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Ecotaxes : quels enseignements ?

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Cette étude présente une analyse complète des écotaxes et de la fiscalité liée à l'environnement en France.

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Avant-propos

Du point de vue économique, le cœur des politiques environnementales consiste à établir des incitations pour orienter efficacement les choix de protection. Idéalement, le signal « prix » correspondant devrait refléter le coût marginal des dommages associés aux comportements de pollution. La mise en place de taxes environnementales ou écotaxes, conçues dans cette perspective incitatrice, constitue un moyen pour faire ressentir aux acteurs économiques le coût des dommages qu'ils font subir aux milieux ou aux autres agents, et opérer cette internalisation.

Les écotaxes, dont les principes ont été formulés théoriquement par Pigou dès les années 20, ont pris leur essor en Europe à la fin du siècle dernier. Les pays nordiques en furent les précurseurs, au début des années 90, rejoints ensuite par une deuxième vague comprenant notamment le Royaume-Uni. La contribution de Stephen Smith, qui constitue le cœur de ce document, décrit la mise en place des écotaxes et en tire des enseignements sur le domaine de pertinence et les conditions d'emploi de ce type d'instrument.

Tout d'abord, il confirme leur efficacité et leur supériorité par rapport aux approches réglementaires, ou *command and control*, pour minimiser les coûts de protection à engager pour atteindre un objectif environnemental donné. Toutefois, il met en lumière une condition importante de réussite : la mise en

place de telles taxes n'a d'intérêt que si celles-ci sont fixées à un niveau incitatif approprié et si elles peuvent peser sur les choix de gestion des entreprises. Par ailleurs, les possibilités de différencier géographiquement les taux étant contraintes, les écotaxes présentent de réelles limites quand il s'agit de pollutions locales.

L'étude synthétise le consensus émergeant sur le champ d'application du double dividende. Celui-ci stipule que l'utilisation des écotaxes ne peut être réellement justifiée en dehors des gains attendus pour l'environnement, c'est-à-dire du premier dividende. Ceci n'empêche pas que certaines taxes environnementales peuvent concourir à la réforme fiscale générale, en facilitant la réduction de distorsions préexistantes. De plus, pour que les écotaxes soient acceptées, il est souvent nécessaire d'en restituer une partie aux pollueurs, sous forme forfaitaire évidemment pour en conserver les vertus incitatives. Le cas de la taxe suédoise sur les Nox, fixée à un niveau ambitieux et combinée à un mécanisme de redistribution quasi forfaitaire, est ici très illustratif.

Ces enseignements, tirés ici de l'expérience britannique, convergent avec ceux des revues transversales de l'OCDE. L'approche monographique y apporte cependant une vision plus dynamique. En une dizaine d'années, l'instauration des écotaxes au Royaume-Uni a connu des progrès impressionants, au-delà des changements de majorité politique. Il s'agit là d'une véritable réforme, combinant la création de nouvelles taxes, la suppression des mesures agissant comme « subventions à la pollution », le « verdissement » de la fiscalité.

De nouvelles taxes ont ainsi été créées, suivant les principes « pigouviens » évoqués ci-dessus. En relèvent les taxes sur les décharges, celles sur les granulats et, plus récemment, la taxe sur le changement climatique et l'introduction de péages de congestion à Londres. A ce jour, ces péages constituent l'application opérationnelle la plus avancée des idées développées par Vickrey il y a une trentaine d'années. L'expérience a suscité initialement des réactions très dubitatives chez la plupart des observateurs français. Pourtant, les premiers résultats semblent très favorables et confirment le rôle des incitations monétaires pour orienter les comportements en faveur de la protection de l'environnement. De plus, ont été supprimés les éléments de la fiscalité existante opérant comme des « subventions à la pollution » avec l'élimination, dès fin 1994, du différentiel entre gazole et supercarburant. Enfin, a été opéré le « verdissement » de cette fiscalité existante, avec l'introduction d'éléments différentiels jouant dans un sens vertueux.

La description de ce processus de réforme retrouve donc, mais par d'autres détours, beaucoup des éléments mis en lumière dans les revues de l'OCDE. Tout d'abord, la distinction polaire entre deux types de taxe du point de vue des finances publiques :

- les taxes sur les biens représentant des postes de consommation importants, avec une élasticité-prix significative mais modérée — les consommations énergétiques et l'usage des transports routiers. Dans ce cas, il est possible d'envisager la génération de recettes fiscales pérennes ;
- les taxes à taux élevé et petite assiette, qui permettent de modifier structurellement des comportements ciblés. En général, les recettes fiscales correspondantes se réduisent rapidement une fois les comportements modifiés.

Dans les deux cas, se pose la question de la compensation à opérer pour rendre acceptable l'instrument, mais avec une économie politique assez différente : dans le premier, double dividende et risque de dissipation des ressources financières ; dans le second, modalités pour intéresser les ministres des finances à des taxes compliquées et rapportant peu, mais permettant d'éviter de recourir à des instruments de protection de l'environnement dont les coûts seraient beaucoup plus élevés.

Un autre point souvent souligné par l'OCDE concerne la construction de l'acceptabilité des écotaxes. Dans les pays nordiques et aux Pays-Bas, un élément clef de celle-ci a résidé dans la mise en place de Green Tax Commissions réunissant des représentants du public, de l'industrie, des milieux académiques et des experts de l'environnement et de la fiscalité. Si le Royaume-Uni n'a pas créé de telles commissions, il a eu recours à des institutions similaires : rapport sur la qualité de l'air urbain, qui a précédé la suppression du différentiel gazole-super ; rapport Marshall sur le recours aux instruments économiques pour lutter contre le changement climatique, puis concertation approfondie sur les projets de mise en œuvre, etc.

Il en ressort deux dimensions complémentaires : l'évaluation de la valeur monétaire des dommages concernés, pour justifier le taux de la taxe, et la construction d'un consensus sur les propositions de fiscalité. L'évaluation de la valeur monétaire des dommages n'est pas suffisante pour assurer que le taux sera fixé au niveau approprié, notamment si la taxe correspondante est perçue comme régressive du point de vue de la redistribution. Par ailleurs, l'exemple de la taxe sur la mise en décharge montre que l'évaluation initiale peut sous-estimer les dommages, obligeant ensuite à réévaluer la taxe. Pour autant, il est frappant de constater que, pour les principales taxes citées, des évaluations

du coût des dommages associés étaient disponibles. Ceci suggère qu'en l'absence de telles évaluations et de leur objectivation, l'acceptabilité des écotaxes est compromise.

Seconde dimension, la construction d'un consensus sur ces propositions fiscales traite des problèmes de redistribution et éventuellement de compétitivité qu'elles soulèvent, ainsi que des conditions d'utilisation des ressources fiscales. La question du choix des instruments — taxes ou permis d'émissions échangeables —, ou leur combinaison, devient aussi de plus en plus importante à traiter dans ce cadre, maintenant que les deux types d'instrument apparaissent opérationnels. A mesure que les problèmes environnementaux se complexifient, c'est en effet une panoplie d'instruments qui est utilisée, dont la doctrine d'emploi se précise.

Emmanuel Caicedo et Annabelle Berger apportent un autre éclairage à la question des écotaxes. Leur étude, réalisée dans le cadre de la Commission des comptes et de l'économie de l'environnement, permet d'apprécier la situation française au regard de ce processus. Il en ressort que l'expérience française en matière de fiscalité écologique est à la fois ancienne — mise en place du système des agences de l'eau et de leurs redevances en 1964, taxation des carburants — et nouvelle — mise en œuvre de la taxe générale sur les activités polluantes en 1999. Le constat fait alors était que les taxes de financement, formes traditionnelles de la fiscalité de l'environnement, avaient pour objectif non pas de décourager les comportements polluants, mais simplement de dégager les financements nécessaires à la réparation partielle des dommages causés à l'environnement.

L'essor de l'écofiscalité en France s'est trouvé interrompu avec l'échec de la taxe générale sur les activités polluantes (TGAP) sur les consommations intermédiaires d'énergie. A cette occasion, a été soulevé un problème juridique, le droit français ne permettant pas de réaliser des compensations sous la forme d'abattements à la base pour les industries grosses consommatrices d'énergie. Outre la résolution de ce problème, la reprise du processus ne semble pouvoir être couronnée de succès que si la plus grande attention est portée à la construction de son acceptabilité. Suivant ce qui précède, celle-ci nécessite à la fois une pédagogie générale sur le rôle du signal « prix » pour orienter les comportements, une évaluation rigoureuse des bénéfices et des coûts des mesures proposées et un processus permettant d'établir un consensus sur de tels projets. L'efficacité de nos politiques environnementales est à ce prix.

Dominique Bureau

Ecotaxes: What have we learned, and how far should we go?

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Abstract

The past decade has seen growing enthusiasm for the use of environmental taxes ("Ecotaxes") to steer the economy towards less-polluting and more sustainable patterns of production and consumption. Ecotaxes have the potential, as compared with conventional "command-and-control" regulation, to reduce the economic cost of achieving a given standard of environmental protection. Many OECD countries have introduced ecotax measures, addressing a wide range of environmental issues with a variety of new ecotax instruments. This paper draws on some of this experience, particularly that of the UK, and on underlying principles and theory, to assess the potential scope of application of ecotax measures.

Most discussion of ecotax reform has concentrated on ecotaxes in the fields of energy and road transport. In contrast to most environmental taxes, taxes on energy have the potential to raise revenues sufficient to alter the constraints and opportunities in fiscal policy. In the long term significant energy taxes seem unavoidable if the growth in carbon dioxide emissions is to be

1. Conférence de Stephen Smith dans le cadre du séminaire Economie de l'environnement et du développement durable, organisé à Paris, le 4 mars 2003, par l'Iddri et le ministère de l'écologie et du développement durable.

halted. However, concerns about competitiveness and income distribution may limit energy taxes to much more modest levels, for some time, and may absorb some of the revenues in compensation for the additional tax burden. Use of some of the revenues to finance abatement subsidies to increase behavioural responses may also be desirable when the tax level is constrained below the first-best.

Introduction

'Ecotax reform' has, over the course of the last decade, moved from theoretical discussion to the practical policy agenda in many European countries (OECD, 1995; EU, 2000). In the UK, a number of tax measures have been implemented primarily with environmental objectives in mind. Table 1 summarises the key features of these taxes. They have included three new national environmental taxes, on landfill, industrial energy use (Climate Change Levy) and aggregates. Taxes on motor fuels, and the annual vehicle excise duty have been restructured, with differential rates reflecting the different environmental attributes of fuels and vehicles. In London, the transport authority has introduced a congestion change for vehicle use in the central area. In addition to these explicitly environmental tax measures, a wider range of areas of tax policy-making routinely include some discussion of environmental issues. In particular, policy towards the taxation of motor fuels—a major revenue-earner—quite clearly has an environmental dimension.

Part of the impetus for ecotax reform has come from the recognition of the limitations of environmental policies pursued solely through conventional regulatory instruments. Over a number of years, there has been a growing recognition that some environmental problems cannot be tackled purely as technical issues, to be resolved straightforwardly through regulations requiring the use of appropriate abatement technologies. To make any serious impact on some of the major environmental problems now facing policy-makers—acid rain, global warming, traffic congestion—environmental policies will need to achieve extensive and far-reaching changes to existing patterns of production and consumption. Achieving the necessary changes inevitably entails substantial economic costs. The search for instruments capable of minimising these costs, and capable of achieving behavioural changes across all sectors, has led policy-makers in the last decade to pay much closer attention to the potential for incentive-based environmental regulation, through taxes, charges, tradable permits, and other 'economic instruments'.

Further pressures for ecotax reform have come from tax policy makers and Ministries of Finance, who have quickly recognised the scope for tax reform using the revenues raised from ecotaxes. Some countries, that have been concerned about the impact—either economic or political—of high taxes on labour income, have used ecotax revenues to reduce tax rates on labour incomes. Sweden's 1991 reforms used revenues from new environmental taxes on energy to finance cuts in labour income taxes. Similarly, a number of the UK's environmental tax measures have been accompanied by provisions to return the revenues through a reduction in the payroll taxes paid by employers. The political attractions of 'packaging' environmental taxes and tax reform in this way are, perhaps, obvious. The environmental gains, too, are relatively clear-cut, but the fiscal benefits of this type of tax substitution are much more contentious.

An important ingredient in the discussion of ecotax reform is the scale of the tax changes that would be involved, and the notion that the introduction of new environmental taxes might significantly alter the constraints and opportunities in tax policy-making. In practice, however, many environmentally motivated tax measures that might be contemplated do not have the potential to raise significant tax revenues. The tax bases involved are insufficiently large to yield revenues that significantly alter the overall tax structure. Taxes on certain types of battery, for example, or on plastic carrier bags, or on household purchases of garden fertilisers and pesticides, have all been employed in some European countries. In each case, they may have appreciable merit as an instrument of environmental policy, but their revenues are negligible in the context of the overall public finances. Even the substantial tax introduced by the UK on the use of landfill sites for dumping waste, which currently yields about £500 million, contributes little more than 0.1 per cent of total revenues. In addition, of course, some environmental taxes may achieve highly elastic polluter responses, eroding the revenue yield. Thus, for example, the tax differential introduced between leaded and unleaded petrol in many European countries was followed by fuel substitution, as consumers shifted to the lower-taxed fuel.

In practice, significant scope for major tax reform financed by the revenues derived from ecotaxes is only likely to arise in the case of two potential environmental tax bases—taxes on road transport and on energy. Congestion charges on private motoring could, for example, be a major source of tax revenues, if levied at a rate reflecting the congestion externality imposed by each individual motorist on other road users[1]. For example, Newbery (1990) estimated that the congestion cost per vehicle-kilometre averaged some

3.4 pence across the UK. If this was fully reflected in a UK-wide congestion charge, it would imply revenues of some £20 billion annually at current values, some 5 per cent of total fiscal receipts. The more limited London congestion charge, which takes the form of a £5.00 flat-rate daily fee for access to the central London area, is set to raise some £130 million annually, a significant amount in relation to the total budget of the sponsoring authority.

Table 1. Environmental taxes in the UK, 2003

Landfill tax

Introduced in 1996, at a standard rate of £7 per tonne on waste delivered to landfill sites. A lower rate of £2 per tonne applies to inactive waste (building rubble, etc). The standard rate was raised to £10 in 1999, and an annual escalation of £1 per tonne applies for five years from April 2000, leading to a final level of £15 per tonne in 2004. The initial tax rate was determined with reference to landfill externality estimates; subsequent increases have been designed to achieve greater behavioural change. Revenues in 2001-02 were £502 million (net of contributions to the accompanying voluntary Landfill Tax Credit Scheme), used to finance a 0.2 percentage point cut in employers' National Insurance contributions. The scheme is estimated to have led to a 60% reduction in the volume of inactive waste sent to landfill, but to have had negligible impact on landfilling of other wastes. A Cabinet Office Strategy Unit paper in 2002 concludes that "a rise to £35 a tonne is required over the medium term".

Climate Change Levy

A tax on energy use by business and industry, introduced in April 2001 as part of the government's Climate Change Programme. Rates of levy are equivalent to 0.15 pence per kWh for natural gas and coal, 0.43p per kWh for electricity, and 0.07p per kWh for liquefied petroleum gas (LPG). The tax does not apply to domestic energy use, or to energy used in the transport sector. Exemptions include fuels used in electricity generation, fuels used for non-energy purposes, and electricity generated from new renewable energy (eg solar and wind power). An 80% discount from the levy applies to energy-intensive sectors that negotiate Climate Change Agreements with DEFRA (Department for Environment Food and Rural Affairs). Full-year revenues approx. £1 billion, partly used to finance energy efficiency schemes, and the remainder returned to business through an offsetting 0.3 percentage point reduction in employers' National Insurance contributions.

Aggregates Levy

Introduced in April 2002. Intended to reflect the environmental costs associated with quarrying. Applies to sand, gravel and rock subject to commercial exploitation in the UK and UK territorial waters. Exemptions for coal and metal ore mining, for materials used to produce lime and cement, for industrial spoil and waste, highway evacuation and marine dredging. Export tax relief, and corresponding taxation of imports. The levy is charged at £1.60 per tonne, normally payable by the quarry operator. Full-year revenues approx. £305 million, part to be used to finance a Sustainability Fund (to promote local environmental benefits in areas affected by quarrying), and the remainder to finance a 0.1 percentage point cut in employer NICs.

Motor fuel differentiation

- Tax differential in favour of *unleaded petrol* introduced in 1987 at 0.96 pence per litre, subsequently widened to 4.8 pence per litre by 1995. Initial aim was to offset the higher cost of unleaded petrol, and subsequently to provide an incentive for fuel switching. Leaded petrol was removed from normal sale in the UK market in 2000.

- Tax differential between *petrol and diesel fuel* was eliminated in November 1994. Budget, which raised the excise duty on diesel to equal that on unleaded petrol. This followed a 1993 report of the Quality of Urban Air Review Group, which drew attention to the rapidly-growing problem of particulates emissions from diesel vehicles in urban areas. Diesel duty (conventional diesel) is now taxed more heavily (51.82 pence per litre) than conventional unleaded petrol (48.82 pence per litre).

- *Ultra-low sulphur petrol* and diesel benefit from duty advantage of 3 pence per litre and 6 pence per litre respectively.

- Lower rates of duty apply to *alternative road fuels*, including biofuels, gas used as a road fuel, and, shortly, bioethanol.

Vehicle excise duty differentiation

From June 1999, an annual vehicle excise duty differential was introduced to favour cars with small engines; this now applies only to vehicles registered before March 2001. Currently vehicles below 1550cc receive £55 discount on £160 annual vehicle excise duty. For cars first registered after 1 March 2001 VED has been graduated according to the CO_2 emissions performance of the vehicle model, in five bands of charges ranging from £70 to £155 annually for petrol cars, £80-160 for diesel cars, and £60-150 for alternative-fuel vehicles.

Central London Congestion Charge

Introduced in February 2003, by the Greater London Authority. Exemptions include taxis, buses, emergency services vehi-

cles, vehicles used by the registered disabled, etc. Vehicles using gas, electric, fuel cells and bi/dual fuel sources are exempt. The charge is £5.00 per day, for driving within a 21-square kilometre area of central London. The charge is monitored and enforced through cameras able to read vehicle registration numbers, sited at entry points to the zone, and at other locations within the zone. Annual revenues net of running costs are expected to be around £130 million, and must be reinvested in transport in London.

The taxation of energy, to reflect the environmental externalities involved in energy use, is the other area with potential to raise major tax revenues. The European Commission's proposal for a carbon-energy tax in the early 1990s would have generated substantial revenues for member states, of between 1 and 3 per cent of total fiscal receipts, despite exempting the most energy-intensive sectors. In 1994, the UK government ended VAT zero-rating on domestic energy as one of a package of revenue-raising measures. The initial proposal to tax energy at the standard VAT rate of 17.5 per cent would have raised some £3 billion of revenues annually, some 1 per cent of total fiscal receipts, but subsequent modifications have reduced the tax rate to 5 per cent, and annual revenues to around one-third of the original projection. Still larger revenues could be raised through carbon tax schemes designed to use carbon pricing to halt the growth in carbon dioxide emissions. Burniaux *et al.* (1991) estimate that a carbon tax equivalent to $300 (£200) per tonne of carbon in current prices would be needed in OECD countries to keep aggregate global emissions of carbon dioxide at 1990 levels over the period until the year 2020. Such a tax, if applied uniformly to all industrial and household energy use, would raise revenues equivalent to about 10 per cent of total UK tax receipts.

The Labour government elected in 1997 began giving serious consideration to the possibility of taxing industrial energy use. A Task Force, chaired by Lord Marshall, reported in late 1988 on the scope for using economic instruments to reduce energy use and emissions of greenhouse gases by the industrial and commercial sectors. Its report argued that a 'mixed approach' would be needed, combining existing forms of regulation with economic instruments, to provide clear signals for longer-term emissions reductions (Marshall Report, 1998).

The 1999 Budget announced the introduction of a new tax on industrial and commercial energy use, the 'Climate Change Levy', as part of the government's Climate Change Programme. The tax took effect in April 2001. It takes the form of a tax per unit of

energy used by industry, at initial rates of 0.15 pence per kWh for coal and natural gas, 0.43 pence for electricity, and 0.07 pence for liquid petroleum gas. There are exemptions from the tax for energy generated in CHP (combined heat and power) plants, and for renewable energy sources such as wind and solar power. An 80 per cent discount from the Climate Change Levy is awarded to energy-intensive sectors which have negotiated 'Climate Change Agreements' with the environment department (DEFRA), under which they have taken on collective quantitative targets for improvements in energy-efficiency or carbon emissions. Revenues raised from the tax (approximately £1 billion in a full year) are partly used to finance corporate tax incentives for energy efficiency investments, and the remaining revenue has been used to finance a reduction of 0.3 percentage points in the rate of employers' National Insurance Contributions. Overall, therefore, the package of measures is revenue-neutral, raising no net revenues, but its incentive effect is forecast to reduce UK greenhouse gas emissions by some 2 million tonnes of carbon.

The evolution of this tax has shown the political difficulties of immediate introduction of large-scale environmental taxes on energy. The political legacy of the previous government's attempt to impose standard-rate VAT on domestic energy has been that the Climate Change Levy excludes the domestic sector. This obviously foregoes the possibility of equal energy-saving incentives in the domestic and business sectors, but, less obviously, has led to some messy compromises in the design of the tax, requiring it to be imposed nearer the point at which energy is sold to final users, so that the domestic sector can be exempted. Fear of the impact that a tax on carbon content might have on the coal industry has led the government to choose energy content, rather than carbon content as the base for the tax, thus foregoing the possibility that carbon emissions could be reduced through fuel-switching incentives. Concern about the impact of the tax on the competitiveness of energy-intensive sectors has led to arrangements that will exempt these sectors from the levy, in return for negotiated agreements with these sectors to achieve equivalent improvements in energy efficiency. This again complicates the design of the levy, reduces further the proportion of the economy experiencing the incentive effects of the tax, and relies on the questionable—and untestable—assertion that the negotiated agreements will achieve energy savings at least as great as those that the Levy would achieve.

Initially, the Climate Change Levy is set to raise only about £1.0 billion in revenues, and this allows only a small 0.3 percentage point reduction in employer's NICs. There is, in principle, scope

for considerably higher tax rates and revenues to be justified by appeal to the environmental consequences of energy use. However, concerns about the impact on industrial competitiveness—whether well-founded or not—seem likely to constrain the tax rate that individual countries, acting without international co-ordination, would feel able to implement. Despite this major constraint, it is likely that in the longer run, as more stringent reductions in energy-related emissions are needed, and progress is made in international agreements, an increasing role may need to be played by energy prices in restraining energy demand growth. Higher energy tax rates, and an increasing revenue contribution from this source, are likely to be a feature of taxation and environmental policies in many industrialised countries in coming years.

This paper considers a number of aspects of the use of taxation as an instrument of environmental policy, and, following this introduction, is in three main sections. Section 2 reviews the arguments for using taxes in environmental policy. These arguments form the backdrop to any discussion of environmental taxes, and neglecting the basic principles they embody could lead to inefficiently designed instruments, or excessive long-run cost. Section 3 considers the value of the revenue contribution from environmental taxes. How far would ecotax reform alter the constraints and problems which tax policy currently faces? In what sense—if at all—would an ecotax reform provide a 'double dividend', in the form of a less distortionary fiscal system, as well as a cleaner environment? Section 4 draws some conclusions about the scope and direction of any future ecotax reforms.

The case for environmental taxes

There is now an extensive literature on the potential for taxes to contribute to more efficient and more effective environmental policy (e.g. Smith, 1992; OECD, 1993, 1996; Bovenberg and Cnossen, 1995; O'Riordan 1997). In comparison with 'conventional' regulatory policies based on technology or emissions standards, ecotaxes may be able to reduce the costs of achieving a given standard of environmental protection (or, alternatively, can achieve a greater environmental impact for a given economic cost). However, environmental taxes are far from being a *panacea* for all environmental problems. Consideration of their advantages and disadvantages, as compared with other instruments, suggests that there is a group of environmental problems for which taxes, of various sorts, may be the best instrument available. There are other environmental problems which would be better tackled by

other approaches, including other 'economic instruments', such as tradable permits, or various forms of command-and-control regulation.

Advantages of ecotaxes

From the perspective of environmental policy, environmental taxes have attractions for a number of reasons.

'Static' efficiency gains through reallocation of abatement

Where the costs of pollution abatement vary across firms or individuals, environmental taxes have the potential to minimise costs, for one of two possible reasons. Where other policy instruments cannot fully differentiate between polluters with different marginal costs of abatement, taxes can achieve a given level of abatement at lower total abatement cost. On the other hand, where other policy instruments take account of differences in polluter abatement costs, taxes can side-step the need for the regulatory authority to acquire detailed information on individual sources' abatement costs, and can thus lower costs of regulation from the side of the public sector.

'Static' efficiency gains through performance incentives

Taxes levied on emissions provide an incentive for care and attention in the operation of mandated technologies. In many cases, use of a given abatement technology does not guarantee a precise emissions level; instead, much depends on how the technology is used. Providing businesses with an incentive to cut emissions can be translated into providing individuals within the business with similar incentives, and some individuals may be in a position to take actions which greatly affect the emissions performance of a given technology. Lövgren (1993) shows that a substantial part of the gains from the Swedish nitrogen-oxides (NOx) charge came from this, perhaps unexpected, source.

Innovation incentive

Regulatory policies, stipulating that polluters must use particular technologies, or maintain emissions below a specified limit, do not provide polluters with any encouragement to make reductions in pollution beyond what the regulations require. Indeed, where regulations are negotiated on a case-by-case basis, polluters may fear that any willingness to go beyond what is strictly required by the regulations will simply lead to the regulator assigning the firm a tougher limit in future. Environmental taxes, on the other hand, provide a continuing incentive for polluters to seek ways to reduce emissions, even below the current cost-effective level. This incen-

tive arises because of the tax payments which are made on each unit of residual emissions, which create an incentive to develop new technologies, permitting further abatement at a marginal cost below the tax rate.

Robustness to negotiated erosion ('regulatory capture')

An important consideration in choosing between different strategies for environmental regulation is the extent to which efficient implementation of the policy requires firm-by-firm negotiation of individual abatement or technology requirements. As noted above, command-and-control regulatory policies could be operated in a way which requires different amounts of pollution abatement from different firms, in order to achieve a more cost-effective pattern of abatement than under a uniform abatement rule. However, the regulator is dependent on the regulated firms for information about their abatement costs, and to obtain this information is liable to be drawn into dialogue and negotiation with the regulated firms. The regulated firms, in turn, then control a key element in the process by which regulatory policies are set, and may be able to extract a price from the regulator for their co-operation, in the form of less stringent abatement targets, or other changes which work to their advantage.

One key difference between regulatory policies which set differentiated firm-by-firm targets and the use of environmental taxes is that environmental taxes achieve a cost-effective distribution of abatement, taking account of the abatement costs of individual firms, while taking a robust, non-negotiated form. All firms face the same pollution tax rate. There is no need for the regulator to consider the circumstances of individual firms, and there is thus little scope for individual polluters to attempt to negotiate more favourable terms with the regulator. The risk that this process of negotiation would erode the environmental effectiveness of the policy is thus substantially reduced.

Cost-limiting properties

As compared with policy instruments which operate by defining a quantitative limit on pollution, environmental taxes have the attraction that they insulate polluters from the risk that regulatory requirements might involve excessive abatement costs. The tax rate per unit of emissions places an upper limit on the unit abatement cost which will be incurred. If abatement turns out to be more costly per unit than the tax per unit, firms will simply pollute and pay the tax, rather than paying for costly abatement. By contrast, regulatory policies which set a quantitative limit on emissions may risk requiring that abatement measures are undertaken which are far more costly than the resulting environmental benefits.

The limitations of ecotaxes

Likewise, and again from the perspective of environmental policy, ecotaxes have a number of identifiable drawbacks and limitations, which will in some cases be sufficiently important to rule out their use in particular applications.

Uncertain environmental impact

The level of pollution abatement achieved by an ecotax depends on individual polluters' responses to the abatement incentive that the tax creates. It is not possible to guarantee that an environmental tax will achieve a particular environmental impact; polluters' behavioural responses may be less, or more, than expected. In cases where the precise achievement of an environmental target is a high priority, this may be an important drawback of ecotaxes. For example, some pollution problems may exhibit threshold effects, where environmental damage per unit of emissions rises sharply beyond a certain level of emissions. On the other hand, many pollution problems do not involve an abrupt boundary between acceptable and damaging emissions, and precise achievement of an emissions target may be relatively unimportant. In these circumstances, ecotaxes may be more attractive.

It will be noted that this uncertain environmental effect is the counterpart of the cost-limiting property of ecotaxes noted above. Quantitative instruments like direct regulation (or tradable permits) guarantee a particular impact on pollution, but at uncertain abatement cost, while ecotaxes guarantee an upper bound on marginal abatement costs, but have an uncertain pollution outcome. Which matters more will depend on the environmental problem under consideration, and on whether society would prefer to take risks on environmental quality or on the costs of environmental policy.

Compatibility with firm decision-making structures

Except in very small firms, it will be efficient for many business decisions to be decentralised. Specialised units or divisions of the firm may be given responsibility for making many decisions requiring specialised expertise or detailed information, subject only to general instructions or guidelines from the centre. This represents an efficient division of labour, but carries with it the implication that not all aspects of the firm's operations will necessarily be taken into account in making a particular decision. The internal organisation of the firm needs to be designed so that related decisions are grouped together, while unrelated business decisions are separated.

For environmental taxes to lead to efficient polluter responses, it is necessary for firms to draw together information relating both to technology choice and to tax payments. Firms considering whether to undertake more pollution abatement need to balance the gains, at the margin, in reduced tax payments, against the marginal costs of abatement. This requires a type of interaction that may not otherwise be a high priority in the internal organisation of the firm, and may require significant changes to the decision-making structure of the firm, so that tax and pollution-control technology decisions are taken together. Restructuring the firm so that such interactions can take place may be costly, and may well not be worth doing if the tax at stake is small. Firms may not, therefore, respond at all to 'small' environmental taxes, and conventional regulatory measures may be more effective, and—taking decision-making costs into account—more cost-effective, too.

Lack of experience

In the past, the lack of experience with environmental taxes may have been a significant obstacle to their adoption in any particular practical context. A novel policy instrument is only likely to be employed in preference to one which is familiar where the conventional instrument has clear, and widely recognised, defects. Increasingly, the objection that environmental taxes are untried and untested is untrue. Many studies, such as those of the OECD, document the extensive international experience with ecotaxes which is now available, and there is increasing evidence evaluating their effectiveness.

Administration and enforcement costs

Both environmental taxes and conventional command-and-control regulation require mechanisms for administration and enforcement. The relative costs of these arrangements should be taken into account in choosing between the different instruments available, and it is difficult to generalise.

However, excise taxes on inputs may be an inexpensive way of regulating polluting processes which use these inputs. Unlike other forms of environmental regulation, there is no need for direct contact between the regulator and polluters, and the number of polluting sources does not, therefore, affect the costs of administration and enforcement. The incentive is transmitted through the excise tax levied on the production or sale of the input. If there is only a small number of producers, this will be comparatively cheap to operate. The excise duties levied on mineral oils are a case in point; there is a small number of petrol companies, and their activities are tightly controlled and well documented.

Geographical differences

If pollution damage varies depending on the source of the emissions, policy based on a uniform pollution tax applying to different sources will be liable to result in inefficiency, and source-by-source regulation may be able to achieve a more efficient outcome. In principle, of course, an environmental tax need not be constrained to applying the same tax rate to all sources, and could thus achieve the efficient outcome through appropriately differentiated tax rates. However, once the tax rate has to be set individually for each source, the tax may become more exposed to lobbying influence from the regulated firms. Also, some possible forms of environmental tax may be constrained to set uniform tax rates, even where damage is known to differ between locations. Thus, for example, ecotaxes based on the taxation of pollution-related inputs to a polluting production process may be unable to differentiate between sources, because of the difficulty (or the costs) of preventing resale of inputs taxed at a low rate to polluters with more-damaging emissions.

The balance of costs and benefits

The implications of the above are that environmental taxes are likely to be particularly valuable where wide-ranging changes in behaviour are needed across a large number of production and consumption activities. The costs of direct regulation in these cases will be large, and in some cases prohibitive. In addition, where the activities to be regulated are highly diverse, it is likely that considerable gains could be made from allowing the required changes in environmentally damaging activities to be achieved in the most cost-effective manner.

Private-sector energy use cannot realistically be regulated through source-by-source regulation. There are too many energy users—both businesses and individuals—and their opportunities for abatement are too diverse. The available options boil down to indirect techniques—either those that operate by restricting or widening the range of available technologies (e.g. regulations requiring standards of energy efficiency from appliances, or subsidies to promote the introduction of low-energy technologies), or incentive mechanisms such as energy taxes. In the long term, given the scale of changes that would be needed in household and business energy consumption to maintain or reduce global energy-related greenhouse-gas emissions (despite rapid industrialisation outside the OECD area), it is almost inconceivable that an effective climate-change policy could be pursued without significant use of energy pricing measures, such as carbon or energy taxes.

On the other hand, the analysis above suggests plenty of areas of environmental policy where advocacy of ecotaxes would be misguided. There is little to be gained from over-sophistication in the tax structure, through the introduction of finely-graded tax differentials to reflect the environmental characteristics of commodities with little environmental significance. Complex tax structures are liable to be costly to operate, and the tax 'boundaries' between products subject to higher and lower rates of tax are always open to costly and socially wasteful litigation, and consequent erosion. Moreover, insufficiently large tax incentives may achieve little change in behaviour. As argued above, it may not be worthwhile for firms to take account of tax incentives in making environmental technology decisions if the tax incentives are too small to justify the costs of changing established decision-making structures. It is perhaps an over-generalisation to suggest that environmental taxes should be large, or not be imposed at all. However, the costs of complexity and the risk that minor environmental taxes will simply be ignored should both caution against too much environmental fine-tuning of the fiscal system.

Decision-making obstacles

In the decision-making process, factors other than objective costs and benefits may well play a major role in the choice between environmental policy instruments. Different actors in the process may have divergent interests, and these may affect the policy finally chosen.

For example, it is often suggested that ecotax policies may encounter opposition from some of the 'stakeholders' in the existing regulatory process who would be liable to lose some of the control and influence that they exert within the current regime. This is in effect the counterpart of the 'regulatory capture' argument above. Negotiated firm-by-firm regulation gives significant influence to the regulatory agency and firms, and this would be simply bypassed with a policy based on a uniform ecotax.

A second possible influence on instrument choice is that some participants in the decision-making process may perceive costs and benefits which differ from the overall costs and benefits to society.

From the perspective of firms, ecotaxes impose costs in terms of tax payments that may outweigh the efficiency savings achieved through a more efficient pattern of pollution abatement. These tax payments are not, of course, costs to the economy as a whole, but simply transfer payments, having as a counterpart the revenue flow to government. Nevertheless, taking firms as a group, and assuming that the revenues are not channelled back exclusively to the tax-

paying firms, environmental taxes result in substantial burdens. Only if the efficiency gains from a more efficient distribution of abatement across polluters are very large would it be possible for environmental taxes to result in net gains to polluters as a group. This implies polluters will not select environmental taxes if given the choice, and policy-making mechanisms that accord a significant or dominant voice to polluting firms in the choice of policy instrument are unlikely to result in tax-based policies being adopted.

In addition to these possible influences on the decision whether or not to employ ecotaxes, both objective considerations and political pressures may influence the scale of environmental taxes that can be introduced. As discussed by Rajah and Smith (1993), there may be a number of restraints on the rates of environmental tax that can in practice be applied, that may lead policy-makers to combine environmental taxes, set below the first-best level, with other, 'second-best', policy instruments (such as, for example, abatement subsidies or quantitative regulation). The first-best rate of an environmental tax may, for example, present an excessive incentive for evasion, and may consequently involve excessive costs of administration and enforcement; setting a lower rate for the tax may keep the level of evasion, and the costs of enforcement, within more acceptable bounds. Another possibility is that the first-best environmental tax rate may have undesirable consequences for distributional objectives; if it is impracticable to offset this impact fully through adjustments elsewhere in the fiscal system, it may then be preferable to levy a lower environmental tax, and to supplement it with other measures (such as subsidies to increase the elasticity of behavioural responses). Third, the tax rate that can be set may be constrained by the perception of adverse effects on the international competitiveness of industry. The adverse impact of energy taxes on energy-intensive industry (although balanced by corresponding gains elsewhere) attracts enormous policy attention; the European Commission's proposed carbon/energy tax attempted to 'buy off' these objections through sectoral exemptions, the Swedish carbon tax was drastically revised under pressure from energy-intensive industry, and the UK Climate Change Levy is charged at a much lower rate on energy-intensive sectors that have concluded 'Climate Change Agreements' with the government. Whether justified or not, concerns about competitiveness are likely to place severe restraints on the ability of governments to set energy taxes at the first-best level, and other instruments will need to be employed in parallel.

Public finance aspects of ecotaxes

How much of a difference could environmental taxes make to the structure and constraints in fiscal policy? Where sufficient revenues can be raised from environmentally-motivated energy taxes to permit radical change in this pattern of UK tax revenues, what—if any—are the fiscal (as opposed to environmental) benefits from such an "ecotax reform"?

Revenue sustainability

The revenues that would be raised from environmental taxes on particular raw materials or products associated with pollution will be a function of the responsiveness of demand and supply to price. The more effective the tax is in restraining production and use of the taxed good, the lower will be the revenue derived from the tax. In some sense, therefore, revenue issues arise in inverse proportion to the environmental effectiveness of an environmental tax; the tax is paid and revenues obtained only where the good continues to be produced and consumed.

The effects on revenues of an environmental tax are likely to change over time. Since, in general, supply and demand responses to the imposition of an environmental tax are likely to be rather greater in the long run (when taxpayers' patterns of production and consumption can be freely adjusted), than in the short run (when taxpayers' production and consumption decisions may be constrained by existing capital equipment), there may be circumstances where the revenues to be obtained from the environmental tax could decline over time. Where long-run supply and demand responses to the environmental tax are large, reflecting the existence of close substitutes which are less heavily taxed, the opportunities and problems posed by the tax revenues and the burden of additional tax payments will be short-lived.

In practice, forecasting the long-run revenue effect of environmental taxes is unlikely to be a precise matter. Not only are there likely to be important uncertainties regarding the size and timing of the effects of the tax on production or consumption of the good in question, but also demands and hence revenues will be a function of the overall economic climate and level of economic activity. Economic growth may increase demands for the polluting good, partly (or fully) offsetting the effects of the environmental tax. Where the price elasticity of demand for the taxed good is low, and the income elasticity is high, the increases in demand due to growth are likely to be large relative to the reductions in demand due to the environmental tax. Thus, one concern in considering

the use of tax on energy to control environmental problems associated with energy use is that the price elasticity of energy demand is so low, that a steeply rising energy tax would be needed merely to keep energy demand constant in the face of rising incomes.

A 'double dividend'?

From the perspective of fiscal policy, what are the gains from using ecotaxes? Do they have the potential to reduce the overall costs involved in raising fiscal revenues? Some commentators (e.g. Pearce, 1991; Oates, 1991) have drawn attention to a potential 'double dividend' from environmental taxes—the possibility that, in addition to their merits as instruments of environmental policy, they have a second benefit in that the revenue raised from the environmental taxes allows other taxes, with possible distortionary effects on labour supply, investment, or consumption, to be reduced. There are a number of strands to this argument.

'Distortion-correcting taxes are better'

Empirical studies of the marginal distortionary costs (the marginal excess burden) of existing taxes show that these costs can be appreciable. For example, Ballard *et al.* (1985) estimate the marginal excess burden of public revenues in the USA at 20-30 cents for each extra dollar of tax revenue. These costs reflect the fact that most taxes (apart from lump-sum taxes) lead to behavioural adjustments which reduce individual welfare, over and above the value of the actual tax payment by the private sector. Raising the rate of conventional taxes will typically increase these distortionary costs. However, the behavioural adjustments that arise from environmental taxes include some which are positively desirable, reflecting changes in private-sector activities that reduce emissions. In these circumstances, making use of environmental taxes to raise revenues would appear distinctly preferable to relying on conventional taxes, which generate undesirable distortions in activity. Surely it must be better to raise revenues from taxes that correct distortions, rather than create them.

Starting from a position in which the system of taxes has been designed to minimise excess burden, without any concern for the environmental implications of the tax structure, there would, indeed, usually be gains from shifting the balance of revenue-raising towards greater reliance on environmental taxes. In this sense, the tax system will be more efficient if ecotaxes are used, than if they are neglected. However, there are two key observations.

First, the particular meaning of 'excess burden' in this argument should be noted. Environmental taxes on energy can be said

to have negative excess burden (at least over some range) if we include within the definition of the excess burden the environmental benefits from the induced behavioural changes. Ecotaxes, on this argument, may have negative excess burden, but to say that they have this desirable property in addition to their environmental benefits involves double counting.

Second, although there will almost certainly be gains from some shift to distortion-correcting taxes, this will be true only up to a certain point. The purely fiscal component of the excess burden, in the form of such things as the reductions in energy consumption and expenditures on energy-saving technologies, will have costs that rise more than proportionately with the rate of tax. Raising the tax rate on energy will initially confer benefits, in the sense that the environmental gains offset the costs of these behavioural adjustments, but as the energy tax rate is further increased, the costs of these behavioural changes will rise more than proportionately, eventually overtaking the additional environmental benefits. As Oates (1991) observes, economic efficiency in raising public revenues requires that the marginal deadweight burden from each revenue source be equal; in other words, that there should not be scope to raise the same revenues at lower deadweight cost by changing the pattern of public revenues. This will imply shifting the pattern of revenue-raising towards ecotaxes, up until the point where the marginal excess burden of each ecotax has risen to equal the marginal excess burden from other taxes.

The above form of the argument that introducing ecotaxes will lead to more efficient fiscal policy does not establish clear and separate 'environmental' and 'fiscal' dividends from the use of ecotaxes. The environmental benefits form part of the claim that revenues can be raised at lower cost through ecotaxes; there are not two separate 'dividends'.

'Using ecotax revenue to reduce other tax rates reduces excess burdens'

A second strand in the 'double dividend' literature concerns the significance, or value, of the revenues raised from environmental taxes. What, if any, are the benefits from choosing an environmental policy instrument which raises revenues, in preference to one which has similar environmental effects but raises no revenues? If we employ a revenue-raising environmental policy instrument, such as an environmental tax or auctioned tradable permits, do the revenues collected as a 'by-product' of its environmental effects give us a more efficient fiscal policy, compared with the use of an equivalent non-revenue-raising instrument?

The closest comparison that can be made between a revenue-raising environmental policy instrument and one that is otherwise

identical but raises no revenues, is that between auctioned and 'grandfathered' tradable permits. Auctioned tradable permits trading at a price x per unit of emissions would provide the same incentive for pollution abatement, and raise the same revenues, as an emissions tax set at the same rate x per unit. The comparison between auctioned and grandfathered tradable permits thus provides a way of thinking through the consequences of two equivalent instruments, differing only in the fact that one raises revenues.

Under a 'grandfathered' scheme, permits are distributed free of charge, according to some system of distribution. Polluting firms may, for example, be allocated permits in proportion to their emissions levels in some past period. The free allocation of permits on the basis of historic emissions levels has a clear opportunity cost to the government. Revenues could have been raised by auctioning the permits, since they are of value to the firms that receive them, and, instead, the government is making a transfer to the firms, of a value equal to the number of permits allocated, times the price at which they subsequently trade. Aside from the possibility that the number of firms in the industry might be affected if permits are auctioned rather than distributed free, it would be expected that the market price at which permits trade would be identical under the two regimes, and the level and pattern of pollution abatement would be identical. The only difference between the two regimes is, then, that one raises revenues, while the other forgoes the opportunity to raise revenues. The latter case may be seen as equivalent to the case where permits are auctioned, and the revenues raised then transferred back to firms through lump-sum transfers.[2]

Looking at the above comparison between auctioned and grandfathered tradable permits, the environmental effects are held constant, and the only difference is that revenues are obtained under the former, but not under the latter. Any fiscal policy benefit from the revenues raised can be clearly distinguished from the environmental benefits from the instrument, which are identical across the two cases.

The revenues raised from the revenue-raising instrument do clearly have a benefit in that they reduce the need to raise revenues from other taxes, and reduce the need to incur the distortionary costs involved in raising revenues through these taxes.

In his discussion of the double-dividend debate, Goulder (1995) refers to this case as that of a 'weak' double dividend. Cost savings are made by using ecotax revenues to reduce distortionary taxes, rather than returning tax revenues to taxpayers through lump-sum payments. He points out that the existence of a double dividend,

in this sense of the term, is uncontroversial, because "the idea that swapping a distortionary tax for a lump sum tax has a positive welfare cost is part of the usual definition of distortionary".

The claim of a double dividend in this form is undramatic, but not without policy significance. In making a choice between policy instruments, it implies that—other things being equal—a substantial premium should be placed on selecting revenue-raising instruments, and on then using the revenues raised to reduce the rates of existing distortionary taxes. There are significant costs if the potential revenues from environmental taxes are dissipated or forgone.

Two examples can be drawn from the recent discussion of the possible use of economic instruments to reduce business use of energy in the Marshall Report (1998). First, the Marshall Report pays considerable attention to the idea that the tax revenues derived from energy taxes levied on industry should be returned to firms, rather than used in other ways. The economic arguments which would support this recommendation are considerably less clear-cut than Marshall appears to think. In the long run, it is not at all obvious that reducing taxes on firms would enhance UK firms' competitiveness by more than if taxes on individuals were reduced. However, if we accept Marshall's recommendation that the revenues should be returned to industry, the implication of the analysis above is that it matters how this is done. Efficiency gains will be made if this is done by reducing the marginal rates of other taxes, and arrangements for revenue return which have a more lump-sum character (as with the return of revenues from the Swedish NOx charge described earlier) will forgo these fiscal gains.

Second, the Marshall Report discusses the relative merits of grandfathered and auctioned tradable permits. The report rightly observes some significant difficulties with grandfathered permits. The basis for allocation may well be controversial, and allocation on the basis of historic emissions would tend to disadvantage firms which had already reduced emissions in the past, and give greatest benefit to the least-dynamic firms. Also, grandfathering may discourage competition, because new entrants to an industry (which have to buy permits) do not compete on equal terms with existing firms (which receive an allocation of free permits). However, the report omits to mention probably the most serious disadvantage of grandfathering, which is that it simply forgoes the chance of raising revenues. If the estimates of marginal excess burden from Ballard *et al.* (1985) are taken, the cost of grandfathering, in terms of the forgone fiscal gains from recycling the revenues through cuts in the marginal rates of distortionary taxes, is of the order of 20-50 per cent of the forgone revenues.

A corollary of the double-dividend argument in this form is that the optimal level of pollution abatement will not be independent of the environmental policy instrument used (Lee and Misiolek, 1986). Where increasing the rate of the environmental tax increases tax revenue, instruments such as regulation or grandfathered tradable permits which forgo revenue will have a higher total marginal abatement cost (taking into account the marginal deadweight burden of raising public revenues as well as the conventional marginal abatement costs) than environmental tax instruments, which can use the extra revenue raised to reduce the distortionary costs of other taxes. In this case, an efficient policy will set a higher level of pollution abatement if the tax instrument is used than if an environmental policy instrument is employed which does not raise revenues.

'Switching to ecotaxes reduces excess burdens'

There has recently been a spate of theoretical papers which have modelled the conditions under which a double dividend would arise, in a more demanding sense of the term, defined by Goulder (1995) as a 'strong' double dividend. He defines this as the claim that a tax switch which increases taxes on energy and reduces existing non-environmental taxes would have negative 'gross costs'. In gross costs he includes all the welfare costs of all behavioural changes from the tax switch, but excluding the environmental benefits. This is an extremely demanding criterion, and will be seen to be a substantially different claim from that being made at the start of this section. A shift towards environmental taxes would have a double dividend only if there were environmental gains (the first dividend), and if the total deadweight costs of revenue raising (including abatement costs in the form of behavioural substitutions to higher energy prices, but excluding the environmental benefits) are negative. The double-dividend argument in this 'strong' sense becomes a 'no regrets' argument; even if the changes in energy use turn out to have no environmental benefit, achieving them has been costless because the overall fiscal costs of the tax change are negative.

One obvious group of circumstances in which the gross costs of a particular tax switch might be negative are those where existing fiscal policy has not been optimised with respect to purely fiscal considerations. Where existing fiscal policy has failed to set the pattern of tax rates so that the marginal excess burden of each tax instrument is equalised, the aggregate deadweight costs of revenues are not minimised (as noted above). It may be possible to reduce the total excess burden of raising public revenues (and, in other words, to make a tax switch with negative gross costs) by introducing an energy tax and using the revenues to reduce a tax

which at the initial pattern of tax rates has above-average marginal excess burden. (Goulder refers to such a case as an 'intermediate form' double dividend.) Although perhaps of interest in the context of practical policy, where inefficiency in the pattern of revenue-raising may well exist and where the introduction of an environmental tax on energy might offer a politically palatable route to a shift to a more efficient pattern of taxation, this case introduces little of theoretical interest.

The more demanding requirement for a 'strong' double dividend, that the gross costs of a tax switch will be negative even where the existing pattern of tax rates is set optimally with respect to fiscal considerations, and equalises marginal deadweight burdens across all taxes, can be satisfied only in a set of somewhat special circumstances. A series of papers by Bovenberg and co-authors has identified the limited range of possible cases where a double dividend of this form could exist (e.g. Bovenberg and de Mooij, 1994; Bovenberg and Goulder, 1994; Bovenberg and van der Ploeg, 1994; see also Parry, 1995).

Bovenberg and de Mooij (1994) argue that the distortionary cost of taxation needs to be considered in a general equilibrium context, in which the effects of taxes on both goods and factor supplies and demands are taken into account. Taxes on goods, for example, will tend to distort not only the pattern of spending on goods, but will also distort labour supply. Since a uniform tax on all goods is formally equivalent in a one-period model to a uniform tax on labour income (since both affect the quantity of goods which can be purchased with the income earned from an additional hour's labour), a shift in the pattern of taxation from income tax to a uniform tax on goods would leave the deadweight burden unchanged (i.e. would have zero 'gross cost' in Goulder's terminology). A shift to a non-uniform tax on goods, in the form of a tax on one good, energy, alone, would, in addition, have a distortionary effect on the pattern of spending (if any environmental benefits are disregarded), and would therefore have a higher deadweight burden than the uniform tax on labour; such a tax switch would have a positive gross cost.

Bovenberg and de Mooij observe that the size of this gross cost will depend on the extent of pre-existing distortionary taxation. The additional distortions to labour supply and other markets from the environmental tax will be greater, the greater the initial degree of distortion in the economy; where an economy is initially highly distorted, the double-dividend argument will then be weaker than where the initial marginal excess burden of taxation was small.

Only a limited range of circumstances is identified in which the strong form of the double-dividend argument holds. Bovenberg

and de Mooij (1994) find that it can hold if the uncompensated wage elasticity of labour supply is negative: Goulder (1995) notes that this condition is generally rejected in empirical studies of the labour market. Shah and Larsen (1992) point out that pre-existing, inefficient, subsidies can generate a strong double dividend, if the tax switch helps to counteract the inefficiency arising from these subsidies. A strong-form double dividend is also possible in the model of Bovenberg and van der Ploeg (1994), where involuntary unemployment can arise due to a fixed real wage, and where part of the burden of the energy tax can be borne by a fixed factor other than labour. Since the tax borne by the fixed factor has little distortionary cost, the gross cost of the tax switch can be negative. This model, they observe, may be appropriate to the case of small open economies.

Pearson and Smith (1991) observe that there is a close link between the impact of an environmental tax on the excess burden of taxation, and the distributional impact of the environmental tax. Where policy-making operates on the basis of a trade-off in taxation between efficiency and equity objectives, it would generally be possible to reduce the excess burden of taxation by relaxing the distributional constraint. If the distributional objectives are weakened, it will be possible to increase the lump-sum, non-distortionary, element within the tax structure, and this will reduce the excess burden of raising a given revenue. An environmental tax which is sharply regressive would tend to increase the lump-sum, non-distortionary component of the tax system, and this will, in turn, tend to reduce the overall welfare costs of raising revenue. This provides a way in which, in practice, environmental taxes could reduce the distortionary costs of the tax system. However, they would, in part, do so only to the extent that the distributional incidence of the tax system is permitted to become more regressive; if the original distributional incidence is restored, this source of efficiency gains would be eliminated.

Conclusions

Environmental taxes may have an increasingly important role to play in environmental policy, especially in achieving the extensive changes in the energy use of firms and individuals that will be required if global greenhouse-gas emissions are to be held constant, or, still more, reduced. Energy-pricing measures, in the form of energy taxes, would provide a common incentive signal to a wide variety of energy users with different abatement costs and opportunities. This will promote cost-effective responses, reducing

the cost of achieving any given level of emissions abatement. In addition, the use of taxes instead of regulation can spread the burden of adjustment efficiently across all energy users, rather than simply concentrating on those most amenable to direct regulation.

Few ecotaxes have the potential to raise revenues sufficient to alter the constraints and opportunities in fiscal policy. Environmental taxes on energy and congestion charges on motor transport are the two areas where ecotaxes could make a major contribution to tax revenues. In both cases the available tax base is broad, demand is inelastic (so revenues will not be greatly eroded by behavioural responses), and high rates of tax may well be warranted by the environmental externalities resulting from energy use and vehicle congestion.

The UK Climate Change Levy on business energy use, introduced from April 2001, represents a relatively modest step towards harnessing the power of tax incentives to the achievement of the UK's Climate Change policy commitments. The Levy takes the form of a tax based on the energy content of fuels, and various political constraints (especially the aim of avoiding adverse effects on the coal industry) have meant that it has not been differentiated to reflect the carbon content—and hence, global warming potential—of different fuels. The tax rates are relatively low (0.15 pence per kilowatt hour on gas and coal), and energy-intensive sectors that have concluded negotiated agreements to improve energy efficiency pay only one fifth of the standard rate. Overall revenues amount to about £1 billion, of which part is used to pay for corporate tax incentives for energy efficiency, and the remainder finances a 0.3 percentage point reduction in employer's National Insurance Contributions.

In the longer run, environmental taxes on energy have considerably greater revenue-raising potential. To illustrate the broad orders of magnitude involved, a carbon tax levied on all energy uses (including domestic-sector energy consumption) at a rate of £60 per tonne (broadly equivalent to the carbon/energy tax proposed by the European Commission in 1991, and about four times the level of tax on carbon compared with the 0.15 pence per kWh standard rate of the Climate Change levy) could raise revenues equivalent to about 3 per cent of total UK tax receipts, which would permit a reduction of about 4 percentage points in the basic rate of income tax.

Revenues on this scale clearly present opportunities for significant change in the fiscal system. The revenues raised from environmental taxes have an enhanced value in the sense that—as with all taxes—the welfare costs of transferring resources to the public

sector are high. Estimates of the distortionary costs of taxation in the USA suggest that the marginal welfare costs of existing tax revenues could be of the order of 20-50 cents for each dollar raised (Ballard *et al.*, 1985). If the tax system of the UK has similar costs, then the revenues raised as a by-product of pursuing environmental policy through taxation have a social value some 20-50 per cent higher than the nominal tax receipts. The benefit from these revenues will be maximised if they are used to permit reductions in the marginal rates of existing taxes, and will be dissipated if the revenues are returned to taxpayers as a lump sum, or in equivalent ways. A lump-sum return of the revenues would forgo the opportunity to reduce tax rates, and thus avoid the opportunity to save on the distortionary costs of other taxes. However, it may be unavoidable in some circumstances.

Thus, for example, offsetting the regressive distributional effects of taxes on household energy may require at least some of the revenue to be returned to households in 'lump sum' form. Pearson and Smith (1991) note that this will generally mean that maximising the 'double dividend' gains from environmental taxes requires tax revenues to be used in the opposite way to that required to maintain the original distributional incidence of the fiscal system.

Lump-sum revenue return may also be needed where environmental taxes are levied on the emissions of some subset of polluters only. The Swedish NOx charge, for example, is restricted to large firms only, because the high costs of measurement rule out its application to smaller firms. To avoid distorting the conditions of competition between large and small firms, the NOx tax revenues are returned to the participating firms in 'lump sum' payments unrelated to emissions levels.

A third case where potential fiscal revenues from an environmental policy instrument are dissipated, in such a way as to forgo the economic gains that could be achieved by using the revenues to reduce other taxes, is where a non-revenue-raising instrument is chosen in preference to an equivalent, revenue-raising, instrument. A case in point is the possible use of grandfathered tradable permits as an alternative to energy taxation. Auctioned tradable permits and ecotaxes are closely similar, both in their environmental and revenue effects. By contrast, grandfathered tradable permits forgo the opportunity to raise revenues, and hence forgo the possibility of reductions in fiscal distortionary costs, by granting the permits, uncharged, to existing polluters. The implication of this is that grandfathered tradable permits are a substantially more costly way of achieving a given outcome than ecotaxes set at an equivalent level. They may appear politically attractive as a way

of avoiding tax burdens on industry, but, at the same time, have a higher resource cost, equivalent (if the figures of Ballard *et al.* are used) to some 20-50 per cent of the tax revenues that could be raised.

Achieving reductions in greenhouse-gas emissions through the use of environmental taxes may confer future environmental benefits, but it is highly unlikely to confer fiscal gains in the sense of reducing the excess burden of taxation below current levels. Ecotaxes are likely to involve distortionary costs at least as high as those involved in raising equivalent revenues through existing taxes. If the question is posed whether we would choose to use energy taxes, in preference to existing taxes on labour or other bases, in the absence of any environmental benefits, then the answer is almost certainly that we would not. Energy taxes would be likely to involve just as much distortion of the labour market as income taxes, and at the same time distort the commodity market. Only if there are expected to be environmental gains can the use of environmental taxes be justified, and the case for ecotax reform must be made primarily on the basis of the environmental gains that would result.

The fiscal aspects of ecotax reform are important, since inappropriate use of the revenues, or their unnecessary dissipation, can greatly add to the costs of environmental policy. But an appeal to the fiscal consequences of ecotax reform cannot justify measures that do not pay their way in purely environmental benefits.

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La fiscalité liée à l'environnement en France

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Pour réduire la pollution et les impacts environnementaux liés aux activités économiques et aux modes de consommation, les pouvoirs publics ont traditionnellement recours à des normes réglementaires ; ils négocient aussi directement avec les secteurs économiques dont l'activité est source de pollution ; parfois, ils interviennent sur le marché, soit directement en modifiant le système des prix via l'instauration de taxes ou en recourant aux marchés de permis d'émission, soit indirectement par des mécanismes incitatifs comme des réductions d'impôt en faveur de comportements d'achat plus favorables à l'environnement.

Durant les années 90, l'utilisation de la fiscalité dans les politiques environnementales s'est fortement développée dans la plupart des pays de l'OCDE Cette tendance, amorcée par les pays d'Europe du Nord, complète la batterie d'outils plus classiques (réglementations, subventions, mesures de couverture des coûts) et amorce un mouvement d'intégration de différents outils fondés sur le marché (instruments tarifaires comme les contributions d'amont sur les déchets, marchés de contrats négociables ou permis d'émission, crédits d'impôt...).

Les taxes environnementales visent à modifier le comportement des agents économiques en intégrant le coût des dommages dans le prix du service ou du bien à l'origine de la pollution. En France, les taux de ces taxes ne sont pas nécessai-

rement au niveau qui permettrait cette internalisation. Tout d'abord, la valeur des dommages ne sert pas, en général, à dimensionner la taxe. Par ailleurs, l'acceptabilité des écotaxes pose problème : risques de perte de compétitivité des entreprises et d'impact négatif sur le revenu des ménages. La pratique s'est donc plutôt orientée vers la mise en œuvre simultanée de plusieurs instruments de gestion des nuisances environnementales.

Pour la France, le rapport à la Commission des comptes et de l'économie de l'environnement est une photographie, en 2002, des instruments fiscaux mis en œuvre dans les différents domaines environnementaux. Il fournit un inventaire des taxes environnementales existant en France, avec, pour chacune d'entre elles, une fiche indiquant les références juridiques, les mécanismes (assiettes, redevables, taux, exonérations, niveau de recouvrement...) et les recettes. Il donne également un éclairage théorique sur les taxes environnementales : internalisation des coûts des dommages, impact environnemental, effets sur les agents économiques et efficience de l'outil fiscal. Il dresse le bilan de certaines taxes environnementales au travers d'études spécifiques. Enfin, il donne un aperçu de la situation et des expériences dans d'autres pays développés.

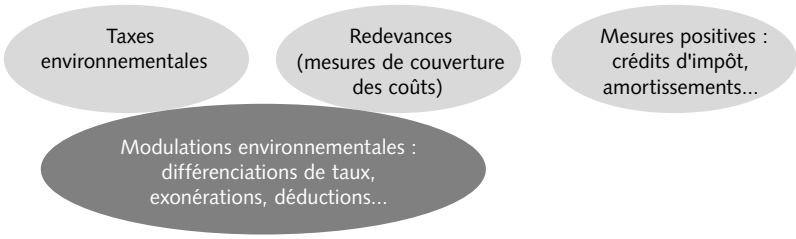
Le champ de la fiscalité liée à l'environnement

Conformément à la définition retenue par l'OCDE et Eurostat, la fiscalité environnementale est définie, sur la base de concepts économiques, comme la fiscalité pesant sur les produits, services et équipements qui ont un effet potentiel ou avéré sur le comportement environnemental des agents. Cette définition comprend notamment les taxes dans les secteurs de l'énergie et des transports. A ce titre, le champ regroupe des mesures fiscales hétérogènes :

- les taxes (prélèvements obligatoires sans contrepartie) dont l'assiette est un produit polluant. Ainsi, les taxes liées à l'environnement comprennent les taxes assises sur des dommages (TGAP [taxe générale sur les activités polluantes] air, assise sur les émissions vers l'air), sur des produits polluants (TGAP phytosanitaires, assise sur les pesticides), sur des équipements potentiellement polluants (carte grise sur les véhicules) et sur l'utilisation de ressources naturelles (TGAP grains minéraux naturels) ;
- les redevances, qui sont des mesures de couverture des coûts pour des services environnementaux rendus aux redevables ;

d'un point de vue économique, les redevances ont un impact sur le prix de certaines ressources naturelles comme l'eau ou un impact sur le comportement des ménages en termes de production de déchets. Dans le cas de l'environnement, les principales redevances concernent les domaines de l'eau et des déchets. La classification retenue entre taxes et redevances est fondée sur des critères économiques ; elle est donc parfois différente de la classification juridique ;

- les mesures dites positives (crédits d'impôt, amortissements accélérés, exonérations...), qui visent à inciter à des comportements exemplaires en matière d'environnement, notamment dans le choix des investissements ;
- les modulations environnementales, qui peuvent prendre la forme d'exonérations, de modulations de taux sur certaines taxes, de déductions... Elles permettent d'orienter les comportements vers des comportements plus environnementaux.



Au total, plus de soixante-dix mesures ont été retenues dans différents secteurs ou domaines : énergie, transports, eau, déchets, pression sur les ressources naturelles, pollution paysagère, prévention des risques et lutte contre le bruit. La plupart des taxes (budgétaires) et les redevances (mesures de couverture des coûts) sont généralement assez anciennes, à l'exception de la redevance d'enlèvement des ordures ménagères (REOM) ; seules les taxes à visée directement écologique sont récentes. Inversement, les mesures positives datent généralement des années 1990, voire 2000.

Les subventions qui accompagnent souvent une mesure négative ne sont pas répertoriées ; certaines, ayant un lien direct avec les comptes économiques de l'environnement, sont brièvement présentées dans le rapport (notamment les subventions de l'Agence de l'environnement et de la maîtrise de l'énergie, Ademe). Les subventions « dommageables pour l'environnement » ne sont pas abordées.

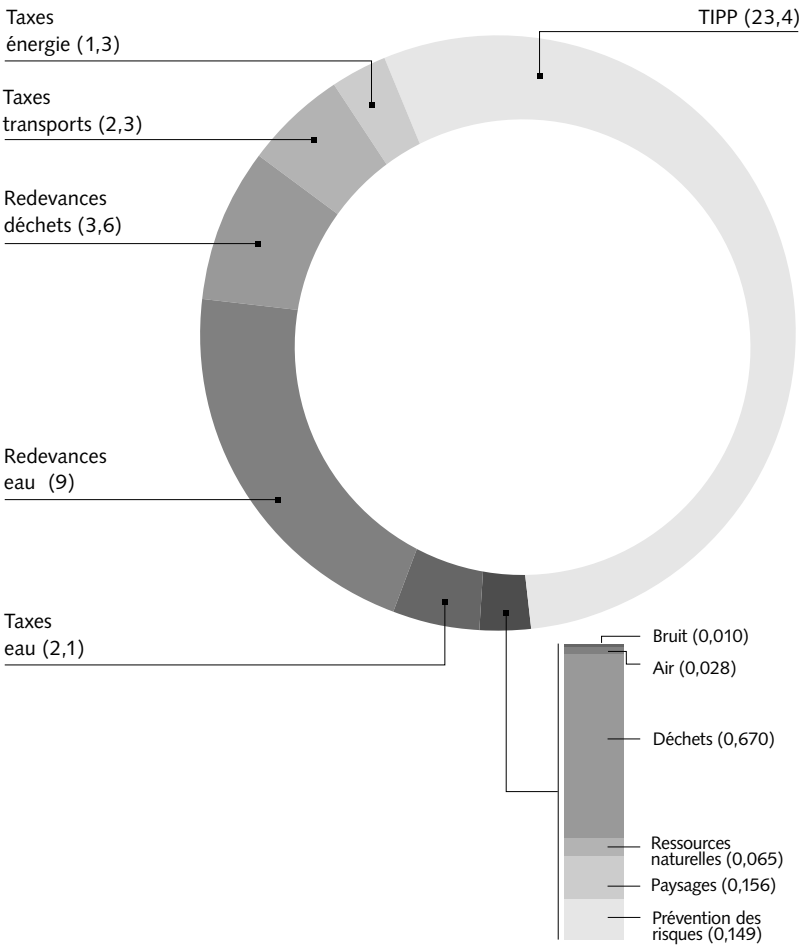
Les recettes de la fiscalité environnementale

Recettes des mesures fiscales négatives pour la France

En 2001, la fiscalité liée à l'environnement représentait 42,8 milliards d'euros, soit un montant de l'ordre de grandeur de la dépense pour la protection de l'environnement (2 % du PIB et 5 % des recettes fiscales totales).

Les redevances pèsent près de 12,8 milliards d'euros, essentiellement les redevances sur l'eau (9 milliards d'euros) et sur les déchets plus quelques autres quasi négligeables. Le montant total des taxes est écrasé par la taxe intérieure sur les produits

Les recettes de la fiscalité environnementale négative en France en 2001 (en milliards d'euros)



pétroliers (TIPP) principalement assise sur les carburants, qui représentait 23,4 milliards d'euros en 2001[1]. Outre la TIPP, et selon un classement qui n'est pas totalement stabilisé (certaines taxes ayant trait à plusieurs domaines environnementaux), les autres mesures énergétiques représentent des recettes de 1,3 milliard d'euros, les autres mesures sur les transports, 2,3 milliards d'euros, et les taxes sur l'eau, 2,1 milliards d'euros.

Pour les autres domaines environnementaux, les mesures comptent pour des montants plus faibles, mesurés en millions d'euros : des taxes sur les déchets (670 millions d'euros) aux taxes sur le bruit (10 millions d'euros). Malgré leur faible impact budgétaire, ces mesures peuvent avoir un effet environnemental incitatif important dans les secteurs concernés.

Ces résultats n'intègrent que les recettes des mesures négatives ; les montants des mesures positives (crédits d'impôt, amortissements, exonérations) sont assez difficilement mobilisables et mal identifiés. Mais leur impact budgétaire est somme toute faible : par exemple, l'exonération de TIPP sur les biocarburants représente un montant élevé (191 millions d'euros) mais finalement faible comparativement à la TIPP (à peine 0,8 % des recettes). Les agrégats par domaine ne sont donc pas remis en cause.

La France et les autres pays

Le poids des accises pétrolières dans les recettes de la fiscalité environnementale n'est pas spécifique à la France : celles-ci représentent une importante source budgétaire dans la plupart des pays d'Europe. Ainsi, la comparaison des agrégats entre les différents pays de l'OCDE reflète l'écart de taxation des produits énergétiques (carburants notamment) plus que le niveau de prise en compte de l'environnement dans la fiscalité. Par ailleurs, ces agrégats ne prennent généralement en compte ni les mesures fiscales positives (crédits d'impôt, amortissements exceptionnels...), ni les différentes modulations environnementales qui recèlent un effet incitatif certain.

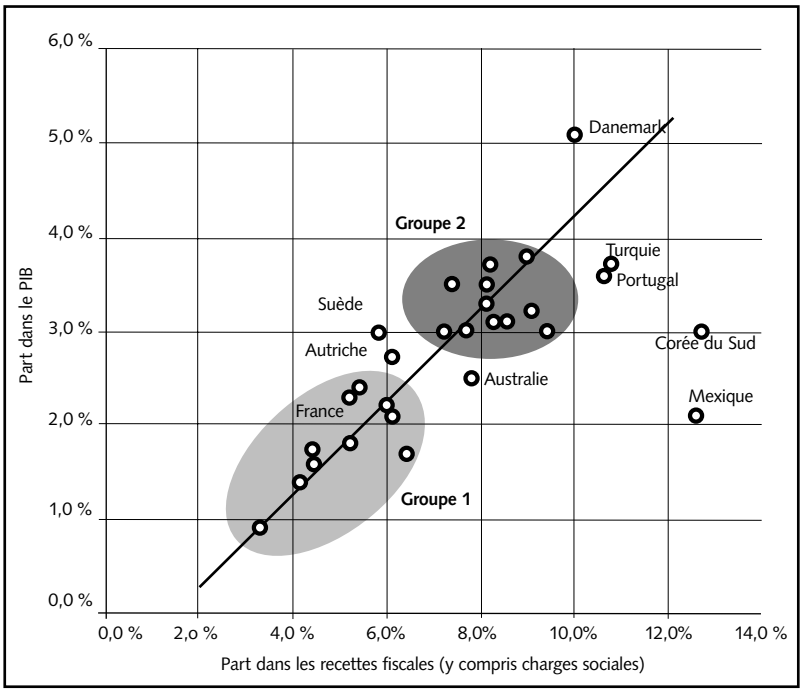
Pour autant, les comparaisons internationales menées par Eurostat entre les pays de l'Union européenne restent intéressantes puisque les fiscalités sur l'énergie sont relativement harmonisées. La part des recettes de la fiscalité environnementale rapportées aux recettes totales varie malgré tout fortement entre les pays : à peine 5 % en Belgique contre plus de 10 % au Danemark ; par rapport à la richesse totale, les taxes environnementales représentent entre 2 % et 5 % du PIB. La France est plutôt en retrait par rapport aux autres pays.

Les mesures fiscales par domaine environnemental

Energie[2], transports et pollution de l'air

La taxation de l'énergie en France est essentiellement fondée sur un système d'accises harmonisé au niveau européen. Ainsi, la taxe intérieure sur les produits pétroliers (TIPP — environ 24 milliards d'euros) et la taxe intérieure sur la consommation de gaz naturel (TICGN — 120 millions d'euros), pèsent sur certains produits énergétiques fossiles. Aussi, depuis le 1er janvier

Poids de la fiscalité environnementale dans les pays de l'OCDE



Source : MEDD, d'après données OCDE, année 1999.

Groupe 1. Fiscalité environnementale faible comparativement aux recettes fiscales totales et au PIB : Japon, Suisse, Allemagne, Espagne, Belgique, Slovaquie, Canada, Pologne, Nouvelle-Zélande, Etats-Unis. La France serait aussi dans ce groupe (les données concernant la France sont issues des travaux pour la CCEE).

Groupe 2. Fiscalité environnementale plutôt élevée, comparativement aux recettes fiscales totales et au PIB : Irlande, Royaume-Uni, Pays-Bas, Islande, Grèce, Hongrie, Italie, Norvège, République tchèque, Finlande, Luxembourg.

2003, la taxe parafiscale finançant l'Institut français du pétrole (près de 200 millions d'euros) a été intégrée dans la TIPP et la TICGN et l'institut reçoit désormais une dotation budgétaire de fonctionnement. Ces deux taxes comptent pour près de 10 % du budget de l'Etat. Les autres taxes sur les transports représentent des recettes budgétaires de 2,3 milliards d'euros.

La TIPP est une taxe sur l'énergie qui touche principalement les transports, puisqu'elle est essentiellement assise sur les carburants automobiles. A ce titre, elle contribue à la fiscalité des transports, qui constitue un instrument d'internalisation des coûts d'infrastructure, de congestion, de pollution locale et d'insécurité. Elle permet notamment d'orienter la demande en carburants : l'avantage fiscal accordé au diesel par un taux de taxation plus faible que celui appliqué à l'essence a poussé à la diésélisation du parc automobile français ; en revanche, les taux moins élevés appliqués aux autres carburants automobiles (gaz naturel, gaz de pétrole liquéfié, biocarburants) n'ont pas permis l'essor du marché des véhicules utilisant ces carburants moins polluants.

Outre la TIPP, seule la taxe sur les autoroutes, due par les concessionnaires d'autoroutes, est directement assise sur le nombre de kilomètres parcourus (6,86 euros au kilomètre). Les autres taxes sur les transports terrestres sont généralement assises sur les véhicules. La taxe à l'essieu s'applique annuellement aux poids lourds de plus de 12 tonnes à des taux dépendant du poids et du nombre d'essieux du véhicule. La taxe sur les cartes grises est une taxe à l'immatriculation de l'ensemble des véhicules, dont les taux sont fixés régionalement et dépendent de la puissance fiscale du véhicule. Elle reste faible comparativement au prix d'achat des véhicules et aux autres pays européens, dans lesquels les taxes à l'achat peuvent doubler le prix d'achat des véhicules neufs. La taxe différentielle sur les véhicules à moteur, taxe annuelle sur les véhicules, a bénéficié quant à elle d'une large exonération en 2001 et ne s'applique plus que de manière résiduelle à certains véhicules de société. Cette situation est unique en Europe où ces taxes sont un outil permettant la différenciation en fonction de performances environnementales : en Allemagne, par exemple, la taxe à l'essieu et la vignette dépendent de la norme EURO atteinte par les véhicules. En France, seules certaines exonérations de taxe sur les cartes grises au profit des véhicules fonctionnant au GPL ou au GNV permettent d'inciter à la diffusion de technologies plus propres. La Commission européenne a récemment plaidé pour le remplacement des taxes à l'achat des véhicules par des taxes annuelles[3].

Enfin, d'autres taxes permettent d'internaliser plus finement les coûts sociaux des transports, comme par exemple la taxe facultative spéciale sur les véhicules empruntant un pont entre le continent et une île (uniquement mise en place pour le pont de l'île de Ré). Certaines mesures sont à visée plus particulièrement environnementale comme les mesures positives en faveur des véhicules propres (amortissement exceptionnel et crédit d'impôt).

Les taxes françaises sur l'énergie, autres que celles sur les carburants s'appliquent aux fiouls lourds et au fioul domestique via la TIPP (ces usages sont taxés à des taux plus faibles que les usages pour carburant des mêmes produits et parfois exonérés dans le cas de certains usages non combustibles). Elles s'appliquent également aux utilisations du gaz naturel (hors carburants) via la TICGN, et ce depuis 1986 (TIPP et TICGN étaient confondues avant 1993). Les autres produits énergétiques (charbon notamment) ne sont pas taxés. Certaines exonérations existent pour ces taxes, qu'elles soient à but social (chauffage en habitation à usage collectif, transports en commun sous certaines conditions) ou à visée environnementale (cas des installations de co-génération).

Parallèlement aux taxes sur les produits énergétiques, la TGAP sur l'air s'applique aux émissions vers l'air des installations classées[4]. Les taux, distincts pour les cinq types de polluant visés, restent faibles : la taxe représente moins d'un millième des charges d'exploitation pour 90 % des redevables. Aussi, son rôle incitatif à la dépollution est peut-être limité.

Dans le domaine de l'électricité, une taxe locale facultative s'applique à la quantité d'électricité consommée. Cette taxe pourrait avoir des effets pervers, puisque les ressources des collectivités qui lui sont liées sont d'autant plus importantes que la consommation électrique est forte.

Enfin, certaines mesures positives (crédits d'impôt, amortissements exceptionnels) visent à inciter à investir dans des matériels de production d'énergie utilisant des énergies renouvelables, ainsi que les gros matériels permettant des économies d'énergie (isolation, chaudières...).

L'eau

Le système de taxes et de redevances sur l'eau est assez élaboré : il existe un grand nombre de mesures hétérogènes, perçues par différents acteurs de la gestion de l'eau. Le système est notamment structuré par la loi de 1964, qui vise une tarification économiquement optimale, d'une part en répercutant la

rareté de la ressource sur les consommateurs, d'autre part en faisant porter sur les utilisateurs le coût des dommages qu'ils infligent.

Certaines sont donc assises sur la consommation d'eau : les redevances d'eau potable et d'assainissement correspondent à un service rendu, soit par les communes, soit par des intervenants privés ; elles représentent à ce titre une partie du prix de l'eau payée par les consommateurs redevables. S'ajoute à ces redevances celle sur la consommation d'eau distribuée dans les communes bénéficiant d'eau potable, affectée au Fonds national de développement des adductions d'eau, qui relève d'une logique de redistribution territoriale entre les communes au profit des services ruraux. Enfin, la redevance sur le prélèvement, traduisant la rareté de la ressource, est due par toute personne qui effectue des prélèvements dans le milieu naturel, à l'exception des eaux de mer ; elle est assise sur le volume de ce prélèvement.

La redevance « pollution » relève d'une logique mixte, entre taxe parafiscale et paiement d'un service ; elle s'est progressivement substituée à des normes d'émission de substances toxiques dans les milieux aquatiques. Pour les usagers domestiques, elle est répercutée sur le prix de l'eau en fonction de coefficients d'agglomération reflétant une pollution théorique par habitant ; pour les industriels, elle est assise sur la pollution mesurée ou estimée. Ce dispositif a été mis en place dans le but de financer les agences de l'eau (établissements publics territoriaux de bassins versants), qui perçoivent ces taxes et les redistribuent aux collectivités locales, aux industriels et aux agriculteurs sous forme d'aides aux travaux de lutte contre la pollution. Toutefois, les études menées montrent qu'elle a un véritable impact écologique, puisque l'élasticité des rejets nets au taux unitaire de ces redevances est de - 0,7 à - 0,8 : non seulement les entreprises limitent leur production de produits toxiques, mais elles investissent dans le traitement d'une partie de ces produits avant de les rejeter dans les milieux. Pour l'heure, il n'existe pas de différenciation des taux selon la sensibilité des milieux vers lesquels est émise la pollution.

Le dispositif fiscal sur l'eau se complète, d'une part par la TGAP sur la mise à la vente de lessives, qui vise à lutter contre l'eutrophisation des rivières et dont les taux varient selon la teneur en phosphates des lessives, d'autre part par les taxes sur l'hydroélectricité (ouvrages hydroélectriques concédés, redevance proportionnelle, redevance piscicole), qui portent atteinte au flux des cours d'eau et en conséquence à la biodiversité. Enfin, des redevances perçues par Voies navigables de France sont versées au titre de l'occupation du domaine public fluvial.

Les déchets

Tout comme dans le domaine de l'eau, la gestion des déchets se caractérise par un système mixte de taxes et de redevances pour service rendu, qui vise à favoriser les filières alternatives en augmentant le coût de la mise en décharge.

La taxe d'enlèvement des ordures ménagères (TEOM) est perçue, depuis 1926, par les communes qui assurent le service public de ramassage des ordures ménagères, parfois en délégant à des sociétés spécialisées. La taxe de balayage, facultative et fonction de la surface du bâtiment bordant la voie publique, relève aussi de cette logique pour service rendu, tout comme la taxe d'équarrissage, assise sur les achats de viande pour la vente au détail et finançant le service public d'équarrissage. La TEOM repose essentiellement sur les ménages puisque les locaux des activités professionnelles productrices de déchets en sont exonérés et font généralement l'objet de la redevance spéciale. Par ailleurs, la TEOM n'incite pas à une moindre production de déchets ou au tri et au recyclage puisqu'elle est assise sur la valeur cadastrale du logement[5].

La redevance d'enlèvement des ordures ménagères (REOM), qui ne peut pas se cumuler avec la TEOM, permet de telles incitations, puisqu'elle peut être calculée en fonction du volume du bac mis à disposition, du poids des déchets... Malgré cet avantage, les études montrent qu'elle n'est que peu choisie par les communes, notamment par les grandes, car elle nécessite un budget annexe équilibré (pas de financement par le budget général), ainsi que la prise en charge du coût et du risque de perception. Par ailleurs, lorsqu'elle est préférée à la TEOM, la REOM est généralement calculée en fonction du nombre de personnes dans le ménage.

Parallèlement, la TGAP sur les déchets ménagers et assimilés et la TGAP sur les déchets industriels spéciaux, taxent, depuis 1992, le poids des déchets respectivement mis en décharge et envoyés vers des centres de stockage. Ces taxes visent à rendre économiquement plus viables les filières alternatives (recyclage, valorisation...).

Enfin, la taxe sur les huiles de base et les préparations lubrifiantes est la seule taxe d'amont sur les produits existant en France, à laquelle il faut néanmoins ajouter les contributions pour le recyclage pesant sur les emballages[6].

Autres domaines liés à l'environnement

Outre les taxes et les redevances sur l'eau, certaines taxes pèsent sur les ressources naturelles et peuvent limiter la pression exercée sur celles-ci : la redevance trimestrielle sur les raffineries

de pétrole (fonction des capacités annuelles de distillation du pétrole), le versement pour dépassement du plafond légal de densité (taxe relative à l'occupation des sols) et la taxe sur les eaux minérales (due par les exploitants des sources). La TGAP sur les granulats instaurée en 1999 est assise sur la quantité de granulats extraits ; elle vise à inciter à produire des matériaux renouvelables plutôt que d'extraire des matières premières.

D'autres taxes ont été classées dans le domaine de la protection des paysages : les redevances pour occupation du domaine public (redevances sur les gazoducs, les oléoducs, les pylônes électriques...) ; les taxes sur les remontées mécaniques et celles sur les emplacements publicitaires fixes ; la taxe départementale sur les espaces naturels sensibles, due aux départements à la délivrance d'un permis de construire, qui finance la préservation de ces espaces naturels ; la taxe spéciale sur les traversées maritimes à destination d'espaces naturels, qui s'applique aux passagers et dont les recettes sont reversées aux organismes assurant la gestion de cet espace naturel ; enfin, depuis 1995, certains impôts (l'ISF notamment) peuvent être acquittés en nature, sur agrément, par le versement de terrains au Conservatoire de l'espace littoral et des rivages lacustres.

La TGAP sur le bruit est une taxe due au décollage des aéronefs, comme il en existe dans la plupart des pays européens. Auparavant destinée à l'Ademe qui en redistribuait les recettes aux riverains des aéroports pour réaliser des travaux d'insonorisation, elle est désormais affectée au budget général de l'Etat.

Enfin, dans le domaine de la prévention des risques, ont été répertoriées les mesures concernant les risques environnementaux et sanitaires. Les premières concernent des installations classées pour la protection de l'environnement : la TGAP sur les installations classées (due à la déclaration et à l'exploitation de ces établissements) et la taxe sur les installations nucléaires de base. Les autres mesures visent à prévenir des risques sanitaires : taxe sur l'utilisation des OGM et possibilité de déduire les dépenses destinées à protéger les locaux des effets de l'amiante.

Conclusion

Le développement d'une fiscalité environnementale peut être considéré comme relativement ancien. D'une part, les fondements théoriques des taxes environnementales ont été jetés par Pigou durant la première moitié du vingtième siècle, à travers la distinction entre coûts privés et coûts sociaux et le concept des

externalités. D'autre part, les polluants constituent, depuis les années 60, l'assiette d'une fiscalité de financement (dans le domaine de l'eau et des espaces naturels notamment).

Pourtant, c'est plus récemment que la fiscalité environnementale s'est débarrassée de son objectif de financement pour s'affirmer comme un outil incitatif, visant à orienter les comportements environnementaux, notamment par la substitution de produits nocifs à l'environnement : taxe sur les CFC aux Etats-Unis dans les années 80, taxation de l'énergie dans les pays du Nord de l'Europe dans les années 90, responsabilisation des producteurs vis-à-vis des déchets dès 1991 en Allemagne...

En France, outre certaines mesures positives touchant les combustibles et les voitures propres, la première taxe environnementale incitative reste la taxe générale sur les activités polluantes (TGAP), mise en œuvre en 1999. Pour autant, la TGAP regroupait initialement cinq taxes parafiscales préexistantes, qui finançaient la politique environnementale. La déconnexion opérée entre ce besoin de financement et une politique incitative montre l'existence de certaines taxes qui peuvent facilement devenir des leviers des politiques environnementales. Le panorama proposé offre, en ce sens, un aperçu du champ du possible pour un plus large verdissement de la fiscalité française.

Notes

Ecotaxes: What have we learned, and how far should we go?

1. On the other hand, once congestion externalities are separately taxed, this may weaken the case for high motor fuel excises and other taxes on motoring. If the remaining motoring externalities did not justify retention of the existing high taxes on motor fuels, the net revenue gain from a congestion tax would be substantially lower.

2. In a one-off, unanticipated, permit allocation, the transfers are lump-sum in the sense that they cannot be influenced by any current decision of the firms. In a repeated, or anticipated, allocation, firms may realise that their current decisions could influence future permit allocations, and grandfathering could be distortionary rather than equivalent to a lump-sum transfer.

La fiscalité liée à l'environnement en France

1. Y compris la taxe parafiscale de l'Institut français du pétrole (taxe IFP), intégrée depuis à la TIPP.

2. Dans ce dossier, la classification dans le domaine de l'énergie ne prend pas en compte l'ensemble des taxes particulières pesant sur ce secteur d'activité. Seules celles correspondant au domaine de la pollution de l'air sont retenues ici, les autres étant généralement classées dans d'autres domaines en fonction des pollutions qu'elles engendrent : la taxe sur les pylônes est classée en pollution paysagère, les taxes sur l'hydroélectricité dans le domaine de l'eau...

3. Communication de la Commission au Conseil et au Parlement européen COM(2002)431 final du 06/09/2002.

4. Cette taxe existait depuis 1985, avant la TGAP, sous la forme d'une taxe parafiscale affectée à l'Ademe.

5. Une taxe sur les terrains de camping vise, pour cette activité particulière, à corriger le biais entre l'assiette et le service rendu.

6. N'étant pas d'ordre fiscal, cette mesure n'a pas été traitée dans cet article.