

Industrial analysis of environmental taxes

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This article provides a breakdown of environmental taxes paid by UK businesses and households in 2001. The article contains a detailed explanation of the different types of environmental tax and the methodology used in compiling the breakdown. The environmental taxes are broken down over four categories: taxes on energy, taxes on transport, tax on pollution and tax on resources. The breakdown of environmental taxes is based on information from the Environmental Accounts energy datasets, the Office for National Statistics (ONS) publication *Travel Trends* and unpublished data from ONS Input-Output branch.

Introduction

The Government is committed to promoting sustainable development, which is vital to ensure a better quality of life for everyone, today and for generations to come. Sustainable development is to be achieved by strong and stable economic growth and social progress balanced against action to protect and improve the environment. The Government believes that economic instruments, alongside other policy levers, have an important role to play in securing this objective. The Government's environmental tax strategy aims to increase incentives to reduce environmental damage.

The Treasury's approach to environmental taxation was set out in the *Statement of Intent on Environmental Taxation* in 1997 and developed further in *Tax and the Environment: using economic instruments*, published alongside the 2002 Pre-Budget Report. The latest steps in the Government's strategy are described in Chapter 7 of the Budget 2004 report.

An environmental tax is defined as a tax whose base is a physical unit (or a proxy for it) that has a proven negative impact on the environment. By convention, in addition to pollution related taxes, all energy and transport taxes are classified as environmental taxes.

Many of the environmental taxes are described by the government as 'revenue neutral' since the impact of new taxes is offset by reductions elsewhere. For example, revenues can be recycled to support specific environmental objectives such as investment in cleaner technologies or to reward better performers.

The Spring 2004 edition of the Environmental Accounts shows that total environmental taxes in 2003 amounted to £33.7 billion compared with £32.9 billion in the previous year, an increase of 2.5 per cent. The industry analysis of environmental taxes is primarily based on information compiled for the annual Input-Output Supply-Use tables. At the time of compiling this report the latest available Input-Output Supply-Use tables covered periods up to and including 2001:

- in 2001, total revenue from environmental taxes amounted to £32.0 billion, of which 69 per cent was from duty on hydrocarbon oils
- environmental taxes accounted for 8.6 per cent of total revenue and social contributions collected and 3.2 per cent of GDP in 2001
- UK households paid just over £17.2 billion on 2001, approximately 54 per cent of total environmental taxes.

Environmental taxes, 1994 to 2003

The Environmental Accounts currently identify eight environmental taxes which, for the purposes of this analysis, are aggregated into four main tax categories:

- energy products
- transport
- pollution
- resources

Figure 1 shows that the largest single source of environmental tax revenue were duties on energy products, which accounted for approximately 80 per cent of all environmental tax revenue. The main energy tax was duty on hydrocarbon oils, which raised £22.5 billion in 2003. The next highest revenue sources were the transport taxes such as Vehicle Excise Duty (VED) and Air Passenger Duty (APD). Taxes on pollution and resource use accounted for just 3 per cent of all environmental tax revenue in 2003.

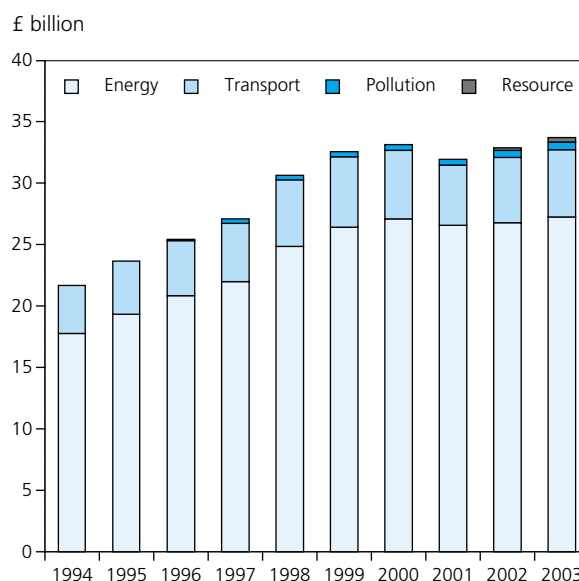
Table 1 shows that between 1994 and 2003 environmental tax revenue increased from £21.7 billion to £33.7 billion, a rise of 56 per cent. Within that, taxes on energy products increased 53 per cent from £17.8 billion in 1994 to £27.2 billion in 2002. Transport taxes rose 41 per cent mainly driven by the increased revenue from APD, which rose from £33 million to just under £0.8 billion over the period. Three new environmental taxes were introduced during the period; the Landfill Tax in 1996, the Climate Change Levy in 2001 and the Aggregates Levy in 2002.

Table 1
Government revenues from environmental taxes, 1994–2003

	£ million										
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
Energy											
Duty on hydrocarbon oil	13,984	15,360	16,895	18,357	20,996	22,391	23,041	22,046	22,070	22,476	
VAT on duty	2,447	2,688	2,957	3,212	3,674	3,918	4,032	3,858	3,862	3,933	
Fossil fuel levy	1,355	1,306	978	418	181	104	56	86	32	0	
Climate change levy	-	-	-	-	-	-	-	585	825	828	
Transport											
Vehicle excise duty	3,848	3,954	4,149	4,334	4,631	4,873	4,606	4,061	4,519	4,724	
Air passenger duty	33	339	353	442	823	884	940	824	814	781	
Pollution											
Landfill tax	-	-	113	361	333	430	461	502	541	614	
Resources											
Aggregates levy	-	-	-	-	-	-	-	-	213	347	
Total	21,667	23,647	25,445	27,124	30,638	32,600	33,136	31,962	32,876	33,703	

Source: ONS, Environmental Accounts.

Figure 1
Environmental taxes by tax type



Source: ONS, Environmental Accounts.

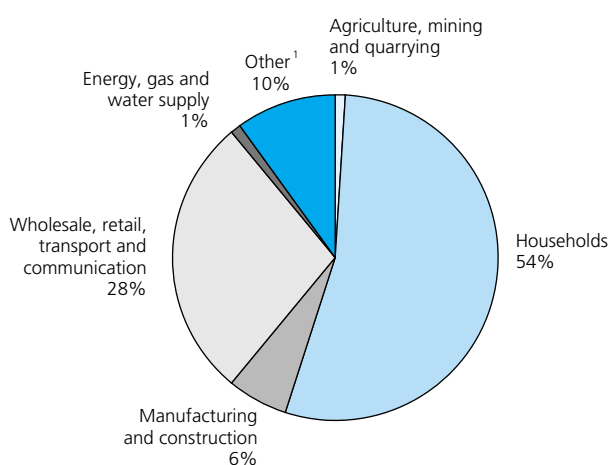
Industry analysis: 2001

New research by the Environmental Accounts team at ONS has resulted in the production of an industry analysis of environmental tax payments. The 13-industry analysis covers the main manufacturing and services industries as well as the household sector and the rest of the world. The breakdown is consistent with that used to present UK energy consumption and the generation of atmospheric emissions albeit with the

addition of the rest of the world sector to cover tax payments made by non-residents.

As can be seen from Figure 2, UK households contributed the most towards environmental tax revenue, paying just over half of all environmental taxes. Table 2 shows that in 2001, UK households are estimated to have paid over £17.2 billion compared to the next highest source, the transport and communication industries, who paid £6.6 billion. The high level of revenue payments by UK households reflects the fact that most of the environmental tax revenue comes from duty on hydrocarbon oils such as petrol and diesel.

Figure 2
Industry breakdown of environmental tax payments in 2001



Source: ONS, Environmental Accounts.

¹ Other includes rest of the world, financial intermediation, public administration, education, health and social work.

Table 2
Environmental taxes breakdown by 13 industries 2001

£ million

	Energy	Transport	Pollution	Resources	Total
Agriculture	251	63	2	0	316
Mining and quarrying	67	9	2	0	78
Manufacturing	1,386	112	90	0	1,589
Energy, gas and water supply	226	4	11	0	241
Construction	233	117	4	0	354
Wholesale and retail trade	1,925	355	37	0	2,316
Transport and communication	6,391	210	20	0	6,621
Financial intermediation	1,381	280	51	0	1,711
Public administration	176	2	190	0	368
Education, health and social work	255	10	58	0	324
Other services	399	44	35	0	419
Households	13,772	3,455	0	0	17,228
Rest of the World	172	224	0	0	396
Total	26,634	4,885	502	0	31,962

Source: ONS, Environmental Accounts.

Methodology for allocating environmental taxes

The methodology used to allocate the environmental taxes is primarily based on unpublished tax information contained in the *UK Input-Output Analyses* that in turn uses information from the annual Input-Output Supply-Use tables. Input-Output Supply-Use tables break the economy down to display transactions of all goods and services between industries and final consumers in the UK for one year. The main data sources used for the Input-Output Supply-Use tables are the ONS Annual Business Inquiry (ABI) and the ONS Purchases Inquiry (PI). Information on product use is generally used as a proxy for allocating the environmental tax payments. The Input-Output Supply-Use dataset is supplemented with information contained in the Environmental Accounts on energy consumption thus ensuring consistency between the energy accounts and the industry breakdown of environmental taxes.

Taxes on energy: sources and methods

Taxes on energy comprise the revenue collected from the Climate Change Levy, the Fossil Fuel Levy (FFL), taxes on hydrocarbon oils and VAT on duty.

The Climate Change Levy was introduced on 1 April 2001. The purpose of the levy was to encourage businesses to use energy more efficiently, which should in turn lead to the reduction of carbon dioxide emissions. The levy is imposed at the time of supply of taxable commodity, that is, electricity, coal, gas, and so on to industrial and commercial consumers rather than on the consumption made by end-users. It does not apply to taxable commodities used by consumers or charities for non-business use.

The levy is partly offset through a facility for business to get an average 0.3 per cent reduction in their employer National Insurance Contributions (NICs). Additionally, some of the energy intensive sectors can enter negotiated Climate Change Agreements in which they can get up to 80 per cent discounts on CCL if they meet the targets set in the agreement.

Rates of CCL as at April 2001 are listed below:

Taxable commodity supplied	Rate
Electricity	£0.0043 per kilowatt hour
Gas supplied by gas utilities	£0.0015 per kilowatt hour
Any petroleum gas or other gaseous hydrocarbon supplied in a liquid state	£0.0096 per kilogram
Any other taxable commodities	£0.0117 per kilogram

Source: HM Customs and Excise

The Fossil Fuel Levy is imposed on sales of electricity generated from fossil fuels. The purpose of the levy is to encourage electricity generation from renewable energy sources. The levy rate has been set to zero since April 2002 in England and Wales and since November 2002 in Scotland. The FFL did not extend to Northern Ireland.

The table below shows FFL's rate in England and Wales since April 1990:

Dates	Rates (per cent)
1 Apr 1990 to 31 Mar 1991	10.60
1 Apr 1991 to 31 Mar 1993	11.00
1 Apr 1993 to 30 Sep 1996	10.00
31 Oct 1996 to 31 Mar 1997	3.70
1 Apr 1997 31 Mar 1998	2.20
1 Apr 1998 to 31 Dec 1998	0.90
1 Jan 1999 to 30 Sep 1999	0.70
1 Oct 1999 to 31 Mar 2002	0.30

Source: Office of the Gas and Electricity Markets (Ofgem)

Duty on hydrocarbon oils includes various types of duty on different energy products such as ultra low sulphur diesel and ultra low sulphur petrol, fuel oils and gas oils. The most significant being the duty on ultra low sulphur petrol (ULSP) and ultra low sulphur diesel (ULSD).

The duties rate in 2001 on ULSP and ULSD:

Fuel	Rate (per litre)
ULSP	45.82 pence
ULSD	45.82 pence

Source: HM Customs and Excise

VAT on duty is calculated as a fixed proportion (in most cases 17.5 per cent) of the duty paid on hydrocarbon oils. In practice much of this VAT will be reclaimed by business, but it could be argued that the total would be paid eventually when the final product or service is purchased. For this reason VAT on duty has been included as an environmental tax. The inclusion of VAT on duty as an environmental tax is currently under review by ONS.

The breakdown of energy taxes is consistent with the Environmental Accounts energy consumption data. The distribution of energy tax payments is based on the Environmental Accounts energy consumption data for 93 economic sectors broken down by fuel type. Energy consumed by households is exempt from the climate change levy and is excluded.

Taxes on energy products amounted to £26.6 billion in 2001, approximately 83 per cent of the total revenue from environmental taxes. The majority of the tax revenue from energy products is from duty on hydrocarbon oils, which includes ultra low sulphur diesel and ultra low sulphur petrol. Taxes on hydrocarbon oils amount to £22.0 billion, approximately 69 per cent of the total revenue from energy products.

In 2001 households were the largest payers of energy taxes, paying nearly £14 billion, 52 per cent of total revenue collected from energy products. Taxes paid by household were mainly from duty on hydrocarbon oils and stem from the extensive use of private vehicles. The transport and communications industries were the second largest payer of taxes on energy products. Once again, most of the tax payments came from the duty on hydrocarbon oils. Wholesale and retail trade industries paid 7 per cent on taxes on energy products, about £2 billion.

Taxes on transport: sources and methods

Taxes on transport include the revenue collected from APD and VED. The breakdown of transport taxes is based on the information obtained from the Supply-Use tables and from the International Passenger Survey (IPS).

Air passenger duty is levied on the carriage, from UK airports, of chargeable passengers on chargeable aircraft. The allocation of APD uses a combination of information from the Supply-Use tables and information on non-residents' visits to the UK and UK residents' visits abroad, collected through the IPS and published in *Travel Trends 2001*. APD is allocated to three main categories of travel; UK residents travel (business), UK residents travel (non-business) and non-residents visiting the UK. The duty paid on business travel is allocated using the Supply-Use information while duty collected on non-business travel and non-resident travel are allocated using the IPS dataset.

The rates of APD since 1 April 2001 are listed below:

Destination	Standard rate	Reduced rate
EEA destinations ¹	£10 per person	£5 per person
Other destinations	£40 per person	£20 per person

¹ European Economic Area (EEA) destinations, certain dependent territories of EU member states, all EU applicant countries and Switzerland.

Source: HM Customs and Excise

The rates of APD that apply to connecting flights (varies between destinations):

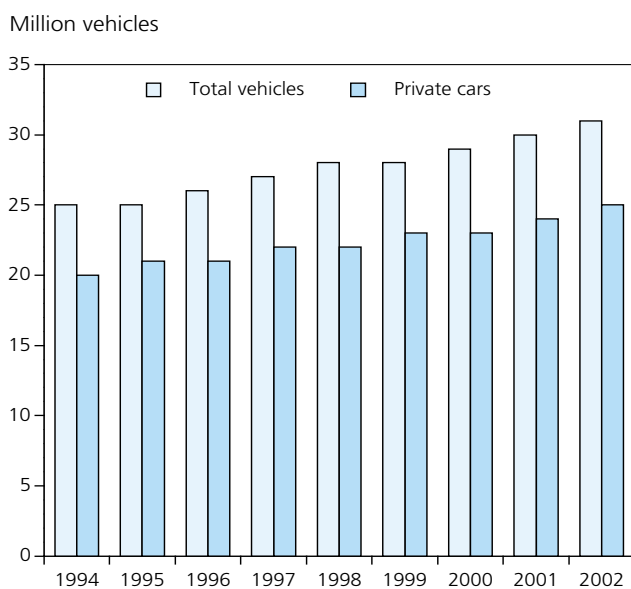
Flight	Rate
Domestic to Domestic	£5/£10
International to Domestic	£0
Domestic to International	£5-£40
International to International	£0

Source: HM Customs and Excise

Vehicle Excise Duty is the duty paid on vehicles by the vehicles owner or keeper. The allocation of VED is separated into VED paid by households and that paid by businesses. The distribution of VED payments is based on information collected through the ABI and the PI.

From 1 March 2001, any cars registered or licensed on or after this date qualified for the graduated Vehicle Excise Duty (GVED). This is the new version of VED, where the duty rate is based on the level of carbon dioxide emissions produced by the vehicle.

Figure 3
Motor vehicles licenses



Source: Department for Transport, Transport Statistics

The aim of the GVED is to encourage people to buy more environmentally-friendly vehicles in order to reduce the level of pollution generated by vehicles.

The rate of GVED of cars as at March 2001 are listed below:

Vehicle registered on or after March 2001	Diesel car	Petrol car	Alternative fuel car	
Bands	CO ₂ emission (g/km)	12 months rate	12 months rate	12 months rate
AAA	Up to 100	£75	£65	£55
AA	101 to 120	£85	£75	£65
A	121 to 150	£115	£105	£95
B	151 to 165	£135	£125	£115
C	166 to 185	£155	£145	£135
D	Over 185	£165	£160	£155

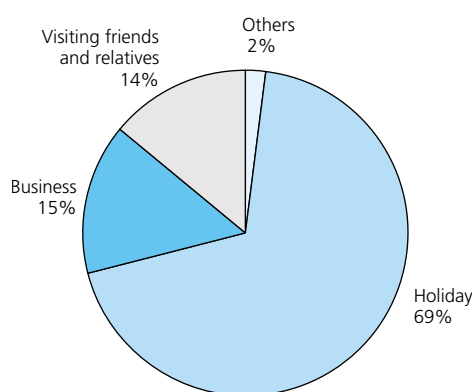
Source: Driver and Vehicle Licensing Agency (DVLA)

In 2001 taxes on transport amounted to £4.9 billion, 83 per cent of which was collected from VED and 17 per cent from APD. Figure 3 shows that in 2001, there were over 30 million vehicles licensed in the UK, of which over 80 per cent were privately owned cars.

UK households were the highest payers of transport taxes. UK households paid £3 billion, 71 per cent of all transport taxes, mainly in the form of VED. UK households were also the primary source of APD. Figure 4 shows that in 2001, 43 million UK residents travelled abroad, of which only 6 million were for business purposes.

Approximately 16 million non-residents visited the UK by air in 2001 generating £0.2 billion in APD, 5 per cent of the total revenue collected from taxes on transport.

Figure 4
UK residents' visits abroad by purpose, 2001



Source: ONS, Travel Trends 2001

Taxes on pollution: sources and methods

Taxes on pollution comprise the revenue collected from Landfill Tax.

The Landfill Tax applies to most types of waste disposed of by way of landfill at a licensed landfill site on or after 1 October 1996. The purpose of the tax is to encourage the generation of less waste. The tax is paid by landfill site operators, based on the weight of the waste deposited at their sites. The landfill site operators in turn charge those disposing waste at their site according to the type of waste dumped. There are two rates of Landfill Tax¹, the lower rate and the standard rate.

The standard rate of Landfill Tax is listed below:

Period	Rate
1 Oct 1996 to 31 Mar 1999	£7 per tonne
1 Apr 1999 to 31 Mar 2000	£10 per tonne
1 Apr 2000 to 31 Mar 2001	£11 per tonne
1 Apr 2001 to 31 Mar 2002	£12 per tonne
1 Apr 2002 to 31 Mar 2003	£13 per tonne
1 Apr 2003 to 31 Mar 2004	£14 per tonne
From 1 Apr 2004	£15 per tonne

Source: HM Customs and Excise

This rate will be increased by £3 to £18 per tonne in 2005–06 and will subsequently increase by at least £3 per tonne per year thereafter, until it reaches to the rate of £35 per tonne. A lower rate of £2 per tonne applies to inactive (or inert) wastes, such as naturally occurring rocks and soils, ceramic material and minerals.

The breakdown of the Landfill Tax is mainly based on information from Supply-Use tables. This is supplemented with information on Landfill Tax paid by the public administration sector using waste data compiled by the Department for Environment, Food and Rural Affairs (Defra).

As with many of these taxes, the likelihood is that much of the cost is passed on to the final consumer. In this instance local authority expenditure on the disposal of municipal waste is covered by local residents council tax payments.

In 2001, the Landfill Tax amounted to £5 billion, approximately 2 per cent of total revenue collected from environmental taxes. The public administration sector was the primary source of Landfill Tax revenues, contributing around 38 per cent of the total revenue collected, about £0.2 billion. This reflects the large volume of municipal waste collected by local authorities disposed of via landfill.

Taxes on resources: sources and methods

Taxes on resources comprise the revenue collected from the Aggregates Levy.

The **Aggregates Levy** is a tax on the commercial exploitation in the UK of rock, sand and gravel. It is charged at the rate of £1.60 per tonne and applies to anyone who is responsible for commercially exploiting aggregates in the UK, such as quarrying operators, mobile crusher operators, and operators of dredgers.

There is no industry analysis as the Aggregates Levy was only introduced in April 2002.

Development of future estimates

The industrial breakdown of environmental taxes is still in its early stages of development.

There is considerable scope for methodological improvement bearing in mind most of the industry allocations are based on proxy information from the Annual Business Inquiry and the Purchases Inquiry. The potential to source the breakdown from alternative sources, that is, revenue managers, needs further exploration.

The Environmental Accounts team intends to create time series for the industry breakdown of environmental tax payments and publish these results biannually.

Note

1 Lower rate: A lower rate of £2 per tonne applies to inactive (or inert) wastes, such as naturally occurring rocks and soils, ceramic material and minerals. Standard rate: on all other taxable waste.

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