aimed at the protection of biodiversity and landscape. It includes administration, training, information and education activities specific to the domain, where separable.

7 PROTECTION AGAINST RADIATION (excluding external safety)
Activities and measures aimed at the reduction or elimination of the negative consequences of radiation emitted from any source. Included is the handling, transportation and treatment of high level radioactive waste, i.e. waste that, because of its high radionuclide content, requires shielding during normal handling and transportation. Excluded are activities and measures related to the prevention of technological hazards (e.g. external safety of nuclear power plants), as well as protection measures taken at workplaces.

7.1 *Protection of ambient media*
Protection of ambient media groups covers activities and measures undertaken in order to protect ambient media from radiation. It may consist of protecting measures such as screening, creation of buffer zones, etc.

7.2 *Transport and treatment of high-level radioactive waste*
Any process designed for the transport, conditioning, containment or underground disposal of high level radioactive waste. Collection and transport of high level radioactive waste consists of the collection of high level radioactive waste, generally by specialised firms and their transport to the place of treatment, conditioning storage and disposal. Conditioning of high level radioactive waste consists of activities that transform high level radioactive waste into a proper and fit condition for transport and/or storage and/or disposal. Conditioning may occur as part of ISIC/NACE 23 (processing of nuclear fuels) activities.

Containment of high level radioactive waste designates the retention of radioactive waste in such a way that it is effectively prevented from dispersing into the environment, or is released only at an acceptable level. Containment may occur in specially built containment spaces.

Underground disposal of high level radioactive waste is the temporary storage or final disposal of high level radioactive waste in underground sites that meet specific geological and technical criteria.

7.3 *Measurement, control, laboratories and the like*
Activities aimed at measuring, controlling and monitoring ambient radioactivity and radioactivity due to high level radioactive waste by means of specific equipment, instruments and installations.

7.4 *Other activities*
All other activities and measures aimed at the protection of ambient media against radiation and transport and treatment of high level radioactive waste. It includes administration, training, information and education activities specific to the domain, where separable.

8 RESEARCH AND DEVELOPMENT (R&D)
Creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this knowledge to devise new applications in the field of environmental protection. The class regroups all R&D activities and expenditure oriented towards environmental protection: identification and analysis of sources of pollution, mechanisms of dispersion of pollutants in the environment as well as their

effects on human beings, the species and the biosphere. This heading covers R&D for the prevention and elimination of all forms of pollution, as well as R&D oriented towards equipment and instruments of pollution measurement and analysis. When separable all R&D activities even when referring to a specific class have to be classified under this environmental issue. Excluded are R&D activities related to the management of natural resources.

9 OTHER ENVIRONMENTAL PROTECTION ACTIVITIES

All environmental protection activities which take the form of general environmental administration and management activities or training or teaching activities specifically oriented towards environmental protection or which consist of public information, when they are not classified elsewhere in CEPA. It also includes activities leading to indivisible expenditure, as well as activities not elsewhere classified.

9.1 *General environmental administration and management*

Any identifiable activity that is directed at the general support of decisions taken in the context of environmental protection activities. Where possible such activities should be allocated to other classes.

9.2 *Education, training and information*

Activities that aim at providing general environmental education or training and disseminating environmental information. Included are high school programmes, university degrees or special courses specifically aimed at training for environmental protection. Activities such as the production of environmental reports, environmental communication, etc. are also included.

9.3 *Activities leading to indivisible expenditure*

Environmental protection activities that lead to indivisible expenditure, i.e. which cannot be allocated to any other CEPA class. International financial aid may be a case in point as it may be difficult for the donor countries to attribute international aid to individual classes.

9.4 *Activities not elsewhere classified*

This category groups together all these environmental protection activities that cannot be classified under other positions of the classification.

Annex 4 **Detailed tables** (unrounded estimates)

General government expenditure on environmental protection, 1996/97

£ million

Environmental activity	Staff costs	Other running costs	Current grants and subsidies	Gross current costs	Capital payments	Capital grants and subsidies	Gross capital costs	Current income	Capital receipts	International grant income	Gross income	Net expenditure
1. Protection of ambient air and climate	25	51	102	179	5	77	82	-14	0	0	-15	246
2. Waste water management	54	111	0	165	7	35	43	-103	0	0	-103	104
3. Waste management	136	1,971	1	2,107	79	0	79	-324	-43	0	-367	1,819
4. Protection of soil and groundwater	6	10	0	16	117	19	136	0	0	0	0	152
5. Noise and vibration abatement	0	1	0	1	0	1	1	0	0	0	0	2
6. Protection of biodiversity and landscape	103	201	63	367	21	32	53	-28	-2	-27	-57	362
7. Protection against radiation	6	9	0	14	0	116	116	-4	0	0	-4	126
8. R & D for environmental protection	0	240	55	295	11	5	16	-69	0	0	-69	242
9. Other environmental protection activities	0	7	30	37	7	18	24	-1	-1	0	-2	60
10. Education and Administration	52	28	17	98	0	0	0	0	0	0	0	98
Total environmental expenditure	381	2,629	268	3,278	247	302	550	-544	-46	-27	-617	3,211

General government expenditure on environmental protection, 1997/98

£ million

Environmental activity	Staff costs	Other running costs	Current grants and subsidies	Gross current costs	Capital payments	Capital grants and subsidies	Gross capital costs	Current income	Capital receipts	International grant income	Gross income	Net expenditure
1. Protection of ambient air and climate	26	46	122	194	9	77	86	-17	0	0	-17	262
2. Waste water management	54	101	0	156	5	41	46	-94	0	0	-94	107
3. Waste management	142	2,175	1	2,317	78	0	78	-354	-15	0	-370	2,026
4. Protection of soil and groundwater	5	10	0	16	108	25	133	0	0	0	0	149
5. Noise and vibration abatement	1	1	0	2	0	1	1	0	0	0	0	3
6. Protection of biodiversity and landscape	97	233	70	399	28	30	58	-23	-1	-33	-57	400
7. Protection against radiation	7	12	0	19	2	142	143	-5	0	0	-5	158
8. R & D for environmental protection	0	248	47	295	12	4	16	-64	0	0	-64	246
9. Other environmental protection activities	2	8	42	52	4	24	28	-1	-1	0	-2	79
10. Education and Administration	61	25	18	104	0	0	0	0	0	0	0	104
Total environmental expenditure	395	2,859	300	3,554	245	344	589	-558	-18	-33	-609	3,534

General government expenditure on environmental protection, 1998/99

£ million

Environmental activity	Staff costs	Other running costs	Current grants and subsidies	Gross current costs	Capital payments	Capital grants and subsidies	Gross capital costs	Current income	Capital receipts	International grant income	Gross income	Net expenditure
1. Protection of ambient air and climate	26	44	118	188	14	78	92	-21	0	0	-21	258
2. Waste water management	58	106	0	164	5	29	34	-100	0	0	-100	98
3. Waste management	164	2,322	1	2,487	57	0	57	-407	-27	0	-434	2,110
4. Protection of soil and groundwater	6	11	0	17	100	32	132	0	0	-1	-1	148
5. Noise and vibration abatement	0	1	0	1	0	1	1	0	0	0	0	2
6. Protection of biodiversity and landscape	100	241	78	418	22	33	55	-25	-2	-40	-67	406
7. Protection against radiation	7	11	0	18	0	151	151	-6	0	0	-6	163
8. R & D for environmental protection	0	237	58	295	8	4	11	-60	0	0	-60	246
9. Other environmental protection activities	3	11	43	57	5	26	31	-1	-1	0	-2	86
10. Education and Administration	65	26	19	110	0	0	0	0	0	0	0	110
Total environmental expenditure	429	3,009	318	3,756	210	354	564	-621	-31	-40	-692	3,628

General government expenditure on environmental protection, 1999/00

£ million

Environmental activity	Staff costs	Other running costs	Current grants and subsidies	Gross current costs	Capital payments	Capital grants and subsidies	Gross capital costs	Current income	Capital receipts	International grant income	Gross income	Net expenditure
1. Protection of ambient air and climate	31	52	79	162	7	79	85	-25	0	0	-25	223
2. Waste water management	61	104	0	165	7	29	36	-102	0	0	-102	99
3. Waste management	176	2,528	2	2,706	60	0	60	-440	-5	0	-445	2,321
4. Protection of soil and groundwater	7	19	0	26	100	43	142	0	0	-6	-6	162
5. Noise and vibration abatement	1	1	0	2	0	1	1	0	0	0	0	3
6. Protection of biodiversity and landscape	137	270	97	504	29	25	54	-28	-3	-49	-80	478
7. Protection against radiation	8	11	0	19	0	142	142	-6	0	0	-6	155
8. R & D for environmental protection	0	244	61	305	14	4	18	-64	-1	0	-66	257
9. Other environmental protection activities	3	15	44	62	4	29	33	-2	-1	0	-2	93
10. Education and Administration	68	32	20	120	0	0	0	0	0	0	0	120
Total environmental expenditure	492	3,277	303	4,071	220	352	572	-668	-9	-55	-733	3,911

General government expenditure on environmental protection, 2000/01

£ million

Environmental activity	Staff costs	Other running costs	Current grants and subsidies	Gross current costs	Capital payments	Capital grants and subsidies	Gross capital costs	Current income	Capital receipts	International grant income	Gross income	Net expenditure
1. Protection of ambient air and climate	37	55	85	178	9	137	146	-35	0	0	-35	288
2. Waste water management	62	88	0	150	7	34	41	-79	0	0	-79	112
3. Waste management	254	2,623	2	2,880	50	0	50	-498	-8	0	-506	2,424
4. Protection of soil and groundwater	7	22	0	29	89	31	120	0	0	-5	-6	143
5. Noise and vibration abatement	1	1	0	2	0	1	1	0	0	0	0	3
6. Protection of biodiversity and landscape	138	297	100	536	26	27	53	-31	0	-49	-80	509
7. Protection against radiation	8	13	0	21	0	187	187	-7	0	0	-7	201
8. R & D for environmental protection	0	234	76	310	15	6	21	-66	0	0	-66	265
9. Other environmental protection activities	3	26	38	67	4	42	45	-2	0	0	-2	110
10. Education and Administration	70	38	20	128	0	0	0	0	0	0	0	128
Total environmental expenditure	581	3,398	321	4,301	199	464	663	-718	-9	-54	-781	4,183