

Green Taxes

Research Paper 97/46

7 April 1997



This paper reviews the increasing use of ecotaxes or green taxes in EC and OECD countries, and considers how such instruments work, their advantages over conventional regulatory systems, and barriers to their effectiveness. This paper also describes various fiscal measures already in place in the UK which can be viewed as having environmental effects, as well as the UK's first true green tax, the landfill levy.

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Summary

In 1990 the Government said it would consider making more use of green taxes to augment the existing conventional regulatory controls on environmentally damaging products and practices. However, it has taken some time for the first true green tax, the landfill levy, to be introduced. In the meantime, other fiscal instruments, such as duty differentials on different types of vehicle fuels, VAT on fuel, and reductions in vehicle excise duty have been implemented.

Green taxes have several advantages over conventional regulatory systems, providing greater incentives to industry to invest in clean technology while, of course, raising revenue. However, they do not always have the effects intended by government, particularly when few alternatives are available to consumers, or when the taxes do not send clear signals as to the correct environmental choice. This paper considers how green taxes work, and how their design can affect whether they produce the desired environmental result.

While taxes on energy have been used extensively for some time in several countries, their environmental potential is now increasingly being exploited. The European Environment Agency has just reviewed the use of green taxes in the European Union and their increasing use by several Member States. However, it argues that there is scope for their far greater application. The European Commission is keen to encourage their use and has issued a Communication on ensuring that they do not damage the Single Market. The EC also lays down minimum rates for some energy taxes although the Commission has failed to have an EC wide carbon tax agreed - a proposal which the UK has consistently opposed.

I. Introduction

A. UK and EC policy

The use of economic instruments in pursuit of environmental policy objectives was first seriously addressed by the Government in 1990, in its first annual environmental White Paper in the *This Common Inheritance* series.¹ It was argued that governments could not rely solely on regulation in any effective environmental strategy:²

1.25 If Governments want to stop something happening, or make something happen in a different way, they have broadly two choices: they can by law lay down rules and regulations on standards to be met or equipment to be installed; or they can use the market to influence the behaviour of producers and their customers. Whichever course they choose, the objective is to make those who cause environmental damage face the costs of control in full, without subsidy. That is called the "polluter pays" principle which the Government, in common with many other Governments, adopts. If we impose higher standards centrally, this puts extra costs on producers and on their customers in turn; if we use price signals, for example by imposing charges or taxes on certain activities, extra costs again fall on the manufacturers, and then on their customers. This "polluter pays" principle is an important means of influencing potential polluters.

1.26 In the past, governments in Britain and elsewhere have mostly used regulation to control pollution ...

1.27 Regulation, however, does have limitations. It can be expensive to monitor and difficult to up-date quickly in response to scientific and technical advance. It cannot always pitch controls at the level which strikes the most cost-effective balance between environmental benefits and compliance costs. Compliance costs can fall widely - on business, on Government, and on consumers - and are easy to underestimate in advance. And so long as it remains the responsibility of the regulator, usually central Government, to lay down the ways in which pollution targets should be met, there will always be the danger that insufficiently flexible systems will be created and some better options overlooked. In short, regulation has always been required and is still required, but it has its shortcomings.

1.28 For these reasons the Government, along with other Governments throughout the world, has begun to look for ways to control pollution which avoid some of these problems by working with the grain of the market. The ideas include various forms of pollution charges, as well as taxes and other economic instruments, all designed to encourage consumers and producers to behave in ways which benefit the environment ...

1.29 These new approaches have been described loosely as the market-based approach to the environment, since they involve integrating economic and environmental concerns and applying market economics more broadly. In the Government's view, market mechanisms offer the prospect of a more efficient and flexible response to environmental issues, both old and new.'

¹ DoE, *This Common Inheritance - Britain's environmental strategy*, Cm 1200 September 1990 Annex A Economic Instruments for Environmental Protection

² *ibid* pp 13-14

Movements in this direction in the UK have been slow. Landfill tax was introduced on 1 October 1996, and it represents the one tax designed specifically to control pollution.³ Of course other fiscal instruments have been used to further 'green' policies; notably the Chancellor announced several changes in both fuel duties and vehicle excise duty to improve air quality in his 1996 Budget⁴.

A shift in taxation away from labour, income and capital and onto resources and pollution was recommended by the high level Government Panel on Sustainable Development in its first report in January 1995, and has been repeated in each of its reports since.^{5,6} In its latest (third) report the Panel commented:⁷

The Government has accepted that more needs to be done but, apart from the landfill tax and the annual increase in road fuel duties, there has been little progress in introducing economic instruments or greening the tax base. In its recent report [see below], the European Environment Agency concluded that, "*if environmental taxes are well designed ... they could deliver improvements in four key areas of public policy: the environment; innovation and competitiveness; employment; and the tax system*". The Panel considers that the Budget offers scope for tackling positively key issues of sustainable development by taxing what is bad and rewarding what is good. **The Panel recommends that the Government should in future prepare and publish an overall assessment of the environmental consequences of measures in its annual Budget.**

The EC's Fifth Environmental Action Programme *Towards Sustainability*⁸ which was adopted in 1992 similarly recommended the greater use of economic instruments. As a parallel move to the development of environmentally adjusted national accounts, the Commission is pushing the use of economic instruments to make sure that the costs of environmental and natural resources are built into market economies. Corrective green taxes would make sure that environmental objectives are given more economic 'clout'.⁹ Resorting to economic instruments to achieve correct implementation of Community legislation is one of the Commission's main policy areas at present.

Yet in August 1996 in response to a request from the European Parliament, the European Environment Agency (EEA) produced the review *Environmental Taxes*¹⁰ which noted little progress in the use of environmental taxes at EU level. On the other hand, at Member State level there has been a continuing increase in their use over the past decade, and an

³ "Environmental taxes" in Institute for Fiscal Studies, *Options for 1997 : the Green Budget*, October 1996 p.130; see also *Landfill*, Library Research Paper 96/103, 8 November 1996

⁴ HM Treasury News Release, *New measures to improve air quality*, 26 November 1996

⁵ British Government Panel on Sustainable Development, *First Report*, January 1995; *Second Report*, January 1996; *Third Report*, January 1997

⁶ "Environmental advisors urge radical rethink on taxation", *ENDS Report*, January 1995 pp 6-7 and "Environmental advisors urge action on targets, taxes and transport", *ENDS Report*, January 1996 p.8

⁷ British Government Panel on Sustainable Development, *Third Report*, January 1997 p.21 para 44

⁸ OJ C 138, 17 May 1993

⁹ *Europe Environment* No.442 8 November 1994 and COM(94)465 *Economic growth and the environment; some implications for economic policy making*

¹⁰ *Implementation and Environmental Effectiveness*, Environmental Issues Series No. 1, Copenhagen 1996

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acceleration in their use over the past 5-6 years, notably in Scandinavia but also in Austria, Belgium, France, Germany, the Netherlands and the UK. The report recommends the greater use of environmental taxes, through their extension to more Member States; increasing their harmonisation and compatibility at EU level and developing new tax bases (on input materials as well as emissions, and on novel resources such as water, minerals, hazardous chemicals, transport, land-use and tourism).

The Commission has now become concerned that the unilateral imposition of eco-instruments may damage the Single Market, particularly when applied to products, and it has just issued a Communication to outline the legal and other constraints on Member States' action in this area. However, the Communication is intended to encourage, not discourage their use, and the Commission considers that there is "considerable room for action by the Member States to implement fiscal instruments, while respecting Treaty obligations."¹¹

B. What is a green tax and how do they work?

The terms 'environmental taxation' and 'ecotaxes' are not defined in legislation. The European Commission considers that they can be used whether the revenue accrues to the Government or is earmarked for a particular purpose, if either the taxable base has a clear negative effect on the environment or if the tax itself has a less clear but discernable positive effect on the environment (this might be achieved through setting a tax differential between two products according to environmental friendliness). There are two basic types of ecotaxes:¹²

- **Emission taxes** [sometimes called '**pollution taxes**']; payments directly related to the real or estimated pollution caused to land, air or water by pollutant emissions from, for instance, power stations, or water outfalls from sewage plants. Noise pollution might also be taxed (in the aviation industry, for instance). If the emissions cannot easily be measured, then it might be easier to levy an input tax;
- **Product taxes**; on raw materials and intermediate inputs such as fertilisers, pesticides, minerals or water [**input taxes**] or on final consumer products such as packaging, car tyres or batteries [**consumption taxes**]. Product taxes in the field of **energy** (taxes on oil, diesel and electricity) which have been imposed for some time for revenue raising rather than green motives, are

¹¹ *Environmental taxes and charges in the Single Market*, COM(97)9, January 1997 and "Taxation: Commission unveils vade-mecum on environmental taxes", *Europe Environment* No.493 11 February 1997 pp 3-4

¹² European Commission, *Environmental taxes and charges in the Single Market*, COM(97)9, January 1997 para 10 and OECD, *Implementation strategies for environmental taxes*, 1996 p.10

increasingly being seen as having an environmental role to play.

Pollution taxes are not a new idea; they were first proposed in the 1920s by an economist called Pigou¹³, who derived a model for an optimum ('Pigouvian') pollution tax. In reality this is impossible to set, mainly because of difficulties in accurately relating units of pollution to costs of damage to the environment¹⁴.

Even so, pollution taxes have several advantages over a conventional enforcement system where a pollution limit is set and a fine is imposed for breaking this. For a firm producing a polluting output, it may be cheaper to pay a fine rather than reduce output to meet an emission standard. Also, once the firm has met the standard there is no incentive for it to clean up its act any further. On the other hand, taxes can continue to provide this; an added incentive to invest in clean technology and to innovate; this is known as 'dynamic efficiency'. It can however be argued that the tax burden drains firms of the resources to invest in technology and that regulation can achieve the same result, particularly if it requires the use of Best Available Technology (BAT)¹⁵. 'Authorisations' to pollute under the UK's pollution control regime¹⁶ usually specify the use of BATNEEC; the Best Available Technology Not Entailing Excessive Cost.

Pollution taxes administered by central government allow less scope for evasion than potentially irregular, on-site inspections by whichever regulatory agency is responsible, and taxes on one pollutant will often cause a reduction in emissions of associated pollutants¹⁷. It is also said that regulators can sometimes get too close to the industry they are regulating, and market instruments are less susceptible to such 'regulatory capture'¹⁸.

However, because of the difficulty of putting a cost on environmental damage, it is difficult to determine the rate at which environmental taxes should be set (although once one tax exists it is relatively easy to extrapolate to other similar pollutants; fuels could be taxed according to their relative carbon content for instance). It is said that another reason for the reluctance of policy makers to set pollution taxes has been that once a firm has reduced its pollutant output to an acceptable level, it is still paying a tax on the pollution which it is producing, which seems unfair. Taxes levied on the pollution or products of one country's industry may also damage that country competitively by making foreign imports more economically attractive; hence the European Commission's desire for internal harmonisation.

¹³ Turner, Pearce and Bateman, *Environmental economics: an elementary introduction*, CSERGE 1994 p.166

¹⁴ OECD, *Implementation strategies for environmental taxes*, 1996 p.11

¹⁵ *ibid* p.12

¹⁶ The Integrated Pollution Control system administered by the Environment Agencies, and the Local Authority Air Pollution Control controls, both under the *Environmental Protection Act 1990*

¹⁷ "Chapter 12: Green taxes" in Turner, Pearce and Bateman, *Environmental economics: an elementary introduction*, Centre for Social and Economic Research on the Global Environment (CSERGE) 1994

¹⁸ OECD, *Implementation strategies for Environmental Taxes*, 1996 p.12

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Most of the concern regarding pollution taxes, however, focuses on the effects on the consumer. Very simplistically, once the firm is paying a tax on each unit of pollutant or item it produces, it will probably try to pass this cost on to the consumer.

The proportion met by the consumer will probably vary according to whether alternatives are available. With a tax on petrol for instance, even a steep rise in price is likely to reduce consumption by only a little, and consumers will be willing to meet most of the cost of the tax (there is an 'inelastic' demand curve). A tax on a washing powder containing phosphorus on the other hand, or on a domestic cleaning fluid containing zinc, allows consumers the choice of switching to alternative brands. In this case the producers have little chance of pushing the cost of the tax onto the consumer (the demand for the product is highly 'elastic' and price sensitive)¹⁹.

Pollution taxes, then, send signals to both consumers (raising prices) and producers (lowering profit margins). The signals indicate the pollution cost of products and encourage a switch to lower pollution cost products. One problem is that of 'linkage'; the link between the tax and the environmental problem needs to be as explicit as possible; a loose link gives poor economic signals regarding the appropriate environmental choice²⁰.

Of course environmental taxes have an added advantage over regulations in that they raise revenue, although some or all of this may be needed to administer the tax, and the OECD considers that only taxes on fossil fuels are likely to raise the significant amounts of revenue able to have any macro-economic impact²¹. It has also been pointed out that the poor might be disproportionately affected because, for instance, a larger proportion of their income goes on items being taxed, such as petrol, or heating fuel. But since profits go to central government, corrections could be made for this by altering tax free income allowances, perhaps increasing targeted social security benefits, or removing tax from other basic commodities²².

In a Resolution on the future of social protection in Europe adopted in Plenary Session in February 1997, the European Parliament has encouraged Member States to consider diversifying sources for funding for social security. With the movement towards EMU it wants to prevent very different levels of provision being established in Member States, and suggests a CO₂ tax or levy on economic activities²³.

So the possibility of a 'double dividend' from environmental taxes exists. Taxing environmentally unsound practices or 'dirty' goods improves the environment thus effecting welfare benefits which outstrip the increased prices. Secondly, the revenue may be used to lower an existing distortionary tax. Swapping an environmental tax for an existing

¹⁹ *Environmental economics: an elementary introduction*, CSERGE 1994 p.178

²⁰ OECD, *Implementation strategies for Environmental Taxes*, 1996 p.74

²¹ *ibid* p.65

²² *Environmental economics: an elementary introduction*, CSERGE 1994 p.177

²³ 'MEPs propose social security funding through CO₂ tax' *Europe Environment* 25 February 1997 p.II.9

distortionary tax gives rise to a more efficient tax system, so improving non-environmental as well as environmental welfare. Whether this works in practice can be debated. The whole point of environmental taxes is that they themselves will produce distortions, in that they seek to alter behaviour. They are imposed to more accurately reflect the externalities and true costs of environmentally unsound practices or goods in their price, and so distort consumer/product choice, not necessarily creating a more efficient tax system. However, by shifting taxes from labour (particularly in countries where wages are 'too high') to pollution, there may be an employment double dividend²⁴.

This paper does not seek to provide an exhaustive list of possible instruments; quarrying taxes and air noise taxes for instance are not covered. However, it does review some of the measures under consideration or adopted in the UK and in other EC and OECD countries.

II. Waste

A. Household waste

There are numerous points in the waste production and management process at which choices are available to manufacturers, consumers, public authorities and others. So it is perhaps surprising that more use is not made of financial instruments in this field. For example, since household waste collection is largely provided 'free of charge' by local authorities, there is no financial incentive for households to reduce the amount of waste they produce which requires disposal; to the typical householder there is no obvious relation between the amount of waste they produce and their council tax bill, and no incentive for them personally to make efforts to reduce their waste²⁵.

In Germany however, a more direct linkage is established between charges for the amount of waste produced by a household and the environmental costs of waste disposal. In some areas householders pay for a particular size of bin to be emptied and charges sometimes vary with the frequency of collections. However, trials are taking place in some states with volumetric and weight-based charging, or with the use of stickers which are purchased and then have to be attached to each container emptied or bag removed. Studies in the US have shown that weight- or volumetric-based charging reduces considerably amounts of household waste and disposal costs, but of course administrative costs are higher, and illegal dumping may be encouraged. Schemes have been most successful in the US when supported by alternative disposal options, such as nearby kerbside recycling facilities²⁶.

²⁴ "Environmental taxes" in IFS, *Options for 1997 : the Green Budget*, October 1996 pp 128-133

²⁵ Stephen Smith, *'Green' taxes and charges: policy and practice in Britain and Germany*, IFS November 1995 p.63

²⁶ *ibid* p.65

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In the Netherlands municipalities are responsible for waste collection, and they normally issue an annual fixed rate waste bill. However, some cities, particularly in rural areas, have started experimenting with variable charge rates. Some charge per bag, others weigh the waste on collection, and yet others vary the charge according to the household size or collection frequency. These solutions have been arrived at by applying the polluter pays principle to the problem of rapidly rising fixed charge bills. There may also be some waste reduction incentive, however. One evaluation study found that municipalities levying charges per bag produced 10-20% less waste per capita than those using traditional methods; illegal dumping was no major problem unless the charge per bag rose above a certain amount (DFL 2; around 70p at today's exchange rate). These results are reported to be similar to US pay-per-bag results²⁷.

B. Landfill

Library Research Paper 96/103 *Landfill* gives the background to the UK's first ever true environmental or 'green' tax, which came into effect on 1 October 1996. The tax can be seen as a step towards curtailing the UK's long tradition of landfilling its waste (over 90% of household waste goes to landfill, with only 5% of household waste being recycled). Controls on landfill practice are tighter today than in the past but environmental problems can still arise, particularly in the generation of gas from landfill sites. In its sustainable development and waste management strategies the Government undertook to swing the balance away from landfill in favour of reuse, recycling and energy recovery from waste.

The Chancellor first announced plans for a landfill levy in his 1994 Budget speech, though the tax only came into operation on 1 October 1996, following a two year consultation process. The tax is levied per tonne of waste at two rates: £2 per tonne for specified inactive wastes (such as glass); £7 per tonne for active wastes which are capable of degrading (such as paper). Around 1,400 businesses will pay the tax, though landfill site operators can mitigate its effects by contributing to an environmental trust. The tax is expected to raise about £450 million per year, and the Government proposes to use these receipts to help fund a cut in the main rate of National Insurance Contributions for employers (from 10.2% to 10% from 6 April 1997).

The decision to impose a landfill tax and for this to be weight-based has been welcomed by environmental organisations, although some have called for the levy to be set at a far higher rate, and to cover all aspects of waste disposal, including incineration. Nevertheless, the general view is that the advantages of landfill over incineration are set to decline anyway (because, for instance, of ever stricter environmental controls on landfills and shortage of landfill sites pushing up prices, and because of financial and regulatory incentives for generating energy from waste). Thus the levy is not expected to have a significant effect on

²⁷

EEA, *Environmental taxes: implementation and environmental effectiveness*, Environmental Issues Series No.1, Copenhagen 1996 p.60

the amount of waste going to landfill in the short term, although it may in the longer term. Similarly, although even a higher levy would probably do little to encourage recycling at present, again in the longer term this might change.

Since 1986 Denmark has applied a tax to each tonne of non-hazardous waste dumped or incinerated; the charge is set at a lower rate for incineration. The intention is to reduce waste generation and encourage reuse and recycling, but also to encourage incineration as opposed to landfill. In practice reuse and recycling have risen from 21% to 50% of the total amount of waste collected from 1985-1993, dumping has decreased from 57% to 26% over the same period, and the share of waste incinerated has stayed constant. The present charges double the cost of landfill and add 70% to the cost of incineration, and in 1997 the charges and differential are due to be raised still further. Landfill will cost DKK 285 (around £28) per tonne, incineration DKK 210 (£21) per tonne, and incineration with energy recovery DKK 160 (£16). Revenues go to the central exchequer, but have been used as part of the green tax reform since 1993²⁸.

In Germany a landfill waste charge (Abfallabgabe) has been under discussion, with different rates per tonne for hazardous, industrial/bulk, excavated and other wastes. The rates would be likely to be higher (two to six times higher) than the UK landfill levy, because they are intended not only to charge for environmental costs but to reflect the status of landfill sites as a scarce resource²⁹.

C. Packaging

It could be argued that if householders were having to pay directly to dispose of their waste, then there might be some incentive for them to seek low volume packaging from packaging and product manufacturers, but by applying prices at this household/waste disposal end of the chain, it is unlikely that the cost incentives would be high enough to feed back to the manufactures. On the other hand, taxes can be levied at the manufacturing end of the chain, to reflect the costs of final disposal; the tax level would reflect the amount of each packaging material or container type recycled and the material used³⁰.

In Denmark new glass bottles are taxed if they are not subject to a deposit-refund system, but the Danish Environmental Protection Agency has concluded that packaging charges account for 'only a minor part of the costs influencing the choice of packaging'. There appear to be several problems. There is a conflict between levying a charge high enough to finance return schemes, and maintaining the competitiveness of returnable vs non-returnable bottles. Plastic beverage containers are charged at the same rate as glass bottles rather than at the same rate

²⁸ EEA, *Environmental taxes: implementation and environmental effectiveness*, Environmental Issues Series No.1, Copenhagen 1996 pp 53-55

²⁹ 'Green' taxes and charges: policy and practice in Britain and Germany, IFS November 1995 p.61

³⁰ *ibid* p.69

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as cardboard and laminated beverage packaging, and this is not considered environmentally justified. Regions of Canada, and Finland, Norway, and Sweden also make charges for beverage packaging according to whether it is returnable, and parts of the USA have a tax on litter-generating products. In both Finland and Norway the use of returnable containers makes up the majority of beverage containers sold, but in Sweden the charge is considered too low for incentive effects³¹.

In the UK a new system for reducing packaging waste has just been adopted with *The Producer Responsibility Obligations (Packaging Waste) Regulations 1997* draft SI (unnumbered) laid under the *Environment Act 1995*, to implement EC Directive 94/62/EC on packaging and packaging waste. The Commons Debate to approve the Regulations took place on 3 March 1997³². Industry has been very much involved in working with Government to find self-regulating solutions to meeting our obligations under the Directive. In May 1996³³ John Gummer ruled out 'bring back' schemes or a tax on packaging which the Government says do not necessarily create a market for recycled material.

Instead, the Government accepted the industry pressure for a shared legal obligation for promoting the reuse, recycling or recovery of waste materials to apply to all major players and at all stages of the chain, to deter 'free riders'. The regulations set out how to calculate the recycling and recovery obligations for individual businesses, who will have to measure how much packaging they manufacture, fill, sell or supply, and then apply percentages to these to calculate their recycling/recovery targets. Each business will then be able to decide whether to operate independently or join a collective scheme. Small businesses are largely exempt³⁴.

When John Gummer said that a 'bring back' scheme or a tax on packaging would not necessarily create markets for the recycled material, his decision would have been based at least in part on Germany's experiences. In December 1991 the Töpfer Law required waste collection to increase in stages so that by 1995 80% of packaging waste was being collected largely to be recycled; recovery/incineration for energy was not an option. German manufacturers and distributors either had to take back their own products and packaging after use, or take the much simpler option of joining 'Duales System Deutschland' (DSD) and paying for the right to put a green spot on their packaging. Any dotted pack can be left in any DSD bin, supplied by retailers and packagers. By 1992 virtually all supermarket goods carried a green spot³⁵. The green dot makes packaging more expensive to the producers, who are thus undertaking to cover the costs of collection.

³¹ OECD, *Managing the environment: the role of economic instruments*, 1994 pp 79-80

³² HC Deb 3 March 1997 cc 637-658

³³ DoE Press Release 185, *Producer responsibility for packaging - the way forward*, 7 May 1996

³⁴ Until the year 2000 firms with a turnover of under £5m are exempt. The figure is £1m thereafter. DoE press notice 573, *Modifications to draft packaging regulations announced*, 18 December 1996

³⁵ *Financial Times*, 20 July 1992

The system in some respects worked too well. German companies dumped zero-cost plastic packaging waste on foreign markets such as South America after being forced to collect it but then finding themselves unable to reprocess it commercially³⁶. German companies being paid by industry to dispose of waste paper had so much that they had to pay German paper manufacturers to take it off their hands³⁷. Even the packaging campaigner at Friends of the Earth admitted that the approach had led to over-collection of waste without facilities to reprocess it, and without markets to re-use it³⁸, and serious problems arose through unfair impediments to trade. The glut of material collected had a destabilising effect on the market for recycled materials in Germany and abroad, but the system has to some extent settled down now; the volume of packaging material, particularly glass and plastics, used has fallen by 1 million tonnes from 1991 to 1993; a reduction of one-tenth³⁹.

III. Pollution taxes

A. Water pollution

The UK does not yet levy any taxes directly on pollution (unless the waste which goes to landfill is itself counted as pollution), but discussion papers on the scope for economic instruments to be used in respect of water pollution and abstraction are in preparation⁴⁰. It has been asserted that the Environment Agencies' charges for 'discharge consents' or 'environmental licenses' (which permit, with conditions, the release of pollution to water, land or air) could relatively easily be converted into taxes⁴¹.

At present discharge consents are issued by the Environment Agencies and the charges are essentially to cover administrative costs. The charge is reduced slightly for discharges of small amounts of sewage or cooling effluent, and with factors applied taking into account the maximum discharge volume allowed, the type of receiving water (ground, coastal, surface or estuarine) and the discharge's particular content⁴². However, the charge structure is intended to reflect the costs of monitoring, not the costs of pollution⁴³, and does not vary, for instance, according to the sensitivity of the local environment nor directly with the volume of pollutant released. The Environment Agency for England and Wales presently sets around 100,000 discharge consents to water including 6000 for sewage works⁴⁴.

³⁶ *ibid.*

³⁷ *The Economist*, 22 August 1992

³⁸ *The Independent on Sunday*, 19 July 1992

³⁹ *Scotland on Sunday*, 29 September 1996 and 'Green' taxes and charges: policy and practice in Britain and Germany, IFS November 1995 p.72

⁴⁰ HC Deb 6 December 1996 c.794W, and DoE, 26.2.97

⁴¹ Stephen Tindale & Gerald Holtham, *Green Tax Reform*, Institute for Public Policy Research 1996 p.97

⁴² NRA, *Scheme of charges in respect of applications and consents for discharges to controlled waters*, 1991

⁴³ 'Green' taxes and charges: policy and practice in Britain and Germany, IFS November 1995 p.32

⁴⁴ <http://www.environment-agency.gov.uk/who/establish.html>

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Water pollution charges are levied in France, Germany and the Netherlands. The Dutch charge was introduced in 1970 to finance collective waste water treatment plants, and one study has found a strong relation between the charge rates of water boards and the reductions of discharges within their jurisdiction; the water charges are considered to have been successful both in increasing treatment capacity and reducing discharges from the manufacturing industry greatly between 1971 and 1991. In another study, 54% of interviewed industry representatives said the charge had been the decisive factor in decisions in favour of water pollution abatement measures. The average charge rate across water boards was only slightly lower than the average pollution abatement costs⁴⁵.

The French charge rates are described as modest compared to Germany and the Netherlands; polluters pay an earmarked amount to discharge, and are financially supported if they undertake treatment measures. Effects are difficult to assess since the charges are built into the whole permit system, but the permits do raise around 8% of total water quality expenses⁴⁶. In Germany water quality is mainly the responsibility of the German Länder, who benefit from the charges and use the money for water reinvestment, and the charging system which has operated from 1981 is meant to be an incentive system, with reductions for using BAT, making investments and for low discharge permits⁴⁷. In 1990 around DM340 million (£118 million) was raised, with administration costs accounting for around 15% of this. The reductions in discharges which have been achieved in Germany cannot, however, be attributed directly to the water charges, since discharge limits were introduced at the same time⁴⁸.

B. Agricultural inputs; fertilisers and pesticides

The above systems rely on levying charges on point (specific) sources of water pollution, but charges on non-point sources might include those on the use of fertilisers or pesticides. These may run off from farms into water courses, but the amount of run-off is difficult to measure, so levies are more easily applied to the inputs themselves.

Since 1984 an environmental charge on nitrogen (N) and phosphorus (P) in fertilisers has been levied in Sweden, to discourage the demand for fertiliser and create funds for mitigating some of the environmental effects of agriculture. The level of the charge was around 10-13% of the sales value of fertiliser in 1992 and the use of fertiliser has reduced significantly since 1984, although agricultural reform has taken place at the same time so again it is difficult to assign cause and effect. However, the reduction of N was highest when the charge rate reached its highest level in 1990, and Swedish evaluation reports attribute the drop in use of P and N (a drop of 50% in P use from 1984-1992) to the charge, and also to public

⁴⁵ EEA, *Environmental taxes: implementation and environmental effectiveness*, Environmental Issues Series No.1, Copenhagen 1996 pp.59-60

⁴⁶ *ibid* p.58

⁴⁷ *ibid* pp 58-59

⁴⁸ 'Green' taxes and charges: policy and practice in Britain and Germany, IFS November 1995 p.28

information campaigns (on the negative effects of P on the environment) financed by the charge⁴⁹.

Austria is another country that has introduced a fertiliser levy; a small levy was introduced in 1986 and, despite its size, is said to have had a significant effect on fertiliser use⁵⁰. Norway has had a fertiliser and pesticides tax since 1988; the fertiliser tax is around 20% of sales price but varies with N content; it is paid by wholesalers. The pesticides tax is around 13% of the wholesale price and is paid by pesticide importers. There is an additional 6% charge on pesticides which covers their control and approval⁵¹.

Finland used to have a fertiliser tax based on N and P content, but this was repealed in 1994 although a pesticide registration and control fee was retained. Denmark has a pesticide tax of one sixth of the retail price for amounts of less than 1kg or 1 litre, and of 3% of the wholesale price for larger amounts⁵². In France attempts by the Agences Financières de Bassin (now the Agencies de l'Eau, the water agencies for each of France's six major river basins) to create nitrate charges to counter the effects of uncontrolled use of chemical fertilisers have 'foundered on the hostility of farmers who are facing enormous economic difficulties in other areas'⁵³.

It has been pointed out that it is difficult to adapt such taxes to fit local environmental conditions (some areas are more sensitive than others to nutrient enrichment or pesticide application, as reflected in the Government's agri-environmental Nitrate- and Environmentally-Sensitive Areas schemes) and to measure directly the amounts used. Regulatory policies would therefore face difficulties, but 'there may be gains from using taxes to discourage excessive uses of fertilisers and pesticides'⁵⁴. Being effectively a tax on intensive agricultural production, this would also produce a level playing field allowing organic farming to become more economically competitive⁵⁵.

⁴⁹ EEA, *Environmental taxes: implementation and environmental effectiveness*, Environmental Issues Series No.1, Copenhagen 1996 p.57

⁵⁰ OECD, *Environmental taxes in OECD countries*, 1995 p.36

⁵¹ *op.cit.* p.37

⁵² *ibid.*

⁵³ OECD, *Applying economic instruments to environmental policies in OECD and dynamic non-member economies*, OECD Documents 1994 p.148

⁵⁴ 'Green' taxes and charges: policy and practice in Britain and Germany, IFS November 1995 p.33

⁵⁵ Stephen Tindale & Gerald Holtham, *Green Tax Reform*, Institute for Public Policy Research 1996 p.97

C. Large plant emissions

Sweden introduced a sulphur tax in 1991 which applies to fuels (coals, oil and peat) that contain over 0.1% sulphur by weight and is levied at SEK 40 (around £3) per kg of sulphur. However, the tax can be reimbursed if sulphur emissions are abated. This should promote the use of cleaner fuels or else the scrubbing of flue gases to remove sulphur if high sulphur fuels are burnt. Swedish studies indicate that there may have already been a significant impact, with the average sulphur-content of fuel oil decreasing from around 0.65% in 1990 to 0.4% recently and with light-oils having sulphur contents of under 0.1% on which no tax is levied. Around a quarter of those taxed have cleaned their flue gases, reducing sulphur emissions by 70% on average and receiving tax refunds⁵⁶. On medium and large combustion plants, Sweden also levies a NO_x (oxides of nitrogen) tax on each tonne emitted, to encourage the fitting of abatement equipment. Measures taken following the announcement of the tax decreased large plant emissions by 35% between 1990 and 1992. According to the Swedish Environment Ministry, as well as fitting new equipment this has provided an incentive for introducing control systems to maintain optimal burn and some operating staff are given bonuses if emissions are kept low⁵⁷.

Sweden's system addresses the problem of poor 'linkage' between a tax base and pollution which may arise when one is seeking to reduce pollution emissions from a production process through a tax on inputs, but where there is scope for cleaning the effluent, or end-of-pipe abatement. In other words, a tax on a dirty fuel may discourage the use of that fuel, but provide no incentive to clean the effluent, so the means by which pollution is being reduced may not necessarily be the most efficient way⁵⁸. Sweden's system however provides an incentive for taking both measures.

Norway has had a carbon dioxide (CO₂) tax for five years which reduced CO₂ emissions by 3-4% between 1991 and 1993. Heating oil and petrol prices rose by about 15 and 10% respectively because of the tax, and oil consumption in the paper industry and government services fell by 21% and 10% respectively as a result. Private car transport by households fell by 2-3% per year because of the tax⁵⁹. Norway levies a sulphur tax on light and heavy fuel oils; light oils with less than 0.05% sulphur content are exempted. As well as CO₂ and sulphur, the tax system for fossil fuels also includes a tax on atmospheric emissions of lead on top of the general VAT rate. The CO₂ element forms a large part of the national budget, raising about 6 billion Nkr in 1994⁶⁰ (roughly £550 million at today's exchange rate).

⁵⁶ EEA, *Environmental taxes: implementation and environmental effectiveness*, Environmental Issues Series No.1, Copenhagen 1996 p.53

⁵⁷ Stephen Tindale & Gerald Holtham, *Green Tax Reform*, Institute for Public Policy Research 1996 p.28

⁵⁸ 'Green' taxes and charges: policy and practice in Britain and Germany, IFS November 1995 p.22

⁵⁹ EEA, *Environmental taxes: implementation and environmental effectiveness*, Environmental Issues Series No.1, Copenhagen 1996 p.54

⁶⁰ OECD, *Environmental taxes in OECD countries*, 1995 p.33

Since 1985 France has taxed nitrogen and sulphur emissions from large power stations and incinerators; the rate is now around £19 per tonne⁶¹. Of course, France's energy policy is weighted heavily towards a reliance on nuclear power.

Carbon and energy taxes are discussed further in section IV.

D. Tradeable permits

Once a system of taxing pollution emissions or of setting emissions quotas is established, the possibility of 'trading permits' arises. This is more of a market mechanism than an environmental tax per se, but as well as considering the scope for using economic instruments regarding water pollution, the Government plans to consult on the potential for introducing tradeable permits for discharges from industry. It has also considered the use of tradeable permits as part of our sulphur reduction strategy, but the conclusions of that consultation will not be released until later in 1997⁶².

The way in which this works is that first of all, an acceptable amount of pollution is determined, such as a national emission limit for carbon dioxide. Then permits are allocated (if a total of 100 units of pollution is agreed ten permits for ten units each might be issued), usually on the basis of historical emissions, but reducing the amounts pro rata so that the desired total is met. After the initial allocation, polluters are free to trade pollution rights. A polluter who emits less than their permit receives a credit, which is then tradeable. So depending on how expensive different polluters find it to abate their pollution, it will pay them to sell or to buy permits; permit holding will be concentrated among those who find it hard to reduce pollution, but control is in the hands of those who find it cheap. The costs to industry of meeting the requirements are reduced, but the overall limit is still satisfied so environmental standards are not compromised, and many environmental groups in the US have now come around to the idea of tradeable permits⁶³.

Australia, Canada and Germany make some use of tradeable permits but the US is the only OECD country which uses them on a large scale, mainly for air pollution as part of its Emissions Trading program under the various Clean Air Acts. However, the number of trades has been lower than expected⁶⁴, and most trades have also been intra-company. This is probably a result of the rules applied to the regime. The newer Acid Rain Control Allowance program is expected to produce a more flexible result⁶⁵.

⁶¹ Stephen Tindale & Gerald Holtham, *Green Tax Reform*, Institute for Public Policy Research 1996 p.28

⁶² HC Deb 6 December 1996 c.794W

⁶³ Turner, Pearce and Bateman, *Environmental economics: an elementary introduction*, CSERGE 1994 p.181

⁶⁴ OECD, *Applying economic instruments to environmental policies in OECD and dynamic non-member economies*, OECD Documents 1994 p.26

⁶⁵ OECD, *Managing the environment: the role of economic instruments*, 1994 p.103

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In advance of the next meeting (in Kyoto) of the Parties to the UN Convention on Climate Change, EC Environment Ministers have just agreed to cut greenhouse gas emissions⁶⁶ by 10% by 2010, and they will do this through a burden-sharing agreement. The different quotas for the fifteen Member States will mean that while the less developed nations such as Greece and Portugal will be allowed to raise emissions, Britain, the Netherlands and Belgium will make 10% cuts and other States such as Germany, Denmark and Austria still greater cuts⁶⁷. The overall target is a 15% cut by 2010, and it is still not clear where the extra 5% will come from. No interim target has been set for 2005. The reductions for 2010 are as follows⁶⁸:

Emission reductions for 2010 compared to 1990

Member State	% Reductions- CO ₂ , CH ₄ , NO _x together (GWP100 weighted)
Belgium	-10
Denmark	-25
Germany	-25
Greece	+30
Spain	+17
France	0
Ireland	+15
Italy	-7
Luxembourg	-30
Netherlands	-10
Austria	-25
Portugal	+40
Finland	0
Sweden	+5
UK	+5

*GWP100 weighted= takes account of the different
'global warming potential' of pollutants*

⁶⁶ carbon dioxide, methane and nitrogen oxides, the three main pollutants

⁶⁷ 'EU to cut global warming gases by a tenth', *Independent*, 4 March 1997; HC Deb 4 March 1997 c.696

⁶⁸ 'Environment Council: Agreement on 'differentiated' reduction of greenhouse gases', *Europe Environment* No. 495, 11 March 1997 p.1

E. Water use

Where charges are made for the supply of water to industrial or domestic users, it can be difficult to separate the charge made for that service from a fiscal element which might be intended to reduce water usage⁶⁹. Water abstraction is a rather more clear cut case, and taking water from groundwater or surface waters is charged for in either the whole of or parts of Britain, Germany, France (since 1966), the Netherlands (since 1983) and Belgium⁷⁰. In the UK the Environment Agency collects abstraction charges, and although there are regional variations these are not set according to the sensitivity of the region to pollution, or the scarcity of water resources in the region, but according to the ease of maintaining services in each region. However, charges are higher for summer abstractions, for instance, and a loss factor is applied that reflects whether the water will find its way back into ground or surface waters⁷¹.

Over-abstraction is more likely to be a problem in certain areas (water resources and sensitivity to pollution vary according to geography and geology). For this reason, although water abstraction charges could have incentive effects in reducing abstraction and the environmental effects of this, it can be argued that this is not a particularly good candidate for efficient regulation through market incentives. As with a tax on agricultural inputs, in some areas the environmental component of the charge would be far higher than in others. There is also the problem of feeding this charge directly through to the users, whose behaviour one would be seeking to modify. Abstraction charges impinge most on the abstractors (ie water companies) who are not always the end users.

Australia imposed an environmental levy on water board customers for a fixed five year period and raised A\$440 million (roughly £210 million) which was earmarked for environmental measures. But if charges reflect directly on the amount of water used as well as being levied on the end users, more efficient control can be achieved through market incentives. Industrial users in the UK and Germany are usually charged according to the quantity of water they use, and in Germany household water supply is also charged for on a volumetric basis. This provides a good linkage or mechanism for transmitting, via the water charging system, incentive signals for water conservation. In the Netherlands there are different tariffs per cubic metre of drinking water used by households according to the water source. The household sector in Denmark pays a tax per cubic metre of water distributed in pipelines⁷².

⁶⁹ OECD, *Environmental taxes in OECD countries*, 1995 p.39

⁷⁰ *ibid*, pp 39-41

⁷¹ 'Green' taxes and charges: policy and practice in Britain and Germany, IFS November 1995 p.34 onwards

⁷² OECD, *Environmental taxes in OECD countries*, 1995 p.40

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Most UK households of course are not yet metered. However, although it can thus be argued that volumetric charging for households could be extended in the UK, the main benefit might be a reduction in usage of water offsetting the need for water companies to invest in new reservoirs, rather than pure environmental benefits⁷³. Small scale trials of metering domestic premises have resulted in average reductions in water demand of 11% and premium charges had more effect. Reductions were higher in a larger scale trial on the Isle of Wight but in this case no control data were available⁷⁴. More background to water metering and Government policy on this is given in another Library Research Paper⁷⁵.

⁷³ *'Green' taxes and charges: policy and practice in Britain and Germany*, IFS November 1995 p.42

⁷⁴ The National Metering Trials Working Group, *Water Metering Trials 1993: Final Report*, p.19

⁷⁵ *Water (Conservation and Consumer Choice) Bill (Bill 33 1995/96)*, Research Paper 96/35, 6 March 1996

IV. Taxes on fossil fuels

A. Excise duty on mineral oils

1. Rates of duty

In his March 1993 Budget the then Chancellor, Norman Lamont, announced a 10% increase in road fuel duties, partly to compensate for the revenue loss from the abolition of car tax in November 1992.⁷⁶ He went on to announce that it was the Government's intention to increase duties on average by at least 3% a year in real terms in future Budgets. With the imposition of VAT on domestic supplies of fuel and power, this long term strategy sought to return greenhouse gas emissions in the UK to 1990 levels by the year 2000, to meet the requirements of the United Nations Convention on Climate Change agreed at the 1992 Rio Earth Summit:⁷⁷

The largest contribution to the growth in United Kingdom carbon dioxide emissions in the coming years is expected to come from the transport sector. I therefore propose to make clear today the Government's long-term intention on road fuel duty. We intend to raise road fuel duties on average by at least 3 per cent. a year in real terms in future Budgets, in addition to the increase I have already announced for this year.

In deciding the level of duty to be levied in any particular Budget, we will, of course, take full account of conditions at the time - including, if charges for motorways and urban roads are introduced, the overall level of taxes and charges which road users are paying. However, my announcement today will help manufacturers and consumers to plan ahead. It should provide a strong incentive for motorists to buy more fuel-efficient vehicles, and it will raise at least a further £520 million in 1994-95 and £950 million in 1995-96.

In the following Budget, in November 1993, duties on petrol - leaded & unleaded - and on diesel used in road vehicles, were all increased by 3p per litre, representing an increase of between 8% and 10%. The Chancellor, Kenneth Clarke, went on to make the commitment that all road fuel duties would be increased by at least 5% in real terms in future Budgets:⁷⁸

This will complete Britain's strategy for meeting our Rio commitment. We are the first country in Europe to do this; and we have done so in a way that minimises the additional costs to industry ... Any critic of the Government's

⁷⁶ A car tax of 10 per cent was payable on all new cars and some other vehicles from 1973 to March 1992. The tax was cut to 5 per cent in the March 1992 Budget, and abolished altogether in the Chancellor's Autumn Statement on 12 November 1992. Further details are given in the Library Research Note 92/99, *Car Tax*, 16 November 1992.

⁷⁷ HC Deb 16 March 1993 c.183

⁷⁸ HC Deb 30 November 1993 c.937

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tax plans who claims also to support the international agreement to curb carbon dioxide emissions will be sailing dangerously close to hypocrisy.

More recently, in his 1996 Budget, the Chancellor announced that excise duties on leaded and unleaded petrol, along with diesel, would be increased by 3p per litre once again: an increase of between 6.5% and 7.5%.⁷⁹ The rates of excise duty rates on the three principal hydrocarbon oils since 1977 are shown below (in pence per litre):

Rates of duty; petrol, unleaded petrol and diesel

Date of change	Petrol	Unleaded Petrol	Diesel (road)
8.8.77	6.6	-	7.7
12.6.79	8.1	-	9.2
26.3.80	10.0	-	10.0
10.3.81	13.82	-	13.82
2.7.81	13.82	-	11.91
9.3.82	15.54	-	13.25
15.3.83	16.30	-	13.82
13.3.84	17.16	-	14.48
19.3.85	17.94	-	15.15
18.3.86	19.38	-	16.39
17.3.87	19.38	18.42*	16.39
15.3.88	20.44	18.42	17.29
14.3.89	20.44	17.72	17.29
20.3.90	22.48	19.49	19.02
19.3.91	25.85	22.41	21.87
10.3.92	27.79	23.42	22.85
16.3.93	30.58	25.76	25.14
30.11.93	33.14	28.32	27.70
29.11.94	35.26	30.44	30.44
1.1.95	36.14	31.32	31.32
28.11.95	39.12	34.30	34.30
26.11.96	41.68	36.86	36.86

* Duty on unleaded petrol was previously at the same rate as leaded petrol

The two duty rate increases in the winter of 1994-95 were made as a consequence of the Government's defeat on increasing the rate of VAT on domestic supplies of fuel and power from 8% to the standard rate of VAT (currently 17.5%). Initially, in the November 1994 Budget, duty rates on petrol, unleaded petrol and diesel were all increased by between 2.5p and 3.2p per litre.⁸⁰ Subsequently Mr Clarke announced a series of revenue raising measures to deal with the estimated shortfall in Exchequer revenues of £1 billion in 1995-96, which included raising road fuel excise duties by 1p per litre, representing an additional increase in these duties of between 2.5% and 2.9%.⁸¹

The Chancellor reaffirmed his 5% target for duty rate increases in his 1996 Budget:⁸²

I firmly believe that motorists should bear the full costs of driving - not only wear and tear and congestion on the roads, but the wider environmental costs. Even those of us who frequently have to drive - and, contrary to rumours that Ministers always travel in limousines, that includes most hon. Members - can take steps to cut fuel consumption and we all ought to consider carefully the use of our car.

I intend to stick to my 1993 Budget commitment to raise motor fuel duties by an average of at least 5 per cent. each year in real terms. In line with this, I am raising the tax on all petrol and diesel by 3p per litre from 6 o'clock tonight. Those tax rises will encourage fuel efficiency and help to control harmful pollution.

Though these duty rate increases have been significant, some commentators have argued that they are insufficient if road users are to be persuaded to cut fuel consumption in the long term. For example, in October 1994 the Royal Commission on Environmental Pollution argued the 5% target was "unlikely to be sufficient to achieve environmental objectives", and instead, duties should be increased by about 9% a year, to double the price of petrol by 2005:⁸³

In view of the limited scope for existing users to modify their car purchase and travel choices in the short term, too rapid a rate of increase would be an unreasonable burden. However, we consider a doubling of the price of fuel in ten years is necessary in order to bring about substantial reductions in fuel use and make a major contribution to achieving the targets we have proposed for carbon dioxide emissions.⁸⁴ We also consider that, in order to alter users' expectations, it is important to make clear that the aim is a permanent and substantial increase in prices. Accordingly, we recommend that fuel duty be increased year by year so as to double the price of fuel, relative to the prices of other goods, by 2005.

⁸⁰ HC Deb 29 November 1994 c.1095

⁸¹ HC Deb 8 December 1994 c.475

⁸² HC Deb 26 November 1996 c.167

⁸³ Royal Commission on Environmental Pollution, *Eighteenth report: Transport and the environment*, Cm 2674 October 1994 p.114

⁸⁴ To limit emissions from surface transport in 2000 to the 1990 level, and reduce them to no more than 80% of this level by 2020. *op.cit.* p.239

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The Commission's view received strong support recently in the *Economist*:⁸⁵

The Commission is reconsidering this recommendation for its second report which is due to be published this summer - after the general election. Whichever party is in government then, the Commission should stick to its guns. Increasing the cost of petrol and diesel is an important element of any sensible approach to curbing traffic growth.

The author went on to point out that, irrespective of the Government's 5% target for duty increases, petrol prices at the pump have not risen by this figure over the past three years. This illustrates an important general point: intended price rises do not always even feed through to the consumer, let alone alter behaviour.

2. Duty differentials

Leaded, unleaded & superunleaded

The duty differential between leaded and unleaded petrol was announced by the then Chancellor Nigel Lawson in his 1986 Budget.⁸⁶ The following year a differential of 5p per gallon - about 1p per litre - was introduced, and it has been increased significantly since then. Clearly the Government believe the policy has been a great success; as the Chancellor noted in his 1996 Budget speech, unleaded petrol now accounts for two thirds of the petrol market.⁸⁷ When duty rates were discussed during the Committee stage of the *Finance Bill 1997*, Alan Milburn raised the concern that the 3p per litre increase the Chancellor had announced was to be applied across the board, shaving the differential between leaded and unleaded:⁸⁸

In recent years, the differential between leaded and unleaded petrol has increased; we all agree that air quality must be improved. It is therefore of some concern that the clause represents a step backwards. Under subsection (1) [of the Bill] the increase in duty is applied across the board to leaded, unleaded and super unleaded petrol. Before the Budget, the differential between leaded and unleaded petrol was 87.68 per cent. It is now 88.44 per cent. - a small matter, perhaps. However, it is a step in the wrong direction, given the Government's general approach to encouraging both improvements in air quality and motorists to convert to unleaded petrol. Can the Minister explain the thinking that lies behind that increase.

⁸⁵ "Jam tomorrow", *Economist*, 18 January 1997

⁸⁶ HC Deb 18 March 1986 c.180

⁸⁷ HC Deb 26 November 1996 c.167

⁸⁸ Standing Committee B 30 January 1997 cc 64-65

The Exchequer Secretary, Philip Oppenheim, responded to Mr Milburn's concern in the following manner:⁸⁹

I should clarify, on the question of the narrowing of the gap in rates of duty between unleaded and leaded fuel, the fact that there is no policy for that, but that as prices increase and cash differentials remain, the percentage of the differential tends to reduce. I accept that there has been a slight narrowing of the percentage of differential this year. We shall have to keep our eyes on that tendency in future years, because it is not our intention significantly to narrow the differential. The differential is still large, and since 1993 all new petrol cars must run on unleaded fuel. That is important, because the use of vehicles that run on leaded fuel is steadily withering away.

In his 1995 Budget, the Chancellor introduced another duty differential, between unleaded and super unleaded petrol, the duty on which was increased by a further 3.9p on 15 May 1996 to 37.62p per litre. He explained that this change "reflects its higher emission of pollutants such as benzene and the dangers to the Revenue of switching to super unleaded from leaded petrol."⁹⁰ In its 1994 report, the Royal Commission on Environmental Pollution had noted the higher aromatics content of super unleaded, compared to either premium leaded or premium unleaded (about 45%, compared with 30% and 33% respectively) posed an unnecessary risk to health, and recommended the Government end its sale.⁹¹ Following the 1996 Budget, the duty rate on super unleaded has risen in line with both leaded and unleaded, by 3p to 40.18p per litre. Robert Ainsworth raised this issue with Philip Oppenheim, concerned this increase was insufficient:⁹²

Although [super unleaded] does not contain lead and must be considered to be environmentally sound from one point of view, it certainly contains elements, including a high level of aromatics that produce volatile organic compounds to a far higher level than other fuels, which offset the benefit of the absence of lead. Yet the Minister plans a lower increase in the rate on super unleaded than on unleaded.

In reply Mr Oppenheim suggested that the current differential was proving a success:⁹³

The hon. Member for Coventry, North-East raised the question of super unleaded fuel and rightly pointed out health concerns relating to aromatics, among other things. If there has been a concerted attempt by fuel companies to target those fuels at users of highpowered cars - and the hon. Gentleman was right to say that they do not really need to use these products - it has largely failed. In my experience more and more petrol stations are ceasing to sell super unleaded. Pretty well all the supermarket petrol stations, which now take a large proportion of the market, have stopped selling it, and I welcome that. This Session's Budget did not further increase the differential between super unleaded and leaded. The previous Budget included a substantial rise with respect to super

⁸⁹ *op.cit.* c.75

⁹⁰ HC Deb 28 November 1995 c.1064

⁹¹ *Eighteenth report: Transport and the environment*, Cm 2674 October 1994 p.124

⁹² Standing Committee B 30 January 1997 c.72

⁹³ *op.cit.* cc 75-76

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unleaded fuel duty. The slight narrowing in the differential that the hon. Member for Coventry, North-East noted is something to keep an eye on, but in the marketplace consumers seem, rightly, not to be prepared to pay the extra for super unleaded, which offers no perceptible gain and a possible health risk.

Petrol, diesel & road fuel gas

The differential between the duty rate on petrol and diesel dates back to 1981, one of the very few occasions in recent years that a tax change announced in the Budget was reversed. In his Budget speech of that year, the then Chancellor Geoffrey Howe had stated: "the duties on petrol and derv will be increased from 6pm tonight by the equivalent, including VAT, of 20p per gallon."⁹⁴ This proposal was debated on the floor of the House on 30 April (cc 916-1006). Cross-party opposition was such that the Chancellor supported an amendment, moved by Trevor Skeet, to cut the excise duty increase on derv by 10p:⁹⁵

Although the reduction does not meet all the points that have been urged on me by my hon. Friends, it will be of particular benefit to rural areas and to the Scottish economy. It will also meet the concern widely expressed about the distribution cost of many commodities, ranging from food for livestock to beer and petrol, which is not unimportant.

The amendment was accepted, and, as a consequence, on 6 July 1981 the Government moved a number of Ways and Means resolutions, to increase the excise duty on tobacco products, and on gaming taxes, to recoup the estimated £85 million it had lost from the cut in derv duty.⁹⁶ Indeed, between 1984 and 1993 the differential increased steadily, from just under 3p to just under 6p. In his 1994 Budget Mr Clarke reiterated his commitment to the 5% target, then went on to announce an additional increase in the rate on diesel:⁹⁷

In recent years there has been a small differential between the duty on diesel and the duty on unleaded petrol. The differential is becoming difficult to justify in economic, health or environmental terms. I therefore propose to tax diesel at the same rate as unleaded petrol. This means an increase of about 3p a litre on diesel [which compared with a 2.5p increase in the prices of both leaded and unleaded petrol].

Since then the duties on petrol and diesel have been increased by the same amounts.

The issue of whether this duty differential should be increased or not was debated at some length during the proceedings of the *Finance Bill* in 1993. Anne Campbell argued that "a major

⁹⁴ HC Deb 10 March 1981 c.773

⁹⁵ HC Deb 30 April 1981 c.937

⁹⁶ HC Deb 6 July 1981 cc 72-235 The resolutions were passed, and suitable amendments were made to the Finance Bill on 14 July, introducing these new rates of tobacco, betting and gambling duties, and bringing the new lower rate of derv duty into effect from 2 July [HC Deb 14 July 1981 cc 1127-1136].

⁹⁷ HC Deb 29 November 1994 c.1095

incentive should be adopted to persuade people to change from petrol driven cars to cars with diesel engines" since "diesel engines emit 20 per cent. less carbon dioxide for every mile travelled."⁹⁸ The then Chief Secretary to the Treasury, Michael Portillo, suggested that the advantage diesel possessed over petrol, with respect to carbon dioxide emissions, did not justify increasing differentials any further:⁹⁹

I do not dispute that diesel engines produce less carbon dioxide per mile ... However, that is not the be-all and end-all of environmentalism. Diesel also produces other things. It produces more particulates, which is a highfalutin word for sooty particles. It is alleged that they have carcinogenic properties, and that is being investigated ... Diesel also produces more nitrogen dioxide ...

On this issue, things change from time to time, and different environmentalists, pressure groups and laboratories take different views on environmental questions ... the Department of Transport is conducting research so that we can have a broader view of the all-round environmental impact of different fuels and engine types ... We are not averse to using duty as a mechanism to stimulating environmental improvement, we must act on clear evidence. Diesel produces less CO₂, but its other effects are less clear. I do not believe, therefore, that the Committee would be justified in establishing the differential that is proposed in the amendment.

When duty rates were debated in Standing Committee in 1994, the then Paymaster General, Sir John Cope, also referred to the mixed environmental effects of diesel:¹⁰⁰

Many hon. Members have spoken as though diesel were undoubtedly an environmentally superior fuel. It is superior in relation to carbon monoxide and hydrocarbons, but it has greater emissions of nitrogen dioxide by a factor of about two and, most important, far greater emissions of particulate matter and of black smoke.

Research in this area suggests that diesel is coming to be seen as having potentially serious drawbacks for people's health.¹⁰¹ The pace of technological change, in engine and catalyser design and in fuel content, is such that it is impossible to take a fixed view of the advantages of one type of fuel over the other. This might explain why the Government has not given a categorical commitment over the future structure of fuel duty differentials.

Recently producers have developed diesels with a far lower sulphur content producing a lower level of particulates, and which can be run through catalytic converters. To encourage its production, ultra low sulphur diesel which contains a maximum of fifty parts per million of

⁹⁸ Standing Committee A 25 May 1993 c.126

⁹⁹ *op.cit.* cc 131-133

¹⁰⁰ Standing Committee A 24 February 1994 c.400

¹⁰¹ see for instance, Quality of Urban Air Review Group (QUARG), *Diesel Vehicle Emissions and Urban Air Quality*, December 1992 and QUARG, *Airborne particulate matter in the UK*, May 1996

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sulphur is to be taxed at a lower rate than conventional diesel. The Chancellor announced this measure as part of a package of fiscal measures to improve air quality in his Budget speech:¹⁰²

I am glad to say that pollution from vehicles is already coming down, helped by tax measures in previous Budgets. The tax measures that we took to encourage unleaded petrol were a huge success. It now accounts for two thirds of the petrol market. I want to go further in this Budget for green purposes or, to put it more sensibly, to attack pollution in cities and to improve air quality by effective steps to reduce particulate emissions - the smoke produced by diesel engines. In recent years, new evidence has come to light strengthening the health arguments for reducing particulates. This pollution is being reduced, but we all want to see it being reduced further and faster.

Ultra-low sulphur diesel is cleaner than ordinary diesel and it is slightly more expensive to produce, so I want to create the conditions where ultra-low sulphur diesel can cost the same at the pump as ordinary diesel. I have just said that I am increasing the tax on diesel by the same amount as petrol. I plan to reduce the duty on ultra-low sulphur diesel by 1p per litre relative to ordinary diesel, when I get the necessary international agreement.

I also want to encourage high-mileage vehicles in our towns and cities to switch to cleaner gas power. Last year's Budget changes broadly equalised the pump prices of liquid gas and petrol. From 6 o'clock tonight, I am reducing the duty on road fuel gases by a further 25 per cent. I also intend to reduce vehicle excise duty by up to £500 for lorries meeting very stringent emissions standards from early 1998. That will give an incentive for lorry owners to fit particulate traps or to convert to gas power. We will be consulting on the practical details of those changes.¹⁰³

I believe that this air quality package will significantly speed up the reduction of urban emissions of particulates, helping us to meet our air quality targets for 2005 and beyond. We intend to ensure that the economic growth that we are achieving faster than others in this country is consistent with a healthy environment and with sustainable development as we become one of the most successful economies in the western world.

During the Committee stage of the *Finance Bill 1997* the Exchequer Secretary, Philip Oppenheim, set out the Government's position on diesel fuel, before going on to explain why, subject to approval at the European level, the duty rate on ultra low sulphur diesel would be cut to 35.86p per litre.¹⁰⁴

¹⁰² HC Deb 26 November 1996 cc 167-168

¹⁰³ Vehicle Excise Duty (VED) is discussed in section VI of this paper.

¹⁰⁴ Standing Committee B 30 January 1997 c.76

The hon. Member for Coventry, North-East urged the Government further to reduce its duty on diesel fuel.¹⁰⁵ He based what he said, despite certain doubts, on its not having quite the same pollution impact as unleaded petrol. I am not necessarily sure that what the hon. Gentleman said is true. The jury is still out on that question. Real problems exist concerning particulates, and they are only beginning to be recognised. It would be unwise to try to give diesel fuel a big fiscal advantage at this stage, bearing in mind that, although buying diesel-powered vehicles entails an up-front capital disadvantage, the significantly lower running cost tends to compensate for that, for high-mileage users.

I think that our approach is right. That is, first, to reduce duty on low-sulphur diesels; secondly, to give the incentives for the fitting of particulate traps; and thirdly to ensure that a new European standard for ultra-low sulphur diesel is introduced at the most environmentally beneficial level, which we shall have to negotiate as European proposals are introduced in the next year or two.

In addition, there is one further duty differential, introduced by the 1995 Budget. At the time the Chancellor explained that studies had shown the gas used in road vehicles - liquid petroleum gas and compressed natural gas - were relatively clean fuels, and to encourage their use, he would cut the duty on them by 15 per cent: from 33.14p per kg, down to 28.17p.¹⁰⁶ These gases offer reductions in nearly all pollutants, but are more expensive to produce than diesel or petrol. The 15 per cent cut was to equalise the cost of using road gases with using either petrol or diesel. A second duty reduction was made in the 1996 Budget: a 25 per cent cut to 21.13p per kg; the intention is that if the pump price of this fuel is lower than petrol or diesel, this will help offset the cost to consumers of vehicle conversion.¹⁰⁷

B. A European carbon tax

Various different fiscal measures have been proposed to help reduce CO₂ emissions. The most popular of these measures is some type of energy or carbon tax which bases the size of the tax either on the carbon content or energy content of the fuel or a combination of the two. Many countries already have taxes on fuels, but only a few, such as Denmark, Sweden and Norway have introduced carbon taxes (as mentioned in Section III of this paper). Others have deferred doing so, believing that unilateral action would both be ineffective in reducing emissions, and would place their energy intensive industries in an uncompetitive position. The area would appear to be one where the harmonisation of taxes between countries would be ideal.

The European Commission first proposed a EU-wide energy/carbon tax in October 1991: specifically, a mixed energy and carbon tax, with 50% being levied on the level of CO₂ emissions

¹⁰⁵ Earlier in the debate Robert Ainsworth had suggested the introduction of low sulphur diesel and developments in diesel engines should be recognised in possibly widening the differential between petrol and diesel duty rates. *op.cit.* c.72

¹⁰⁶ HC Deb 28 November 1995 c.1064

¹⁰⁷ HM Customs & Excise press notice, *Changes in fuel duties*, 26 November 1996

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produced by the fuel (ie, on its carbon content) and 50% on the energy (calorific) value of the fuel.¹⁰⁸ The tax was to be introduced at the rate of \$3 a barrel in 1993 rising to \$10 a barrel by the year 2000. Large scale exemptions were suggested for energy intensive industries with a large involvement in international trade: steel, chemicals, non-ferrous metals, cement, glass, and paper. Furthermore, the Commission suggested the tax should only be introduced if other industrialised countries adopted similar measures. The tax was very strongly opposed by the UK. In addition, Greece, Ireland, Portugal and Spain all stated they would only support the tax if they, as less developed countries, could still increase their own emission levels.

In a report on climate change published in March 1995, the European Parliament's technology assessment body, STOA, commented on the opposition to this tax:¹⁰⁹

The European Parliament and the Economic and Social Committee have both supported the tax proposal. Nonetheless, the prospects for the tax have not been bright, since the governments of only six countries (Germany, Denmark, Belgium, Netherlands, Luxembourg, Italy) have pronounced themselves clearly in favour of introducing it. These six countries consider the tax necessary to achieve the joint stabilisation target, and in some cases to reach their own national target. The Netherlands and Belgium have recently announced that unless there is progress on the CO₂/energy tax proposal at the Community level, they will introduce unilateral taxes. They hope that their main trading partners, Germany, Luxembourg and France, will join them. France supports the principle of the tax, but at the same time continues to question the need for an energy component.

The United Kingdom, however, has fundamentally opposed the tax on the ground of the principle of subsidiarity in matters of taxation. The UK objects to the introduction of any tax measure through the European Community and its Commission, maintaining that fiscal instruments are not appropriate on an EU-wide basis. Popular and political opposition to an extension of VAT on domestic fuels in Britain, and the British Parliament's rejection of increasing such taxes illustrate how difficult it would be for a British government to push through a rise of energy taxation - especially one initiated by the European Community. Remaining Member States did not explicitly profess their unwillingness to introduce a tax, but let the UK take the lead in opposing the tax.

In October 1994 a compromise proposal was presented at the Environment Council, comprising an increase in the existing European minima for duty rates on mineral oils, and a broadening of this system to include other products. By December 1994, the proposal had been dropped entirely, and the Council agreed simply that further discussions should take place. In December 1996 it was reported that the Commission was in the process of drawing up a new draft text, similar to that proposed two years before, to increase the existing minimum duty rates on mineral oils, and to agree new minima for other energy products.¹¹⁰ This is discussed in the following section.

¹⁰⁸ *Proposal for a Council directive introducing a tax on carbon dioxide emissions and energy*, EC draft 7018/92 30 June 1992

¹⁰⁹ Scientific & Technological Options Assessment (STOA), *Climate change and energy use: final report*, March 1995 p.60

¹¹⁰ "EC energy tax plan ignites controversy", *The European*, 5 December 1996

C. Excise duty rates & energy taxes across the EU

The harmonization of indirect taxes has been seen for some time as vital to the creation of the Single European Market, as the Treaty of Rome recognises. Article 99 of the Treaty states that "the Council shall, acting unanimously on a proposal from the Commission ... adopt provisions for the harmonization of legislation concerning turnover taxes, excise duties and other forms of indirect taxation to the extent that such harmonization is necessary to ensure the establishment and the functioning of the internal market." It should be emphasised that legislation in this field must be agreed **unanimously** at Council level.

The current agreement on harmonising excise duties was reached on 24 June 1991 and incorporated into a number of EC directives adopted on 19 October 1992. Specific minimum rates were set for excise duties on mineral oils, alcohol, and tobacco products, from 1 January 1993.¹¹¹ Member States are free to set rates appropriate to their own circumstances, provided they were not lower than the minimum levels specified in the relevant directive. In each case, the Council of European Finance Ministers (ECOFIN) agreed that these minimum rates should be reconsidered every two years. The minimum rates for major categories of mineral oils are given below:¹¹²

Product	Minimum rate £ per 1,000 litres	UK rate £ per 1,000 litres
Leaded petrol	239.27	416.80
Unleaded petrol	203.77	368.60
Diesel (DERV)	175.37	368.60
Heating gas oil	12.78	25.00

(Rates in ECU are given in the table on page 37.) No significant changes have been made since then. This gives some indication of the relative importance accorded duty harmonisation, in comparison to VAT harmonisation. Indeed little appears to have been written on the future prospects of the former, beyond the pressure that cross-border sales, in alcohol and tobacco, has put on the UK to align these excise duties with those on the Continent.

¹¹¹ The four directives setting minimum duty rates were: cigarettes (92/79/EEC); other tobacco products (92/80/EEC); mineral oils (92/82/EEC); alcohol (92/84/EEC).

¹¹² ECU exchange rate as of 25.2.97: 1 ECU equal to £0.71. UK duty rates as of 26.11.96. In addition, a minimum duty rate for heavy fuel oil is set at £9.23 per 1,000 kg. There is no single equivalent category in the UK, though UK rates on oils which fall under this definition - such as diesel - comply with this standard.

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On 23 October 1995 ECOFIN considered a report from the Commission which concluded that action should be postponed pending a wider analysis of the range of relevant issues.¹¹³ As the report made no concrete proposals, the Council simply discussed it; no legislative decision was required. Initially the Commission was to make a further report on duty rates by the end of 1996.¹¹⁴ During the Committee stage of the *Finance Bill 1997*, the Exchequer Secretary, Philip Oppenheim, commented, "the Commission is currently undertaking a review of excise and other duties, possibly with a view to recommending some harmonisation. It is due to report by the end of the year."¹¹⁵

Recently the Commission has published work on the overall future for all taxation in Europe. In March 1996 the Commission issued a working paper on taxation for the Verona ECOFIN Council (13 April 1996).¹¹⁶ Although taxation was recognised as an important element of the Single Market, the paper placed limited emphasis on harmonisation, despite some commentators' assessment of it as much more direct and action-minded than previous policy papers. Indeed, it was argued "there is no issue of harmonisation per se", though it suggested harmonisation measures would be put forward "where appropriate".

To further discussion of this paper, the Verona Council established the 'High-Level Group on Taxation', comprised of personal representatives of ECOFIN Ministers. During the year the Group met 4 times. In October, its chairman, Mario Monti, the Commissioner responsible for the internal market and taxation, published a personal report summarising the work of the Group, and his proposals for the way forward.¹¹⁷ This report made the following comments on environmental taxation:¹¹⁸

The environment

- 6.15 For the *environment* the Commission acknowledges the need to explore an increased use of energy and environmentally related taxes. However, current practice shows that environmental objectives are often best achieved when taxation instruments are combined with other measures, used consistently to change behaviour. In deciding the choice of instruments, the effects on competitiveness, on employment and on the environment should be carefully assessed.
- 6.16 Although the appropriate mix of policy instruments for achieving environmental objectives may not be the same for all Member States, it is essential that differences are compatible with the smooth functioning of the Single Market. In this respect, the Commission will present shortly a communication giving guidelines for Member States on the use of environmental taxes on the basis of current Community law.

¹¹³ HC Deb 3 November 1995 cc 505-506W; see also, HM Customs & Excise, *Explanatory Memorandum on Commission Report COM(95) 285 final*, 25 October 1995

¹¹⁴ HC Deb 13 June 1996 cc 237-238W

¹¹⁵ Standing Committee B 28 January 1997 c.23

¹¹⁶ *Taxation in the European Union*, SEC (96) 287, 20 March 1996

¹¹⁷ *Taxation in the European Union*, COM(96) 546 final 22 October 1996

¹¹⁸ *op.cit.* p.8

6.17 Although Member States will need to judge the degree to which fiscal instruments will be necessary to meet their environmental goals at a national level, there is one clear area where action has been identified as necessary at Community level. This concerns the taxation of energy products which, inter alia, has an important role to play in helping to achieve the objective of stabilising CO₂ emissions by the year 2000 at the 1990 level. In this context, the Commission will bring forward new proposals on the taxation of energy products before the end of the year. These proposals will provide a common framework, giving Member States flexibility to modulate their tax systems in the light of their own national circumstances while respecting the proper functioning of the Single Market.

In December it was reported that the Commission was in the process of drawing up a draft text, to increase the existing minimum duty rates on mineral oils, and to agree new minima for other energy products:¹¹⁹

The new taxes, which would come on top of VAT and be phased in over a four-year period starting on 1 January 1998, would also provide member states with increased revenue during the crucial stages of monetary union. 'We are still looking at economic instruments such as tax as a way of curbing carbon dioxide emissions,' said Stephen Bill, DG21's head of indirect taxation.¹²⁰ 'It will probably go before the college of Commissioners early next year. We have made some amendments since it was first presented to the other Commission services in September, but I do not expect many more. I would give the present document, in its basic form, a 50:50 chance of becoming a directive.'

EU ministers have pledged to stabilise carbon dioxide emissions at 1990 levels by 2000. Emissions are still rising, however, mainly due to higher pollution from cars and power stations. The proposal has already infuriated large industrial consumers of energy, who say it would make them uncompetitive with producers outside the EU, especially in the US. They believe that the new proposal contradicts the Commission's attempt to bring down energy costs to consumers through the liberalisation of the electricity and gas markets. The directive would tax electricity, causing prices to rise by around two to three per cent in most member states. Only four EU countries currently impose tax other than VAT on electricity: Denmark, Italy, France and the Netherlands.

It also sets out minimum levels of taxation for motor fuels such as petrol, gas oil and kerosene. Greece, Ireland, Luxembourg and Spain all currently levy lower excise duties on these products than those proposed by DG21. Only the UK levies higher taxes on oil than the minimum rate proposed. Taxes are also proposed on coal and natural gas. Eleven member states currently do not tax coal and another eight have no excise tax on natural gas. Denmark, Sweden and Finland already apply a wide range of energy taxes and are unlikely to oppose the adoption of the measure. France and Germany backed the idea of excise taxes as an alternative to the carbon tax in 1994. UK sources in Brussels said John Major's government was unlikely to make a fuss over energy taxes in the run-up to next spring's election, a view which may raise Euro-sceptical eyebrows in London.

¹¹⁹ "EC energy tax plan ignites controversy", *The European*, 5 December 1996

¹²⁰ DG21 is the EC's Directorate-General for the internal market.

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This is not a carbon tax. The method has completely changed,' said Volker Stehmann, executive secretary at Eurelectric, which represents the European electricity supply industry. 'It is an energy tax. Private consumers will notice the tax on their electricity bills. The question is whether it will make them change their consumption attitudes. I don't think so.' A spokeswoman for the Paris-based International Federation of Industrial Energy Consumers said: 'We do not need energy taxes to be motivated to undertake measures that have a good impact on the environment. Companies for whom energy is a very significant portion of their costs cannot take on any, even slight, additional burden without being very much disadvantaged in the market. For most energy-intensive industries, the energy component is the only variable that makes or breaks competitiveness.' ...

Details of these new minimum rates were given at the time in the *Financial Times*, from which the table reproduced on the following page is taken.¹²¹

¹²¹

"EU acts on minimum energy tax rates", *Financial Times*, 6 December 1996

Taxes on energy products in the EC: new minimum rates

	Petrol	Lead-free petrol	Diesel	Heating oil	Heavy fuel	Coal	Natural gas	Electricity (Industrial consumption)	Electricity (Household consumption)	Electricity (Nuclear Production)	
	(Ecu per 1,000 litres consumed)				(Ecu per 1,000 kg consumed)						
Existing EU minimum rates	337	287	245	18	13	-	-	-	-	-	
Proposed minimum rates	450	450	343	21	18	5	7	1	1	1	
Existing rates in selected countries											
Denmark	538	448	314	241	272	127	32	6.9	63.1	-	
France	596	556	334	75	24	-	11	0.5% of price	8.5% of price	-	
Germany	579	526	334	47	20	-	21	-	-	-	
Italy	526	484	354	354	43	-	6-122	1.9	1.9	-	
Spain	400	367	267	78	13	-	-	-	-	-	
UK	472	414	414	28	22	-	-	-	-	-	

Source: European Commission Directive-General for Customs and Taxation [taken from: *Financial Times*, 6 December 1996]

Note: the EC has based its figures for existing duty levels in the UK on those in force up to 26 November 1996

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Since December 1996 there has been a considerable lobbying effort to amend the proposals and some speculation as their final form:¹²²

The European Commission will try next week to adopt a controversial proposal to raise minimum taxes on mineral oils such as petrol and diesel, a move fiercely opposed by European industries. The Commission itself was split on the issue at a meeting earlier this month. But officials hope a new text stressing that member states should use the additional tax revenue to lower labour costs will rally the majority. 'We have put the emphasis on the need to ensure that the tax is fiscally neutral; that it contributes to creating employment through a reduction in social contributions,' a Commission official told Reuters. But European industry fears a cut in salary-linked contributions will not happen or will only partially offset the increase in minimum EU rates on motor and heating fuels and their extension to electricity, coal and natural gas ...

The Commission's latest proposal on minimum taxes has already been softened from earlier drafts to meet the industry's objections. The Commission wants to promote fairer trade in the 15-country bloc, which scrapped its internal borders in 1993. There has been much gnashing of teeth in Belgium and Germany about their citizens nipping across the border to buy cheaper petrol and diesel in neighbouring Luxembourg. The proposal also answers a call by EU leaders to raise excise duty rates to compensate for the deadlock on an old proposal to introduce a CO2 tax to curb climate change. European Trade Commissioner Sir Leon Brittan and his industry and economic affairs counterparts, Martin Bangemann and Yves-Thibault de Silguy, are still said to oppose the proposal by Internal Market and Taxation Commissioner Mario Monti. De Silguy is reported to have told fellow commissioners on February 12 that the proposal was ill-timed because EU states were already taking unpopular measures to meet strict budget criteria to qualify for the European single currency.

The Commission agreed a draft text on 12 March summarised in a press notice issued at the time:¹²³

a) Scope

The proposal for a Directive includes within its scope all energy products: apart from the mineral oils already covered by excise duties, these are chiefly coal, natural gas and electricity. For all these products, with the exception of electricity, only their uses as motor fuel or heating fuel are taxed, and not their use as raw materials, nor in chemical reductions or for electrolysis. As regards electricity, the proposal for a directive provides for the taxation of output at the final consumption stage. Member States are also authorized to refund to the producer the tax paid by the consumer where they wish to encourage the use of renewable energy sources.

b) Minimum rates

Proposed minimum rates [are given] which are intended to lead to a closer approximation of national rates in three two year stages [from 1998 to 2002]. The minimum levels of taxation for the last stage (2002) are put forward as target rates and will need to be confirmed as binding in a subsequent report and proposal from the Commission. In its report, the Commission will pay particular attention to the measures taken by Member States to avoid any increase in their overall tax burden.

¹²² "European Commission moves to raise energy taxes", *Reuter Textline*, 25 February 1997

¹²³ "Commission adopts proposal on energy taxation : European Commission press release: ip/97/211 Document date: March 12, 1997", *Reuter Textline*, 13 March 1997

These minimum levels are set for the following three categories:

- * energy products used as motor fuels;
- * energy products used as motor fuels for certain industrial and commercial purposes;
- * energy products used as heating fuel.

As regards the structure of rates, the following should be noted:

- * the difference in taxation between petrol and gasoil is gradually reduced;
- * a very low level is set in 1998 for newly taxed products;
- * heating fuels and motor fuels used for certain industrial and commercial purposes receive more favourable treatment;
- * in 2002 the energy value is the basic criterion for taxation.

c) Differentiation of rates

The Member States are free to apply differential rates to the same product, provided that these rates are higher than the minimum levels. This tax technique is already widely used by Member States to guide consumers towards more environmentally friendly products.

d) Exemptions and reduced rates

Member States are obliged to exempt energy products used for the purpose of air navigation (until such time as their international commitments permit them to tax them), and products used for navigation within Community waters. Member States may also choose to exempt (or to tax at a reduced rate) renewable energy sources, biofuels, energy products used in the field of pilot projects, the carriage of goods and passengers by rail, and navigation on inland waterways.

e) Provisions to assist firms

In order that the setting of new Community minimum levels do not harm the competitiveness of European firms vis-vis third countries, the Commission is proposing:

- for firms whose energy costs are between 10% and 20% of production costs, that Member States may refund some or all of the tax paid by a firm on the proportion of their energy costs in excess of 10% of its total productions costs;
- for firms whose energy costs are higher than 20% of production costs, that Member States be obliged to refund all the tax paid on the proportion of their energy costs in excess of 10% of their total production costs.

A preliminary discussion of these proposals was held at the ECOFIN meeting on 17 March, when Ministers suggested the Committee of Permanent Representatives should "examine the proposal in view of an indepth discussion, if possible, at the ECOFIN meeting in May."¹²⁴ When asked about the March ECOFIN meeting, Phillip Oppenheim, who represented the UK, said that¹²⁵:

The Commission presented proposals for an energy products directive. I made it clear that any proposals which would require the UK to introduce new taxes on gas, electricity or coal would be unacceptable'.

¹²⁴ *Council of Ministers conclusions*, 17 March 1997 (provisional text)

¹²⁵ HC Deb 21 March 1997 c 971W

V. VAT on fuel & power

A. Introduction

As well as the commitment to increase road fuel duties on average by at least 3% a year, in the March 1993 Budget the then Chancellor, Norman Lamont, announced the two stage abolition of the zero rate of VAT on domestic supplies of fuel and power:¹²⁶

... We intend to raise road fuel duties on average by at least 3 per cent. a year in real terms in future Budgets, in addition to the increase I have already announced for this year ...

However, in order to meet the commitment that we entered into at Rio, action will be required not just in the transport sector, but across the whole economy, and in deciding how best to meet our carbon emissions target, we will need to ensure that the right incentives are in place throughout the economy — encouraging people to consume less and conserve more. Above all, it is crucial to avoid taking measures that will have a disproportionate impact on the competitiveness of British industry.

Against this background, I have one further measure to propose that will not only encourage greater energy efficiency in every household in the country, but will also raise a considerable amount of revenue for the Exchequer over the years ahead. Fuel and energy supplies to industry pay VAT in Britain. Those to the home do not. In this respect, we are unique in the European Community. I therefore propose, over the next two years, to end the zero rate of VAT on domestic fuel and power. Again, this change will not come into effect immediately, but in 1994. VAT will be charged at 8 per cent. from 1 April 1994 and at 17½ per cent. from 1 April 1995.

This measure will raise some £950 million in 1994-95, £2.3 billion in 1995-96 and around £3 billion a year thereafter. For the first time, the rate of VAT on domestic fuel and power will be the same as that charged on goods like loft insulation material, which improve energy efficiency. This will bring to an end the current anomaly, which makes nonsense of any attempt to use the tax system to improve the environment.— *[Interruption.]* ...

Social security benefits will, of course, rise automatically to reflect the price effect of this change, but I recognise that this will cause particular problems for those on low incomes. My right hon. Friend the Secretary of State for Social Security will take this into account when the income-related benefits are uprated next year.

Taken together with the measures which have already been announced, these tax proposals take Britain two thirds of the way to meeting the Rio target, and they will do so in a way that does the least possible damage to the competitiveness of British industry. I am confident that the remaining gap can be filled through sensible energy-saving measures, as and when the convention is ratified by our major industrial competitors.

The abolition of the zero rate was to have been accomplished in two stages. From 1 April 1994 to 31 March 1995 supplies would be charged VAT at the transitional rate of 8%. From 1 April 1995 they would be charged the standard rate (currently 17.5%). Previously these supplies had been zero-rated since the introduction of VAT in 1973.

The abolition of this zero rate was implemented by section 42 of the *Finance Act 1993*. Further legislation would not have been required to ensure supplies became liable to the standard rate on 1 April 1995. However, in January 1995 the Government was required to introduce amending legislation following its defeat on the Budget Resolution vote relating to VAT on domestic fuel, so that these supplies have continued to be charged the 8% reduced rate.¹²⁷ The imposition of VAT on these supplies has raised £850 million in 1994-95, and £1,100 million in 1995-96.¹²⁸ It should be emphasised that the decision to end the zero-rating of these supplies was the Government's alone; the UK was not forced to take this step under EC VAT law, as some have suspected. Section V.D examines the issue of European law in a little more detail, though the matter is discussed in some depth in a recent Library Research Paper.¹²⁹

B. Standing charges

VAT is charged on both parts of someone's fuel bill; that is, both the standing charge element, and the variable charge. It was the Government's decision to do this; the utility companies do not have any discretion in whether they charge VAT on standing charges or not, though some customers have suspected they might have. VAT is charged on the supply of all goods and services, unless they are specifically exempt, made in the course of a business by a taxable person. VAT is generally charged on the entire cost or value of any taxable supplies - that is, the consideration in money which the business receives in return for this supply. The definition of "value" is given in Section 19 of the *Value Added Tax Act (VATA) 1994*. Section 19(2) of *VATA 1994* states: "If the supply is for a consideration of money its value shall be taken to be such amount as, with the addition of the VAT chargeable, is equal to the consideration." If a supplier divides any bill for a single supply into a variable element, and a standing charge, both parts will be charged VAT in the normal way.

As a consequence, standing charges for domestic supplies of fuel and power are charged VAT at 8%. During the Committee stage of the *Finance Act 1993*, the then Chief Secretary to the Treasury, Michael Portillo, explained that it would be too costly to charge VAT on only one part of the charge for supply:¹³⁰

¹²⁷ Section 21 of the *Finance Act 1995*, which amended the *VAT Act 1994* accordingly.

¹²⁸ HC Deb 13 February 1997 c.313W

¹²⁹ *VAT Harmonisation*, Research Paper 97/31, 27 February 1997

¹³⁰ HC Deb 10 May 1993 c.519

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If we were to exclude standing charges from VAT that would mean a substantial reduction in the revenue and we would then have to seek that revenue elsewhere. It would be administratively extremely inefficient to exclude standing charges, and it would certainly mean that in the long term the industries would be given the opportunity to restructure the way in which they charged people in order to avoid VAT falling on their supplies.

The then Paymaster General, Sir John Cope, went on to make an additional argument for charging VAT in this fashion:¹³¹

It has been suggested that we should not apply VAT to the standing charge as that would somehow offer help to the most needy. Some of the least well-off gas consumers pay by token meters. Their standing charge is lower and their unit charge is higher. As a result, that suggestion would not help the most needy. They would benefit less than other consumers from zero-rated standing charges. In any case, it is difficult to see how one could divide up a fuel bill and avoid problems

It has been argued that standing charges represent a charge for the supply of other services, quite separate from the actual supply of fuel and power, and should not now be included in the assessment of electricity and gas bills for VAT. However, if this were the case, standing charges would now have to be charged VAT at the standard rate, currently 17.5%, since there is no separate provision in *VATA 1994* for their zero-rating.¹³²

C. Compensation & regressivity

When the abolition of zero-rating was first announced, the Government intended to provide compensation for poorer pensioners and disabled persons on income-related benefits. This compensation was in addition to the increases made to all income-related benefits under the normal uprating rules, to keep benefits in line with inflation. In his November 1993 Budget the Chancellor, Kenneth Clarke, announced that this extra compensation would be given to all pensioners, in two staged increases in the weekly retirement pension: one from April 1994; the second from April 1995. Following the decision not to impose the full rate of VAT on fuel, the second element of this compensation was withdrawn. In April 1995 the weekly rate of retirement pension for a single person rose from £57.60 to £58.85. The rate for a married couple (wife on husband's insurance) increased from £92.10 to £94.10. Both these represent increases in line with the 2.2% change in the Retail Prices Index (RPI) in the year to September 1994. These rates replace those which had previously been announced at the time of the 1994 Budget - £59.15 single and £94.45 married. These figures included the 2.2% uprating factor, and the second tranche of extra compensation for VAT on fuel which had been withdrawn.

¹³¹ *op.cit.* c.594

¹³² Sir John Cope confirmed this in a written answer in March 1994: HC Deb 29 March 1994 c.643W

Of course existing compensation for the first phase of VAT on fuel remains as part of the benefit rates. So, for example, from April 1995 the basic pension for a single pensioner includes 70p compensation and for a pensioner couple £1.05 per week. These figures represent the sum of compensation awarded on top of the normal uprating in April 1994 in anticipation of the first phase of VAT on fuel (50p for single and 70p for married), and an element of the 2.2% uprating which results from the effect of the first phase of VAT on fuel on the rise in the RPI in the year to September 1994 (20p single and 35p married). These amounts are subsumed within the normal benefit rates and, contrary to what some have thought, they are not separately identified in social security order books. Apparently this would be difficult to do in practical terms. Moreover, the enhancements were not a separate benefit but an integral part of the existing benefit which will be uprated in future years.

Despite this compensation, many commentators have pointed out that VAT on domestic fuel is a regressive tax, as spending on domestic energy accounts for a considerable share of spending by poorer households and rises little with increasing income.

The regressive nature of the tax lies behind Labour's objection to VAT on domestic fuel, and its commitment to reduce it to 5 per cent.¹³³ The Institute for Fiscal Studies reviewed the distributional impacts of this move in their most recent *Green Budget* as shown in the table on the next page:¹³⁴

¹³³ First announced by the Shadow Chancellor, Gordon Brown, on 2 October 1995 at the party's annual conference: "Brown aims to cut VAT on fuel to 5%", *Times*, 3 October 1995

¹³⁴ IFS, *Options for 1997: the Green Budget*, October 1996 p.133

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Reducing the VAT rate on fuel from 8% to 5%: who would gain?

<i>expenditure</i>	<i>Average size of gain (per week)</i>	<i>Average size of gain as share of total</i>
Income decile 1 — £61 per week	£0.25	0.44%
Income decile 2 — £97 per week	£0.29	0.38%
Income decile 3 — £136 per week	£0.31	0.31%
Income decile 4 — £181 per week	£0.32	0.24%
Income decile 5 — £230 per week	£0.35	0.22%
Income decile 6 — £281 per week	£0.36	0.20%
Income decile 7 — £342 per week	£0.38	0.18%
Income decile 8 — £411 per week	£0.41	0.18%
Income decile 9 — £515 per week	£0.41	0.14%
Income decile 10 — £827 per week	£0.52	0.13%
Age 20-34	£0.32	0.21%
Age 35-49	£0.41	0.20%
Age 50-64	£0.40	0.22%
Age 65+	£0.31	0.33%
Average	£0.36	0.24%

Note: This shows first-round effects only; losses if benefits were indexed are not included.
Source: Family Expenditure Survey, 1994/95.

The authors went on to make the following comments on the party's proposal.¹³⁵

As can be seen, the overall effect is progressive, with the highest gain as a share of expenditure accruing to those over 65, a group of particular concern. In the past, the Labour Party has claimed that not only is such a tax inequitable but, since the demand response to price changes is estimated to be low, it is also ineffective in reducing carbon dioxide emissions. In itself, this is not a watertight argument, since the tax should be set at the level that elicits the desired amount of emissions reductions. The demand curve represents the marginal cost to society of reducing carbon dioxide emissions in terms of the increased energy costs. An inelastic demand curve simply means that this cost increases more sharply than for a more elastic demand, and so the desired level of emissions reductions is lower than for elastic demand.

What could be true, though, is that industrial demand is more price elastic, and so a given tax would elicit a greater response from industry than from domestic users. In addition, lack of awareness of the possibilities, or capital constraints, may prevent homeowners from undertaking cost-effective energy efficiency improvements (such as roof insulation and fitting double glazing), resulting in a lower-than-optimal response to increased energy prices.

D. The EC VAT rules

The harmonisation of VAT across the EU is well advanced, and no Member State has complete discretion in charging this tax. The sixth EC VAT directive (77/388/EEC), adopted on 17 May 1977, established common criteria for the VAT base, specifying those goods and services which could be exempt. Agreement on harmonising VAT rates was reached in June 1991, and incorporated in directive 92/77/EEC of 19 October 1992, which amended the sixth directive accordingly. In brief, all Member States:

- must apply a standard VAT rate of 15% or more from 1 January 1993.
- have the option of applying one or two reduced rates, no lower than 5% to certain specified goods, as listed in Annex H of the directive.
- are able to continue charging any lower rates, including zero rates, that had been in place on 1 January 1991 for the duration of the "transitional period", assuming these rates were in accordance with Community law.

Separate provision was made in the directive for Member States to apply a reduced rate to supplies of natural gas and electricity, should they so wish (Article 12(3b), as amended). In addition, the UK secured a special right to bring any of its zero rates into a reduced rate band, even if they were not in Annex H (under Article 28(2b), as amended). As a consequence the UK has been able to charge the reduced rate of 8% for domestic fuel and power on supplies of fuel oil, coal, and peat (since they are not covered by the provision dealing with supplies of natural gas and electricity). It is important to note that Member State may only continue to charge zero rates in place on 1 January 1991. No Member State can introduce a new zero rate or reintroduce a zero rate once it has been abolished.

Initially it was thought that the "transitional period" would come to an end on 31 December 1996, when a definitive VAT regime came into force. However, there has been considerable delay in the next stage of VAT harmonisation. No legislation has been proposed as yet, and without unanimous agreement on any future changes in EC VAT law, these arrangements may continue indefinitely.

As mentioned, there is provision for all Member States to charge a reduced rate of VAT - between 5% and 15% - on "supplies of natural gas and electricity provided that no risk of distortion of competition exists", under Article 12(3b) of the sixth VAT directive.¹³⁶ Article 12(3b) goes on to state, "a Member State intending to apply such a rate, must, before doing so, inform the Commission. The Commission shall give a decision on the existence of a risk of distortion of competition. If the Commission has not taken that decision within three months of the receipt of the information a risk of distortion of competition is deemed not to

¹³⁶

Indeed Ireland, Italy and Luxembourg do this in practice: HC Deb 15 October 1996 cc 834-836W.

exist." It has been estimated that reducing the VAT rate on domestic fuel and power to 5% would cost £430 million in a full year.¹³⁷

Nonetheless, there has been some doubt cast on whether the UK could do this. It was reported recently that the Commission felt this move would not be 'within the spirit of the transitional arrangements', and, as such, might result in this decision being legally challenged.¹³⁸ Clearly a definitive answer to this question lies with the ECJ itself, but one wonders if the possibility has been rather overstated in the press. The Commission has answered this question twice in recent years: in September 1994, and November 1995.¹³⁹ On the first occasion, it stated simply that the sixth VAT directive "permits Member States, under certain conditions, to apply a reduced rate of VAT, which may not be less than 5%, to supplies of natural gas and electricity."¹⁴⁰

On the second occasion, the Commission used the opportunity to refer to the wider aim of greater harmonisation in VAT rates; the answer is reproduced in full below:¹⁴¹

Question No 90 by Barry Seal (H-0748/95)

Subject: VAT on domestic fuel

Would there be any European Union opposition to a future British Government reducing VAT on heating fuel from 8% to 5% in order to help the elderly and people on low incomes?

Answer

Those Member States which, at 1 January 1991 and in accordance with Community law, exempted supplies of fuel and power from VAT, with a refund of the VAT paid at the previous stages (i.e. zero-rated), or applied reduced rates lower than 5% are, on a transitional basis, entitled to continue to apply those zero-rates or to apply a reduced rate, which may not be less than 5% (Article 28(2)(b)). At present, the taxation of heating fuel in the UK is based on this provision.

However, the general position in Community legislation is that Member States should apply a standard rate of VAT, which may not be less than 15%, to the supply of domestic fuel and power. The above-mentioned transitional arrangements (which will anyway finish when the definitive VAT system for the internal market comes into force) were agreed in order to enable Member States, for a certain time, to keep the status quo. This does not mean that a zero-rate cannot be changed. But it is evident that, if changes were to be made, they could only have as their aim further harmonization, i.e. taxation at the standard rate. Thus, the earlier decision of the UK government to give up the zero-rate and to apply a reduced VAT rate of 8% to heating fuel instead of the zero-rate, is in line with the wording and the underlying ideas of the transitional provisions.

¹³⁷ HC Deb 29 January 1997 c.238W

¹³⁸ "Labour plan to cut VAT on fuel faces threat from EU", *Guardian*, 15 February 1997

¹³⁹ Apparently the journalist responsible for the *Guardian* piece cited above based his article on the second of these answers, and a personal briefing from an official in the office of Mario Monti, the Commissioner with responsibility for taxation.

¹⁴⁰ EP written question E-1771/94 OJC 24 30 January 1995

¹⁴¹ EP written question H-748/95 OJ Annex 4-470 13-17 November 1995

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Conversely, any possible move by the British government to reduce the VAT rate on heating fuel from 8% to 5% would go against the objective of further harmonization and would not be within the spirit of the transitional arrangements.

If any such request were to be received from the British Government, the Commission would examine it against this background.

It is notable that the Commission does *not* state that it believes that this move would be illegal under European law. One suspects the Commission's choice of words may have a good deal to do with its wish to see better progress toward a definitive VAT system.

E. VAT on energy saving materials

When he announced the abolition of the zero rate of VAT on domestic supplies of fuel and power in his March 1993 Budget, the then Chancellor, Norman Lamont, commented that, "for the first time the rate of VAT on domestic fuel and power will be the same as that charged on goods like loft insulation material, which improve energy efficiency. This will bring to an end the current anomaly, which makes nonsense of any attempt to use the tax system to improve the environment".¹⁴²

In January 1995 Alan Simpson introduced a Private Members Bill to charge the same rate of VAT on a range of materials which reduce domestic use of energy, such as domestic heating controls, draught-proofing materials, loft insulation, cavity wall insulation, hot water tank jackets and low-emissivity glazing.¹⁴³ Mr. Simpson quoted Mr Lamont's comments when he set out the case for his Bill at its Second Reading.¹⁴⁴

The former Chancellor pursued an impeccable logic - it is a transparent nonsense to tax goods that save energy more heavily than we tax consumption ... There is no point in having environmental or energy conservation policies that are moving in one direction, when the weight of the tax system pulls in the opposite direction.

It cannot be in the Government's interest to hold a view the defacto consequence of which acts as a disincentive to people to pursue energy efficient measures such as insulating their homes to reduce their energy bills ... If the Government raise the tax on energy use, it is the poorest people who will have the least scope for exercising elasticity of demand in terms of the fuel they use. For those at the lowest end of the income scale, raising taxes on fuel use is demand inelastic. We must find ways to give low-income households easier access to energy-reducing materials to make their homes more energy-efficient.

¹⁴² HC Deb 16 March 1993 c.183

¹⁴³ *Energy Saving Materials (Rate of Value Added Tax) Bill* [HC Bill 31 1994/95]

¹⁴⁴ HC Deb 20 January 1995 cc 975-976

Though the debate was adjourned for want of time, and the Bill did not complete a Second Reading, it did attract cross-party support. Indeed there were 342 signatories to an Early Day Motion in favour of the proposal.¹⁴⁵ No official estimate of the cost of this measure has been made, though the trade lobby group ACE has suggested it might cost £10 million in a full year.¹⁴⁶

During its Second Reading, Richard Spring was one of those who spoke against the Bill:¹⁴⁷

The most significant problem [in the Bill] is the issue of an intermediate rate of VAT ... I believe that it is important that this country does not go down the route of having countless different levels of VAT. The complications of that from a fiscal and administrative point of view are enormous. There are many worthy causes. Every hon. Member knows of constituents who have an interest in a particular subject and are pleading for a lower rate of VAT ... [Moreover EC VAT law] gives scope for reduced VAT levels on certain goods and services. But the blunt truth is that energy-efficient goods are not included on the list ... The heart of the Bill is incompatible with European law.

The current structure of EC VAT law was discussed in an earlier part to this paper (V.D). In essence, Member States may only charge a reduced rate of VAT on those goods and services listed in Annex H to the sixth EC VAT directive (77/388/EEC). Annex H includes certain supplies which are standard-rated for VAT at present in the UK - including, hotel accommodation (item 11), and admission to cultural events (item 7) - but it makes no mention of energy saving materials. One might add that charging a reduced rate of VAT is a rather blunt instrument for encouraging lower income households to purchase energy saving materials, rewarding, as it does, all households for doing so, irrespective of their income.

When this issue arose a few days later, during the Standing Committee debates on the Finance Bill, the Paymaster General, David Heathcoat-Amory, made a similar case to Mr Spring's:¹⁴⁸

We do not intend to bring in any more reduced rates of VAT. To do so would undermine the comparative simplicity of the VAT system in this country. It would create new boundary lines between rates and types of products and services, which would provide endless scope for disputes and difficult decisions ...

In answer to a question about energy saving materials, I can confirm - it was apparently not understood by the hon. Member for Nottingham, South (Mr. Simpson), who introduced his Bill last Friday - that such products are not on the annexe to the sixth VAT directive and therefore we could not introduce a reduced rate for such products, even if we wished to.

¹⁴⁵ EDM 383 of 1994-95, *Reducing VAT on energy saving materials*, 12 January 1995

¹⁴⁶ HC Deb 20 November 1996 c.572W

¹⁴⁷ HC Deb 20 January 1995 c.979

¹⁴⁸ HC Deb 23 January 1995 c.58

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As a consequence, it seems relatively unlikely that the Government would wish to create a new reduced rate of VAT for energy saving materials in the near future. These points were confirmed by Robert B. Jones, Minister for Construction, Planning and Energy Efficiency, in an adjournment debate on energy conservation in July 1996:¹⁴⁹

The hon. Gentleman referred to VAT. He will know that that subject has been raised on a number of occasions with my right hon. and learned Friend the Chancellor. The Government's long-standing policy is one of a simple taxation system, with just the standard rate of VAT operating in conjunction with the zero rate. The 8 per cent. reduced rate for domestic fuel and power is the exception. Long-term retention of that, as the hon. Gentleman will know, was not of the Government's choosing. I understand that my right hon. and learned Friend has no intention of extending that unique reduced rate to other areas of spending.

My right hon. Friend the Paymaster General has set out the Government's view that, notwithstanding all the arguments made by the energy efficiency industry, it would be difficult to set a special rate for energy-saving products. To try to do so might well achieve little and would certainly complicate the operation and administration of the tax. There seems little doubt that it would give rise to disputes about the energy-efficient qualities of various products - about the boundaries between those goods and services that should and should not be included.

Most recently the issue was raised at the Report stage of the *Finance Bill 1997*, when Alan Simpson put down a new clause to allow taxpayers to claim part of the cost of purchasing these products against income tax.¹⁵⁰ Mr Simpson used this tactic since he was prevented from proposing any amendment to cut the rate of VAT on these or any other products under the amendment of the law resolution. These resolutions are passed after the Budget debate each year, and determine the scope of the Finance Bill. Any amendments that are made to the Bill during its progress through the House must fall within its scope.

The proposed tax relief was strongly criticised, for being exploitable and for only providing relief for those with sufficient incomes to be paying income tax, and in the event it was not adopted. However the Government accepted a second new clause put forward at the same time. This requires the Treasury to prepare a report within twelve months of the *Finance Act* receiving the Royal Assent "on the consequences to the Exchequer of reducing VAT on energy saving materials."¹⁵¹ In accepting this clause, the Financial Secretary to the Treasury, Michael Jack, explained "the Government have an excellent record of achievement on and commitment to energy saving ... let the report be written, and let our record shine forth."¹⁵²

¹⁴⁹ HC Deb 3 July 1996 c.950

¹⁵⁰ HC Deb 11 March 1997 cc 189-206

¹⁵¹ New clause 15 - now section 111 of the *Finance Act 1997*.

¹⁵² HC Deb 11 March 1997 c.204

VI. Vehicle Excise Duty

A. Introduction

Motoring taxation is nowadays made up of two elements, Vehicle Excise Duty (VED), which can be considered a tax on ownership, and fuel duty, which is a tax on use. Over the years the balance of taxation has shifted towards fuel policy and the policy of recent UK governments has been to charge duty on road fuels at rates which will not only raise sufficient revenue but also take account of the need to conserve finite stocks of fuel and the general environment. Although historically the road fund tax was considered a hypothecated tax to pay for the building and maintenance of the road network, this is no longer so and it is now a general money raising tax. Recently there has been pressure from various organisations to be more proactive and to use the tax as a means of encouraging certain behaviour, such as the use of environmentally friendly vehicles.

Vehicle excise duty is a fixed annual tax and is charged on every "mechanically propelled vehicle" used or kept on a public road. The rate is currently £145 for a car regardless of size. The VED on goods vehicles is not a flat rate and depends on gross weight and axle configuration. The relevant legislation is the *Vehicle Excise & Registration Act 1994*, and any person who uses or keeps on a public road any vehicle (apart from one of an exempted class) for which an excise licence is not in force commits an offence under section 29 of this Act. The Act also lists, in schedule 2, the exemptions to the duty. Changes to the rates and coverage of the duty are made in the Finance Acts.

Vehicle Excise Duty was first introduced for four-wheeled motor road vehicles on 1 January 1889 by the *Customs and Inland Revenue Act 1888*. Historically the road fund tax was used for the building and upkeep of roads. The creation and history of the road fund is described in detail in William Plowden's book *The Motor Car and Politics 1896-1970*. The Road Fund was set up by the *Roads Act 1920* and replaced a combination of a body called the Road Board, which had been set up in 1909 and the Road Improvement Grant which financed the Board from the Exchequer. The Road Fund received the money derived from the taxation of motor vehicle which was collected by county councils and it paid it back to local authorities to finance expenditure incurred on roads. The fund was in practice never spent in full and was notorious for being raided for other purposes. It was finally wound up by the *Finance Act 1936* and since then the revenues from motor vehicle taxes have been paid directly into the Consolidated Fund. In other words, they are not now assigned or hypothecated in any way, so that expenditure on roads is not related to the yield of motor vehicle taxes.

B. Setting the rate

There are various types of cost involved in the use of the road system: the infrastructure costs of investing and maintaining the road system, funded by the Exchequer from the taxation system; the private costs of acquiring and operating vehicles, paid by the individual motorist;

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and the external costs including, for example, the environmental damage resulting from the construction or existence of a road, air and noise pollution, the cost of accidents and congestion costs.

Government policy is to ensure that the taxes paid by road users at least cover the full economic costs of road provision and road use. It is trying to produce better measures of the costs of road use to include noise and environmental costs. In 1994 the Paymaster General was asked what factors were taken into account in setting levels of VED and his reply was still being referred to in the Government's Green Paper *Transport - the Way Forward* published in 1996.¹⁵³ Sir John Cope's reply was:¹⁵⁴

Sir John Cope: As with other taxes, the Chancellor takes account of a wide range of factors in setting the structures and rates of vehicle excise duty (VED). These include the need to raise revenue while minimising economic distortions; the impact of the tax on inflation; the transport costs of British industry and the competitive position of United Kingdom hauliers relative to their continental counterparts; and the costs of other forms of transport. In general the Chancellor will seek to ensure that, through a combination of VED and fuel duty, road users at least cover the economic costs they impose, though further work is required to estimate these costs accurately. When direct charges for motorway use are introduced the Government will take these into account in setting motoring taxes.

Policy in the past has been that road vehicles should, through VED and fuel duty, at least cover their annual "track costs".

However, the Government made clear in its Green Paper, "Paying for Better Motorways", that this measure has limitations as a basis for setting motoring taxes. For example, it takes account only of the cash costs of capital expenditure on road construction, and of current expenditure on road maintenance and makes no allowance for a return on capital. Publication of the annual Road Track Costs Bulletin will therefore be discontinued. The Government intends to produce better measures of the costs of road use including, where these can be valued, wider costs such as noise and other environmental costs.

The Department of Transport publishes an annual table showing the relationship between the revenue from road taxation (VED and fuel duty) and the public sector costs of road infrastructure in Britain:¹⁵⁵

¹⁵³ *Transport - the Way Forward: the Government's response to the Transport Debate*, April 1996 Cm 3234 Annex 4

¹⁵⁴ HC Deb 9 February 1994 c.248W

¹⁵⁵ Department of Transport, *The Allocation of Road Track Costs 1996/97*, Table 9

Table 9 Road taxation revenue and road costs in 1996/97: classified by vehicle class

Thousands /£ millions at 1996/97 prices/ratio								
Vehicle class	Number of vehicles	Road taxation revenue and road costs (£ million at 1996/97 prices ¹)				Road costs	Taxes less costs	Taxes to costs ratio
		Road taxes			Total			
		Fuel tax	VED	Total				
thousand								
Cars, light vans and taxis ²	24,458	13,300	3,590	16,890	4,130	12,760	4.1 :1	
Motorcycles	658	50	25	75	20	55	4.1 :1	
Buses and coaches	79	395 ³	25	415 ³	240	175	1.7 :1	
Goods vehicles over 3.5 tonnes GVW	436	2,980	570	3,550	2,160	1,385	1.6 :1	
Other vehicles ⁴	1,486	425	25	450	175	275	2.6 :1	
All vehicles	27,117	17,150	4,230	21,380	6,725 ⁵	14,655	3.2 :1	

1. Rounded to the nearest five.

2. Includes goods vehicles under 3.5 tonnes.

3. Includes all fuel duty paid although some is rebated to local operators.

4. Crown, disabled and other vehicles exempt from VED, haulage, machines, 3-wheeled motor vehicles, special types, recovery vehicles and non plateable vehicles.

5. Excludes expenditure allocated to pedestrians: £ 483 million

C. Air pollution: use of VED

The use of vehicle excise duty has only recently been included as a tool in the fight against pollution from road traffic¹⁵⁶ and only in a very minor way. In the 1996 Budget statement the Chancellor of the Exchequer announced VED would be reduced by up to £500 per year for lorries meeting certain low emission standards.

John Bowis, Minister for Transport, published a consultation paper on 22 January 1996 on proposed vehicle excise duty incentives for lorries meeting low emissions standards.¹⁵⁷ The plan is to introduce the incentive early in 1998. It primarily aims to encourage lorry operators to fit particulate traps to their vehicles or convert them to road gas fuel. The Government also hope it will stimulate further developments in technology to reduce emissions.

The consultation paper asks for views on how such an incentive scheme should be administered and enforced. The main points the Government need to determine are what emissions standards should qualify vehicles for reduced VED, the testing procedures that might be applied to such vehicles and how enforcement and certification procedures might operate. Among the issues considered in the paper are:

¹⁵⁶ see Library Research Paper 97/33 *The National Air Quality Strategy*

¹⁵⁷ Department of Transport press notice, *John Bowis consults on tax cut for 'green' lorries*, 22 January 1997

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- whether diesel vehicles could consistently meet specific emission limits using both existing and future technologies
- whether to adopt an absolute or a relative emissions standards system and the testing arrangements for particulate emissions
- whether multi-fuelled vehicles should qualify for the incentive
- whether operators should apply for the concession through a vehicle inspection system or should "self-declare"
- how the incentive should be applied to smaller lorries
- costs to operators

The aim of the policy is to reduce the level of particulates in the final exhaust emissions of lorries. These particulates are associated with a range of serious health problems, including effects on the respiratory and cardiovascular systems, asthma and premature mortality.¹⁵⁸ Substantial reductions, of perhaps 60% or more compared with current levels, of all road traffic particulate emissions will be required if European and national air quality targets for the beginning of the next century are to be met.

The incentive would apply only to lorries used commercially. Diesel exhaust is a major source of particulates and most heavy goods vehicles are diesel powered. HGVs are estimated to account for about 47% of urban particulate emissions; so VED incentives for HGVs to encourage technologies which will reduce particulate emissions should help to improve air quality.

D. Reform of VED

Rather more radical changes have been suggested for the vehicle excise duty, including its abolition and replacement by an increased fuel tax, or the introduction of a graduated tax.

1. Abolition of VED

It is sometimes argued that the VED should be abolished and the whole cost should be raised through duty on fuel. According to the House of Common's Library Statistical Section, to replace the £4.2 billion currently raised from VED by an increased charge on fuel would mean an increase of about 46p a gallon.

¹⁵⁸ see for instance *Particulates*, Expert Panel on Air Quality Standards, October 1995

The main argument put forward for abolishing VED and raising the money through fuel duty is that it would encourage fuel efficient and environmentally friendly vehicles. According to estimates made by the Institute for Fiscal Studies, in 1990,¹⁵⁹ the change from taxing ownership to taxing the use of cars would cut car use by 8 per cent in one year. This would immediately effect the amount of fuel consumed, the damage done to the environment and the congestion on the roads. In the longer term, fuel efficient cars would become more popular. Such a policy would take account of the need to conserve finite stocks of fuel and the general environment, and give motorists an incentive to cut their tax bill by using fuel more efficiently.

It is argued, second, that such a policy would be fairer. If one taxes motorists through duty on petrol, or through road pricing, rather than the VED, those who use most fuel and cause most pollution will be taxed most. The counter argument is that such a move would increase the costs of firms with high mileage costs. This would include those who live in rural areas, many business users, and lorry and van users and the impact on this group, particularly in the current economic climate is a reason for the retention of VED. There would also be inflationary consequences.

A third argument for abolishing VED is the problem of evasion, although this has improved recently and will do so further with the change to SORN, the new "off road statutory notification system" in early 1998.

Even if it was thought desirable to end VED, it would not be possible to abolish the vehicle excise licence completely as some sort of registration of car owners would be needed. The central vehicle register at the Driver and Vehicle Licensing Agency (DVLA) contains 23 million vehicle records and is regularly updated through relicensing. The records need to be as accurate as possible as they may be used by motor manufacturers for safety recalls and to update the Police National Computer which is regularly used in connection with crime. The records and relicensing are also used to check insurance and the existence of a MOT certificate if necessary. Governments will always insist that drivers pay for the procedures involved in issuing a licence so there will always be a charge, even if it is minimal.

One last argument in favour of keeping the VED is that if it is wished to give concessions to certain groups, for example to disabled people, they can be exempt from VED with relative ease. It would be administratively very difficult to exempt them from part of fuel duty.

¹⁵⁹ Mark Pearson & Stephen Smith, *Taxation & environmental policy: some initial evidence*, IFS Commentary No. 19 1990

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2. A "greener" VED

Rather than abolish VED, some have argued that it should be used to influence the purchase of cars which are environmentally friendly. Both the Labour Party and the Liberal Democrats have argued that large cars should be taxed more heavily and that the VED should be related to engine size instead of being a flat rate for all cars, regardless of size, although it does not necessarily follow that smaller cars are more fuel efficient. The Citroen AX and the Skoda, for example, can have the same size engine but a 20 mpg difference in fuel consumption.¹⁶⁰

Although a number of environmental bodies have advocated the greening of VED, few detailed proposals have been formulated.

The Royal Commission on Environmental Pollution argued that although increasing the level of vehicle excise duty would slow the spread of car ownership, it would be unfair on those families who were only now able to afford a car.¹⁶¹ Although increasing VED might seem an appropriate way of requiring road users to make a payment to cover external costs, they preferred this to be done through payments which were associated with use rather than ownership. However they did feel that VED could be graduated or varied in order to influence behaviour in environmentally beneficial ways. Specifically the Royal Commission recommended that VED on heavy goods vehicles be graduated according to the emission limits their engines were designed to meet, and that reduced rates of duty should be payable for vehicles meeting planned emission limits.¹⁶²

The Institute for Fiscal Studies argued in *Options for 1997* that a VED should be differentiated according to emissions rather than fuel efficiency alone, but it also pointed out that although such measures may have a positive effect on reducing transport related pollution, it may have the opposite effect on the volume of traffic:¹⁶³

VED differentiated according to emissions would probably be superior to one based on fuel efficiency alone, since emission levels depend not only on fuel efficiency but also on the fitting and maintenance of cleaning equipment such as catalytic converters. In addition, VED based on fuel efficiency when new would give no incentive to maintain this efficiency as the car gets older (fuel efficiency has a tendency to decline over the life of a vehicle). Emissions tests now form part of the annual MOT test, so information is already collected that could be used as a basis for a VED differentiated by emissions. But differentiated VED would still be imperfectly related to emissions, since owners of similar vehicles would pay the same amount regardless of yearly fuel use and hence emissions. Conversely, fuel taxation does not distinguish between low- and high- emissions vehicles. However, the fact that there is an

¹⁶⁰ Standing Committee B 16 May 1991 c.38

¹⁶¹ Royal Commission on Environmental Pollution, *Eighteenth report: Transport and the environment*, Cm 2674 October 1994

¹⁶² *ibid.* para 8.68

¹⁶³ Institute for Fiscal Studies, *Options for 1997: the Green Budget*, IFS 1996 pp 50-51

imperfect range of fiscal tools with which to tackle a complex problem should not preclude attempts to do so. ...

Whilst measures to encourage vehicle fuel efficiency may have a positive effect on reducing transport-related pollution, they are likely to have the opposite effect on the actual volume of traffic by reducing the cost per mile of vehicle travel. Thus measures to combat pollution may exacerbate the other main externality associated with transport, which is that of congestion.

Similar views have been put forward by Transport 2000 and the Institute for European Environmental Policy. The latter were commissioned by the RSPB to produce the report, *Greening Vehicle Excise Duty*.¹⁶⁴ It proposes a system covering both carbon monoxide and other pollutant emissions and goes into some detail of the pollutants which should be reflected in the VED system and the practical consequences of a change.

The proposed system would classify cars into a number of classes, based partly on the EU emissions standards to which they were manufactured, and partly on carbon dioxide emissions. The classification should ideally be applied to existing as well as new cars, using simple banding criteria. It proposed that a new system would be applied in a broadly neutral manner, and initially be introduced with a relatively small differentiation of duty rates. Existing cars would therefore be subject to manageable changes in the level of tax. As new cars entered the stock, however, those cars with the highest pollution levels would gravitate towards the upper end of the tax range. Conversely, new cars would tend to attract lower rates of VED, reflecting their lower emissions of regulated pollutants. Small, efficient cars would also tend to be subject to lower tax levels than 'gas guzzlers'.

The report concluded that a restructured VED offered a number of distinctive features to reinforce environment policy:

- It would provide a strong signal to motorists, as it is the only tax which is paid over separately and directly in a lump sum.
- It could encourage the introduction of cleaner cars in advance of EU requirements.
- It would provide manufacturers with a basis on which to market clean and efficient cars.
- A tax disc which distinguished a vehicle's emissions class could be used to identify 'dirty' cars and exclude them from some urban areas as an air quality management measure.

¹⁶⁴ RSPB, *Greening Vehicle Excise Duty: a report by the Institute for European Environmental Policy*, October 1996

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- It could also help to encourage retrofitting of catalytic converters to pre-catalyst cars.

The authors recognised that the existing vehicle registration database does not at the moment hold sufficient information to implement an effective system, but while there were some technical obstacles to be overcome in upgrading it, these need not be insurmountable. Changes would take time to implement, however, and some urgency was needed if this problem was not to bar progress on greening VED. If the necessary impetus was not given to this process, then a self-defeating cycle would be established wherein graduated VED could not be introduced because of technical problems.

E. European countries

1. Private vehicles

The United Kingdom appears to be unique in the European Union in having a flat rate of VED for private cars. Exact details of vehicle tax systems in other Member States are not available but it is known that in most states the ownership tax is graduated according to engine characteristics. Engine capacity is used in most cases but other factors, such as turbocharging, fuel injection, bore, stroke and number of cylinders are sometimes taken into account. Germany is the first Member State to introduce, from 1997, a tax based on the emission performance of the vehicle. Vehicles in Denmark and the Netherlands are rather different and use maximum unladen weight to determine duty. Other variations include discounts for low emission vehicles, such as those with catalytic converters, in Greece; additional taxes or a higher rate for non-petrol vehicles in the Netherlands, Denmark and Italy (perhaps because diesel duty is lower than unleaded petrol duty); and discounts for older vehicles (generally more than five or six years) in France, Greece and Portugal.

2. Commercial vehicles

Member states use different systems for allocating and recovering road infrastructure costs. All rely on annual vehicle taxes and fuel excise duties but six (France, Italy, Austria, Spain, Greece and Portugal) also use road tolls. Road user charges - based on the time during which the infrastructure network is used - were introduced for trucks in Germany, Denmark and the BENELUX countries in 1995. Council directive 93/89/EEC adopted on 25 October 1993 prescribed minimum rates of vehicle tax for heavy goods vehicles and the conditions under which tolls or charges may be imposed on such vehicles for the use of motorways.

In July 1995, however, the European Court of Justice ruled that the directive was invalid, because the Council had not followed the procedure for Parliamentary consultation strictly enough. Though this ruling had no practical consequences - the Directive is to remain in

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force until a replacement is adopted - it has meant the EC has had to look afresh at the issue of pricing in road haulage. This review has coincided with the publication in December 1995 by the Commission of a substantial Green Paper, *Towards Fair and Efficient Pricing in Transport*, a document which has shaped the subsequent debate on a wide variety of transport issues.¹⁶⁵

In it the Transport Commissioner, Neil Kinnock, proposed that the system for standard charges on road freight hauliers - known as Eurovignettes - should be replaced with variable charges related to the age of vehicles, to relate the size of charge to the damage that a vehicle causes to the road infrastructure.

Comparative material on road taxes in Member States was published in this Green Paper¹⁶⁶

Road taxes applied in the European Union - ECU

	Belgium	Denmark	Germany	Greece	Spain	France	Ireland	Italy
Annual Vehicle Tax ¹	940 ³	1245	2676	304 ⁴	464 ⁴	787	1965	711
Fuel Excise Duty ²	298.3	289.6	324.9	243.4	257.6	328.2	301.8	375.8
continued...	Lux	NL	Austria	Portugal	Finland	Sweden	UK	EU legislation (min)
Annual Vehicle Tax ¹	779	1038	2825	349 ⁴	3333	2591	4100	700
Fuel Excise Duty ²	260.1	316.5	297.0	315.0	284.5	316.2	399.3	245

Source: Commission services

¹HGV 38 tonne (1994) ²Diesel per 1000 L (1995)

³HGV 40 tonne (1994) ⁴Greece, Spain, Portugal allowed lower rates until 1.1.97

On the basis of this table the Commission argued that the differences shown point to a potential distortion of competition between hauliers of different nationalities. Hauliers operating the same vehicles and carrying identical consignments are charged differently on the basis of their nationality. This, in turn, constitutes an obstacle to the efficient functioning of the internal market. The Report suggested that more harmonisation of minimum levels was needed to create a level playing field for hauliers of different nationalities. The Commission

¹⁶⁵ COM (95) 691 final 20.12.95

¹⁶⁶ COM (95) 691 final 20.12.95, Table 4.2

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concluded that implementation of efficient transport pricing would "significantly strengthen European competitiveness." It continued:¹⁶⁷

Reducing congestion, air pollution and accidents means that the associated costs, currently borne by the European economy as a whole, are reduced. For example, curbing congestion will reduce the time losses incurred by businesses and consumers. A reduction in accidents leads to lower health care costs which translate into lower social charges. Bringing down air pollution will also cut health bills and, in addition, increase agricultural productivity (e.g. through reduced ozone concentrations). Moreover, where higher transport charges might occur, revenues should be returned to the economy through reductions in other taxes and charges.

A draft text to replace Directive 93/89/EEC was produced by the Commission in summer 1996. The text is more complex than the directive it is to replace and so may therefore be more controversial. It covers tax policy as well as road charges which immediately gives rise to discussions of subsidiarity and it also includes a formula for an environmental charge, which is likely to be questioned.

The draft directive proposed that charges levied on road freight hauliers should relate the tax more to the actual damage and pollution caused by particular trucks. The Commission said the proposed changes to the Eurovignette system would give road hauliers incentives to use cleaner trucks and vehicles that do less damage to the road infrastructure and have a small marginal impact on transport costs.¹⁶⁸ Transport Commissioner Neil Kinnock said the proposal was "not anti-road or anti-truck but anti-congestion and anti-pollution." But the International Road Transport Union (IRU), the hauliers' lobby, is quoted as saying the plan could "unfairly and arbitrarily result in an exorbitant increase in the taxation of heavy vehicles." It said it had warned the Commission such a proposal "would be detrimental to the economic growth, employment and competitiveness of EU member states."

The Commission estimates that this proposal will lead to significant reductions in emissions, cut down congestion on sensitive routes and generate infrastructure cost savings of 1,600 to 4,000 million Ecus (\$1,980 million to \$4,960 million). The charge structures would be based on axle weight and on the number of axles and would also differentiate between lorries on the basis of exhaust emissions. The Commission proposes to use the existing three standards for heavy goods vehicles: pre-1988, which are known as non-Euro, Euro 1, which became mandatory in October 1993, and Euro 2, which becomes mandatory in October 1996. A pre-Euro truck is more than twice as polluting as the greenest Euro II truck. The maximum annual user charge will vary between 2,000 Ecus for the most polluting non-Euro truck and 750 Ecus for the least polluting Euro 2 truck under the proposal.

¹⁶⁷ *op.cit.* p.1f

¹⁶⁸ "Commission adopts Eurovignette revision", *Reuter News Service Western Europe*, 10 July 1996

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Neil Kinnock put this draft in the context of the Green Paper in a speech to the Irish Belgian Business Association in Brussels on 24th September, from which the following paragraphs are taken:¹⁶⁹

Making more efficient use of the transport systems which we already have is basic to the thinking behind the Commission Green Paper called 'Towards Fair and Efficient Pricing in Transport' which I published last December. The link between creating sustainable transport systems and fair and efficient pricing is clear. As a general rule, people and businesses will only use transport in a sustainable manner if the full costs of unsustainable decisions are borne by them rather than by others and by society as a whole. And continual and substantial investment in clean technology is much more likely to be made if there is an economic reward for doing so. In any walk of life prices obviously have a major influence on peoples' behaviour. But in transport the taxes and charges most transport users pay on vehicles and fuels are 'flat rate'. As a result, it usually costs little more to drive 'dirty', heavily polluting cars or lorries than to drive clean vehicles. And the cost of driving on a clear rural road is no lower than the cost of using a busy road at peak time. Clearly, the system as it exists does not deter congestion and it offers no real inducement to move to uncongested times and routes.

The objective of a fair and efficient pricing policy would be to correct this imbalance and to ensure that the prices charged for transport reflect more accurately the degree to which each individual journey causes congestion or environmental damage. What we are trying to promote is clarity in the connection between real transport costs and real transport prices and, crucially, differentiation between efficient and inefficient transport behaviour. The purpose is not higher revenues - it is the reduction of pressures on the infrastructure and the environment and a sensitivity to price effects which induces the use of better vehicles, travel on less congested routes at less congested times and on less congested modes like rail and water.

¹⁶⁹ "Address by Neil Kinnock - the Transport Challenge", *European Perspectives: Rapid Reuter Textline*, 25 September 1996

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VII. Further Reading

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