APPENDIX F
Owen Connellan, *Land Value Taxation in Britain: Experience and Opportunities*
Chapter 16: Final Review: What Does All This Mean and How Important Is It?

This appendix contains the following abridged version of the Lichfield and Connellan working paper *Can Land Value Taxation (LVT) Aid and Supplement Eco-Taxes?*

Scope of Report

This paper is visualised as an exploration of the inter-relationship between the two forms of taxation, and in essence, this exploration starts with clarifying the distinct nature of the two forms of taxation and the link between them followed by the possible application of LVT to supplement eco-taxation.

Comparing Origins of LVT and Eco-taxation

Land value taxation (LVT) is a means of shifting part of property taxes from land and buildings in combination onto land values alone "for the benefit of the community." They are sometimes coupled with other types of exactions, and from their previous analysis of the U.K. Lichfield and Connellan (2000a) identified two other types of taxation that could have a similar impact on land values, viz. value capture (betterment) and infrastructure recovery (impact fees).

It is the first form of LVT, which targets the landowner and could be used for garnering revenue for meeting government expenditures, that is considered most appropriate for this report. The advantage of this form of LVT is that it is a continuing tax that runs from year to year, on a quasi-rental basis, unlike the two other forms, which are occasioned upon a particular event, such as an act of development or a disposal transaction. By contrast, eco-taxes are taxes on the use of energy and other natural resources, including the capacity of the environment to absorb pollution and waste (Robertson 1998, 8)

The two kinds of taxation are arguably quite different and have quite different origins. Land value taxation has a long history in economic and political theory (Prest 1981), but even so, its application around the world is comparatively rare in practice, and as Andelson comments: " there is a paucity of hard empirical evidence for its success in practice. Yet the evidence that does exist is consistent and its cumulative weight, if not entirely conclusive is, at the very least, impressive" (1997, 8). As to Britain, the efforts towards the application over the twentieth century have been powerful indeed but so far without sustained success (Lichfield and Connellan 1997, ch. 1, 5).

Eco-taxation, however, is a comparatively recent feature of the last half century, in tune with the upsurge in awareness of the threat to the planet earth of pollution and resource depletion. However, while this awareness, which has led to a huge proliferation in eco-taxes and economic instruments, is comparatively recent, the need for them emerging initially in the beginning of the nineteenth century with the first industrial revolution on the planet with its consequent depredations upon the environment.

There is no need in this Paper to take on a detailed description of land value taxation and its implications, for the topic has been very well illuminated over the last century since Henry George's seminal writings and activities (George 1879). By contrast there is less background information on eco-taxes, although some exploration does exist (O'Riordan 1997). There is by now (OECD 1994) an impressive amount of information on the nature and distribution of such measures for the 28 OECD countries. They comprise economic instruments (other than eco-taxes) that are currently in place for the purpose of pollution control; and economic instruments (including eco-taxes) that are currently in place for the purpose of

natural resource management. Not only is there considerable variety in these measures but the distribution is not at all uniform as between the various countries.

Eco-tax here follows the definition proposed by Eurostat, namely, that it is based on a physical unit (or proxy for it) of something that has proven specific negative impact on the environment. It can be a tax (unrequited payments to government) or a charge (requited payments for which a service is provided by some public body generally in proportion to payment made). Such economic instruments are designed to modify market behaviour with a view to achieving government objectives (DoE 1993).

Comparing the Subject Matter of the Two Taxations

Any taxation measure must have full regard to the subject matter to which it is applied. Here lies another major difference between the two kinds of taxation, namely that LVT is assessed on land as terra firma, and eco-taxation on nature as a whole. Bringing that concept to bear on our concerns in this report means that the recoupment for the community of some element in the developing value of land must be extended to the wider concept of nature. For example, development of land as terra firma creates wealth on the land but in the process can destroy nature, as for example in the externality of environmental pollution. How then can economic instruments be used in the situation where socio-economic activities on terra firma are seen not simply in the growth in development value, which can be taxed, but in the generation of activities which together produce environmental pollution and natural resource depletion which needs to be checked?

Link between LVT and Eco-taxes

Despite the significant differences between the two kinds of tax there appears nonetheless to be links between them. A general overriding reason has been introduced by Robertson (1998, 1999) in emphasising that "policy makers should seriously examine the potential of the site-value tax, as a resource tax which will contribute to economically efficient, social equitable, and environmentally sustainable developments." Robertson's reasons for doing so, which reflect the views of many others, are amplified later within the general argument for a "tax shift" from "enterprise and employment and onto resources including land, energy and the capacity of the environment to absorb pollution."

Given this, our research aim is to explore further the nature of the link in order to see the mutual relationship of the two, and more precisely whether LVT can aid eco-taxation and vice versa. But necessarily our exploration will be in principle and speculative in order to open up the subject for subsequent major research.

Possible Application of LVT to Supplement Eco-taxation

In LVT, it is the land as terra firma that is taxed, and the possibility of levying the tax is reasonably straightforward, as evidenced by practice around the world (Andelson 1997, 2000). It is possible, for example, to identify the owner and also the occupier, and to organise therefore the mode of assessment, the disbursement between owner and occupier, and the method of collection. In the case of eco-taxes, this is not at all so clear. Thus, in relation to the link between LVT and eco-taxes, it is important, if we are to explore the possibilities of LVT aiding eco-taxation, that the pre-conditions for so doing are considered. Some of the criteria, or canons of taxation, could be:

- The socio-economic activity to be taxed should, like land, be *physically identifiable*. This is hardly the case in such fundamental examples as the air and sun.

- The land in question must be capable of being appropriated, that is made the property of an owner, private and public to whom the tax demand is addressed. This clearly applies to terra firma, but not to minerals on the seabed since there is no exclusive owner. To meet the situation under the sea, governments have resorted to international agreement on the use and exploration of resources such as oil or minerals under the sea.
- Whatever the ownership of the resource to be taxed, there needs to be a rental surplus in the value of the resource over and above the cost of operation, or otherwise there could be no prospects of tax receipts.
- Linked to the identification and appropriation there needs to be the possibility of collecting the tax from the owner or occupier/operator.
- Thus where, following the Eurostat definition, there is a "physical unit (or proxy for it) of something that has proven specific negative impact on the environment" it might be possible to use LVT as a means of taxation to aid the general thrust of the eco-taxation.

In summary, in order to consider whether LVT might be practicable to supplement eco-taxation, it is necessary to apply the canons just described. It is also necessary to understand the incidence on the various parties involved in order to be able to direct the LVT to the appropriate party in the chain. The difficulties of so doing are brought out in **Annexe 12** to this appendix for three economic instruments in the U.K., showing their complexity. Since the taxes and instruments are so varied we visualise the need for study in greater depth on this issue in the next stage of this research.

Government Planning, Management and Regulations: The Basis for and Means of Intervention in Socio-Economic Activities

As already indicated, it is the activities of people in production, distribution, transportation and consumption on planet earth that give rise to the fundamental problems with which we are concerned. On the one hand, people must engage in these activities to exercise their human condition; and on the other, it is the very activities that need the use of natural resources on planet earth and thereby bring about the deprivation and pollution that gives rise to environmental concerns. It is these activities that can be summarised briefly as the operations of the market, the interchange between the demand and supply for production exchange and consumption. And it is this market, as operated by the population of planet earth, which is taken to be both the source of wealth creation and also the source of wealth depletion via environmental and natural resource degradation

From this situation has arisen the recognition of the need for intervention by government, at central, regional and local levels, aimed at remedying the defects of market operations, which in general terms is referred to as market failure

Market-Based Instruments

If markets work well, the goods and services people want to buy will be produced by the suppliers able to produce those goods and services for the least cost. However, for various reasons, markets sometimes fail in this regard in not being optimal for society as a whole. Externalities are one important example of market failure. They arise where one person's actions impinge on other people's well-being in ways that are not reflected in prices, simply because such action under typical rules in the market does not reflect the costs that the actor does not have to bear, nor the benefit for which he cannot charge (Pigou 1920).

Without government intervention, markets do not usually provide a mechanism for such external costs to be included in pricing decisions, and it is for this reason that the OECD has promoted the application of the so-called "polluter pays" or "user pays" principle whereby the cost of adhering to government-

sponsored environmental quality standards (EQOs) is borne by the polluting agent or user rather than by the taxpayer.

Eco-taxes can help to overcome the problem of externalities by attaching a price to using the environment or to causing environmental damage. In principle, an eco-tax would be levied on a polluting activity to reflect the extent of the externality caused by the pollution. Ideally, an eco-tax should be equal to the value of environmental damage done by the pollutant emitted. This could ensure that the extent to pollution abatement will be optimal.

Regulations via Urban Regional Planning and Environmental Protection

In such regulation the protection and enhancement of the environment are certainly important objectives (Cullingworth and Nadin 1994). Therefore, the two systems can be said to be running in parallel (DETR 1994).

But the functions of each differ. The regulatory control under planning is exercised in the main at the point of change, through development in the urban and regional system. In such regulation, the future activities on the land in question are visualised, on occasions with the aid of an environmental assessment in particular projects, which are likely to produce significant impacts on the environment. Control can then by employed by refusal of planning consent, or grant subject to conditions, and also by planning agreements, including planning gain/obligations. These conditions and agreements certainly look into the future, but their potential effectiveness is circumscribed in urban and regional planning law, mainly to ensure that they are reasonable.

In practice it is difficult to accurately forecast the future, at the time of considering the planning application. By contrast, the controls through environmental and fiscal measures are primarily applied to the operations that subsequently take place on the land in question (airplane take-off landing and flight; transport on roads; collection and disposal of landfill). In this context, the environmental controls can look further into the future, and indeed are generally capable of adjustment over time should the problems with which they are concerned demand it. But by definition they do not bite until after the point of change, when the environmental impact is introduced.

The Constraints of Sustainability on Development

The options just described for government interventions in the working of the market are essentially based on the nation state and its subsidiary local government organisations. But recent years has seen the beginnings of a federal approach for supra-national intervention, as in the European Community, and even fully international approach in particular aspects of the environment, for example, the international concern with global warming. It was in relation to this latter concern that the international community has been urging constraints on, and securing agreements with, the nation states under the concept of "sustainable development." This seminal concept was explored in the World Conservation Strategy (IUCN 1980) and was then picked up by the World Commission on Environment and Development (1987) in its Brundtland Report. This not only adopted the concept from the World Conservation Strategy but also attempted to make it operational in the now famous formula that there should be constraint on economic growth in order to make development sustainable in that "it meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, 8).

This formulation has been endorsed as a matter of principle in the deliberations of various international bodies since Brundtland, for example at the 1992 United Nations' Conference (UNECD) in Rio de Janeiro, and also in Kyoto in 1997. International agreements policies and targets have been formulated and action initiated within the member countries down to the local level, under the title of Action 21.

Thus it can now be said that: "the concept of sustainable development has been successful in promoting the idea that public policy should be concerned with improving the living standards of the people of a current generation as well as with concerning the environment for the benefit of future generations" (Robertson 1998). This context leads us to consider here the degree to which LVT and eco-taxation are consistent with the concept of sustainability.

It is not difficult to do so in relation to eco-taxation, since this can be regarded as a natural offspring of the IUCN (1980) and WCED (1987). The primary purpose of eco-taxation is to ensure that the environment is conserved in order to ensure its availability to the future generations, even though this implies diminution of the product from contemporary development.

But it is less easy to show that LVT in itself is sustainable in this sense. For one thing, the concept was not around when LVT was first subsequently introduced into the world through Henry George. Indeed doubts have arisen as to whether LVT as visualised by George can be seen as "green," because as practiced it could stimulate development on open space, which should be protected into the future, and also stimulate the premature release of farmland for development and encourage the related speculation in doing so. This apparent conflict stems, in our view, from the inherent incompatibility between the system of LVT, which follows the market in making the assessments related to the "highest and best use" that can be obtained, and public policy, which aims to regulate the market in the public interest, as for example in the conservation of open land, natural amenities and beauty, and coastal zones.

In order to ensure compatibility between LVT and regulation via planning, etc., it is necessary to introduce the concept of the "regulated market." This means that the assessments of land value for LVT are based not on the unregulated market known to Henry George at the close of the nineteenth century, but on the regulated market of those countries that have subsequently introduced planning regulation and economic instruments in order to protect the environment. If this situation is to be the basis for the LVT assessment, then LVT must of necessity be "green" insofar as the plans and policy instruments of the locality in question are also "green." The two would run together.

Indeed, our views on this compatibility (Lichfield and Connellan 2000a) go further. Land Value Taxation can be seen as an economic instrument for aiding the implementation of planning policy for the area in question, as the following instances will illustrate. Should there be an area that the market considers desirable for development, but is visualised by the local planning policy as green belt, or an area of landscape beauty that should not be spoiled, then the land value taxation assessment would be tempered in order to avoid any stimulus to development. On the other hand, should there be an area of old, high density and unsanitary dwellings, which the owners retain in that condition because of their high profitability, but which policy considers should be redeveloped, then a LVT would be levied to stimulate development. But where there is an area of architectural and historic interest, which should be conserved for the future, then again the LVT would be pitched at a level to avoid any stimulus towards redevelopment that would undermine the conservation area.

This approach visualises the existence of a land value taxation system, and the relevant assessments, but would recognise the ability to vary the tax impact of the assessment which would enable differing policies to be applied within the same local authority planning area. In this way LVT would act as an influence for greening and would follow the principles and precepts of sustainability.

Compatibility in Varying Planning Systems

Zoning makes for the valuation assessments being fairly uniform and straightforward within any particular zone. By contrast, in development plans valuation assessment is more difficult to make in

advance of a permit for a particular development project, thus giving rise to difficulties for the valuation assessors for the purpose of a LVT. But they can be overcome (Lichfield and Connellan 2000a, ch. 8).

From the above, it is apparent that LVT could be accused of not being "green" if applied independently of the planning policies and proposals of the authority in question. By the same token, if compatibility between the two systems is sought then the LVT can be "green." In addition, there is another dimension where this could be claimed, namely if the income from LVT could be allocated in the interests of obtaining sustainability. Young (1992) suggests that the LVT income would be directed towards conservation. Lichfield (1999) goes further. He points out that while there is general agreement around the Brundtland formula there are numerous interpretations (Pearce et al. 1989, appendix) and no general agreement on how the objectives are to be achieved. As a result, there are many approaches in theory (Faucheux et al. 1996). Among these, Pearce et al. (1989) build upon the concept of constant capital as a basis for "non declining human well-being." This simple formulation certainly has echoes in the topic addressed here: a need to protect the capital in natural resources and the environment as a basis for pursuing the fundamental Brundtland concept.

The problems of so doing are at the core of the international and national programs to which we have referred. Clearly heavy endeavours will be required for the purpose over a long period. To cope with these endeavours, financial resources in large quantities are going to be needed. From this basis it would appear logical that the financial resources should come not, for example, from general taxation, but from the transference from private consumption by landowners of the economic rent of land to public revenue, in accordance with Georgist principles. Furthermore, the source for the revenue can be continually expanding as the needs arise, by balancing the levels of LVT required with the general increasing level of land values.

Towards an International Strategy for Worldwide Natural Resource Management

The preceding section shows that while the growth of economic instruments and eco-taxes is flourishing and certainly making their contribution, there is considerable fragmentation of the measures themselves, and also inadequate coordination between them. One consequence could be inefficiency and ineffectiveness arising from the fragmentation, and there can also be internal contradiction in that particularly measures or taxes are working against others.

Thus it would appear necessary to introduce some rationalisation in the total process that could be termed a Strategy for Environmental Protection and Coordination. For example, there would need to be some machinery for predicting the impacts (physical, fiscal and economic) of each of the measures on the source of the environmental pollution that is creating problems (Tindale and Holtman 1996, ch. 6). And there needs to be some coordination among the agencies that are responsible for the measures and the taxes.

Land Value Taxes and Resource Taxes

Pressures for Restructuring the Tax System

Pressures for change in the structure of national tax systems are part of the overall context in which both land taxation and environmental taxation are likely to become more important. In addition to specific arguments for particular changes in particular taxes, more general pressures for change are gaining support, as the existing structure of taxation becomes more widely recognised as perverse. The arguments include:

- the economic gains to be achieved by reducing distortionary taxes on business enterprise and human effort and skill;
- the economic gains to be achieved by greater efficiency in the use of natural resources (many of which are now overused), and greater efficiency in the use of human resources (which are now underemployed and underdeveloped);
- the social benefits, as well as the economic gains, of reducing unemployment by reducing the tax costs that employees and employers now both have to bear;
- the environmental benefits of taxes that will help to reduce levels of energy use, other natural resource use and pollution; and
- the economic gain of developing capacities and skills to exploit the growing world market for environmental technologies.

Towards a Tax Shift

Two important American reports are among recent publications that have discussed in depth the need and scope for a tax shift on those lines. Hamond et al. (1997) do not specifically include LVT among their recommendations. But they underline land value taxation's compatibility with them.

> Reconciling healthy economic development with the protection of the air, water and natural habitats is one of the great challenges of the next century. A revenue-neutral shift to resource taxes offers a way to help to meet this challenge. A resource tax could work somewhat like a rental or interest payment for the use of assets that are owned by all of us, ranging from the broadcast spectrum to the air we breathe. These new revenues would, by reducing other taxes that are a drag on the economy, provide a dividend—lower taxes on work and saving—to which the public is entitled.
>
> These environmental levies would not impose a sudden charge for things that used to be available at no cost, as some people will protest; rather they would extend the effort to end "free lunches" to perhaps the biggest free lunch of all: free or low-cost use of assets owned by everyone in common. (1997, chap. 4)

In the other American report, Durning and Bauman (1998) give a prominent role to LVT as a sprawl tax, which it treats as one of five major types of desirable tax—the others being carbon taxes, pollution taxes, traffic taxes and resource consumption taxes. The following indicates the approach it supports:

> Most Northwest jurisdictions seek to prevent sprawl through the regulatory tools of land use planning; none applies taxes to the same task. Yet a simple reform to the existing property tax would turn it into a powerful incentive for investment in city and town centres and in adjacent neighbourhoods.
>
> A property tax is actually two conflicting taxes rolled into one. It is a tax on the value of buildings and a tax on the value of the land under those buildings. As experience in Australia, New Zealand, Taiwan and Pennsylvania shows, shifting the tax from the former to the latter aids compact development while suppressing land speculation, promoting productive investment, and tempering housing costs, especially for the poor. (2–3)

With these approaches Robertson recommends that policies for a sustainable future should include eco-tax reform and site-value land taxation, among the connected parts of a larger package based on:

- the introduction of a range of taxes and charges on the use of common resources and values, including—but not limited to—energy and the site value of land; and
- the reduction, and perhaps the eventual abolition, of taxes and charges on employment, incomes, profits, value added, and capital; together with
- less heavy tax on the incomes and profits they earn from useful work and enterprise, on the value they add, and on what they contribute to the common good; but
- heavier taxes and charges reflecting the value they subtract by their use of common resources, including land, energy and the capacity of the environment to absorb pollution and waste.

Eco-Taxes Are Regressive: Can Land Value Taxation Help?

If existing taxes on incomes, profits and savings are simply replaced by environmental and resource taxes imposed on consumers (i.e., at the end, rather than at the beginning of the "economic pipe"), this will hit poorer people relatively harder than richer. In fact, regardless of what taxes they replace, eco-taxes are bound to have this regressive effect if they are applied "downstream" at the point of consumption. For example:

- Value Added Tax (VAT) on household energy has hit poorer households in the U.K. harder than richer ones, because poorer households do not have the money to absorb the higher cost of the tax or to invest in greater energy efficiency; and
- Similarly, fees and charges to reduce urban congestion will hurt small trades people who need to use their vehicles for their work, but will be painlessly absorbed by users of chauffeur-driven limousines.

If eco-taxes are to become a significant source of public revenue, this problem will have to be solved. Land Value Taxation can help.

The first point is that eco-taxes should be applied "upstream" whenever possible. Of key importance will be a tax on carbon-energy (or on fossil fuels and nuclear energy), *collected at source*, cascading down through the economy, and raising the cost of the energy content of all goods and services. It will reduce pollution, because pollution arises predominantly from energy-intensive activities. It will be administratively simpler and easier to understand than a proliferation of separate eco-taxes on individual consumers and polluters. And, by clearly raising costs for the extractors, producers and providers of energy and energy-intensive goods and services (as well as the prices consumers have to pay for such goods and services), salaries, dividends, pension contributions, stock options, capital appreciation, etc., they get from energy-intensive activities. It will thus be experienced as less biased against poorer people than a tax imposed directly on consumers. Even so, the impact of eco-taxes on consumers will still be regressive. It will have to be offset in other ways, too.

This is where LVT comes in. There are obvious parallels between a tax on the site value of land (i.e., land in its unimproved state) and a tax on energy at source (i.e., energy in its unextracted state). Land and energy are essential to all economic activities. Their value, in their unimproved or unextracted state, has not been created by the efforts and skills of those who own and extract them. Requiring the owners and extractors to pay for that value makes sense.

In spite of this parallel, there is also an important difference between them. The LVT is clearly progressive. It is not the poor but the rich who are enriched by "enclosing" the value of land. Taxing land values will not raise prices to consumers, whereas a tax on energy at source will cascade right down through the economy. This means that eco-tax reform is likely to be easier to introduce on a substantial scale, if it is part of a package that includes a site-value tax on land.

Summary of the Affinities

From the above we can now summarise the affinities between LVT and eco-taxes. Our basic assumption is that LVT could be imposed as an overall fiscal instrument and would therefore impinge on most owners (exemptions have already been referred to). What then is its effect on "green issues"? If the assessments are to be "plan led" (in our parlance for a U.K.-style planning system), then green spaces within urban areas will be assessed at their present use and any hope value for future development will not be reflected. If the assessments are left to follow market expectations (in more open planning systems), then the retention of such green spaces can be encouraged by scaled reductions in the tax bite or even exemptions. In other words, the imposition of LVT will not be used for penalising the owners of green spaces and forcing them towards the development option. This same principle of tax amelioration can be applied to areas outside the urban fringes (if LVT is to be imposed generally) where preservation of the countryside is a policy aim.

At the same time the general imposition of LVT would encourage development within urbanised areas and mitigate the tendencies towards sprawl at the urban edges with a beneficial effect on the green spaces beyond. The classic Georgist argument is that in this way the imposed taxation puts financial pressure on those owners of vacant lots and derelict properties where there is development potential and, updating the argument to address the current green issues, this brings with it the concomitant effect of lessening the pressures to expand the urban fringe. In addition, there is the linkage between a general imposition of LVT and its affinity with eco-taxation as can be cemented by adopting a principle that revenues garnered from such LVT could be used for the amelioration of pollution and redemption of other eco-transgressions.

Finally there is the overall moral point that LVT and other resource-based eco-taxes share a fundamental principle in that people should pay for what they take out of the common pot as contrasted with resources that they add to the common pot. So, in summary, the imposition of LVT in this way can be seen as being at least compatible with the armory of green taxes and at best a widening of the concept of how we should order our institutions to serve our truly best interests.

Annexe 12 (to Appendix F of Chapter 16): Three Economic Instruments in the U.K.[1]

1. Landfill Tax

Landfill sites for waste disposal are becoming increasingly scarce, as existing sites are exhausted and as planning obstacles limit the development of new sites. This trend is forcing many industrialised countries to reappraise waste management strategies, and to reduce reliance on landfill disposal and to increase the proportions of waste reused and recovered. Where waste management is operated by government agencies and private companies paying the full market rate for the landfill facilities they use, there is no obvious need for central government to discourage the use of landfill disposal on grounds of future scarcity. Scarcity of landfill sites will be reflected in higher charges levied for their use by owners and operators, reflecting the opportunity cost of current landfill use in terms of future landfill capacity.

Government intervention in waste management is, however, needed to regulate the externalities from landfill and other waste disposal options that are not reflected in the charges levied by operators. In the U.K., two components of the externalities associated with landfill sites have been identified. One is a "fixed" element, not directly related to amounts disposed, reflecting the disamenity of the site to local residents. The other is a volume-related component. The landfill tax that was announced in the 1994 Budget proposed an ad valorem tax on the charges levied by landfill operators. This was objected to on the grounds that an ad valorem tax would penalise facilities that operated to higher and more costly environmental standards. Thus an ad valorem tax would be a poor proxy for the environmental externalities that the tax should aim to internalise. As a result of these objections, the basis of the landfill levy was revised, and, when it was introduced, it was based on the weight of land filled waste. There is, however, a strong case for recognising that different categories of waste may have different environmental implications and therefore for levying different rates of charges per ton on different categories of waste. For example, rubble and other inert construction wastes pose relatively few environmental problems when land filled, and the appropriate charge would be much lower than for other types of waste.

In parallel with the landfill levy, provision was made for "environmental trusts," which could be financed from rebates from the landfill tax. The trusts are non-profit private-sector bodies engaged in the restoration of landfill sites or research into waste management. Rebates against the landfill levy are made available to landfill operators who make payments to the trusts. In effect, the landfill operators can choose whether to pay the landfill levy to government or to an environmental trust.

In a major policy statement in September 2000, the British government announced a package of fiscal measures, aimed at helping the U.K. move towards more sustainable waste management. The government will consult on a revenue-neutral proposal to raise the landfill tax escalator—currently the tax is at £13 per tonne, and is raised by £1 per year until 2004–2005—to £3 per tonne in 2005–2006 and to increase the rate of tax by at least £3 per tonne in future years, on the way to a long-term rate of £35 per tonne. The landfill tax credit scheme will be reformed with approximately one-third of the funding—nearly £50 million—continuing to be available for spending on community environment projects. The remainder—almost £100 million in 2005–2006, rising to £110 million in 2006–2007 and 2007–2008—will be allocated to public spending to encourage sustainable waste management.

2. Increases in the Rates of Excise Duty on Motor Fuels

In the 1995 budget, the U.K. government made a commitment, as part of its strategy to curb greenhouse

1. Smith 1995.

gas emissions, to a steady annual increase in motor fuel duties, of 3 percent in real terms. Higher motor fuel prices have, in principle, three main effects of relevance to environmental policy:

- The cost of each journey made would increase, and "marginal" or inessential journeys would be discouraged;
- For some owners of motor vehicles, a higher fuel price would make ownership no longer worthwhile. The number of vehicles owned would fall, as a result of fewer purchases of new vehicles and/or earlier scrapping of existing vehicles particularly "gas-guzzling" makes:
- Higher petrol prices would tend to encourage manufactures to design more fuel-efficient motor vehicles, and to encourage purchasers of new cars to choose more fuel-efficient vehicles.

3. Water Emissions Charges

Polluting emissions to the water system in the U.K. are regulated through a system of discharge "consents," which specify for a particular operator the maximum levels of permitted emissions. The system is operated by the Environment Agency, which took over functions previously performed by the water authorities before privatisation of the water industry and then by the National Rivers authority. A system of discharge consent charges is levied by the Environment Agency (EA). Charges for the consents are intended, in the long run, to raise revenues sufficient to cover the administrative costs of the EA in administering, monitoring and enforcing the system of consents.

It is clear that the charges levied on water pollution in the U.K. have the potential to have incentive effects on polluters' decisions. However, the current structure of charges levied may not maximise the potential for environmental and economic gains from the use of economic instruments in water pollution control.

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