Centre *for* Reform

Paper No. 20

Don't Tax More, Tax Different!

A Tax Paradigm for Sustainability

By Mark Hinnells and Stephen Potter

New Ideas for a New Century

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Executive Summary

The combination of direct taxation (income tax, corporation tax etc) and indirect taxation (VAT etc) has been established for a century and a half. A good tax has traditionally been one that gave government a stable income base (additional issues included cost of collection, deadweight loss, compliance, competitiveness and equity). However the introduction of the Landfill Tax and the Climate Change Levy have begun nothing short of a paradigm shift in taxation, - shifting taxation from ‘goods’ (employment and value) to ‘bads’ (pollution). Environmental taxes (including taxes on energy in all its forms, vehicles, air travel, landfill etc) currently stand at around 9% of the Government’s revenue. But there is no ‘big picture’ of how environmental taxation might develop over the longer term. Government has been proceeding with understandable caution in a new area, and in its first term. But it is time to press ahead. Much of the new framework will need to be in place within the next Parliament. It is also time to develop a more comparative approach to the underlying principles across the picture.

Our exploitation of natural resources continues to increase in an unsustainable way. This includes extraction of materials and of fossil fuels, as well as the loading of the planet’s natural carrying capacity with pollutants such as carbon dioxide. Government can provide advice and information, set regulations, levy charges and taxes, or provide support for investment. In practice, a combination of these is likely to be needed in order to achieve the transformation to a sustainable economy. What is needed is a recognition that the destination - sustainability - is more important than any dogmatic political view about whether information alone can work (because it won’t) or whether regulation alone can work.

This document, in the style of a consultation paper, raises questions and sets the scope for a debate about how this paradigm shift might develop. It focuses on the opportunities for taxation within sustainable development policy, and makes reference to parallel informational and regulatory needs. It asks:

1. Against what principles can we judge what is a good or bad environmental tax?
2. What is the opportunity to reduce key environmental impacts including emissions to air, water pollution and land use? Key targets for taxation will include major contributors to each of these areas. They include:

- the effects of energy use on greenhouse gas emissions and local air quality (including transport taxes on energy, vehicles and road space);
- the effects of water abstraction and pollution, for example by pesticides and fertilizers; and the pollution and use of land space, including the use of land for extraction and for landfill.
- What is the potential for parallel reform of indirect and direct taxation?

Taken together, there is huge potential for environmental tax reform, first to contribute to significant reductions in environmental impact, and second, to become a mainstay of the Government’s revenue stream, allowing major reductions in tax elsewhere. But this will only happen if there is a broad consensus not only across political parties, but with the electorate. This means that the purposes of tax must be clear, and widely understood - to tax good things less, and undesirable things more, to encourage changes in behaviour.

Environmental taxes must not only be 'good taxes' in the conventional sense of the word but must be 'good taxes' in a strictly environmental sense. Key conclusions on the design of individual measures are:

1. In environmental and economic terms, intervention is justified wherever the costs to society of environmental impact are greater than the cost of reducing an impact through technical or behavioural change. The difficulty comes in making such a judgement.

2. Inevitably, this assessment will need to use different types of evidence in combination. For example, hard, almost 'epidemiological' evidence (a sort of 'show me the bodies' approach to evidence), must be balanced with uncertainty and with the precautionary principle. Epidemiological evidence can be used, for example, to divine a relationship between, say, energy price and energy use. But the costs of damage are harder to determine. Firstly there is uncertainty. The external costs for many impacts are expected to increase dramatically, for example, through increases in energy use, and in road, freight and air traffic. Secondly, once damage occurs through climate change or species loss, it cannot be reversed: if we wait until the earth is warmer to determine the effects and costs of global warming, it will be too late to prevent the effects by reducing greenhouse gas emissions. Thus a precautionary approach must take a principal role, and epidemiological evidence, a secondary, supporting role.

3. Economists describe the relationship between price and demand for a commodity as the price elasticity of a commodity. If all else is equal, and if price goes up, demand goes down. But this relationship is not a simple one.
   - First, all else is not equal. Actual behaviour will depend on how certain the long term political signal of increased prices is, the alternative technologies available, the ease of adoption of alternative modes of behaviour, income, capital availability, understanding, the regulatory framework and a wide range of other factors.
   - Second, a tax can only be expected to deliver significant change if it is set high enough to be equal to, or exceed the costs of change. That way, decision-makers can see a clear value in action, and a cost of inaction. The proposed solvents tax is a good illustration of this.
   - Third, the costs of change will be different in different sectors, and at different times (e.g. implementing different changes takes longer for decisions which involve capital, or for larger amounts of capital).
   - Thus, the marginal costs of change must be transparent. Often, decision-makers do not know what action to take, or the benefits and costs of that action (economists refer to this as a transaction cost). Thus government needs to ensure that 'transaction costs' are as low as possible, by providing a framework of information, advice and regulation.

4. Environmental taxes may also be equal to, or greater than the cost of damage (internalisation of externalities) or the perceived cost of damage (assessed through 'willingness to pay').

5. An escalator should be built in to any tax. First, it is not necessary for a tax to exceed the marginal cost of change or the external costs of damage immediately. It is better that a tax starts earlier and lower, to give a long-term signal for change. In any circumstance an evolution is more manageable than a revolution. Second, it is reasonable for rates of tax to be amended in the light of the behavioural response to a price change. Third, it is likely that easy changes will be made first, and over time, the marginal cost of reductions in emissions or resource use may be expected to increase. Fourth, if behaviour is not changed, and energy use (or other resource use) continues to increase, the external costs would increase.

6. Decision-makers are generally more responsive to capital availability than they are to the cost of resource consumption. Thus a key part of the package is to recycle revenue from a tax to allow it to be used for investment to reduce resource consumption. Thus, to take an energy

tax, the same energy savings can be achieved with a lower level of tax if a higher proportion of the revenue is recycled for investment in energy efficiency.

Key conclusions on the design of a package of environmental tax reforms are:

1. Environmental taxes could double in a decade, and double again the following decade. They could contribute a third of total government revenue, worth around £110 billion at present rates.
   - Key to this will be taxation on energy. The model proposed here is the reform of the Climate Change Levy and Road Fuel Duty, together with the extension of the tax to areas where it currently does not apply, i.e. the domestic sector and aviation fuel. These taxes should, in the longer term, be brought together under the same legislation and rates of tax based more on the externalities of energy use, particularly, but not exclusively, the carbon content of the fuel.
   - As well as taxing the use of fuel, other clear tax signals can be given to influence both the choice of, and the use made of, infrastructure that uses fuel. Infrastructure includes houses, cars, industrial equipment and aircraft.
   - Other taxes or charges on air emissions, water abstractions and pollution, and land use (including aggregates and minerals extraction, and landfill) are discussed. More work is needed to determine the long term contribution these other taxes might make, both to reducing environmental impact and contributing to government revenue.

2. The tax reductions elsewhere must be clear and measurable. Environmental taxes must produce an equitable outcome, even if this requires adjustments elsewhere in the tax or social security system. Some environmental impacts (such as miles travelled by car) are broadly proportional to income. But others (energy used in the home) are independent of income. Thus a key issue is the treatment of different income groups, where the relative change in price triggered by a tax will bite in different ways: different income groups will have different sensitivities to price signals.

3. Taxes raised from households should be returned to households and taxes raised from business returned to business.

4. Options for reducing taxes elsewhere (costed at current values) include:
   - reducing VAT to 5% (costing around £47 billion p.a.);
   - taking many more households out of tax, for example by cutting the 10p personal tax rate to zero (costing £4 billion p.a.);
   - abolishing NICs for the self employed (costing only £0.23 billion p.a.);
   - abolishing stamp duty (costing around £8 billion), to reduce the cost of moving house, thus encourage a more mobile workforce;
   - and cutting business rates and corporation tax.

5. To cope with this paradigm shift requires a change in organisation which is profound and permanent. The proposals for organisations such as an Environmental Tax Commission and an Environmental Tax Agency (to work alongside Customs and Excise and Inland Revenue) are necessary to embed, develop and constantly reinvigorate the new thinking.

Taken together, the paper represents an evolutionary approach to a revolutionary goal. A series of incremental changes, all within the framework of environmental tax reform, can together represent the most important changes to the tax system since Robert Peel's administration in the 1840's. They represent a new Environmental Tax Paradigm. And whilst achieving a paradigm shift in a system of taxation that has stood for 150 years can be expected to take a decade or two, a strategy needs to be laid out now.

1 Introduction

The combination of direct taxation (income tax, corporation tax etc) and indirect taxation (VAT etc) has been established for a century and a half. In the 1840's Sir Robert Peel's Government introduced an income tax for the first time outside war, and reduced indirect taxation through the abandonment of the Corn Laws and other measures. Whilst the balance of taxation has changed since, the principles have stayed the same. Until now. The introduction of the Landfill Tax and the Climate Change Levy have begun nothing short of a paradigm shift in taxation, shifting taxation from 'goods' - employment and value - to 'bads' -pollution.

But where is this paradigm going?

The Conservatives in Government shifted away from direct taxation towards indirect taxation, and in some cases, indirect taxation that reflected environmental impact: Key examples are the Fuel Duty Escalator, VAT on domestic fuel, the landfill tax, and Air Passenger Duty. In opposition, the Conservatives have, rather surprisingly, said they will repeal the Climate Change Levy in favour of carbon trading. Carbon Trading represents a loss of benefit to Government because the money flows to the person selling the carbon. It doesn't allow reform of other taxes. The Conservatives position is surprising because of their previous support for moving away from income towards indirect taxes: surprising because, instinctively, one always feels Conservatives prefer taxes where people have a choice about how to spend money, and obviously, by investing in alternatives, people can reduce the tax they pay. It is unclear what this implies for the portfolio of other environmental taxes and the potential for widespread tax reform. One assumes that the Conservatives must, at some point soon, re-examine this commitment to repeal the Climate Change Levy, preferring instead significant reform.

In opposition, Labour stated it would change the emphasis of economic policy to encourage 'goods' such as employment and discourage 'bads' such as pollution (*In Trust for Tomorrow*, 1994). This itself was a significant statement; that pollution was a matter for economic policy as much as for environmental policy. *In Trust for Tomorrow* took no rigid view of when to use regulation and when to use economic instruments to correct market failure. In government, Labour has acted with prudence on the issue of environmental taxation, as with other tax issues. The Climate Change Levy is its first step in the direction of environmental tax reform, but it has studied other tax options long and hard (for example on water pollution from pesticides and fertilizers, minerals extraction, landfill tax, energy efficiency, and vehicle excise duty[1]) The demands of taxing in a new way should not be underestimated, and Labour's caution is understandable, if exaggerated. One would hope that further reform will eventually follow. But crucially, the party has set its face against extending Climate Change Levy to the domestic sector and, after an acceleration, has halted and even reversed the rise in Fuel Duty, in the face of vehement, if not widespread fuel protests. It is unclear now, whether these first faltering steps will be the only steps.

The Liberal Democrats have long advocated environmental tax reform, beginning with *Costing the Earth* (1989), which advocated a wide variety of environmental taxes. *Taxing Pollution Not People* (1993) set out proposals for an energy/carbon tax (at that time proposed by the EU Commission as the preferred model) and transport taxes including fuel tax, road pricing, vehicle excise duty and company car tax reform). It also advocated other environmental taxes including site value rating as a replacement for business rates, and taxes on fertilisers and pesticides, and on

[1] http://www.hm-treasury.gov.uk/pub/html/prebudgetNov97/prebudget/chap5.htm

packaging. All of these ideas have seen considerable research since this paper. In recent years, the party has expressed preference for two things: a carbon tax over an energy tax[2], and that an increase in environmental taxes would see direct reductions in other taxes, while any expenditure on investment in efficiency coming from general taxation.[3]

The three main parties thus have a varying allegiance to the ideas of Environmental Tax Reform. Yet, over the 20 year time-frame of this paper's proposals, all three parties have the opportunity to hold the reins of power, either solely or in coalition, in Brussels, Westminster, Edinburgh, and in Cardiff. Responsibilities for tax affairs may even move from one Parliament to another over that time. So a new and much broader consensus would be needed for this vision to evolve.

In this widest context, there is not yet an underlying political or philosophical rationale for the design of this new paradigm - no test of 'good' and 'bad' tax proposals. There is not yet a plan for how much revenue might be gleaned from environmental taxes, how this total would be made up, or what other taxes might be cut. Nor is there yet a target for the overall proportion of government income that might come from environmental taxation. The necessary parallel informational, regulatory, and institutional reform that would be needed to bring about this new paradigm has yet to be mapped out. There is little in the way of advocacy of the benefits that properly designed green tax reform can bring, such as net resource and cost savings to the country, to companies and households.

Without a coherent vision environmental tax reform will be sub-optimal, or will not be understood, and will, therefore, not be accepted by the electorate. Indeed, a series of measures have been (and continue to be) opposed by whichever interest group they may affect. Examples include VAT on fuels, Road Fuel Duty, and the Climate Change Levy. Sooner or later, politicians may decide that environmental taxes are unpopular and abandon them. They would be mistaken, and the environment, and hence the electorate, would suffer. But it is true (and indeed right) that poorly designed and poorly explained environmental taxes are unpopular!

The paper sets the scope for a debate about how this paradigm shift might develop. It poses a set of questions, and provides a framework, rather than providing detailed, worked out solutions.

[2] The most recent paper on this is from Vince Cable, Shadow Trade and Industry Secretary, who sees the exemptions and discounts framework surrounding the Climate Change Levy as burdensome.
[3] Matthew Taylor's autumn conference speech at Eastbourne, September 2000.

2 The Principles of Environmental Taxation

The use of market-based measures as part of environmental policy is widely espoused by environmentalists, economists and some governments. In general, this has involved proposals to introduce additional environmentally based taxes, such as the proposed European Union Carbon Tax and has occurred in the UK.

The logical conceptual outcome of the move towards environmental taxation is represented by ecological taxation reform (ETR). The concept of ETR was developed by German and Dutch authors in the late 1980s (von Weizsacker, Bleijenberg and Sips) and is defined by Whitelegg[4] as:

> based on the principle that taxes should fall most heavily on those activities and materials that produce pollution and/or environmental damage. Such taxes would replace taxes on labour and capital… The total taxation burden in Europe would remain constant. ERT is not an additional tax; it is a replacement tax.

The core of thinking behind ETR dismisses the idea that environmental concerns can simply be added on to existing fiscal structures, but that these structures themselves need to be subject to ecological reform. This is the suggested new taxation paradigm. Our taxation and fiscal systems contain many elements that produce adverse environmental impacts; simply adding on a few ecotaxes will fail to address this structural effect. Instead, the whole system needs to be subject to a process that will change the basis of taxation in order to make environmental impact the core rationale.

2.1 THE STATE OF THE ENVIRONMENT

Our understanding of our impact on the natural world improves all the time. Take climate change. The latest projections from the Hadley Centre indicate that we may still be underestimating the extent of the damage which we are storing up for our climate. Recent projections show a warming of up to 6^0C by the end of this century. But, in a way, the further advice of the scientists is not the most potent warning we have seen.

The last year has seen a string of extreme weather events which have had costly and devastating consequences all around the world. We have seen a destructive storm devastate France last Christmas; forest fires raging out of control in the drought stricken west of America; India affected by, on the one hand, extraordinary flooding which has displaced millions and, on the other side of the country, drought which has destroyed the livelihood of millions of farmers. We have seen devastating floods in the alpine regions of Italy which have killed many and destroyed millions of pounds worth of property; and close to home we have had an extraordinary sequence of floods with some 5,000 homes flooded, resulting in excess of £400m of insured damage. It has brought misery to communities across the UK. We cannot say that any one of those single events can be directly attributed to climate change. But those events presage the sort of natural disasters which

[4] Whitelegg, John (1992): Ecological Taxation Reform, pp 169-183 of Whitelegg, John (Ed): *Traffic Congestion: is there a way out?* Leading Edge, Hawes, UK.

must be regarded as likely to be increasingly normal as a result of the climate change which we have already induced.

We need to have a sense of urgency now about responding to climate change. That response must come both in changes to the way we lead our lives and the way we consume energy so that we can mitigate any further damage. But it must also mean we now take on board urgently the question of adapting to what we can no longer avoid.

Climate Change is not the only issue that threatens human health, happiness and survival. Childhood asthma has increased markedly with increasing traffic. Over the last decade or so, groundwater pollution incidents reported have increased by 75% though prosecutions have fallen by 66%. We continue to produce around 400 million tonnes of waste a year, much of which goes to landfill sites which are nearing capacity. But much of this could, in fact, be a raw material somewhere else in the economy. Over a quarter of fish, amphibians and reptiles, and 10-20% of invertebrates, and plants, assessed in the UK in 1997 are considered 'threatened' species, whilst populations of woodland and farmland birds have fallen by 20 and 40% respectively in the last thirty years.[5]

Our economy, our way of life, is just not sustainable. We need to reduce our use of resources and our emissions to the environment. The aim must be sustainable development. Sustainable development is a term that has many definitions, perhaps the most common of which is 'meeting the needs of the present generation without compromising the ability of future generations to meet their needs'. Sustainable development includes environmental sustainability, social sustainability and economic sustainability. Arguably, it needs a mix of information, regulation, and taxation to get us there.

2.2 WHY DOES TAX HAVE ANY ROLE IN ENVIRONMENTAL POLICY?

In its first budget, this Labour Government stated:[6]

> The primary aim of tax policy is to raise sufficient revenue for Government to pay for the services which its policies require, and to service its debt, while keeping the overall burden of tax as low as possible. But taxation is not wholly neutral in the way it raises revenue. How and what is taxed sends clear signals about the economic activities which governments believe should be encouraged and discouraged. It is essential that tax policy is based on clear principles. These are to encourage work, savings and investment, and fairness without generating undesirable side effects; it must keep taxpayers' compliance costs to a minimum; it should avoid the less well off bearing an unfair burden; and attention must be paid to any implications for the United Kingdom's international competitiveness.

Many commentators (from Pigou in the 1920s, onwards[7]) have discussed the role that tax, as an element in price, may have in environmental policy. One of the basic lessons of the market place is that by increasing the price of something, we make it rarer. By decreasing the price of something, we make it more common. Why not tax the things we want (like employment) a little

[5] Environment Agency figures, included in, for example, The Environment in your pocket 2000, from DETR
[6] http://www.hm-treasury.gov.uk/budget/1997/report/chap1a.htm, para 1.66
[7] The literature is vast, but a good summary is **Dasgupta** in **Helm** (1991) *Economic Policy Towards the Environment.* Blackwell.

less, and things we don't want (like pollution) a little more? Why can't tax be used to influence societal behaviour?

Thus tax is taking on a different role. Instead of taxing things that people will continue to want, because these provide a steady tax base and are therefore easily managed, another, more important principle has been discovered in the bowels of the Treasury. Tax can, and arguably should, be used more progressively and more creatively to change behaviour, as an alternative to, or in combination with, regulation.

Environmental taxes could be applied to any inputs or outputs of physical processes.

- Inputs include: fossil fuels, whether used for energy or as a feedstock in chemicals or other processes; materials such as aggregates; water, and fertilisers and pesticides. A wide definition would include land (e.g. to encourage redevelopment of urban areas and avoid scarring of green spaces) and even road space as resources that could be priced to encourage a change in behaviour.
- Release to environmental media include emissions to air, water, or solid waste. The biggest current concern is the release of carbon dioxide and other greenhouse gases to the atmosphere, but other combustion products (like sulphur dioxide, oxides of nitrogen, and particulates) all have regional or local air quality implications, affecting both natural habitats and human health.

Most economic instruments are aimed at improving conversion inefficiencies, or reducing wastes. Factors for consideration in the design of any regulation or economic instrument include the extent of depletion of natural resources, the effect on the carrying capacity of the physical environment, and the cost of moving to a lower-impact alternative.[8]

2.3 HOW SHOULD ENVIRONMENTAL IMPACT BE TAXED?

The Government's Statement of Intent on Environmental Taxation, published in July 1997, set out that:

> 'Just as work should be encouraged through the tax system, environmental pollution should be discouraged. But environmental taxation must meet the general tests of ***good taxation***. It must be well designed, to meet objectives without undesirable side-effects; it must keep deadweight compliance costs to a minimum; distributional impact must be acceptable; and care must be taken with regard to implications for international competitiveness. Where environmental taxes meet these tests, the Government will use them.'[9]
> *(Authors' emphasis).*

But is this a sufficient test of good taxation? Surely there must be more criteria to satisfy in terms of good ***environmental*** taxation? There are a number of key theories about how environmental impact should be taxed, and with what aim in mind. Key issues are whether action is necessary or not, and at what level. Many of these themes are explored later in the paper, and in individual examples of tax proposals, but it is worth stating them as key principles first.

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[8] Though this latter is given too much credence by economic modelling: in practice when the price of a resource increases, innovation is encouraged, aimed at reducing the demand for that resource. Economists cannot predict what technical innovations may result.

[9] http://www.hm-treasury.gov.uk/pub/html/budget97/hmt4.html, 2 July 1997

1. In environmental and economic terms, logic surely says that intervention is justified wherever the costs to society of an environmental impact are greater than the cost of reducing an impact through technical or behavioural change. The difficulty comes in making such a judgement;

2. The 1997 Pre-Budget Report added to the criteria for environmental taxation in the original Statement of Intent, stating that "environmental policies must be based on *sound evidence...*". The Environmental Audit Committee of the House of Commons has already pointed out that the need for sound evidence conflicts with the need to operate the 'precautionary principle'. Indeed there is a conflict of culture here: on the one hand, an epidemiological approach requires 'sound evidence' before action, - an attitude of 'show me the bodies first'. On the other hand, the precautionary principle suggests that it is not necessary to see 'bodies' to believe that preventive action is necessary. Epidemiological evidence can be used, for example, to divine a relationship between, say, energy price and energy use. But the costs of damage are harder to determine. Firstly there is uncertainty. The external costs for many impacts are expected to increase dramatically, for example, through increases in energy use, and in road, freight and air traffic. Secondly, once damage occurs through climate change or species loss, it cannot be reversed: if we wait until the earth is warmer to determine the effects and costs of global warming, it will be too late to prevent the effects by reducing greenhouse gas emissions. Thus a precautionary approach must take a principal role, and epidemiological evidence, a secondary, supporting role;

3. Economists describe the relationship between price and demand for a commodity as the price elasticity of a commodity. If all else is equal, and if price goes up, demand goes down. But this relationship is not a simple one. For example, evidence of the effect of a change in energy price suggests that, all else being equal, a 1% increase in price leads to a 0.12% reduction in demand in the short term, and as high as 0.3% in the long term;
   - First, all else is not equal. Actual behaviour will depend on how certain the long term political signal of increased prices is, the alternative technologies available, the ease of adoption of alternative modes of behaviour, income, capital availability, understanding, the regulatory framework and a wide range of other factors.
   - Second, a tax can only be expected to deliver significant change if it is set high enough to be equal to, or exceed the costs of change. That way, decision-makers can see a clear value in action, and a cost of inaction. The proposed solvents tax is a good illustration of this.
   - Third, the costs of change will be different in different sectors, and at different times (e.g. implementing different changes takes longer for decisions which involve capital, or for larger amounts of capital).
   - Thus, the marginal costs of change must be transparent. Often, decision-makers do not know what action to take, or the benefits and costs of that action (economists refer to this as a transaction cost). Thus government needs to ensure that 'transaction costs' are as low as possible, by providing a framework of information, advice and regulation.

4. Some economists have argued that taxes should be related to people's 'willingness to pay' to preserve a given habitat or species or avoid a certain impact. However, 'willingness to pay' a certain price, as expressed in surveys, whilst very democratic, is not necessarily linked to the cost of preventing or reversing environmental damage. Willingness to pay is also strongly linked to understanding of environmental causes and consequences;

5. Some economists have argued that we should price the damage a given activity causes to another party (e.g., to the Government in terms of expenditure elsewhere, such as via the health service, or in terms of loss of environmental resource. These casts are known as the external costs). Policy can aim to 'internalise' these costs in the price of the activity, through

tax, regardless of whether people are 'willing to pay'. In a perfect market, and if costs were internalised, rational economic choices would be made which limited damage. But the market is not perfect, and internalisation of external costs does not correct lack of information, lack of available capital or competing priorities for capital. Nevertheless, internalisation of external costs to society is an economically sound principle, as long as other barriers (lack of information and capital) are similarly addressed;

6. There is a sound theoretic basis for an escalator to be built in to any tax. First, it is not necessary for a tax to exceed the marginal cost of change or the external costs of damage immediately. It is better that a tax starts earlier and lower, to give a long-term signal for change. In any circumstance an evolution is more manageable than a revolution. Second, it is reasonable for rates of tax to be amended in the light of the behavioural response to a price change. Third, it is likely that easy changes will be made first, and over time, the marginal cost of reductions in emissions or resource use may be expected to increase. Fourth, if behaviour is not changed, and energy use (or other resource use) continues to increase, the external costs would increase;

7. Another strand of thought is that by setting a target based on environmental rather than economic criteria, and by limiting the availability of a resource (say the ability to add carbon to the atmosphere) the market will find its own price. This is the principle behind, say, carbon trading. But with carbon trading the cash flow is to the seller of reduced emissions, not to the Government. The Government foregoes the opportunity of substantial tax reform;

8. Decision-makers are generally more responsive to whether they have the capital available to invest in alternatives, than they are to the cost of resource consumption.[10] Thus a key part of the package is to recycle revenue from a tax to allow it to be used for investment to reduce resource consumption. Thus, to take an energy tax, the same energy savings can be achieved with a lower level of tax if a higher proportion of the revenue is recycled for investment in energy efficiency;

9. Some environmental impacts (such as miles travelled by car) are broadly proportional to income. But some (energy used in the home) are independent of income. Thus a key issue is the treatment of different income groups, where the relative change in price triggered by a tax will bite in different ways: different income groups will have different sensitivities to price signals.

'How' and 'why' are crucial questions, and the marginal cost of change, overcoming transaction costs, willingness to pay, internalisation of external costs, and letting the market find its own price must all be issues to be taken into account in the design of ***'good environmental taxation'***. But to it needs to be added, 'how much more ***help***, both informational, and in the form of capital or income, and for whom is required?'. If these factors are not addressed either implicitly or explicitly, one can only assume that purpose of the tax is the collection of revenue, and ***not*** to produce a change in behaviour. Or at least, if the tax is ***claimed*** to encourage a change in behaviour, its design will inevitably be sub-optimal.

[10] Vermeend, W. and van der Vaart, 1998. *Greening Taxes: The Dutch Model.* London, Kluwer Law International

3 A New and Evolving Paradigm

3.1 THE STARTING POINT: ENVIRONMENTAL TAXATION TO DATE

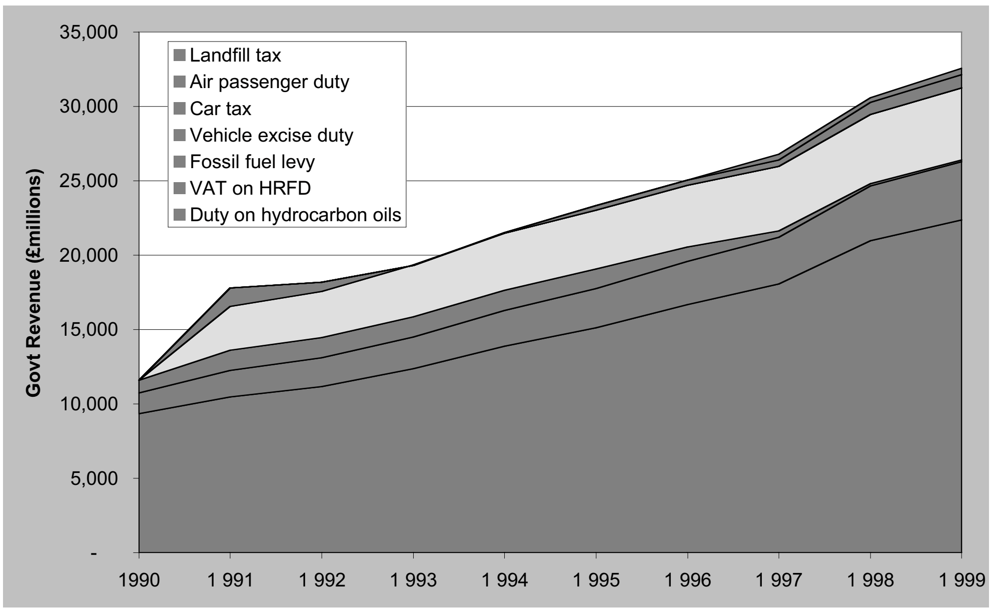
There is no universal definition of an environmental tax. A strict definition of environmental tax is 'a tax whose tax base is a physical unit (or proxy of it) that has a proven specific impact on the environment'. This defines an environmental tax by the tax base. Air Passenger Duty, for example, would have only an indirect effect on air passenger travel, and hence impact, and might not, under a strict definition, be considered an environmental tax.

In this paper, the definition assumes that revenue increases with environmental impact (this seems the base adopted by *National Statistics* in calculating the proportion of tax derived from environmental taxation).[11] This definition includes both direct and indirect effects, such as Air Passenger Duty.

The application of these principles in environmental taxation to date is, at best, weak. It would be fair to say that many 'environmental taxes' - especially those introduced under the last Conservative Government - were conceived more as part of a plan to shift tax from direct to indirect taxation. They were revenue-raising measures, and the cloak of reducing environmental impact was but a thin one.

On the definition used by *National Statistics*, 'environmental taxes' account for around £32.6 billion, or 9.8% of income in 2000 (Figure 1). Of this, Road Fuel Duty accounts for 69%. In 2001, Climate Change Levy will add another £0.8 billion. In percentage terms, however, environmental taxes as a percentage of total taxes and social contributions has risen over the last decade from 7.9% to 9.8% of the total: hardly the presage of a paradigm shift.

Figure 1 Environmental taxation 1990 to 1999 [12]



[11] http://www.statistics.gov.uk/nsbase/themes/environment/Articles/EnvironmentalAccounts/downloads/taxes.xls

[12] Two things need to be noted. First, whilst the revenue collected in cash terms increased, so did the overall level of revenue. Second, inflation is not accounted for in this graph.

One of the key issues this paper raises is how far and how fast could environmental taxation develop? Is it possible for the taxation of 'bads' to become a fundamental plank of taxation as significant in revenue terms as the taxation of income, or the taxation of value?

A working hypothesis of the paper is that it is both possible and desirable for environment to become as significant in revenue terms as income or value, and a crude assumption is that environmental taxation could provide a third of government revenue. The derivation of the remaining two-thirds of government revenue from income and value is beyond the scope of this paper. But suffice to say, significant reductions in the taxing of either or both income and value would be possible, and, indeed, the whole point of shifting to environmental taxation is that it substitutes for conventional taxation upon income and wealth.

To get to this level of taxation would require a significant transition period. Even if the goal is revolutionary, reforms must be evolutionary: to avoid mistakes, to learn from experience, and to allow time for businesses and consumers to adapt. A 5% or 6% Fuel Duty escalator has proved to be unsustainable. A lower rate of growth of 3 or 4% may be more realistic. At this rate, prices after tax may double over the course of a couple of decades. However, the whole problem with the Fuel Duty Escalator was that it did not substitute for existing taxation, but was in addition to existing taxation. A clear substitution of environmental taxation for wealth taxation should permit a more rapid introduction, as is the case with the Climate Change Levy and should be done for the introduction of other measures.

The paper now explores the opportunity for environmental tax reform, including the need to hypothecate revenue to invest in reducing resource consumption and the potential for parallel tax reductions. The possibilities are addressed for reducing greenhouse gas emissions (in particular through energy and transport); water abstractions and significant sources of water pollution; and land use, including aggregates and minerals extraction.

3.2 GREENHOUSE GASES AND AIR QUALITY

3.2.1 Energy taxation

The starting point for any strategy has to be the future of energy taxation. Climate Change resulting from greenhouse gas emissions is the fastest rising issue on the environmental agenda. Road Fuel Duty currently accounts for the largest portion of tax. The Climate Change Levy is the newest measure, and the one where the link between environmental impact and tax is most closely made.

The current value of fuels and the tax applied to fuels is shown in Table 1 (itself a summary of Table 1.4 in DTI's Digest of UK Energy Statistics 2000). Across the whole economy, the value of energy use (including distribution and profit) is £41 billion. On top of this, another £30 billion is taken in tax. However, in 1999, 97% of this was from Road Fuel Duty. Road Fuel Duty, before tax, is worth £4.3 billion, to which is added £29.3 billion in tax; an effective tax rate of 682%. This table shows how utterly disproportionate the rate of tax on fuel is, compared with energy use elsewhere in the economy. This is not an argument for reducing road fuel taxation, but it is an argument for a more balanced approach.

Table 1 The value of fuels and tax (UK) 1999

	Value of commodity before tax £million	Tax £million	Total value £million	Effective Tax rate in 1999 %	Estimated effective tax rate in 2001 %
Domestic	12,995	655	13,650	5	
Industry	5,615	135	5,750	2	10
Commerce	5,560	60	5,620	1	10
Agriculture	310	25	335	8	10
Energy Industry	10,685	30	10,715	0	
Road Fuels	4,305	29,345	33,650	682	
Aviation Fuels	1,160	15	1175	1	
Rail	450	50	500	11	
Total	41,080	30,315	71,395		

In April 2001, the Climate Change Levy takes effect. The Climate Change Levy is a tax on the use of energy in industry, commerce and the public sector. It does not discriminate between carbon content of fuels. It does, however, discriminate between primary fuels (coal and gas etc) and delivered fuels (electricity). The tax is designed, quite deliberately, to provide the right signals to a site to reduce energy use and emissions.

- A tax achieves savings by making the price of a commodity more expensive, so users find ways of using less: but where a similar saving can be guaranteed through negotiation and agreement, a tax would, in environmental terms, be redundant. Thus, where a trade organisation and Government can reach a legally binding agreement, the Government has agreed to reduce the Levy by 80%. There will always, therefore, be an incentive to go that bit beyond the agreement.
- In environmental terms, the biggest savings can be made from switching to Combined Heat and Power[13] or renewable energy. To provide the right signals, heat and electricity supplied from renewable fuels are exempt, so switching to these sources avoids the tax altogether.

[13] CHP is the simultaneous generation of electricity and heat. CHP has significant (25-40%) savings in terms of primary energy, emissions, and cost over separate generation of heat in boilers, and electricity in power stations. The current installed capacity of CHP saves the UK approximately £4 billion a year. CHP could save another £6 billion a year by 2010. About 40% of the remaining cost effective energy savings on industrial sites would come from installation of CHP.

- And where energy is used as a feedstock to a process,[14] the levy would not encourage an improvement in efficiency, because there is no improvement in efficiency to be had! The only reduction in consumption under these circumstances would be to drive UK companies abroad, which is not the purpose of the tax.
- In addition to all of this, the Government has effectively reduced the capital cost of a range of well proven energy efficiency technologies[15] through the introduction of Enhanced Capital Allowances.

The Government has, therefore, provided the energy manager on any given industrial, commercial, or public sector site with the clearest possible set of signals as to how to reduce their tax liability and environmental impact. In terms of the principles of 'good environmental taxation', the purpose of the tax is clear: it is well designed to overcome transaction costs.

One of the key debates over the Climate Change Levy has been whether the tax should be linked to the units of energy consumed or the units of carbon produced. The answer lies in whether the purpose of the tax is the 'internalisation of external costs' or driven by a desire to change behaviour. The answer also depends on whether it is given by an economist or an engineer.

If the tax were simply to be linked to the carbon content of the fuel (i.e. the internalisation of one major external cost) the effect would be to drive any changes upstream into the choice of fuel for power generation. It will kill the already rapidly declining coal industry too quickly for the social effects to be ignored (rather than the managed decline which is current policy). It will incentivise nuclear power, retaining it in the energy mix for longer than is necessary. But above all, it will have little or no effect on the industrial site or the home. The major effect would be that the big energy users (the electricity industry) would switch from coal to gas to reduce the carbon content of electricity. In other words, the effect would be limited and upstream, not a change in culture in the broad range of commercial and industrial companies. There would be little effect on councils, leisure centres, offices, and even on many large industrial sites.

The same criticism would be made of carbon trading in the early years: the number of players able to engage in trading carbon will start out very small. Although carbon trading may become important, in the early years its benefit will be minimal. Neither a carbon tax nor carbon trading would save significant amounts of energy.

In terms of barriers to change, the lack of knowledge as to what the alternative options for a given site might be is a more fundamental barrier than the fact that external costs are not internalised. The Government have, at least in the short term, got it right, and the Government's critics have got it wrong. It may be that in ten years time or so this issue could be revisited, when the understanding of the options is more 'perfect' and then a carbon tax may be more viable.

The Climate Change Levy and Road Fuel Duty taxation is the starting point for considering future energy taxation options. There are three major areas of reform:

- **Linking the rate of energy taxation more closely to external costs**, one element of which is carbon. However taxation which is absolutely proportional to carbon content is unlikely to be achieved because different fuels have externalities other than carbon, and the externalities

[14] For example, the manufacture of fertiliser requires natural gas as a raw material, or feedstock. The gas itself is converted into fertiliser. The process also requires significant heat, which is obtained by burning gas. In this process, the gas used for feedstock will not be taxed, but the gas used for heating - where efficiency improvements could be made - will be taxed.
[15] CHP, boilers, motors, variable speed drives, refrigeration, - see www.eca.gov.uk

are different for different fuels and different sectors. What is needed is to provide clear signals as to what to do to reduce environmental impact (i.e. reduce so-called transaction costs). This, the Climate Change Levy does, and exemptions should continue for CHP and renewables, with money recycled into investment in energy efficiency, across *all* sectors;
- **The introduction of a clear escalator for the levy**, with the target being the external costs;
- **The extension of the tax to the domestic sector**, though this is likely to be the most controversial element.

Reforming the Climate Change Levy
An escalator should be built into the Climate Change Levy in the same way as it has been built into the Road Fuel Duty: unpopular as it is, it is the only way. If energy prices don't rise gradually now, they will inevitably rise steeply later as a result either of scarcity or the damaging effects of climate change. The key issue is at what rate should the escalator rise?

The CCL was originally planned as a 14% increase in electricity prices, and a 29% increase in gas prices, but the Chancellor revised the proposed rates to a 10% and 19% rise respectively. We might expect to get to the originally proposed levels within a year or two of a 2001 General Election, with a commitment to increase beyond that. If energy prices were to double in 20 years, the average annual rise would be around 3.5%. A doubling of price in 10 years would be an average price rise of over 7% which is not realistic unless significant effects from climate change become apparent.

These prices are well within the rate of natural market variation. Up to the summer of 2000, electricity and gas prices had declined by around a quarter in the decade or so since privatisation, and further declines in both gas and electricity prices could be expected as gas and electricity supply liberalisation progresses. Introducing an escalator at a time of declining fuel prices is a politically easier process than when prices are rising. In the transport sector, the Fuel Duty Escalator only hit problems when fuel prices temporarily rose in 2000. For a decade the Escalator had done little more than compensate for drops in road fuel costs and had been accepted. In all cases, Government may choose to operate the proposed escalators bearing in mind underlying energy prices, with smaller escalators at times of high prices. Since the summer of 2000, gas prices have followed the variability in the oil price market.[16]

Extending the Levy to the domestic sector is likely to prove extremely controversial. The uproar caused by the addition of VAT to domestic fuel was an indicator of the strength of public feeling - not least amongst pensioners because of the scandal of fuel poverty. But public protests don't make a domestic energy tax wrong. They do make it difficult. This only reinforces the principle of ETR that new environmental taxes must substitute for taxes on income and wealth. However, distributional effects need careful consideration. It is unlikely that the Levy could be extended to the domestic sector until it has been seen to work in industry. It is unlikely to be acceptable unless the Government gets serious about eradicating fuel poverty. And it is unlikely to be acceptable without a concerted effort to explain the environmental basis of the tax (linking global warming and floods), ways of reducing energy use, and how the Government intends to recycle the revenue. Even so, it will require determination and compromise.

Current DTI projections are that energy demand - under a business as usual scenario - would increase by around 13% by 2020.[17] However, if the price of energy (including tax) doubles, then projected use may be expected to decline by between 10% and 30%.

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[16] See www.alliancegas.co.uk, which maintains a time-series of spot market prices over any given 12 month period.
[17] See Table 6.1 of DTI Energy Paper 58, at www.dti.gov.uk/energy/energy_projections.htm. All scenarios show an increase, but the scenario usually used as the central scenario is CL (central growth, low fuel price). The range of projected growth across the scenarios is 6%-16% by 2020.

Other domestic sector taxes could, in time, be reformed alongside a domestic energy tax, for example, by making variable rates of VAT dependent on the energy efficiency of products, with the most efficient products (shown by an EU-wide energy label or possibly a much-reformed EU eco-label[18]) being lower, or even zero-rated. However, varying rates of VAT is difficult within the context of attempts by the EU to harmonise rates.

In any reform of domestic sector taxation, information and help with investment, particularly for the fuel poor, will be crucial.

3.2.2 Transport Taxation

The impacts of transport

The Road Fuel Duty, congestion-charging and other measures aimed at reducing vehicle use will be a matter of intense political debate.

Road transport is responsible for a quarter of UK carbon dioxide and is the prime cause of poor air quality. It is a contributor to respiratory disease including asthma, bronchitis and cancers and prematurely kills between 12-24,000 people annually, with consequential costs to the health service, and the wider economy. Congestion reduces the efficiency of the economy. The present transport system is also deeply inequitable, and is unable to meet the needs of the one third of UK households who have no regular access to a car.

Estimates of external costs associated with road transport are quoted by SACTRA as between £8-39 billion.[19] The costs of congestion are an additional £7-19 billion per annum.[20] Economists would say that, at present, many journeys have a marginal social cost in excess of marginal benefit[21], though the costs and benefits associated with different types of journey will vary enormously. The key to the application of environmental taxation to road transport, is that it is not simply energy use that is important, but the time and locational impacts of that energy use. Rather than burning vast quantities of fossil fuel in remote power stations with sophisticated pollution control equipment, fossil fuel is being burned on our streets, with poor levels of control, and consequently high levels of unburnt hydrocarbons, particulate emissions, oxides of nitrogen, and ozone.

Whereas the energy intensity of the economy is in decline, the transport intensity of the economy has been increasing.[22] According to the Commission for Integrated Transport (CIT), traffic is

[18] The provision of environmental information to consumers deserves a separate paper. But the EU Eco-label has been an unmitigated disaster. In a misguided attempt to make the regulation self-financing, manufacturers have to pay a licence fee to use the logo: this is tantamount to a tax on efficiency. There was a mistaken belief that consumers were prepared to pay more for reduced environmental impact. Now this has been shown to be erroneous, manufacturers see no benefit in paying a license fee for a logo. In addition the logo tells the consumer nothing about why a product is better or worse than another product.

[19] Of which only £5 billion in 1999/00 was spent on roads.

[20] SACTRA is the Standing Advisory Committee on Trunk Road Assessment, set up by, and reporting to DETR. See http://www.detr.gov.uk/roads/roadnetwork/sactra/report99/7.htm

[21] Marginal costs are often the external costs imposed on society through pollution and other costs are greater than the economic benefit enjoyed by the person making the journey.

[22] Each unit of economic output is associated with less energy overall, but perversely, with a greater amount of movement of people or goods. This is based on DTI Digest of UK Energy Statistics, 2000 Para 1.34, see http://www.dti.gov.uk/epa/01.pdf) and the DETR's Standing Advisory Committee on Trunk Road Assessment, http://www.detr.gov.uk/roads/roadnetwork/sactra/report99/

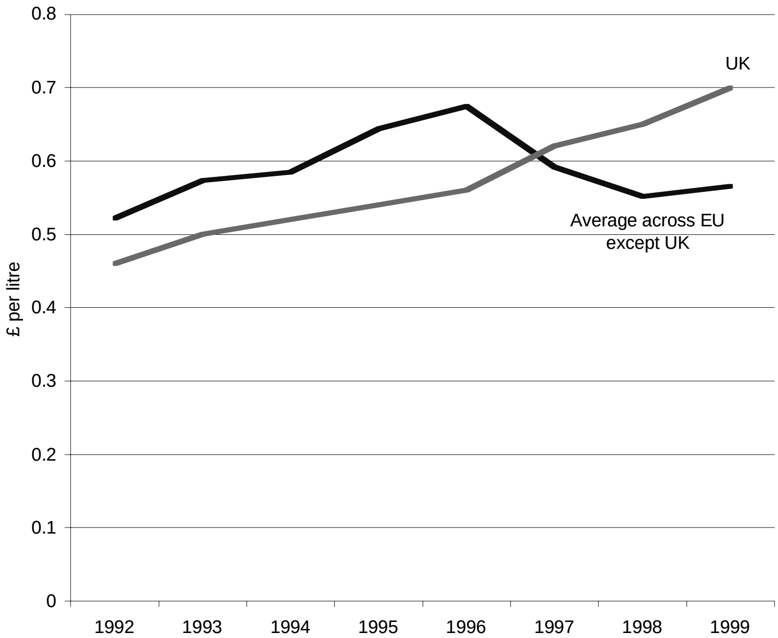
expected to grow by 35% between 1996 and 2010 without the congestion charges and parking levies included in the Transport Bill and 27% with these measures in place.

Changing the framework for transport taxation
Current taxation of transport includes:

- £22 billion raised by oil duties including road fuel duty;
- £5 billion in VAT relating to motor vehicles and road fuel;
- £5 billion in vehicle excise duty;
- £2 billion in income tax on company cars and fuel;
- £? billion in employers' class 1A national insurance contributions on company cars and fuel.

These elements total over £36 billion.[23] Road Fuel Duty has had a marked effect on petrol prices to date (Figure 2), bucking the downward trend over the last few years across Europe as oil prices have fallen.

Figure 2 Road Fuel Duty



However, even at this high level of taxation, transport costs are not fully reflective of external costs.

In addition, the current framework does not signal marginal costs to motorists and is a blunt method of trying to reduce traffic levels. For example, the level of VED does not vary significantly with vehicle size, or with miles driven, while road fuel duty is imposed at the same rate on petrol used for rural and urban motoring, although the external costs of congestion and emissions are typically very different. Most importantly perhaps, the relative cost of road transport compared to other modes of transport does not reflect the relative environmental impacts: although the real cost of motoring has increased, it has risen less than the costs of using public transport. The cost of rail

[23] House of Commons research paper 99/42

and bus/coach fares, as measured by the travel components of the Retail Prices Index, more than doubled between January 1987 and April 2000. The real increases over this time were 18% for bus/coach fares and 21% for rail fares compared to 7.2% for motoring.

The aim of taxation measures must be to make explicit and to internalise the full social and environmental costs of transport, through a combination of taxes on fuel, vehicles, and on road space at certain times and in certain places. Reflecting the full externalities, the total tax take from road transport could be of the order of £50-60 billion by 2020 (current values and consumption levels) which is significantly higher than the £36 billion currently levied. However, the tax system must also give the right signals about moving to alternatives, including smaller and more efficient vehicles, and when alternatives to the car would be a more suitable mode.

Road Transport

The aim is a mix of taxes on fuel, vehicles, and on road space at certain times and in certain places, which internalises the external costs.

The current Government's attitude to road fuel duty is impossibly short term: there is no environmental justification whatsoever for lower diesel rates for different users such as farmers. Fuel duty should be strictly linked to environmental impact, and if farmers have a legitimate need for support, that should be forthcoming in other ways. There is little justification for the maintenance of a differential between low sulphur and ordinary fuel, when regulation could have made the use of the lower sulphur alternative compulsory at a significantly lower cost to the Government. Any price reduction on fuel will see an increase in use, with concomitant increase in environmental impact.

A fuel duty escalator of 6% is called for by some, such as Friends of the Earth. But in the current political climate this not only runs the risk of giving environmental taxation a bad name, it is not the optimal environmental solution.

There is a good case for moving fuels onto a scale which reflects their carbon content, and in time, merging the Road Fuel Duty framework with the Climate Change Levy, even if this means stabilising or reducing the total tax take from Road Fuel Duty. Increasingly the fuel mix will include petrol, diesel, electricity, and new and alternative fuels such as liquid petroleum gas, compressed natural gas, and renewables-derived road fuels (including plant oils or hydrogen derived from renewable sources such as solar). Each has significantly different environmental impacts. The aim of fuel tax must be to encourage a switch to alternative fuels with a lower environmental impact and to reduce dependence on fossil fuels.

It is conceivable that if the emphasis of taxation were to move beyond fuel tax and a lower tax rate were offered to alterative fuels, the total tax take from Road Fuel Duty might decline from its current levels of £25 billion, to around 20 billion a year.

The taxation of cars could provide more significant signals to consumers over vehicle choice. Manufacturers have already offered a voluntary agreement to improve vehicle efficiency.[24] Further incentive might be given to buy more fuel efficient cars through changes to Vehicle Excise Duty and Company Car Tax. Vehicle Excise Duty is only very loosely related to engine size. In a short

[24] If required, this rather wishy-washy commitment by manufacturers could be replaced with a US-style Corporate Average Fuel Economy (CAFÉ standard), a mandatory regulation by which the average efficiency of new vehicles sold from each manufacturer must reach a given level, or the manufacturer must buy credits from other manufacturers, or pay a fine.

time the new Energy Label for Vehicles[25] could be the basis for taxation. This could even be combined with the Vehicle Emissions Test conducted as part of the annual MOT. The £7.5 billion currently collected from VED and company car taxation could easily be twice this, with very substantial VED (say over £1000 a year) for less efficient or more polluting vehicles, and with rebates for the most efficient vehicles (say up to £200 a year). This combined system of fees and rebates is known as Feebates, and such schemes have been used in Canada and elsewhere.

As well as taxes on fuels and vehicles, legislation now allows local authorities to charge for road space, and London may well be the first. SACTRA quote research on the benefits of congestion charging for London (Table 2), and calculate that optimal congestion charging in current circumstances might produce national revenues as high as £18bn per year. One of the main attractions of congestion charging is that it would be levied by local government, and could replace national taxes. It could thus be part of a wider move to allow local government to be much more responsible for taxation, less controlled by central government finance.

Table 2 A congestion charge for London

	£4 Charge	**£8 Charge**
Total Congestion Charge £m	246.6	437.1
Net Economic Benefits £m	158.7	159.2

(from SACTRA)

In total therefore, Road Fuel Duty might account for around £20 billion, vehicles for around £15 billion, and road space for around £18 billion: a total of £53 billion, at current rates.

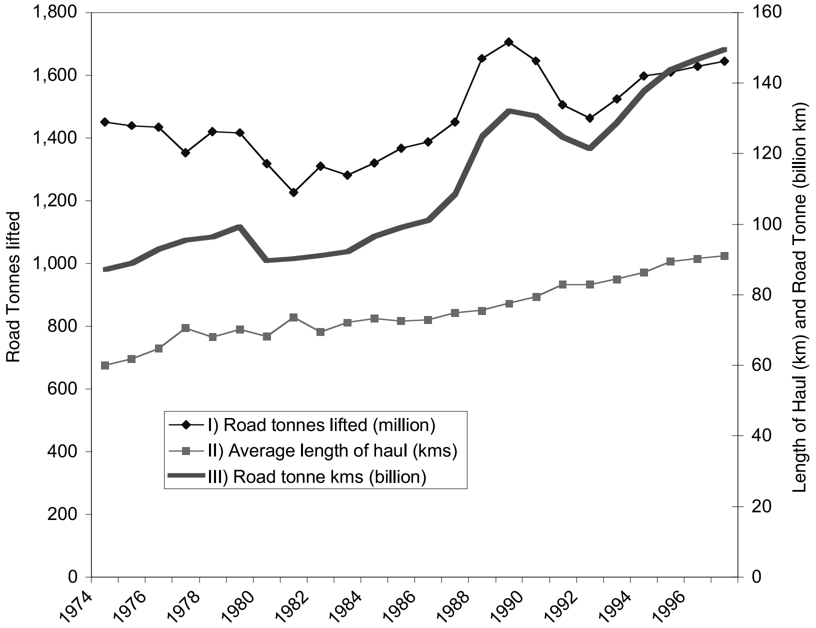
Freight transport

Road freight is a particular subset of road transport. Road freight accounts for over 50% of all goods moved. Figure 3 shows road freight traffic (billion tonne km) increased by 67% since 1980, outgrowing GDP (47%), manufacturing output (26%) and construction output (42%).[26] Growth was more due to the distance carried rather than an increase in weight carried.

[25] [www.eci.ox.ac.uk/…….].

[26] House of Commons research paper 99/42

Figure 3 HGV Great Britain Road Freight, 1974 to 1997



Source: DETR, Transport of Goods by Road in Great Britain 1997

Road traffic forecasts estimate that articulated vehicle traffic will double between 1996 and 2026 to around 350 billion km. This implied increase in externalities needs addressing (again via a combination of measures to address not only fuel use, but the impacts of different fuels in different places at different times) so that goods travel fewer miles, and travel differently.

Again, the taxing of fuel may have reached its zenith, and a wider tax base is needed. Freight VED could be replaced by a Weight-Distance tax, as currently used in New Zealand and proposed in Switzerland, Austria and Germany. The UK should participate in the development of such a system from the outset. By relating tax paid to the distance travelled and weight of vehicles, it links closely to environmental impacts. Of course, freight would also be affected by road-space charging.

Aviation

The appropriate pricing of Aviation must be a part of the package. The total number of terminal passengers at UK airports grew strongly between 1995 and 1998 at an average annual rate of 6.9%, to 160 million. According to DETR forecasts, this is expected to increase to 276 million by 2010 and 400 million by 2020.[27]

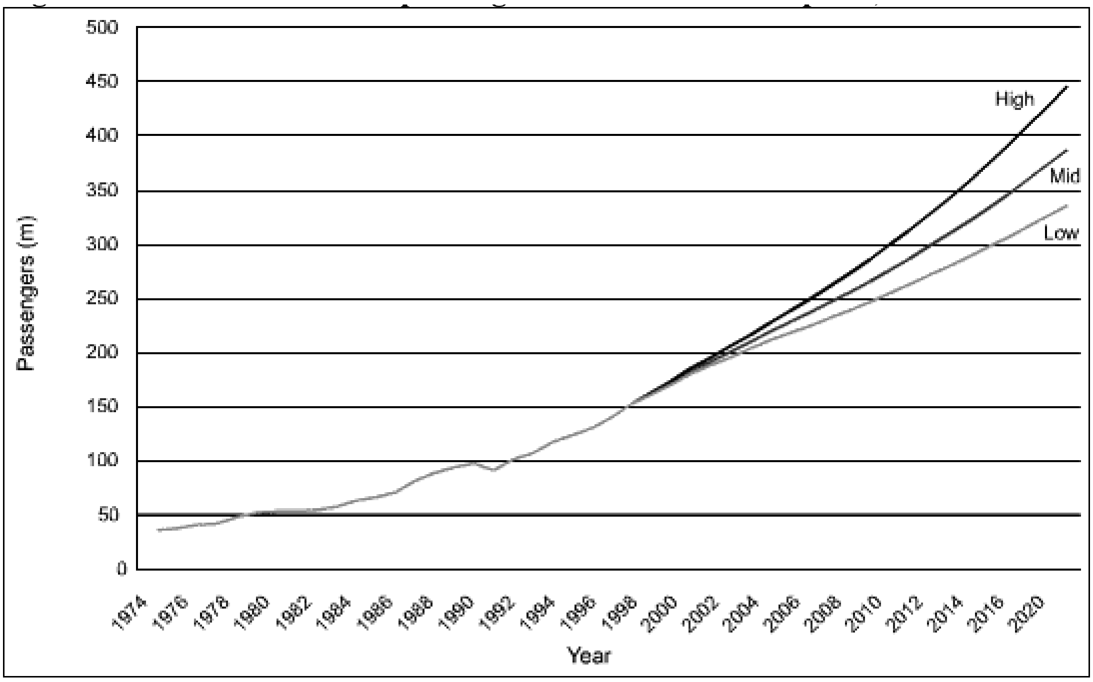
Again, with air travel it is not simply an issue of energy use, but where the energy use takes place. Take-off and landing is responsible for a high proportion of fuel use, and is concentrated on the edge of major conurbations, with resulting air quality implications. And at the altitude at which aircraft fly, atmospheric chemistry is extremely delicate, and even water vapour is an unusual substance. Damage to stratospheric ozone and implications for climate change are poorly understood, but must be reflected in internalisation of external costs.

In terms of encouraging alternatives, domestic flights cause significantly more externalities than the equivalent journey by rail and the pricing of the alternatives ought to reflect this; short-haul

[27] See http://www.aviation.detr.gov.uk/atfuk2000/index.htm

continental flights could be replaced by rail links via the Channel Tunnel. There is good societal and environmental argument for investment and support to ensure the right price signals are given.

Figure 4 Actual and forecast passenger numbers at UK airports, 1975 to 2020



The DETR forecasts also examined the effect of a fuel tax. Fuel accounts for about 10% of airline costs. The forecasts assumed a fuel tax of 10% in 2006 followed by a 10% increase in the fuel tax rate per annum for the next nine years. This raises airline costs, all other things being equal, by 1% per annum. This would reduce projected growth figures by about 10%, to about 340 million passengers. This still represents a doubling of passenger movements by 2020.

By implication, to constrain air travel at close to current levels would require an escalating tax on fuel reaching around 600% by 2020. This would mean that by 2020, aviation fuel would have risen from 10% to about 40% of the total cost of air travel. To get to this point would require an escalator of around 11% per annum from 2001 onwards, raising around £6.6 billion a year in tax by 2020.

However, a simple fuel tax is likely to drive long-haul flights moving to EU airports, - and this becomes more important the higher the tax. The aim should therefore be a combination of:

- a fuel tax;
- a vehicle excise duty for aircraft (as for lorries, based on a vignetting system), which is based on relative fuel efficiency per passenger carried;
- and take-off and landing charges, which would affect peak time traffic, and internal flights in particular.

3.2.3 Encouraging alternatives through information and incentives

A crucial point raised by environmental economics writers is that fiscal measures on their own do not constitute a policy. Taxation only affects certain parts of the system and how subsequent revenues are spent is a vital element, particularly in addressing aspects unaffected by taxation (like poor investment in alternatives to energy-intensive transport methods). A ‘greening’ of fiscal policy can only be effective if it is part of an overall coherent policy framework. Fiscal measures alone cannot be effective unless coordinated with government spending plans.

Given that transaction costs are a key barrier to energy efficiency (and more generally to improved environmental efficiency) then information and advice is a key part of the package. For any given environmental improvement, the more information that is available on alternative behaviour or technologies, the lower the tax would need to be to trigger change.

Information

Key elements would continue to be the energy efficiency best practice programme for industry[28] and massive extensions of the market transformation programme for household and commercial products.[29]

The forthcoming energy label for cars needs to be extended: not only is information at the point of purchase useful, but every year, when a car has an MOT test, the level of emissions are tested. This information, combined with the annual mileage - also recorded on the MOT certificate - could demonstrate vividly the emissions that people are personally responsible for. Combined with fuel prices the cost can be shown. Furthermore, the costs and emissions of a vehicle compared to similar vehicles in the same class doing the same mileage can also be made available. Understanding, feedback, measurement and comparison are all vital in changing behaviour of companies as well as households.

Not surprisingly, surveys of motorists show a strong feeling against the recent increases in the price of fuel. Different surveys have put the net support for the fuel duty escalator at -82% and -89%. Higher prices have been found likely to affect travel behaviour.[30] Research by the AA shows that the cost of fuel is the issue of greatest concern to motorists - as drivers and users of cars. The amount of tax-take in fuel was next most important. The cost of fuel was deemed relatively more important by people who live in rural areas, those with lower incomes and younger people.

In addition, houses would need mandatory energy ratings for their energy efficiency at point-of-sale or when being rented. When a purchaser applies for a mortgage, the rating should include a list of the top handful of measures that would reduce the energy bill (including how much they would cost and how much they would save).[31]

Investment in industry

Alongside the reformed Climate Change Levy, the amount available for investment in energy efficiency should increase substantially. Under the current proposals for Enhanced Capital Allowances, an investment of £1million can be set against a tax liability of £1million in the year of the investment. The package is worth around £100 million to industry, but is only around 6-7% of the cost of a given investment. Enhanced Capital Allowances greater than 100% could be made

[28] www.energy-efficiency.gov.uk
[29] www.mtprog.com
[30] Research by Stephen Glaster and sponsored by the RAC found that, faced with a 25 pence increase in the price of a litre of petrol (i.e. around a 33% price increase), 24% of motorists would drive less and 10% would use other forms of transport more. A further 14% would change the type of car they drove. 39% of drivers would not change their driving behaviour. In terms of the general literature on price elasticities, studies suggest a short term elasticity of –0.4 (i.e. a 10% rise in price would cut consumption by 4%), so a 33% rise in fuel costs might be expected to cut fuel (not necessarily car) use by about 13%. http://www.parliament.uk/commons/lib/research/rp2000/rp00-069.pdf
[31] These measures may be developed in the Government's proposed new sellers pack

available (so an investment of £1million could result in an allowance against tax of between perhaps £1 million and £2 million, dependent on the carbon or energy saving effectiveness of the technology).

Investment in the domestic sector

If the Climate Change Levy were extended to the domestic sector, the revenue, especially in the early years, needs to be recycled in investment in full, starting with households currently in fuel poverty.

Fuel poverty means not only is a household unable to afford an adequate level of warmth, light etc, but it cannot afford to improve their home to reduce energy bills. Fuel poverty is not only an income problem, it is a capital problem. Fuel poverty is caused by the state of our housing stock. The common definition of fuel poverty is when a household would need to spend more than 10% of its income on all fuel to achieve the standard heating regime. By this definition around one in four households in DETR's1996 English House Condition Survey are in fuel poverty. In addition 6% of homes suffer from serious or defective levels of damp, and another 10% are 'just acceptable'.

Fuel poverty is the reason why we have the highest cold-related excess winter deaths in Europe, even though we do not have the coldest winters in Europe. Around 40,000 excess winter deaths occur each year, or around 60 in every constituency: every MP should know someone who has died in fuel poverty. In addition, cold related illnesses include respiratory diseases such as bronchitis, pneumonia, and asthma. The most vulnerable groups are children and lone pensioners.

From the limited evidence available, a very broad estimate is that up to 5 to 10% of excess winter deaths might be prevented by full implementation of home energy efficiency measures. Many more would benefit from reduced morbidity and improved quality of life. Thus far, the Government's fuel poverty strategy has relied on falling energy prices, winter fuel payments to pensioners of £150 a year, and reduced VAT, as well as a 'beefed-up' HEES (Home Energy Efficiency Scheme). But its strategy fails to recognise the fact that this is a capital problem. At current levels of spend, HEES would take about 150 years to eradicate Fuel Poverty. In the meantime, avoidable ill-health causes the Health Service a huge problem at its winter peak. Investment in any system is determined by peak demand. The NHS has a winter management plan, but nowhere in this plan is there any thought of peak demand management, through reducing fuel poverty and consequent illness.[32]

The scandal of fuel poverty must be addressed before any net revenue is available for general expenditure. At a tax rate of 3.5% in year 1, the revenue from the tax would be worth some £257 million, increasing each year. Up to £20 billion is needed for investment in domestic energy efficiency.[33] If the 3.5% p.a. escalator were used, all of the first 5 years income, and a portion of the levy thereafter, needs to be recycled in improving energy efficiency firstly in fuel poor households, but then, later, in other income groups.

[32] www.doh.gov.uk

[33] There will be around 25 million households by 2010, so this is less than £1000 on average per household. Some dwellings will need a new wet radiator system, boiler, and fabric insulation measures, costing around £4000 per dwelling. Some households will not be able to make a capital contribution to this. In some cases, the assets can be leased from an energy services provider. Other households may invest, but in measures, themselves, but energy efficiency loans would make such investments happen more quickly. In the long term, micro-CHP will replace many domestic boilers, usually owned, managed and maintained by an energy services company. Although Micro CHP is more capital intensive, it offers significant savings.

Households, though sometimes in need of help and advice when selecting and purchasing products, could reduce energy use by 40% or more by the use of energy efficient light bulbs and appliances, by the installation of the best gas boilers, and by insulation measures.

Investment in transport alternatives
The potential for recycling revenue for investment in transport infrastructure is vast, and includes alternatives to the car such as buses and trams; freight infrastructure; and easing of longer distance journeys such as expansion of the rail connections to Europe and access to airports via public transport. However, it is typically the many small projects, rather than the one or two prestige investment projects, that make the biggest difference.

If more public money is to be invested in transport infrastructure, it cannot merely be a public gift to the private purse. The vigorous pursuit of the right partnership model is a necessity. And there is much to learn from abroad, especially from German *Verbunds*, where public bodies in partnership with elected regional assemblies determine strategic issues (like route design, transport interconnections, through-ticketing, integrated timetabling and information). Within this strategic approach, the private sector exists to provide a given service at best value.

3.2.4 A solvents tax: an example of taxation to reduce trace gases

Carbon dioxide is responsible for around four-fifths of global warming. The rest is due to a range of trace greenhouse gases, present in small quantities but with a significant impact per unit weight (e.g. methane). In addition, trace gases are responsible for ozone depletion (e.g. CFCs, HCFCs, and HFCs) and for significant local air quality problems.

A range of solvents contribute to a number of these problems. The Government has examined the role of a solvents tax as a way of implementing the Solvent Emissions Directive.[34] A solvents tax could be a model for a much wider use of economic approaches to reducing other trace gases.

The Solvent Emissions Directive proposes emissions limits for different processes. If these limits are applied directly, the Directive could have a considerable impact upon the emissions and costs of a range of solvent-using businesses and industries in the UK. Because of existing UK regulations, the impact of the Directive is not uniform across sectors. Some sectors are required to make considerable reductions in emissions in order to comply with the Directive; other sectors - even high-emitting ones - are unaffected. There is considerable variation in the costs which firms must incur to comply with the Directive, and considerable variation in the marginal cost of emission reductions across those reduction measures required by the Directive for compliance. This variation would suggest potentially large gains to be made from a flexible approach to reducing emissions.

The Directive includes the option of compliance through the establishment of flexible National Plans which should achieve the same level of emission reductions as the Directive and over the same timetable, but can achieve it without the need for individual firms to comply with the Directive's limit values. This implies flexibility which could make a National Plan a lower cost means for the UK of complying with the Directive. These savings are secured through increasing abatement in some sub-sectors of the printing processes sector, and reducing it in textile coating and elsewhere in printing.

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[34] DETR *Scope for the Use of Economic Instruments in the Implementation of the EC Solvent Emissions Directive* Final report January 2000. http://www.detr.gov.uk/environment/consult/emissions/pdf/instrum1.pdf

A solvents tax to achieve the required level of emissions reductions might need to be as high as £3,245 per tonne reduced per annum, which might equate to an *ad valorem* tax rate in the region of 253 per cent. Although firms are predicted to reduce their emissions by 35,000 tonnes per annum under the tax regime, they would still be emitted in the region of 44,500 tonnes per annum, giving an annual tax bill of almost £150m per year.

3.3 WATER POLLUTION

Damage to water systems can be caused both by excessive abstraction, and by pollution, especially from run-off from agricultural land carrying with it pesticides and fertilizers. The Government has examined all of these areas, but has yet to take significant action. It produced a consultation paper on options for helping to deal with water pollution[35] which outlined a number of possible instruments, including water pollution charges linked to the nature and amount of pollutants discharged to our watercourses. The potential for charges in relation to pesticides and nutrients is also explored.

Action is, indeed, needed given that over the last decade or so, groundwater pollution incidents reported have increased by 75% though prosecutions have fallen by 66%.

Alongside these proposals, it would only be rational to change the law on environmental liability. The US has, and Europe supports, a system of strict liability (i.e. it is only necessary to prove who caused pollution). In the UK it is necessary not only to show that someone caused pollution, but that they should have known that what they were doing was likely to cause pollution. Of course, strict liability would affect pollution to air, water and to land, but some of the most harmful incidents relate to water pollution, especially when it affects drinking water.

3.3.1 A trading scheme for abstraction licenses

Water abstraction charges are based on the maximum quantity licensed to be abstracted, rather than the amount actually abstracted. The charges are set at a level which enables the Environment Agency to recover, year on year, the costs of carrying out its water resources management functions. The consultation paper considers the case for increasing abstraction charges above the cost recovery level. This would amount to an environmental tax and would require a change in the law to be made through a finance bill.

There might be two reasons for doing this. One would be to make abstractors bear more of the true costs of the effects of their abstractions on the environment. The other reason for increasing abstraction charges above cost recovery level would be to reduce the overall amount of water abstracted for economically low-value uses. But research indicates that this latter objective would take tenfold increases or more, with widespread effects, notably upon public water supply prices, and perhaps on electricity prices (the electricity industry is responsible for around half of water abstractions, for use in cooling towers).

The paper points out that legislation already provides direct means to curtail abstractions, and that licence trading may have an important role to play in redistributing water resources. It therefore seeks comments on the view that increasing charges specifically in order to reduce abstraction would not be justified**.** But the paper recognises that there may be scope for re-balancing cost recovery-based charges to reflect differing water resources positions. Research indicates that

[35] http://www.detr.gov.uk/environment/consult/ecowater/pdf/ecowater.pdf

markets for trading licences can be created. The paper invites comments on the Government's view that, in principle, abstraction licence trading should be promoted as an effective means of achieving the optimal distribution of water resources within and between different sectors of use and thus contributing to sustainable development.

3.3.2 Fertilisers and pesticides

Separate taxes on pesticides and on fertilizers should include substantial hypothecation into sustainable farming, including a best practice programme for both conventional farming methods and in organic farming. The overall result would be less pollution, better food, more jobs in farming and a stronger rural economy.

There is increasing evidence to support the view that reductions in pesticide use can be made without sacrificing adequate crop protection and reducing farm profitability. At the same time there are costs to society over and above those which pesticide users pay for the products they use. The external costs associated with pesticides have been estimated at between £100m and £300m per year. Externalities include:

- the detection of increasing levels of pesticides (particularly herbicides) in groundwater;
- the low rate of degradation of pesticides, particularly in aquifers, and delays in the full effects becoming apparent;
- there may be effects on particular non-target species, and a loss of biodiversity, as well as a risk to human health.

According to the DETR there is thus a case for the introduction of an instrument to provide incentives for more environmentally-benign behaviour, based upon existing environmental evidence, a precautionary approach (given scientific uncertainty), and the application of the Polluter Pays Principle. A pesticides tax might:

- **secure reductions in pesticide usage** (for example, by encouraging the adoption of reduced spraying programmes);
- **increase efficiency in usage by improved targeting** both in terms of the number of applications and the area in which applications are made;
- **achieve substitution either by less harmful pesticides or by alternative techniques** such as the re-introduction of natural predators or by techniques which aim to avoid the need to use a pesticide;
- **provide cash incentives from the revenue for environmental protection measures** to promote increased awareness of best practice, and reduce the impact of pesticides in different media (such as buffer strips beside water-courses).

DETR's consultants, ECOTEC[36], examined an illustrative average tax of 30% of the product price, equal to a tax take roughly equivalent to some £85m to £130m based on overall UK sales of pesticides of £520m. This broadly correlates with available environmental damage cost estimates. Such a tax rate would be expected to trigger a reduction in use of the order of 4-9%. With supporting measures, reductions in use of the order of 20% could be expected. Under these circumstances, the number of occasions under which drinking water quality standards would be exceeded would be reduced by a third.

The worst case cost to farmers amounts to about 3% of farming income. For some farmers, whose performance by this measure is already below average, the tax has a substantial impact on net farm income. It is estimated that overall 2% of businesses (280 out of 15,000) become unprofitable

[36] *Economic Instruments for Pesticide Minimisation*, ECOTEC et al, 1997, Birmingham

due to a 30% tax. Such an effect is dwarfed by the implications for farmers of exchange rate movements and associated changes in the green rate. The cost to consumers represents less than 0.1% of total household expenditure on food. There would be significant benefit to the water consumer, through reduced capital expenditure and operating costs incurred by the water industry.

The industry remains concerned at the impacts of the tax, and continues to develop voluntary proposals.[37] The Environmental Audit Committee of the House of Commons remains in favour of introducing a pesticides tax.[38] Meanwhile, the Government prevaricates, and to the Committee's astonishment, dropped a pesticides tax from the 1999 budget, probably to avoid alienating the farming community in the run up to a General Election.

The Committee are concerned that although the overall weight of pesticides used may have declined, this may have been outweighed by the increased toxicity of new formulations and changing patterns of use. With the dropping of a pesticides tax, dormant proposals for taxing fertiliser use may also fall off the agenda. The Government's plans to implement the 'polluter pays' principle in a major area of environmental concern - water resources - seem therefore to have come to nothing. The Committee regarded this as a significant failure in its commitment to place the environment at the heart of government and to pursue sustainable development.

From an environmental tax reform perspective, this seems a classic arena for a successful tax: not one necessarily designed to raise significant revenues, but one in which the income can be used to promote significant change within a very specific sector of the economy. A tax would not only address externalities but the income could be used to address transaction costs.

3.4 TAXING THE USE OF LAND

Using land causes environmental damage. Farming, greenfield development, aggregates and minerals extraction, landfill, or road space, (or abuse of land, for example through pollution incidents) all contribute to habitat and species loss. But several of these issues are more complicated than merely an issue of land. Aggregates and minerals extraction depletes the earth's stock of natural resources, and 'environmental capital' is reduced. Burying rubbish in landfill locks away a potentially precious raw material. Concreting over a strip of land induces more traffic, with a consequent increase in emissions and fossil fuel use.

The traditional approach to preserving land has been through the planning system. But is there an opportunity to go beyond this, through the tax system?

3.4.1 Preserving green spaces

There are several approaches to preserving green spaces:

- To make it more expensive not to use brownfield spaces by Site Value Rating;
- To reduce the cost of developing brownfield sites (e.g. by reducing VAT charged on developments on brownfield);
- To discourage greenfield development by a greenfield development tax.

There is no reason why more than one of these options could not be used in combination.
The aim is to make business rates and council tax bills more closely related to land use and environmental impact. Business rates raise around £15 billion a year, whilst council taxes raise 12

[37] http://www.baa.org.uk/visitors/v_content.asp?page=content/news.htm

[38] Environmental Audit Committee Fourth report *The Pre-Budget Report 1999: Pesticides, Aggregates And The Climate Change Levy.*

billion a year. The loss of VAT income from abolishing VAT on developments on brownfield is trivial in both revenue and expenditure terms.

Site Value Rating is an idea long advocated by Liberal Democrats. In theory, basing rateable values on the value of a site (rather than the use to which it happens to be put at any given moment) would encourage the re-use of abandoned urban spaces. It also has the benefit of simply being better government. The biggest problem with the present business rate system is the cost of legal challenges. This is no wonder, since it is arcane in its logic, and has become convoluted and lacking in transparency.[39]

3.4.2 An aggregates tax

All quarrying (e.g. for limestone, clay or gravel) despoils the countryside, and any policy with sustainable development at its heart would minimise it. The DETR has estimated local environmental costs associated with the extraction and transport of aggregates, including noise, dust, vibration, loss of biodiversity and amenity and visual intrusion, at around £1.80 per tonne. There is also evidence of wider public concern over the environmental impact of quarrying in protected areas such as national parks.

A tax on primary aggregates would, over a period of years, shift the balance towards:

- greater use of re-used secondary material;
- changes to buildings design and management, including refurbishment.

In March 2000 the Government announced a new levy to tackle the environmental costs of quarrying and encourage the use of recycled materials.[40] The Government has taken a cautious approach by introducing the levy at a lower rate of £1.60 per tonne for sand, gravel and crushed rock extracted in the UK or its territorial waters, and by giving firms two years to plan for its introduction. To protect international competitiveness, the tax will be levied on imports but exports will be exempt. Recycled aggregates will also not be subject to the levy.

The levy will raise around £380 million per year. The levy will be administered by Customs and Excise and will take effect from 1 April 2002. There will be no net gain to the Exchequer from this reform. All of the revenues will be returned to business through a cut in employer NICs and a new Sustainability Fund to deliver environmental benefits to the local communities affected by quarrying.

The benefits of the tax will need to be kept under review, and in particular, the change in behaviour it triggers at this low level. Complementary changes to information and regulation will need to include:

- Initiatives to increase the use of recycled materials, including reviewing regulatory requirements which prevent the use of recycled materials, developing new quality standards with appropriate specifications and further research on their potential use;
- The revision of the Minerals Policy Guidance (MPG) governing mining and it will be essential for the Government to place sustainable development at the heart of the new guidance;

[39] The basis of rates goes back to fifteenth century concepts of landlord and tenant. That which a landlord provides - or is assumed to provide - is rateable. That which a tenant brings to a site is not rateable. This is regardless of whether there actually is a tenant or landlord involved. The whole concept is pre-industrial, and it is not easy, for example, to determine whether a landlord or a tenant brings any given piece of industrial kit to a site, and, therefore, whether it is rateable.

[40] HM Customs & Excise C&E 5/00, 21st March 2000, *Tackling the environmental costs of quarrying*.

- Public sector action. Insofar as the public sector is responsible for 40 per cent of all aggregate consumption, government has a major role to play in helping the country move towards a sustainable aggregates policy through the procurement policies and specifications it adopts. This Government's new procurement arrangements, in particular for Partnerships UK to improve PPP and PFI, should have objectives cast with this in mind.

The externalities associated with mining and minerals extraction are not dissimilar to those of quarrying. If a tax is justified for aggregates, why not for opencast coal mining? Why not for peat extraction? The marginal costs of change (e.g. to deep-mined coal, or even switching to cleaner fuels such as gas) are different, so a different tax-rate may be justified. The principle, however, remains the same.

3.4.3 The Landfill Tax

The Landfill Tax increases the cost of sending waste to landfill, and is intended to encourage development of alternatives.

The staged increases in the Landfill Tax announced in the last budget will bring the standard rate of tax to £15 per tonne by 2004. Friends of the Earth have found, however, that less than a third of companies had either stepped up or started programmes to reuse or minimise waste. The Environmental Audit Committee agrees and has concluded[41]

> If the tax is to achieve its objective of reducing the amount of waste sent to landfill, it must be set at a level which changes the economics of waste management so that less environmentally damaging options, such as recycling, composting and energy from waste plants, are no more expensive than landfill. To do this the tax on active waste would need to rise… to a level of £30/tonne.[42] We recommend that the tax rise to £20/tonne over the next five years, and that the Government set out its proposals for additional increases in the following years.

They added:

> The tax has had undesirable effects, including an increase in fly tipping and the imposition of a serious and, in the short term, largely unavoidable financial burden on local authorities. When establishing future taxes, it will be necessary to provide funds (which would normally be a fraction of the revenues raised from the tax) to mitigate such consequences.

The Landfill Tax is one of the most progressive environmental tax measures introduced, and whilst the polluter is paying more than before, it is not yet sufficient to change behaviour. Nor is there sufficient investment in encouraging alternatives. There is much to learn about the effect of tax on behaviour, and a willingness to revisit operational weaknesses is needed.

[41] The Government's Response to the Environment, Transport and Regional Affairs Committee's Report, *The Operation of the Landfill Tax*, DETR October 1999

[42] Equivalent, after anticipated changes in behaviour, to a revenue before hypothecation of around £ 360 million a year

4 The Environmental Tax Package

Putting these principles together requires a coherent framework. There are elements of it in place at the moment, and in some cases, whilst the goal is revolutionary, some of the changes are evolutionary[43]. The paradigm change is that rather than representing hidden tax increases, environmental tax reform represents the *replacement* of wealth and income taxes by those on environmental impacts. This is a long-term and significant trend and it needs to be presented and defended in an open and transparent manner.

Table 3 shows what might happen if these proposals, including escalators, were applied over 20 years to current values and consumption levels. The current total environmental tax contribution is around £32 billion, but could be as much as £123 billion. This compares to a total estimated receipts in 1999-00 of £356 billion[44].

Given changed consumption patterns and changed overall rates of taxation, it is possible to conceive that environmental taxation could contribute around a third of government income, over time.

Table 3 also shows typical annual potential for hypothecating revenue (present value), and shows it to be as much as £6 billion a year. In the early years of environmental taxation, this is likely to be a large portion of the additional revenue beyond the sum currently collected. In later years, an increasing proportion could be used to reduce other taxes.

Table 3 Total environmental tax contribution

	Maximum Value of tax in 2020 £million*	Typical annual potential for hypothecated expenditure £million
Total Energy Tax	35,400	500 p.a. for business 1,000 p.a. for households
Road Fuels	20,000	2,000 p.a. for new public transport infrastructure
Vehicle Excise Duty	15,000	
Congestion charging	18,000	
Aviation Fuel, VED and take-off and landing slots charge	6,600	2,000 p.a. for new public transport infrastructure
Solvents	150**	150
Pesticides	130**	130
Landfill	360**	360
Aggregates	380**	380
Site Value Rating	27,000	0

* These figures are derived from the assumptions stated in the relevant section of the paper, and based on 2000 values and usage levels
** More work needs to be done on these sectors to consider whether higher rates of net income could be justified in the longer term, either by marginal costs of change or by externalities.

[43] Most of the legislation is in place, and needs amendment not re-writing. The first place to start would be in amending the rate of levy. The levy rates could be increased and a differential introduced to reflect carbon content without new primary legislation. Deletion of some of the clauses on exclusions would extend the scope to the domestic sector.
[44] Table C4, Budget statement 2000, http://www.hm-treasury.gov.uk/budget2000/fsbr/chapc.htm

4.1 TAX REDUCTION OPTIONS

A variety of taxes could be targeted for reform. In addressing the options, a number of issues need to be considered:

1. The tax reductions elsewhere must be clear and measurable. Environmental taxes must produce an equitable outcome, even if this requires adjustments elsewhere in the tax or social security system;

2. Taxes raised from households should be returned to households and taxes raised from business returned to business;

3. Options for reducing taxes elsewhere (at current values) include:
   - reducing VAT to 5% (costing around £47 billion p.a.);
   - taking many more households out of tax, for example by eliminating the 10p personal tax rate (costing £4 billion p.a.);
   - abolishing NICs for the self employed (costing only £0.23 billion p.a.);
   - abolishing stamp duty (costing around £8 billion), to reduce the cost of moving house, thus encouraging a more mobile workforce;
   - cutting business rates and corporation tax.

4.2 CAPACITY BUILDING

The current structure of responsibilities in Government will not deliver sustainability. The Civil Service is not well equipped to deal with these cross-cutting technical, economic and environmental issues, each with different types of evidence, risk, and uncertainty.

Customs and Excise broadly deal with indirect taxation and Inland Revenue with direct taxation. Whilst in the first instance a good proportion of environmental tax measures may be introduced via these organisations, they do not have the capacity to manage the necessary long-term change. A new and specialist agency of equivalent status may be needed to design, monitor, administer and police new environmental taxation. A new Environmental Tax Agency should be jointly responsible to the DETR and the Treasury, and a much closer relationship will need to be developed between these two departments. By way of illustration, the current purdah that grips the Civil Service in the run-up to the budget cannot remain. Civil servants in the DETR were unaware of recent announcements by the Treasury concerning the design of a tax, as a result of which they made crucial mistakes. Such occurrences could only damage the reputation of environmental taxation.

The Environment Agency, and the Energy Efficiency Best Practice Programme, operating at arms-length from the Department, and staffed with technical rather than administrative personnel, have made significant contributions to current proposals. Their role should be strengthened by the establishment of sister agencies: a Sustainable Energy Agency, and Regional Sustainable Transport Agencies. Such agencies should be more involved in the design and implementation of tax and expenditure measures to contribute to our environmental tax targets.

The Environmental Audit Committee have proposed a Green Tax Commission. It would ensure greater consistency of approach in researching and developing tax proposals, and in building consensus between government, business and industry, environmental bodies and non-governmental organisations[45]. Such a commission would provide intellectual steerage, whilst an agency would be responsible for implementation.

[45] Environmental Audit Committee, Press Notice No. 11 of Session 1999-2000, dated 29 February 2000

5 Conclusions

Taken together, there is huge potential for environmental taxes to deliver major environmental improvements, and for them to become a mainstay of the Government's revenue stream. But this will only happen if there is a broad consensus not only across political parties, but with the electorate. This means that the purposes of tax must be clear and widely understood - to tax good things less and undesirable things more in order to encourage changes in behaviour.

The Government has been proceeding with understandable caution in a new area, and in its first term. But it is time to press ahead. Much of the new framework will need to be in place within the next Parliament. It is also time to develop a more comparative approach to the underlying principles across the picture.

Our use of natural resources continues to increase in an unsustainable way. This includes extraction of materials and fossil fuels, as well as the loading of the planet's natural carrying capacity with pollutants such as carbon dioxide. Government can provide advice and information, set regulations, levy charges and taxes, or provide support for investment. In practice, a combination of these is likely to be needed in order to achieve the transformation to a sustainable economy. What is needed is recognition that the destination - sustainability - is more important than any dogmatic political view about whether information alone can work (because it won't) or whether regulation alone can work.

The document, in the style of a consultation paper, raises questions and sets the scope for a debate about how this paradigm shift might develop. It focuses on the opportunities for taxation within sustainable development policy, and makes reference to parallel informational and regulatory needs. It asks:

1. Against what principles can we judge what is a good or bad environmental tax?

2. What is the opportunity to reduce key environmental impacts including emissions to air, water pollution and land use? Key targets for taxation will include major contributors to each of these areas. They include:
   - the effects of energy use on greenhouse gas emissions and local air quality (including transport taxes on energy, vehicles and road space);
   - the effects of water abstraction and pollution, for example by pesticides and fertilizers;
   - and the pollution and use of land space, including the use of land for extraction and for landfill.

3. What is the potential for parallel reform of indirect and direct taxation?

Environmental taxes must not only be 'good taxes' in the conventional sense of the word but must be 'good taxes' in a strictly environmental sense. Key conclusions on the design of individual measures are:

1. In environmental and economic terms, intervention is justified wherever the costs to society of environmental impact are greater than the cost of reducing an impact through technical or behavioural change. The difficulty comes in making such a judgement;

2. Inevitably, this assessment will need to use different types of evidence in combination. For example, hard, almost 'epidemiological' evidence (a sort of 'show me the bodies' approach to

evidence), must be balanced with uncertainty and with the precautionary principle. Epidemiological evidence can be used, for example, to divine a relationship between, say, energy price and energy use. But the costs of damage are harder to determine. Firstly there is uncertainty. The external costs for many impacts are expected to increase dramatically, for example, through increases in energy use, and in road, freight and air traffic. Secondly, once damage occurs through climate change or species loss, it cannot be reversed: if we wait until the earth is warmer to determine the effects and costs of global warming, it will be too late to prevent the effects by reducing greenhouse gas emissions. Thus a precautionary approach must take a principal role, and epidemiological evidence, a secondary, supporting role;

3. Economists describe the relationship between price and demand for a commodity as the price elasticity of a commodity. If all else is equal, and if price goes up, demand goes down. But this relationship is not a simple one.
   - First, all else is not equal. Actual behaviour will depend on how certain the long term political signal of increased prices is, the alternative technologies available, the ease of adoption of alternative modes of behaviour, income, capital availability, understanding, the regulatory framework and a wide range of other factors.
   - Second, a tax can only be expected to deliver significant change if it is set high enough to be equal to, or exceed the costs of change. That way, decision-makers can see a clear value in action, and a cost of inaction. The proposed solvents tax is a good illustration of this.
   - Third, the costs of change will be different in different sectors, and at different times (e.g. implementing different changes takes longer for decisions which involve capital, or for larger amounts of capital).
   - Thus, the marginal costs of change must be transparent. Often, decision-makers do not know what action to take, or the benefits and costs of that action (economists refer to this as a transaction cost). Thus government needs to ensure that 'transaction costs' are as low as possible, by providing a framework of information, advice and regulation;

4. Environmental taxes may also be equal to, or greater than the cost of damage (internalisation of externalities) or the perceived cost of damage (assessed through 'willingness to pay');

5. An escalator should be built in to any tax. First, it is not necessary for a tax to exceed the marginal cost of change or the external costs of damage immediately. It is better that a tax starts earlier and lower, to give a long-term signal for change. In any circumstance an evolution is more manageable than a revolution. Second, it is reasonable for rates of tax to be amended in the light of the behavioural response to a price change. Third, it is likely that easy changes will be made first, and, over time, the marginal cost of reductions in emissions or resource-use may be expected to increase. Fourth, if behaviour is not changed, and energy use (or other resource use) continues to increase, the external costs would increase;

6. Decision-makers are generally more responsive to capital availability than they are to the cost of resource consumption. Thus a key part of the package is to recycle revenue from a tax to allow it to be used for investment to reduce resource consumption. Thus, to take an energy tax, the same energy savings can be achieved with a lower level of tax if a higher proportion of the revenue is recycled for investment in energy efficiency.

Key conclusions on the design of a package of environmental tax reforms are:

1. Environmental taxes could double in a decade, and double again the following decade. They could contribute a third of total government revenue, worth around £110 billion at present rates.
   - Key to this will be taxation on energy. The model proposed here is the reform of the

Climate Change Levy and Road Fuel Duty, together with the extension of the tax to areas where it currently does not apply, i.e. the domestic sector and aviation fuel. These taxes should, in the longer term, be brought together under the same legislation, and rates of tax based more on the externalities of energy use, particularly, but not exclusively, the carbon content of the fuel.
- As well as taxing the use of fuel, other clear tax signals can be given to influence both the choice of, and the use made of, infrastructure that uses fuel. Infrastructure includes houses, cars, industrial equipment and aircraft.
- Other taxes or charges on air emissions, water abstractions and pollution, and land use (including aggregates and minerals extraction, and landfill) are discussed. More work is needed to determine the long term contribution these other taxes might make, both to reducing environmental impact and to government revenue.

2. The tax reductions elsewhere must be clear and measurable. Environmental taxes must produce an equitable outcome, even if this requires adjustments elsewhere in the tax or social security system. Some environmental impacts (such as miles travelled by car) are broadly proportional to income. But others (energy used in the home) are independent of income. Thus a key issue is the treatment of different income groups, where the relative change in price triggered by a tax will bite in different ways - different income groups will have different sensitivities to price signals.

3. Taxes raised from households should be returned to households and taxes raised from business returned to business.

4. Options for reducing taxes elsewhere (costed at current values) include:
   - reducing VAT to 5% (costing around £47 billion p.a.);
   - taking many more households out of tax, for example by cutting the 10p personal tax rate to zero (costing £4 billion p.a.);
   - abolishing NICs for the self employed (costing only £0.23 billion p.a.);
   - abolishing stamp duty (costing around £8 billion), to reduce the cost of moving house, thus encouraging a more mobile workforce;
   - and cutting business rates and corporation tax.

5. To cope with this paradigm shift requires a change in organisation which is profound and permanent. The proposals for organisations such as an Environmental Tax Commission and an Environmental Tax Agency (to work alongside Customs and Excise and Inland Revenue) are necessary to embed, develop and constantly reinvigorate the new thinking.

Taken together, the paper represents an evolutionary approach to a revolutionary goal. A series of incremental changes, all within the framework of environmental tax reform, can together represent the most important changes to the tax system since Robert Peel's administration in the 1840's. They represent a new Environmental Tax Paradigm. And whilst achieving a paradigm shift in a system of taxation that has stood for 150 years can be expected to take a decade or two, a strategy needs to be laid out now.

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Centre for Reform Paper No. 20

Don't Tax More, Tax Different!

A Tax Paradigm for Sustainability

By Mark Hinnells and Stephen Potter

The combination of direct taxation (income tax, corporation tax etc) and indirect taxation (VAT etc) has been established for a century and a half. A good tax has traditionally been one that gave government a stable income base. However, the introduction of the Landfill Tax and the Climate Change Levy has begun nothing short of a paradigm shift in taxation - shifting taxation from 'goods' (employment and value) to 'bads' (pollution). Environmental taxes (including taxes on energy in all its forms, vehicles, air travel, landfill etc) have now reached around 9% of government revenue. But there is no 'big picture' of how environmental taxation might develop over the longer term.

This document, in the style of a consultation paper, raises questions and sets the scope for a debate about how this paradigm shift might develop.

- What is a good or bad environmental tax?
- What is the role for taxing emissions to air, water pollution, and land use? Key targets for tax are energy (including transport energy), water use and pollution (including pesticides and fertilisers) and aggregates, landfill, and land use.
- Is it possible or desirable to see a doubling of the contribution of environmental taxes in the next decade, and a further doubling in the following decade? Could environmental taxes make up as much as a third of government income?
- And what is the potential for parallel reform of indirect and direct taxation?

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