FISCAL MEASURES IN THE TRANSPORT SECTOR
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1. **Outline of the research paper**

This working document was drawn up by the European Parliament's Directorate-General for Research as part of its 1997 research programme at the request of the Committee on Transport and Tourism. Although the European Parliament has already made its position known on the Commission's Green Paper entitled "Towards fair and efficient pricing in transport", taxation in this crucial sector of the economy will continue to be a key issue in the debate on state policies geared to or having an impact upon that sector. This issue is of particular importance as regards environmental protection and the financing of infrastructures at a time when state financial resources are limited and also as regards the delicate problem of competition without distortion between the various modes of transport, which must be achieved without jeopardizing the external competitiveness of the European economic system.

The aim of this working document is to fill a gap in the publications of the Directorate-General for Research by looking at such issues as sustained economic growth and the European Union's approach to this particular problem. With this in mind, the general part of the working document in particular is designed to update and expand on the previous document entitled 'Economic and fiscal incentives as a means of achieving environmental policy objectives'.

2. **Taxation as an instrument of sustainable development**

It is first of all necessary to clarify what the notion of sustainable development actually means. It arose initially from a desire to combine environmental protection with economic growth, and has now come to indicate the compatibility of growth with a whole series of requirements for restoring balance in various areas which, in United Nations documents, also include poverty. This concept has probably taken on the meaning in many people's minds of quality of life, an all-embracing and therefore ill-defined notion covering vastly differing aspirations depending on who is using the term.

Sustainable development is pursued by means of various economic measures aimed at making those who carry out a given activity or who are in a given situation bear the costs incurred by the community as a result of that activity or situation: this is the polluter pays principle, which, from being initially targeted at environmental costs, has now been extended to include other costs and given rise to the principle of the internalization of external costs which, if generally applied, would radically alter the relationship between the private domain (user and taxpayer) and the state.

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You can find the references at the end of the text. Note: The references (COM(95) 691 and PE 167.027) are not part of the main content and should be disregarded for the purpose of reading this text.
The principle of *internalization of external costs* tends to use the laws of the market to achieve the desired behaviour patterns. In the environmental sphere, for example, if the cost of a polluting fuel equals or exceeds that of other less polluting fuels as a result of the environmental taxes levied on it, then it is assumed that the rational user will modify his consumption in the desired way.

The objection to this argument is that the increase in costs has far more of an adverse than a corrective effect and, in order to forestall this likely objection, the theory of a sustainable economy highlights the principle of the *fiscal neutrality* of environmental taxes, this principle entailing two very different correctives: one consisting of a downward revision of the mechanisms for calculating other taxes in such a way as to ensure that overall revenue, *i.e.* the *tax burden*, remains unchanged, and the other consisting of incentives for those who adopt ecologically neutral behaviour patterns. Using the first corrective, the principle of neutrality entails a decrease in taxation in other public policy areas, orients consumption and investment if the downwardly revised taxes are imposed indirectly or alters the actual redistributive function of taxation if the compensation involves direct taxes. Using the second corrective, the redistributive function of the tax system is directed to a greater extent towards environmental concerns which are different from the purely economic concerns which normally guide it.

One can see, therefore, that there is a link between sustainable development and a review of the general structure of the tax system, which is currently the subject of discussion and debate within certain Member States, and the question of tax harmonization at Community level.

3. Taxation and transport

In the transport sector, the term *sustainable mobility* is preferred to that of *sustainable development*. This is a concept which has taken on a precise meaning making it the equivalent in this sector to *quality of life*. **Sustainable mobility** implies rational and efficient transport which minimizes risks (the ever-present problem of safety), inconvenience, time and energy consumption. There are those who believe that, in order to achieve this rational and optimal situation, it is necessary to overcome the economic advantages which *certain* modes of transport, essentially road transport, *undeservedly* (in the eyes of some) have over the others and which enable them to charge lower prices. As these very same favoured modes of transport are also the ones which have the greatest impact on the environment, supporters of the sustainable economy theory propose that these undeserved advantages should be offset by means of taxation.

Environmental issues, or rather sustainable mobility, in the transport sector therefore overlap with the issue of intermodal competition. In particular, infrastructure costs would appear to favour the use of road transport over other modes, especially rail transport, as these costs are not passed onto road users\(^3\). There are historical reasons why road infrastructures are free of charge, albeit with the exception of motorways, and they are a corollary to the right to freedom of movement enshrined in

\(^3\) This is a simplified version of the argument for the purposes of this working document. Users’ preference for road transport is determined by other causes which are not a distortion of competition, such as the greater flexibility offered by road transport and the wider coverage of the road network compared with the rail network, and also by certain rigidities in the management of the rail companies which are the result of the monopoly system under which they have operated for many decades.
the French Revolution. Even today, this right forms a constitutional obstacle in some countries to any attempt to pass on the costs of road infrastructure.

However, nowadays the purpose of charging such costs is not only to internalize external costs but also to ensure a remunerative return on private capital, whose contribution to the construction and management of infrastructures has become crucial owing to the lack of financial resources which is a problem currently affecting the industrialized countries. Naturally, remuneration is not a fiscal issue and, for the purposes of this working document, is not considered as such: the distinction between the remunerative nature and the fiscal nature of charges arises mainly over the issue of tolls. Of course, it has not always been possible to separate the dual nature of tolls, particularly in the section on *electronic fee collection (EFC)* technology, which is the same irrespective of the destination of the revenue or how it is obtained.

However, the remunerative purpose of charging costs is a factor even when private capital is not involved, as public investment in the construction of the infrastructure tends to be taken into account when determining its external costs.

With these issues in mind, this working document has devoted the first two chapters to an illustration of the general principles of the theory underlying the fiscal regulations pertaining to transport and the European Union's approach, with particular reference to the actual tax systems involved. The other three chapters are devoted to taxes on *vehicles*, or rather taxes on the movement of vehicles since purchase taxes do not fall within the category of transport (although they do fall within the category of environmental issues), *motor fuel*, which is clearly an object of taxation on environmental grounds, and the *use of infrastructure*.

Despite the author's intentions, this working document focuses almost exclusively on road transport, which is the target - or victim, depending on your point of view - of fiscal policy relating to transport.

### 4. Hypotheses

The main purpose of this document is to give an outline of the situation. A number of proposals are put forward in relation to individual issues where the relevant subject is discussed. A study hypothesis, for example, could attempt to provide an answer to the following question: *can the internalization of external costs be best achieved by taxing vehicles, motor fuel or the use of infrastructure?*

Various issues are involved here. First of all, it can be said that, if the environment is the chief concern, then the main burden of taxation on transport must be directed at motor fuels. In that case, however, the less well-off members of society will suffer indiscriminately. If external costs are to be properly borne by actual users, the system of tolls should be extended, but this would require technologies that are not yet available although they are at an advanced stage of development.
Another general hypothesis lies partly outside the area covered by this document, but is particularly topical now that tax harmonization is on the agenda in the political debate on the completion of the internal market and on how taxation can be used as an instrument to combat unemployment. This hypothesis can be summed up in the question: can the harmonization of taxes on transport play a significant role in providing an alternative revenue to that derived from other taxes, in particular taxes on labour?

This touches on highly sensitive issues in the Member States' fiscal policies as, if the answer is yes, it would involve a radical change in the very bases on which national tax policies have been built for decades, i.e. the priority given to obtaining public financial resources between the various sectors targeted by those policies, to taxing income and to the redistributive function of the tax system.

As has already been pointed out, and will be discussed in more detail later on in this document, the theory of the sustainable economy views the kind of taxes it advocates as a way of guiding behaviour by means of the market, which implies a link between the tax burden of such taxes and tax incentives or tax cuts. If such taxes are seen as fulfilling the traditional financial function of the tax system, this robs them of some of their effectiveness.
CHAPTER I
THEORETICAL BASES AND FUNDAMENTAL PRINCIPLES

1. Transport as an object of taxation

Taxation through taxes on transport, for example circulation taxes on vehicle mobility or the use of certain infrastructures (tolls)\(^4\) or excise duties on motor fuels, has traditionally responded to the fundamental aim of each taxation system, namely, to obtain the financial resources needed for the functioning of the apparatus of the state.

The taxes referred to here have been characterized by their simplicity and the immediacy with which they are levied. Their economic impact has consisted in increasing the taxpayer's costs, shifting traffic flows to other routes (in the case of tolls) and increasing the end price, in the case of commercial transport, thereby influencing the choices of the end user.

These effects, which were not originally intended and are not generally desired, have taken on a specific function other than a merely fiscal function now that environmental protection and a more rational use of resources have become public policy objectives. This change in the purpose of taxation on transport should be enshrined in economic theory.

2. Environmental policy as an economic lever\(^5\)

The economic approach to environmental policy is based on the premise that the environment is an asset and that the planet’s resources must therefore be conserved as long as possible by creating a sustainable economy in which development is compatible with the environment.

This objective is pursued by making those who use the resources bear all the costs pertaining thereto as well as the costs of rehabilitating the environment when it suffers damage through the use of the product and that product’s destruction at the end of its life-cycle. The term environmental damage is taken to mean all these costs. Operators in an economic system which passes the cost of environmental damage onto the undertaking concerned will therefore have to improve the ratio of their own costs to the quality of the environment and will therefore ensure that the desire for profits

\(^{(*)}\) Here we are referring to tolls which are a type of tax rather than those intended to provide a return on investment in a given infrastructure. Tolls which are a type of tax are one of the oldest forms of taxation on transport and became less widespread after the principle of freedom of movement was enshrined by the French Revolution. More recently there has been a return to the use of tolls as an instrument for reducing traffic in certain areas where it is not wanted.

is in harmony with protection of the environment. The term internalization of external costs is now used to denote this process.

Under this system, the theory of a sustainable economy involves including in the economic analysis the obligations imposed by environmental policy, which means trying to overcome the objective difficulties of quantifying environmental damage and ensuring that the costs are correctly passed on to the polluter.

The theory set out below consists in including in the market economy model suitable economic incentive and fiscal disincentive instruments which have an impact on prices and hence on trade, thereby ensuring that the environment acts as a real economic lever. The aim is to make economic development compatible with this.

Internalization of the external costs of safeguarding the environment should spark off a process of permanent innovation which mobilizes the same degree of energy as that to be found in the inherent dynamics of private initiative. In other words, the economic lever wielded by the environment would have the effect of boosting technological innovation and hence the competitiveness of undertakings.

The theory of the sustainable economy is therefore a market-oriented one which sees the market as an instrument for safeguarding the environment. It accordingly rejects state intervention and adheres firmly to the principles of free trade. It is therefore critical of all those derogations to environmental rules which are aimed at protecting specific crisis-hit or disadvantaged production sectors, regions or types of undertaking, on the grounds that rebuilding an economic system so that it is based on technological and economic innovation is incompatible with the preservation of old, assisted structures.

Lastly, it is seen as an alternative to the traditional economic approach to environmental policy geared towards minimizing the link between the objectives of that policy and the related costs. There are certain drawbacks to that approach, in that the tendency to minimize costs has limited the range of instruments tested to those which are market-compatible, whereas in reality the costs of those instruments are no lower than those of the more traditional instruments, and this has adverse repercussions in terms of practicability and the amount of bureaucracy.

3. Basic problems

The sustainable economy theory raises a number of basic problems, such as macroeconomic effects, social compatibility and exposure to environmental "dumping".

The first of these concerns the costs of environmental policy which could divert resources away from the structural adjustment of the economy. In actual fact this is a conundrum facing any public policy which changes the framework of private economic activity. Sustainable economy theorists have overcome these problems, in theory, by adopting a notion of productive activity

(6) See section 4 of this chapter for an illustration of this concept.
Fiscal measures in the transport sector

which is different from the traditional concept and encompasses not only that which creates income but also that which creates utility.

However, this is an answer which, although satisfactory at a scientific level, does not resolve the doubts about social compatibility, i.e. does improved quality of the environment not lead to a greater disparity in the redistribution of purchasing power or income? Here a distinction must be made between the costs of adjustment and the effect of the global costs, including those inherent in a less efficient use of the factors of production, on the various income bands. Adjusting the economic system to take account of environmental concerns is less costly if it is achieved by means of economic instruments rather than control instruments and, furthermore, environmental taxes yield revenue which can be redistributed - at least that proportion which exceeds the cost of adjustment. Lastly, if it is accepted that the environment constitutes an asset, in line with the notion of productive activity outlined earlier, then improved quality of the environment is an added bonus for the less well-off - a positive aspect to be borne in mind when assessing the social compatibility of environmental policy.

The third problem area, environmental “dumping” raises fears that the application of sustainable economy mechanisms in just one area, for example one country or the European Union alone, will mean that undertakings operating in that area will be penalized compared to those outside as regards competitiveness either within that area (vis-a-vis imported goods) or on international markets. This is a serious issue but it is not confined to the question of a sustainable economy; it also affects any philosophy underlying environmental policy or any other public policy, starting with labour and social policy, which aims to maintain or improve given levels of family income and working conditions. Compared with other instruments, the sustainable economy has the advantage of generating public resources which can be used for investment and public consumption or for redistributing income in a way that boosts domestic demand and results in a more intense use of plant and equipment, thereby improving productivity and hence competitiveness.

4. External effects and how to internalize them

Before proceeding further it would be useful to provide a sufficiently detailed illustration of the notions of "external effects" and "internalization", on which the solutions proposed by the sustainable economy are based.

The first external effects which come to mind are marshallian external economies and diseconomies. The economist Alfred Marshall gave the example of a fishing area in which an extra fisherman comes to work. His choice is a rational one, but the fact that he is now fishing there will mean that there are fewer fishery resources in that area, to the detriment of those fishermen already working there. In other words, his presence leads to a discrepancy between the private marginal costs and the social marginal costs, and this difference prevents the economy from operating to optimum effect. In order for the balance to be restored, it is necessary for charges to be levied on

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(1) Sustainable economy theorists have therefore rediscovered the economic thinking of Fernando Galliani as opposed to the traditional economic thinking of Adam Smith. On this specific point, see Economic and fiscal incentives. .....p. 24.

(2) This section is based largely on A. BONNAFOUS, Coûts environnementaux de transports routiers et tarification d'usage des infrastructures ("Transports" 1994 (No.368), pp. 406-417).
the use of a rare resource, by ensuring that the cost of an externality is passed on directly to whoever causes it.

The second category of external effects are those which affect collective assets, i.e. those assets which, although entailing a production cost, are used free of charge, such as roads. The body which manages such assets bears the cost of their wear and tear.

The third category consists of interindividual external effects, i.e. the disadvantages suffered by private individuals as a result of the actions of others, for example, disturbance from noise or traffic congestion, which impinge on personal satisfaction, an immaterial asset that is difficult to put a value on in economic terms.

Lastly, there are external effects on the environment, a category that is self-explanatory.

Those who bear the cost of these categories of external effects can be divided into five groups: individual consumers or the undertaking responsible for production, i.e. those who are actually responsible for the external effect which is therefore immediately internalized, the market which suffers from the distortions of competition caused by the externality, the public authorities which will bear the costs of maintaining the infrastructures and, in a more general sense, the cost of the measures needed to offset the externalized inconveniences, private individuals who will suffer inconvenience and, lastly, the biosphere which will suffer the environmental damage.

Internalization, in its most radical form as postulated by the sustainable economy theory, consists in passing the costs of all the external effects onto the first group of payers, i.e. those responsible for the effect. However, how is internalization to work? First of all, the external effect must be noticeable, in other words, whoever internalizes its cost must be aware of it and pay a charge that is higher than the benefits he gains from the positive external costs. For example, the cost of getting rid of the noise from a main road must be higher than the advantages resulting from the ease of getting from one place to the next. However, the balance between positive and negative externalities will be different depending on the group to which one belongs. For example, a private individual who suffers from the inconveniences resulting from a main road may welcome the fact that the infrastructure has increased the value of his property, but this will not be a positive externality for the public authorities.

Once the (negative) external effect is noticeable, the cost of eliminating it can be passed onto three different groups: whoever is responsible for it, the public authorities or the private individual. Bonnafous talks of radical internalization (the process of charging to whoever is responsible), public internalization" (charging to the public authorities) and pecuniary internalization (charging to the private individual).

Radical internalization is the goal to which the sustainable economy theory aspires, but there are considerable difficulties involved in quantifying external cost in terms of ‘value added’", and there are substantial drawbacks to each of the methods illustrated in the following section.
5. Evaluation of externalities

Determining the value of external costs is a crucial problem for the sustainable economy theory. This is dealt with in sufficient detail in the Commission's Green Paper of 20 December 1995 entitled "Towards fair and efficient pricing in transport" with particular reference to the transport sector which concerns this working document. We shall return at a later stage to the political substance of the Commission paper.

The starting-point is the definition of transport externalities as a situation in which a transport user either does not pay for the full costs (e.g. including the environmental, congestion or accident costs) of his/her transport activity or does not receive the full benefits from it. These external costs consist of the costs relating to the construction and operation of infrastructures for the use of which no charge is made, environmental costs and those resulting from congestion.

One criticism which is rightly levelled at this definition is that it takes no account of the positive externalities, i.e. the benefits which a transport activity can bring to the community without the latter having to bear the costs thereof, such as the contribution to regional economic development resulting from the transport of goods to and from isolated areas which are not served by any other mode of transport. The Green Paper answers this criticism as follows: "The bulk of the available scientific evidence suggests that, in modern industrialized economies, increases in transport efficiency are generally reflected in decreased transport costs: these effects are internal to the market mechanism and not external. Some studies claiming external benefits of transport seem to refer uniquely to private benefits."

However, this argument seems to overlook the advantage derived from the territorial integration of isolated regions, which does not appear to benefit individual economic operators only. The essentially free market approach of the sustainable economy results in a certain distrust of any attempts to provide assistance for regional development which may distort competition but this approach, which is reflected in the extract from the Green Paper quoted above, leads to a potential conflict with the aim of economic and social cohesion enshrined in the Treaty. It is highly likely that taking account of positive externalities would make fiscal policy in the sphere of transport more consistent with the overall aim of Community integration.

Once they have been defined, externalities must be quantified in monetary terms either by inferring their value from observed market transactions (e.g. expenditure on damage avoidance, health costs, property value loss, etc.) or by asking people how much they would be willing to pay for the reduction of a specific negative transport externality by a certain amount. However, this concept leaves open the question of the method of calculation, for which there are various possibilities, each of which leads to substantially different results. The difficulty of choosing the method lies in the lack of market transactions involving specific assets such as clean air, and hence the lack of an immediately obvious price.

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(12) COM(95) 691, also published in Supplement No. 2/96 of the EU Bulletin.
(13) Ibid. p. 5.
(14) Ibid. p. 8.
(15) See section 2 of this chapter.
(16) COM(95) 691, p. 7.
The first method is the *damage function/dose response approach* which consists in assessing, on the basis of scientific knowledge, the observable impact of a given negative externality, for example, the increase in disease resulting from the pollution of areas surrounding a main road. A value equivalent to healthcare costs is put on these diseases, absences from work, etc., and is taken to be the value of the externality. The criticism levelled at this method is that it only looks at visible costs on the basis of the health service’s accounts and those of the other public departments involved, or on the basis of the market, and does not take account of the social costs.

The second method is the *avoidance costs approach*, which confers on transport externalities a value equivalent to the costs of measures to reduce such externalities. This method is easily applied since the costs of the corrective measures are known, but it has the disadvantage of being based on the premise that such measures are adequate - if they are not, this means that the externality will be under-valued or alternatively, if the cost of such measures is excessive, through poor management, then the externality will be over-valued.

The third method consists of a *hedonic pricing approach* which calculates the value of the externality as the difference between the market price of an asset not exposed to such an externality and that of an asset that is so exposed. A typical example is the price difference between a property situated far away from a noisy main road and another propery with identical characteristics close to the road. The drawback to this method is that the price difference is made to depend purely on the known externalities and that it is objectively difficult to have a genuinely comparable reference asset. This appears to be a somewhat approximative method.

The fourth method, favoured by the Green Paper, is the *contingent valuation/stated preferences approach* which consists of surveys, conducted by means of interviews or questionnaires, of those exposed to an externality in order to ascertain how much they would be willing to pay (WTP) in order not to be exposed to that externality any longer or how much they would be willing to accept (WTA) by way of compensation for it. The WTP survey appears better suited to cases where people are already exposed to an externality, while the WTA method is more suited to potential cases of exposure (for example, where there are plans to build certain infrastructure). One criticism that may be made of this method is that the responses can be highly subjective depending on the income of the interviewee in the case of WTP surveys and a degree of aspiration to material wealth in the case of WTA surveys.17

6. **The range of environmental policy instruments available**

The propositions underlying the sustainable economy theory allow for a coherent evaluation of the environmental policy instruments available to the public authorities.

**Administrative regulations** can be deemed to have a negative impact in that they are inefficient and excessively costly. In particular, their aim is not to improve the environment but to contain the damage caused to it by means of legal limits on the exploitation of environmental factors or on the emission of toxic substances. However, such limits are often a compromise between the

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17. The methods set out here are those contained in Annex I of the Green Paper.
environmental requirements laid down by the authorities and the economic requirements of producers. Administrative regulations entail a number of risks: the limits may not be appropriate to ensure genuine protection of the environment, there may be insufficient controls and, lastly, the total emissions from an excessive number of plants may exceed the ecosystem's absorption capacity, even though the individual plants comply with the standards laid down. The most negative aspect, however, is the fact that administrative regulations cannot provide a stimulus for technological research into the product or the production process as a whole, but will merely stimulate research into the final phase of such production, i.e. the purifying of toxic emissions.

The sustainable economy theory classifies environmental policy instruments into three categories:

- dynamic instruments,
- instruments which are static in their effect,
- instruments which have an effect on widespread behaviour patterns.

**Dynamic instruments** are those which are most directly linked to the sustainable economy in that their aim is to increase the cost of consumption of resources or the cost of emissions. The following instruments come into this category:

- **taxes**, which should, however, be redistributed among taxpayers in another form so that environmental taxes are an instrument of income policy which penalizes those who have an effect on the quality of the environment. In other words, the revenue from such taxes could be used to finance a social policy in favour of consumers, in order to offset the effects which the tax has on end prices, or other measures in favour of undertakings;

- **tradeable emission rights**, i.e. an emission authorization which the holder can transfer to others. These are mechanisms which do not, however, allow the public authorities to receive revenue from the transactions and hence to redistribute economic resources, as is the case with taxes. Moreover, this instrument may lead to cumbersome bureaucratic procedures for monitoring the transfer of resources;

- **levies**, which should be in strict proportion to the environmental damage caused and hence allow for a greater margin of manoeuvre, compared with taxes, in influencing environmental behaviour on a large scale.

**A fundamental point of the sustainable economy**, often forgotten by the very proponents of that theory, is the fiscal neutrality of such instruments - in other words, they must not add to the total burden of taxation under a system imposing taxes by two different means.

The first of these consists in reducing income taxes, taxes on wealth and indirect taxes which take no account of the environmental impact. This means, of course, that the distribution of the tax burden is altered - some production sectors would be penalized compared with others, while, as regards factors of production, there should be an easing of the tax burden on labour and an increase in that on capital (including the environmental charges borne by companies).

In addition to these instruments there are others which are a variation thereof, such as **no claims bonus** systems, which consist largely of levies, the revenue from which is turned into incentives for those companies which lead the way in environmental protection, **financial compensation** and
Instruments which are static in their effect are those which tend to apply familiar technical and economic solutions, including administrative regulations, related incentives and disincentives, taxes earmarked for purification and disposal plants and provisions under the law on liability.

Lastly, instruments which have an effect on widespread behaviour patterns are aimed at making the general public and business operators aware of environmental issues and the various solutions available. Such instruments are well known, i.e. information campaigns, technology demonstrations, the dissemination of data and labelling of products.

7. From theory to practice: the general approach of the economic lever

The first signs of an economic approach to environmental issues became apparent in the early 1980s, and by the end of that decade a total of 150 economic instruments of environmental policy was being used in 14 industrialized countries, 80 of which were of a fiscal nature**, mainly taxes on products, especially energy products. These instruments subsequently became more widespread and now the economic lever involves a whole array of instruments of either a fiscal or parafiscal nature ranging from deposits on packaging to mechanisms for incorporating the demolition cost of equipment and motor vehicles into the sale price, or negotiable rights, which are not yet very widespread apart from in the United States.

Barde and Vos*** have made a general study of the use of the economic lever in environmental policy and identified six main features.

Firstly, economic instruments are always implemented together with legislative measures, thereby giving rise to mixed systems - regulations define the desired or prohibited types of behaviour with a view to achieving a given environmental objective, and the related tax or other levy provides an incentive to comply with the regulations and a means of financing direct measures by the public authorities. Such mixed systems are not a pure application of the sustainable economy theory, which criticizes legislative requirements, but they are effective in that they make up for the relatively small amount of money usually generated by economic instruments owing to the widespread fear that higher "green" taxes will slow down economic growth.

Another aspect of the use of the economic lever is the prospect of raising financial resources which environmental taxes afford to governments. Taxpayers, incidentally, are generally more willing to accept such taxes when the revenue therefrom is earmarked for environmental protection, even though earmarking such income for a particular purpose is not in line with the principle of the general purpose nature of state budgets, which is usually deemed to be fundamental to the national accounting systems of the industrialized countries. Wider use of environmental taxes raises the

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(19) Environnement: du baton à la carotte, op. cit.
question, which has not yet been satisfactorily solved, of incorporating such taxes into the tax system. On the one hand this means ensuring that general taxation does not have adverse effects on the environment, while on the other hand it means ensuring that the increase in revenue earmarked for environmental purposes does not detract from the flexibility of national budgets, by undermining the "general purpose" principle.

The economic lever is needed as an environmental protection strategy at international level. It is enshrined in multilateral international agreements and in UN and OECD documents with differing degrees of legal validity, and is included in the Community's legislative programmes. As the application of this economic lever affects competitiveness at international level, it is likely in the medium and long term that international regulations will be drawn up on the distortive effects on competition of its opposite, environmental dumping. This prospect is strengthened by an awareness on the part of the international community of environmental issues, given that, under GATT rules, taxation of imports is permitted when it applies equally to national products, and given also that the economic lever is also starting to be used outside the industrialized countries. However, for the time being this is mainly limited to the countries of Central and Eastern Europe, which are probably coming under pressure from the European Union, while there are fewer examples at the present time of 'green' taxation in the Asian countries.

8. Transport and the sustainable economy

The obvious negative externalities of transport are well known**, as is the strong competition which rail transport, which is more environment-friendly, faces from road transport and in which the former loses out to the latter. This situation results in increased fuel consumption and hence increased emissions of carbon dioxide and nitrogen, increased consumption of tyres and oils, thereby engendering waste and having adverse effects on water sources and biotopes in general, and noise pollution.

The reason for this preference for road transport lies in the fact that not only does it offer greater flexibility but it also makes use of many externalities. In its document21, the Institut für Europäische Umweltpolitik considers that what is needed is a strategy involving a change of emphasis in favour of the more environmentally compatible rail network and shipping and the avoidance of (road)traffic.

The transfer of traffic towards rail carriage has been repeatedly advocated by the European Parliament and other Community and national political bodies, but the results have fallen short of the original aims. Achieving a reduction in transport is a target which is hardly feasible unless the European economy undergoes a recession, which no one wants. Implementing certain dynamic measures in respect of mineral oils and motor vehicles, would appear to be a more feasible option.

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(20) The table annexed to this chapter shows the main adverse effects engendered by each mode of transport, and is taken from Environmental externalities and transport policies by K. Button in the "Oxford Review of Economic Policy", 1990 (No. 2), p. 63.

(21) PE (DG IV) Economic and fiscal incentives.... op. cit. p. 42.
Fiscal measures in the transport sector

Firstly, the Institut proposes that taxes on mineral oils and motor vehicles be harmonized in line with the highest rates currently applicable in the Member States. Such harmonization should allow for an annual increase in rates over a longer period and should be in line with an overall environmental policy, backed by increased investment in rail transport and urban transport systems, which should attract the private sector. Bearing in mind that the supporters of this proposal link it to criticism of catalytic converters, which are a typical end of pipe administrative regulatory solution, it can be seen that the application of the sustainable economy model to transport is perfectly consistent with the theoretical bases examined earlier.

A basic premise of the sustainable approach to transport consists in re-evaluating, in the light of various recent studies, the degree of substitution elasticity (between the different modes of transport) of demand related to motor fuel prices and tolls, while the evidence relating to reductions in public transport fares continues to suggest a low elasticity. In other words, increasing tolls and fuel prices is far more effective in shifting transport away from car use towards other modes than cutting public transport fares, which is tantamount to saying that increased taxes are more effective than incentives.

Naturally, fiscal measures must not be indiscriminate but must differentiate the costs of different modes of transport or, within a given mode, the costs of vehicles and motor fuels. Moreover, the various fiscal measures available will have different effects on the different externalities — for example, fuel price increases will be more effective in reducing atmospheric pollution than in curbing congestion, whereas tolls are a more efficient way of acting on congestion.

9. The European Union and the sustainable transport economy

The introduction of the sustainable economy approach into the common transport policy has been a gradual one, and it is interesting to look at the various stages of this process. The first such stage can be said to date back to 2 December 1992, when the Commission adopted the White Paper on the future development of the Common Transport Policy. That document marked the transition from a sectoral approach to the policies governing the various modes of transport to an integrated approach based on the concept of sustainable mobility. Although this concept can be traced back to that of the sustainable economy theory in both historical and conceptual terms, there are substantial differences between the two.

While the sustainable economy theory is basically concerned with conserving resources, and therefore sees the greater competition resulting from the internalization of costs as a secondary benefit, sustainable mobility is aimed at achieving an overall improvement in transport from the point of view of the market, efficiency and the environment.

This is reflected in the subsequent Commission communication of 12 July 1995 entitled "The common transport policy action programme 1995-2000" which focuses on three fundamental areas: improving quality by developing integrated systems based on new technologies which also (22) See Annex 1 of the Commission’s Green Paper: Towards fair and efficient pricing in transport (COM (95) 691, which gives specific quantified examples.
(23) COM (92) 494 final.
(24) COM (95) 302 final.
contribute to environmental protection and safety objectives, improving the functioning of the single market, which consists mainly in promoting intermodal competition while safeguarding social standards, and broadening the international dimension by improving transport links with third countries and fostering the access of EU operators to external transport markets.

The European Parliament supported this approach to the common transport policy, particularly in its resolution of 18 January 1994 on the future development of the common transport policy, which laid particular emphasis on the question of the environment, which is linked to the internalization of external costs.

The EP resolution lists improving quality, improving the functioning of the internal market and environmental protection as objectives which should form an integral part of sustainable mobility. The first two objectives are closely linked to the third, since those modes of transport which pass a proportion of their costs onto the community, and thus benefit from market distortions, are also those which are most polluting. This points to the fundamental role which sustainable mobility can play in achieving the general aims of the sustainable economy, despite the differences in their general aims as illustrated earlier.

These differences in the underlying theoretical principles also mean that there are two other differences between the sustainable economy and sustainable mobility, in respect of the instruments used: sustainable mobility requires more specific, comprehensive action by the state, not only fiscal measures and actions to disseminate suitable technical know-how but also direct intervention in the form of building infrastructures and operating systems which enable transport to be interoperable and intermodal, thereby improving its quality and efficiency and hence improving the environmental impact of the transport sector.

The second difference in terms of instruments concerns the approach to fiscal instruments. After operating systems, Community legislators have turned their attention to taxation in the transport sector which has been viewed, initially at least, in economic rather than environmental terms. Taxation, or rather charging, of transport is used as means of overcoming the distortions in intermodal competition and ensuring the financial return on infrastructures which is needed in order to attract private investment for infrastructure projects and solve the problem of finding the vasts sums of money needed to carry out Community programmes for developing and modernizing infrastructure. In actual fact this purely financial objective, which finds its most concrete form in the application of tolls, is more commercial than fiscal in nature (which is why it is preferable to use the term charging) but nevertheless results in the internalization of a cost and therefore has the same economic effects as a fiscal measure.

It is easier to draw up plans to use taxation as a means of regulating the transport sector than it is to put them into practice, owing to the reluctance of some Member States to introduce restrictions on the right to mobility enshrined in their constitutions (for example, by imposing tolls) or to trigger off higher inflation, through increased transport costs, at a time when inflation is one of the parameters used in deciding on monetary union. Such reluctance on the part of governments is backed up by pressures from professional associations in the road transport sphere, which do not talk merely of the problem of increased costs but also emphasize the potential offered in terms of efficiency and environmental protection by suitable Community measures in the field of road haulage, such as technological research programmes.
10. Fundamental principles and instruments of the common fiscal policy in the field of transport

The formulation of a fiscal policy in the transport sector is set out in the Commission’s Green Paper of 20 December 1995 entitled Towards fair and efficient pricing in transport, which contains an analysis of externalities and includes taxation among the instruments available for use by the state in the transport sector. In line with the specific characteristics of sustainable mobility described in the previous section, the Green Paper includes fiscal measures among the Community’s traditional regulatory approach or, to use the typical classification of the sustainable economy theory, combines dynamic measures with measures whose effect is static. This does not therefore amount to changing the common transport policy into the sustainable economy model but rather of using some of the latter’s instruments which, “as part of a multifaceted transport policy ... can contribute to solving the most important transport problems with which the Union is currently faced”.

The fundamental principles set out in the Green Paper are broadly comparable to those already described in relation to the sustainable economy theory, although they do not detract from the effectiveness of the regulatory strategy. Indeed, this strategy is seen as complementary to that of internalizing external effects. The various instruments used to implement those strategies must be selected on the basis of effectiveness, transparency, fairness and any side-effects they might have, whether positive or negative.

Generally speaking, however, fiscal policy instruments are deemed to be more effective in terms of costs in that they allow the taxpayer a wider range of options for tackling and thus reducing externalities and entail less red tape, but their effectiveness also depends on the lack of market distortions other than those which they are intended to rectify and on the cost of monitoring fiscal instruments to prevent cases of fraud. There are undeniable advantages to regulatory instruments, on the other hand, when it comes to imposing specific technical options and certain quantitative standards.

The European Parliament stresses that the purpose of internalization must not be to make transport more expensive but only to ensure a more rational apportionment of existing costs. This proviso leads on logically to the EP’s next point, which is to reassure the road transport sector that the aim of a fiscal policy in transport must not be to banish the transport of goods from the roads, since this is a necessary component of all economic activity. With this in mind, external costs must be apportioned among all modes of transport at the same time so that fresh distortions of competition may be avoided and advances in environmental compatibility are reflected in the internalization of external costs as a reduction in costs.

In line with this approach, fiscal policy in the transport sector must be viewed in conjunction with other transport policy measures, in particular the various Directives, the development of the citizens’ network, trans-European networks and the application of telematics.

(COM(95) 691, also published in Supplement No. 2/96 to the EU Bulletin.
Ibid. p. 3.
Resolution of 30 January 1997 on the Commission’s Green Paper entitled “Towards fair and efficient pricing in transport”, in OJ C 55, p. 41. This section gives a general outline of the resolution, the more specific points of which are dealt with in later chapters. Quotations from the resolution are given in italics.
Table I/1 - Negative external effects of the main modes of transport

<table>
<thead>
<tr>
<th>Mode</th>
<th>Atmos. pollution</th>
<th>Water pollution</th>
<th>Land-use</th>
<th>Solid waste</th>
<th>Noise</th>
<th>Accidents</th>
<th>Other effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail</td>
<td></td>
<td></td>
<td>Area occupied by infrastructure</td>
<td>Rolling stock equipment</td>
<td>Noise and vibration</td>
<td>Derailments and collisions</td>
<td>Divisions in populated areas</td>
</tr>
<tr>
<td>Road</td>
<td>Local: CO, NC, NOx. Global: CO2, CFC</td>
<td>Pollution of surface water and groundwater</td>
<td>Area occupied by infrastructure Quarrying of construction materials</td>
<td>Material from vehicles no longer in service Fuel discharges</td>
<td>Noise and vibration</td>
<td>Deaths, injuries and damage; risks from the transport of dangerous goods; collapse of structures</td>
<td>Divisions in populated areas</td>
</tr>
<tr>
<td>Air</td>
<td>Atmos. pollution</td>
<td></td>
<td>Area occupied by infrastructure</td>
<td>Out-of-service aircraft</td>
<td>Noise and vibration</td>
<td></td>
<td>Traffic around airports</td>
</tr>
<tr>
<td>Sea and inland water-way</td>
<td></td>
<td>Change of system during port construction</td>
<td>Area occupied by infrastructure</td>
<td>Out-of-service vessels</td>
<td></td>
<td>Transport of petroleum products and dangerous goods</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER II
TAXES ON EXTERNAL COSTS IN GENERAL

1. Introduction

The first point which emerges from any analysis of the general issues involved in introducing taxes on externalities is how to deal uniformly with taxes on environmental externalities and on other externalities, starting with infrastructure costs. While there is a common basic principle involved, i.e. internalization, there are major differences in applying this principle and these result mainly from the different classifications of the taxpayer depending on the external effect which the tax aims to abolish: polluter in the case of environmental taxes and user in the case of infrastructures.

In the latter case, the global value of externalization can be easily quantified - the cost of building and managing the infrastructure and also the advantage derived therefrom, i.e. the use of the infrastructure. It is therefore relatively easy to determine a commercial price on use. Moreover, there is a longstanding tradition in the road transport sector of internalizing the main infrastructure costs by means of tolls, which are a form of internalization even though they are not generally of a fiscal nature. The basic problem of infrastructure costs is whether and how to pass onto the user the cost of infrastructures in general, i.e. those infrastructures which are currently not subject to toll charges. This means assessing the appropriateness of such charging in political and economic terms, its legitimacy in relation to the right to mobility of citizens recognized by Western democracies and the arrangements for achieving such internalization from the point of view of either the type of taxation to be levied or the technical instruments for avoiding material obstacles to traffic.

The polluter, on the other hand, causes environmental damage to the community on which it is difficult to put an overall price and in many cases such damage is only noticeable when it is the joint result of the behaviour of many polluters. This adds to the difficulty of evaluating the environmental impact of the individual taxpayer for the purposes of levying the tax.

This chapter focuses mainly on environmental externalities owing to their greater complexity.

(28) Mainly motorways. Although the debate on the internalization of infrastructure costs focuses mainly on road transport, it should be pointed out that there are also charges on the use of infrastructures at the service of other modes of transport, such as airports.

(29) The question of the technical instruments for passing on infrastructure costs without holding up traffic is also relevant to the collection of tolls already in force, and studies are under way into the development of electronic fee collection (EFC) systems.
2. Definition of taxation of externalities

Implementing a tax system for the internalization of externalities must fulfil various requirements such as fiscal strategy, transparency and the efficiency of the actual system.

Upstream of this, however, is a political decision which consists in identifying the problem of internalization - generally environmental - to be tackled, the most suitable instruments to be employed and, in this context, the role to be attributed to the fiscal instrument. Once such identification has occurred, it is necessary to determine whether fiscal measures are appropriate: according to the sustainable economy theory the answer is yes, but legislators face the question of the extent to which such measures are generally compatible with the economic system and what balance must be struck with other control and incentive measures.

Legislators must accordingly consider what effects the proposed tax will have on the market and what either the absolute or the substitution price elasticity will be for the product so taxed, bearing in mind its market structure, the degree of self-sufficiency of the domestic market in relation to foreign producers and the export rate of the product to be taxed.

This raises a whole series of questions concerning the external effects, such as: what level of taxation is required to ensure a reduction in demand for the polluting product (or a reduction in use if the tax is aimed at pollutant emissions)? Are the products which will replace it less polluting? Other questions concern the reaction of the market and the effects on the national economy, namely, how will the producer undertakings behave? In a competitive market technological research should be promoted in order either to reduce production costs (which would lessen the impact of the tax) or to remove the polluting aspects of the product which were the reason for the tax. However, where there are distortions of competition, producers may react differently to product price increases caused by the tax, leading to undesirable variations in the price and quantity of the products supplied. Lastly, the tax must not penalize domestic supply in relation to foreign supply, nor must it penalize national production on the foreign markets.

Once this pre-fiscal decision has been taken, the first strategic option as far as actual taxation is concerned consists in deciding whether to target the external effects, such as pollutant emissions\(^M\), the use of a product or the product itself and, in the latter case, at what point in the lifetime of the product it should be taxed. This decision must be based on information regarding the environmental damage caused, the polluters and the polluting product, namely, at what point does the environmental damage occur, i.e. at the production or the consumption (use) stage, how and how frequently - does it occur? How great is the damage and how is it distributed over the territory? What is the structure of the polluters' costs? What is the life-cycle of the polluting product - how does its environmental impact vary in the course of its life-cycle and how is it disposed of? These facts must also form the basis for the second decision which legislators are required to take, namely, how much is the tax to be?

\(^{(20)}\) Throughout this chapter, we shall use pollutant emissions as an example of an externality, as many surveys have been carried out and much has been written on this subject.
Fiscal measures in the transport sector

On the basis of the information obtained, a decision may be taken to target emissions, if these can be easily measured. In that case, the most suitable method, generally speaking, will be to impose taxes which achieve a highly accurate internalization of the external environmental costs. Taxing the use of the product will be a solution where it is difficult to measure emissions and where there is a direct and constant relation between the use of a product and the environmental damage this causes. In the transport sector this option can be better implemented by means of a system of tolls and user charges than by a tax instrument. The third possibility is to target the polluting product through either purchase or ownership taxes. A tax will be levied on the actual product where it is itself a pollutant or where there are objective difficulties in evaluating emissions or establishing a link between environmental damage and use of the product. In the second case, there is less of a link between the tax and the environmental damage. In the transport sector, particularly road transport, the three options can be seen to coexist.

When deciding to tax the product, the question also arises of at what point in the lifecycle the tax should be levied: (1) at the time of production, thereby indirectly passing on to the purchaser the price increase resulting from the tax paid by the producer; (2) at the time of purchase, thereby directly taxing the purchaser; (3) during the time of ownership; or (4) at the end of the lifecycle, i.e. at the time of scrapping or disposal.

3. The rate of the tax and its introduction

The previous section described the information needed in order to determine the rate of an internalizing tax and earlier in this document we discussed how externalities should be evaluated. On the basis of this data the sustainable economy theory postulates that the rate of a tax should be determined at the level in which the marginal cost of reducing the environmental damage is equal to that of the externalities caused by such damage. It is actually difficult to apply this method, given that it is easier to devise methods for evaluating externalities than to put them into practice.

Legislators often prefer, therefore (openly or otherwise), to define an environmental protection objective and decide on the tax rate in line with the projected reactions of the taxpayer. It is all very well to say that this empirical method cannot be deemed to be an application of the sustainable economy theory, as there is no link with the externalities in terms of real value, but it can nevertheless be effective and, in any case, it provides a perfect response to one of the questions which legislators face when deciding to introduce an environmental tax, namely: what level of taxation will ensure a reduction in demand for the product that is so taxed (or a reduction in use if the tax is targeted at pollutant emissions)? However, it is precisely because of its empirical nature that this method can allow for subsequent adjustments in the tax rate which leave the taxpayer in a state of uncertainty and hence undermine the credibility of the tax system, such credibility being a guarantee of its effectiveness.

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(31) The various hypotheses will be examined later, with particular reference to the transport sector, in the chapter specifically concerned with taxes on vehicles.
(32) For example, waste discharges, containers and packaging and also, in the transport sector, vehicles to be scrapped.
(33) This is true of vehicle registration taxes even though they have not hitherto been seen as internalizing taxes.
(34) See section 5 of Chapter I.
(35) See the previous section.
Fiscal measures in the transport sector

Where the rate of the tax is accurately determined in accordance with the sustainable economy theory, it is necessary to decide whether the aim of internalization is pursued in the short or in the medium- to long term. It should be pointed out here that medium- and long-term objectives enable the polluter to plan his investments and thus lead to greater acceptance of the tax. Moreover, if the objectives are short-term, the tax rate will have to be higher to enable them to be achieved.

However, this does not make it easy to introduce the tax progressively, which can be useful for the polluter who can plan his investments in such a way as to reduce pollution without running into severe financial difficulties, and also work to the benefit of the community at large, which can be sure that environmental protection measures will be introduced on a larger scale. These considerations also apply when plenty of notice is given before introducing the tax, although this has the unwelcome effect of enabling the taxpayer to devise forms of tax avoidance in advance, rather than changing behaviour patterns as intended by the legislators.

The rates of environmental taxes must apply per unit rather than ad valorem so as to ensure that producers do not compete with each other by lowering prices or standards, but determining the rate per unit exacerbates the adverse effect of inflation on the internalizing function of the tax with the result that, during periods of high inflation, constant adjustments must be made to the tax rate which, whether automatic or otherwise, make the tax less acceptable.

The foregoing analysis of environmental taxation policy reveals a fundamental principle which reflects the underlying premises of the sustainable economy theory, namely, that whatever the option chosen it is crucial that the link between the externality and the tax is sufficiently strong to induce taxpayers to change their behaviour, otherwise the tax will simply lead to a further distortion of the market.

4. Incorporating the internalizing tax into the taxation system

Once its basic characteristics have been decided on, the internalizing tax must be made compatible with all the taxes in force and made applicable by the public authorities. One fundamental issue, highlighted by the sustainable economy theory, is fiscal neutrality, i.e. the revenue from the environmental tax must be offset by incentives for pollution-reducing measures or, particularly in the case of taxes on externalities other than environmental externalities, by tax cuts in other areas. In other words, the tax burden must remain unchanged once transfers for environmental incentives have been effected.

Ensuring fiscal neutrality can lead to contradictions between internalization objectives, fiscal objectives and budgetary principles, which can take the form of conflicts between the respective departments involved. In particular, it may be necessary to increase overall tax revenue, and the financial authority may use the environmental tax for this purpose on the grounds that it is more

\(^{(29)}\) A study carried out in Germany into the application of the two laws on water pollution (\textit{Abwasserabgabenentsetz} and \textit{Wasserhaushaltgesetz}) showed that in the period of time which elapsed between the notification of the two laws and their actual entry into force, a considerable number of environmental protection measures was introduced (OECD Strategies, op. cit. p. 29).

\(^{(37)}\) Number, weight or volume as appropriate.
acceptable than other taxes in the eyes of the public or is easier to collect. If this is the case, the financial authorities will have failed to apply correctly the principle of neutrality, thereby detracting from the usefulness of the economic lever which, if it is to be fully effective in the sphere of the environment, must put the taxpayer-polluter in a position to make rational choices as to the end use of the value added thus obtained.

The contradiction with fiscal policy objectives may also arise in connection with the issue of achieving a balance, for reasons of economic policy, between revenue from direct taxation and that from other taxation. The principle of fiscal neutrality may alter that balance or, in the field of indirect taxation, may prevent market operations for other products through the mechanism of imposing indirect taxes. This is linked to the question of the increases in taxes, generally indirect taxes, which may result from an environmental tax and which affect products designed to replace or substitute the product on which the tax has been levied for environmental purposes. If the principle of neutrality is to be applied properly, then such increases should be deemed to have been produced by the internalizing tax.

As far as budgetary principles are concerned, earmarking taxes for a particular purpose, which sometimes happens in the case of the revenue from environmental taxes, increases the budget's rigidity and can therefore lead to reluctance on the part of the financial authorities to use this type of tax. However, this problem can easily be solved since earmarking the revenue for a particular purpose is not essential to the environmental function of the tax - it is enough to ensure that provision is made for allocations for incentives on the basis of revenue estimates.

Another problem involved in incorporating such taxes into the general tax system concerns the active subject of the tax obligation, i.e. the level of government at which the tax is to be collected. This decision will depend on the country's constitutional and administrative system, but the nature of the taxes themselves would appear to point to certain solutions - for example, taxes on pollutant emissions are better administered at local level as the environmental damage caused is local. It is therefore easier not only to collect such taxes locally but also to take the corresponding environmental measures. In the case of user charges, it seems most appropriate that they should be collected by the entity managing the infrastructure, while in the case of taxes on goods it is best that they be dealt with by whoever administers the other taxes on the product so taxed.

This question is linked to that of the administrative costs involved in levying the tax - these can be extremely high in the case of taxes on emissions, which require an extensive network of controls. Excessively high administrative costs can mean that a tax is uneconomic and becomes extremely unpopular in the eyes of the public. Responsibility for charges on goods, on the other hand, can be given over to the same departments which deal with the other taxes on goods, thereby leading to useful synergies.

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(38) As part of its reform of fuel taxes, the Netherlands recently re-established the principle that taxes of this nature should be entered in the budget for general purposes.

(39) The term ‘collect’ is used generically here and refers to all the decisions and operations which form part of the activities of a particular tier of government in tax matters, ranging from political legislative decisions to tax assessment, settlement and collection in the actual sense of the term. For the purposes of this working document, it is irrelevant which tier of government is responsible for these public functions.
The acceptability of the tax in the eyes of the taxpayer is an issue of fundamental importance. This question has already been dealt with in connection with other aspects relating to environmental taxes. We shall therefore confine ourselves here to a few general points. Firstly, the tax must be clearly understood to be a means of solving a specific problem which is perceived as such by the general public. A dual consensus is therefore needed on the scale of the problem and the need for a tax measure to deal with it, whether this is perceived as a mere instrument for procuring the financial resources needed to eliminate the environmental problem\(^\text{40}\) or as an instrument having a disincentive effect.

It is a serious matter if the environmental nature of a tax is seen as justifying an increase in fiscal revenue which is not earmarked for a specific purpose, and this inclines legislators to opt for earmarking, so that the tax is combined with incentives for less polluting solutions, generally of a technological nature or, as happens in Belgium, the principle is laid down that environmental taxes may be levied on goods for which there are no other substitutes\(^\text{41}\). The foregoing considerations contradict what was said earlier as regards making environmental taxes compatible with the principle of the general nature of budget funds, but this subject involves various different public policies and therefore raises the question of coordinating the various objectives. Lastly, as far as the relationship between the authorities and the taxpayer is concerned, simplicity and speed of application of taxes are crucial.

5. Incorporating environmental taxes into the Community system

The Community has only fairly recently expressed support for introducing environmental taxation. Two instances of such declarations of intention are to be found in the conclusions of the two European Councils held in 1996, in Madrid and Florence. However, the Treaty contains certain provisions which open the way for environmental taxation: Article 2, which states that the Community objective of growth must respect the environment and Article 130R, which enshrines the polluter pays principle.

However, fiscal policy is not a common policy and the fiscal harmonization necessary to ensure the establishment of the internal market is governed by Article 99 of the Treaty. Fiscal legislation is therefore predominantly a national responsibility, except where it is subject to the directives which will be discussed at a later stage.

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\(^{40}\) We use the term environmental problem for the purposes of simplicity, but the question of the perception of the problem may vary - it may be perceived in terms of, for example, traffic congestion or the financing of infrastructure.

\(^{41}\) OECD Strategie... op. cif. p. 23
Despite the lack of a common policy or of harmonization, national tax legislation does not operate in a legislative vacuum in the Community, as it must nevertheless comply with the principle of fiscal neutrality\(^\text{(42)}\) enshrined in Article 95\(^\text{(43)}\) of the Treaty which prohibits discrimination against Community products by means of indirect taxation in the case of either similar products (first paragraph) or other products (second paragraph).

The case-law of the Court of Justice is of fundamental importance in interpreting the principle of fiscal neutrality. Generally speaking, this involves three basic principles: general national competence in this area, the adoption of the tax arrangements applicable to national products as a reference parameter for evaluating tax arrangements for products from other Member States, and infringement of Article 95 where the levy applied to Community products is higher than that applied to domestic products.

General national competence in the sphere of taxation includes the power to introduce differentiated taxes even for similar products\(^\text{(44)}\), but such tax differentiation must be based on objective criteria "such as the nature of the raw materials used or the production processes employed"\(^\text{(45)}\) and must pursue objectives that are compatible with the Treaty - in this case, environmental protection. If the reasons for introducing such taxes are objective and not discriminatory, then there is no infringement of Article 95 even if only non-national products are subject to the higher tax band\(^\text{(46)}\).

Various factors are taken into account when comparing the tax arrangements applied to domestic products and those applied to products from other Community Member States, such as the tax band, the definition of the tax base, and the arrangements for monitoring and collecting the taxes\(^\text{(47)}\), but the tax band is not assessed in relation to its compatibility with the environmental objective pursued\(^\text{(48)}\), which justifies the empirical method of environmental taxation\(^\text{(49)}\).

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\(^{(42)}\) It will not have escaped the reader that the fiscal neutrality referred to here is very different from that which is postulated by the sustainable economy theory (see the previous section and Chapter I). The latter means neutrality in relation to the overall revenue from taxes net of environmental incentives, whereas the former means that taxes have no effect on competition between national and Community products.

\(^{(43)}\) For the benefit of the reader, the first two paragraphs of Article 95 are as follows:

"No Member State shall impose, directly or indirectly, on the products of other Member States any internal taxation of any kind in excess of that imposed directly or indirectly on similar domestic products. Furthermore, no Member State shall impose on the products of other Member States any internal taxation of such a nature as to afford indirect protection to other products."

Article 95 is supplemented by the following article on the fiscal neutrality of exports.


\(^{(47)}\) Commission of the European Communities: \textit{Environmental taxes and charges in the single market} (COM(97)0009, p. 8).


\(^{(49)}\) See section 3 of this chapter.
Fiscal measures in the transport sector

What exactly are the domestic products the tax arrangements for which must be compared with those for Community products? The Court of Justice refers to "similar products", i.e. products which "have similar characteristics and meet the same needs from the point of view of consumers" - a concept which establishes two criteria for the purposes of comparison: the nature of the product, i.e. involving its characteristics, component materials, methods of functioning and hence the forms of energy or fuels employed, and the function of the product, i.e. the use for which it is intended. A domestic product which, although a substitution for other products (meeting the same needs), has environmental characteristics which appear different in the eyes of consumers will not therefore be deemed to be similar. On these grounds any tax arrangements which impose higher taxes on a Community product than on a domestic product which is a substitute for the Community product but is less polluting will not constitute an infringement of the first paragraph of Article 95 of the Treaty, but could possibly constitute an infringement within the meaning of the second paragraph of that Article.

The legal principles relating to fiscal neutrality, in particular the possibility of derogations therefrom in order to achieve objectives compatible with the Treaty, must be incorporated into those which the Court of Justice has laid down in the environmental sphere if environmental taxes are to have legitimacy at Community level. In this context it should be pointed out that, back in 1985, the Court stated that environmental protection was "one of the Community's essential objectives", even though protective measures must not "go beyond the inevitable restrictions which are justified by the pursuit of environmental protection, which is in the general interest".

On the basis of the case-law of the Court of Justice, environmental taxes are permitted provided they do not lead to distortion of competition between producers from various Member States. In particular, there are no limits on the amounts of such taxes.

The European Community is also empowered to harmonize certain legislative aspects of indirect taxation. One of the more important measures is the directive on the general arrangements for products subject to excise duty and on the holding, movement and monitoring of such products, which applies to mineral oils, alcohol and alcoholic beverages and manufactured tobacco.

These products may be subject to other indirect taxes subject to compliance with the provisions of the tax rules applicable for excise duties as far as determination of the tax base, calculation of the tax, chargeability and monitoring of the tax are concerned or, failing that, on the basis of the corresponding provisions on VAT. The products shall be subject to excise duty at the time of their production within the Community or of their exportation, but the duty is chargeable at the time of release for consumption. This way also makes it possible to determine which Member State can legitimately impose an environmental tax.

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CHAPTER III
VEHICLE TAXES

1. Introduction

The aim of vehicle taxes is to produce tax revenue by taxing a product which must be registered. It is therefore easy to assess and levy such a tax. Motor vehicles are subject to taxes which are levied on purchases in general (VAT), on ownership of goods which must be registered (registration tax), on the use of such goods in general (circulation tax) and on their use involving specific infrastructure (user charges). This chapter will focus on taxes on vehicles as products, excluding taxes on their use involving specific infrastructures but including circulation taxes which, except in rare cases where a motor vehicle is not intended to be used on infrastructures, becomes a tax on the ownership of that product. Other vehicles are also subject to purchase and registration taxes (ships and aircraft) and taxes on the use of specific infrastructures (ports, airports and the rail network”), but motor vehicles account for the highest proportion of tax revenue and taxes on such vehicles have a greater impact on transport costs.

Each country has developed its own policy of taxing vehicles in line with its own specific requirements, be they financial, social or aimed at protecting its own automobile industry. Such characteristics vary even within the Community, although they are subject to the limits imposed by the principle of fiscal neutrality in respect of the origin of vehicles.

2. The nature of vehicle taxes

The first question which arises is that of identifying the nature of the various taxes on vehicles, first and foremost the circulation tax, which is the main tax on vehicles. Is it an indirect tax or a levy?

The distinction between these two categories is essentially the same throughout the Member States. A tax is a pecuniary payment, the premise for which is the general obligation of citizens to contribute to the state budget (or the budget of another authority) on the basis of their economic capacity which, in the case of indirect taxes, can be inferred from the ownership of a product or the movement of wealth. A levy, on the other hand, is “a charge exacted for the use of public property, the provision of a public service or an activity carried out by the authorities which concerns or is to the particular benefit of the person liable for the charge”.

(33) Under a system of separation from the service, the use of the rail network is subject to a specific charge.

(34) The passage in inverted commas and italics is taken from Article 26(1) of the Spanish tax law, but we could equally well have quoted from the laws of any other Member State. For example, the definition of Gebühr given in the German law on municipal taxes is substantially similar. German law places emphasis on the principle of covering (administrative) costs.
This distinction is an important one when it comes to justifying the internalization of external costs. Internalization can be achieved by means of the charge in question if it is deemed to be a levy exacted for the use of public property whereas, if it is deemed to be an indirect tax, the level of that tax is not related to any reference parameter governing the use of public goods and services. In that case, internalization is not seen as a factor in its own right, even when it has been taken into account for the purposes of deciding on the rate of the tax. The financial requirement will therefore be fulfilled but the taxpayer will be unaware of the reason for the amount due, even though such awareness plays an important role in determining his behaviour as a user.

Tax law identifies another category of tax which is important for the purposes of vehicle taxation, namely, the charge imposed on each member of a group benefiting from an advantage resulting from an investment or from a given public service. Theoretically speaking, this charge lies somewhere between an indirect tax and a levy, as it is linked to a public service (like a levy) but not to the direct use of that service. The author believes that a charge is a form of taxation which goes well with the nature of the tax on the circulation of vehicles on the basis of the potential use of infrastructures highlighted in German tax law. A levy presupposes actual use of infrastructure, even if this is not quantified, and does not therefore appear to have any bearing on the link between vehicle and infrastructure that is targeted by the circulation tax. On the other hand, a tax is utterly obviated by any link, even a generic one, with a particular public service or the use of a public asset, and therefore the circulation tax, which is targeted at a link, albeit a potential one, between vehicle and infrastructure, cannot be considered a tax as such.

Subsuming vehicle taxes into this category is confirmed by the factor that is actually being taxed by the exaction of such a charge. This can vary, but it is not generally the value of the vehicle which is targeted and, in most cases reference is made not to the ownership of the vehicle but to its use, which consists of circulation and not the actual use of the infrastructure.

Levying a charge on vehicles allows the external costs to be passed on to that category of taxpayers who, by their behaviour as users, cause such costs to arise. We are far from the strict approach advocated by those who wish to impute the costs to individual polluters, but the comparison is valid from a conceptual point of view. By separating internalization from specific use, this notion of taxation makes it possible to overcome the constitutional obstacles which, to varying degrees in the

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(55) German law, to which we are mainly referring here, sees the difference between a charge (Beitrag) and a levy (Gebühr) as lying in the potential use of a service as something taxable rather than in the actual use of that service. See P. BOHLEY Gebühren und Beiträge in Handbuch der Finanzwissenschaft (edited by F. NEUMARKT), vol. II, Tübingen 1980, p. 924.

(56) Revenue from such a charge has the same characteristics as revenue from a tax, i.e. it is generally used for state financing and not allocated for a particular purpose.

(57) In some systems the circulation tax is justified on the grounds that it amounts to authorization on the part of the public authorities to carry out an activity (circulation) which is prohibited in the absence of such authorization. This amounts to a legal basis for the tax which is closely linked to the policing functions of the state. This is a very traditional concept which means that the tax has no function other than that of being a means of raising financial resources.

(58) Which excludes it being a form of property tax.
different Member States, prevent charging for infrastructures on the grounds that this is incompatible with the right to mobility\textsuperscript{59}.

3. Nationality and territoriality

Although the taxation is targeted at circulation, the actual use of the infrastructure would be preferable as the legal basis for the tax in the light of the sustainable economy theory. However, such a legal basis runs up against obstacles when it comes to linking the tax to the active subject. This point of linkage is a key issue in the whole argument.

There are two points (or criteria) of linkage: nationality and territoriality. On the basis of the former criterion, the tax is payable to the state in which the vehicle is registered, while on the basis of the latter, it is payable to the state in which the infrastructure is actually used.

The principle of nationality, which is the most traditional and prevalent, achieves the financial objective of the tax but does not allow for an equal distribution of the revenue on the basis of the charges which the state incurs for the infrastructure, thereby penalizing those countries with a large amount of international traffic which have to bear higher infrastructure costs. It has the advantage of being easily chargeable.

The principle of territoriality achieves a close link between the tax and the use of the infrastructure, and is therefore more consistent with the principles of the sustainable economy. On the other hand, it is more difficult to levy, and is generally better implemented by means of tolls, which do not, however, constitute a form of taxation.

The second principle is bound to become more widespread in Europe, in particular the European Union, despite the considerable resistance to this idea. There are various reasons for this belief. Firstly, the distribution of road traffic in an internal market tends to take no account of national borders, although the infrastructure is still managed on a national basis, and road traffic tends to increase inter alia following Community legislation on market liberalization and opening up to non-resident transporters. Moreover, Community enlargement has increased north-south traffic in the ecologically sensitive area of the Alps, where the road network has proved unable to cope with the new traffic flows, resulting in serious congestion and effects on the environment.

Some countries are experiencing a massive increase in transit traffic and are having to bear the marginal costs of building and managing the infrastructure as well as the social costs to the community. It is inevitable that such countries, including non-EC countries such as Switzerland, will tend to impose charges and tolls (as they are already doing) which, for obvious reasons of ensuring that the charges are fairly passed on to transporters, will lead to pressure from operators for a

\textsuperscript{59} It should be pointed out in this context that German tax law tends to classify taxes on commercial vehicles somewhere in between a Beitrag and an indirect tax. There is in fact a link between the charge and the adjustment of infrastructure for the purposes of motor vehicle traffic (Beitrag), while the nature of the tax is not called into question because of the lack of any legal connection between the charge and the adjustment of the infrastructure. See T. MERZENICH Die Harmonisierung der Belastung des Strassengüterverkehrs in der EG. Aachen (Shaker) 1995. p. 290.
reduction in vehicle taxes. This will lead to a gradual move towards the principle of territoriality, helping inter alia to reduce the tensions which currently exist between certain countries over the issue of transit traffic.

4. The criteria for determining the tax base

A further topic of interest in any general discussion of vehicle taxes concerns the criteria governing taxation. As we have seen, value is not a factor in determining the tax, and the criterion most commonly used is that of fiscal horsepower, i.e. a circulation tax, as it is most commonly known, that is differentiated depending on engine performance, on the grounds that vehicles with more powerful engines make greater use of infrastructures and hence entail higher expenditure for the relevant public services. Other criteria used in calculating the circulation tax are cylinder capacity, vehicle weight and age. All the factors to which such criteria refer indirectly determine the motor vehicle's emissions and it can therefore be said that the circulation tax represents a form of environmental tax.

Other criteria used in deciding on the tax may include the type of fuel used, the dispersal of gaseous substances into the atmosphere and the age of the vehicle - all elements which point to the level of the vehicle's negative externalities, which may be taken into account along with other factors and the horsepower criterion itself. A criterion used by the Community is the number of axles and the gross laden weight. This is probably the most suitable criterion to apply when taxing a vehicle for the degree to which it adds to the wear and tear on infrastructure, in particular road surfaces.

All these criteria are selected by the authorities responsible in order to impose the tax on a basis which most closely reflects the negative external effects caused by the vehicle, but at present vehicle registration documents give no indication of any negative effects caused by a vehicle's technical characteristics. The ecocard provided for under the system of ecopoints for transit through Austria is a step in this direction.

Econometric evidence shows a high elasticity in the motor vehicle market which is related to the circulation tax, to the extent that there is a smaller proportion of large-cylinder vehicles in countries where the tax on such vehicles is higher. From the point of view of internalizing costs, it remains to be seen whether large-cylinder engines actually do cause greatest inconvenience to the community at large. The fact that speed is the main cause of road accidents appears to justify the horsepower criterion, but this is not true of gaseous emissions, noise pollution and congestion.

\[\text{(60) As we shall see later, when considering the proposal which was to become Directive 93/89/EEC, the European Parliament proposed - although this was not taken up - a compensation mechanism in respect of the user charges paid and vehicle tax. However, two years later, the EP's Committee on Transport and Tourism declared its opposition to allowing any derogations to the minimum rates of the vehicle tax in those Member States which adopted a Community system of user charges.}\]


5. Guidelines on the use of purchase taxes for environmental purposes

In line with the sustainable economy theory, it is possible to envisage a tax on purchases of motor vehicles and on the circulation tax which orients motorists and transport undertakings towards more efficient models in terms of emissions. Austria already imposes a purchase tax based on a vehicle’s fuel consumption, and the Commission proposes a similar solution in its document entitled A Community strategy to reduce CO$_2$ emissions from passenger cars and improve fuel economy.$^63$. The method indicated is a Community directive establishing an emissions reduction plan, the criteria for differentiating tax rates and the bands within those rates in relation to each phase of the reduction plan. To achieve a consumption target of 5 litres of petrol and 4.5 litres of diesel per 100 km by 2005, a study has shown that the purchase tax would have to be ECU 1050 per additional litre of fuel consumed for petrol cars and ECU 1180 per additional litre of fuel consumed for diesel cars.$^64$. Such high rates are aimed at inducing purchasers to take more account than at present of fuel consumption and manufacturers to focus research and development to a greater extent on energy saving, which would become an important market factor.

However, this could have the unwelcome effect of slowing down the replacement of the car fleet and hence its total energy efficiency. The Commission communication surmises that differentiating purchase/registration taxes introduced in a revenue-neutral manner can potentially overcome this effect because, on average, car prices will not increase and the impact on fleet renewal is likely to be neutral.$^65$. The author points out that a system of incentives for replacing older vehicles, along the lines of that introduced in France and Italy, is perfectly in line with other measures to internalize externalities, and is probably one of those which is more immediately effective.$^66$. 

6. Guidelines on the use of circulation taxes for environmental purposes

We have already mentioned$^67$ that circulation taxes can be considered a form of environmental tax as the tax base for such taxes consists of factors which determine the level of emissions, especially CO$_2$ emissions. However, the differences between rates of circulation tax are not such as to influence motorists’ behaviour in a way that leads to a substantial reduction in emissions. The

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$^63$ Commission communication COM(95) 689.

$^64$ The rates given in the text are based on the assumption that the target set for 2005 could be reached by imposing a tax of 45 Ecu per additional gramme of CO$_2$ per kilometre.

$^65$ Commission communication A Community strategy to reduce CO$_2$ emissions ... op. cit., p. 13.

$^66$ In its communication, the Commission also looks at the issue of fiscal incentives in connection with the question of setting environmental taxes for vehicles which consume less fuel than the norm.

$^67$ See section three of this chapter.
Commission envisages that better differentiation of tax rates, which would be aimed at reducing energy consumption, could be a further fiscal instrument to be used in this field.

The mechanism in question is similar to that discussed in the previous section for purchase taxes, namely, a directive with the same regulatory strategy. The rates would be determined on the basis of those already mentioned in connection with purchase taxes, assessing the extent to which purchasers take account of future costs.

The Commission's hypothesis is based on the assumption of a vehicle lifetime of 10 years and a discount rate of 8%. It therefore considers that the rate of the circulation tax needs to be ECU 140 per additional litre of fuel consumed for petrol cars and ECU 160 per additional litre of fuel consumed for diesel cars in order to achieve the objectives for 2005 indicated earlier. If consumers do not take sufficient account of future costs, the rates have to be higher.

To ensure that a circulation tax of the kind envisaged by the Commission does not slow down the replacement of the vehicle fleet, it should be applied to the whole vehicle fleet from the outset and not just to new vehicles.

7. Community laws on taxation of commercial vehicles

The European Community has harmonized taxes only in respect of vehicles used for commercial purposes and not in respect of private vehicles. Tax harmonization at Community level has only been necessary for the former category of vehicle as the taxation of such vehicles affects competition and hence the internal market; while as far as the latter category is concerned, Member States are responsible for taxation in accordance with their own criteria in line with the principle of subsidiarity. It might be argued that the atmospheric pollution produced by motor vehicles, including private ones, justifies harmonization of circulation taxes on the latter, but the environmental objective is more effectively pursued by imposing excise duties on petroleum products which are perfectly commensurate with actual consumption of such products, while harmonization of vehicle taxes is more suited to the requirements of ensuring healthy competition, as clearly set out in the recitals of the directive on the application by Member States of taxes on certain vehicles used for the carriage of goods by road and tolls and charges for the use of certain infrastructures, which is the basic Community text for taxation in the transport sector.

(68) Commission communication: A Community strategy to reduce CO\textsubscript{2} emissions ....op. cit.
(69) These rates are based on the premise that the target set for 2005 can be achieved by imposing a tax of 6 ecu per additional gramme of CO\textsubscript{2} per kilometre.
(70) Directive 93/89/EEC of 25 October 1993 - OJ L 279, 12.11.1993, p. 32. This directive was the culmination of a political process begun in 1968 when, following an in-depth analysis of the situation of charges for the use of infrastructure, the Commission submitted an initial proposal for a directive on the taxation of commercial vehicles. However, it was only 10 years later that the Council reached an agreement in principle on this subject, but even then no Community legislation was forthcoming. In 1988 the Commission submitted another proposal on user charges (OJ C 79, 26.3.1988, p. 8) introducing the principle of territority. The proposal, which was subsequently amended on two occasions (OJ C 75, 20.3.1991 and COM(92) 405), gave rise to the above-mentioned directive. Article 2 stipulates that the directive applies to motor vehicles or articulated vehicle combinations intended exclusively for the carriage of goods by road and with a maximum permissible gross laden weight of not less than 12 tonnes.
The chapter on **motor vehicle taxes**\(^{(71)}\) applies to a series of taxes imposed by each Member State\(^{(72)}\) which are harmonized by laying down at Community level a minimum rate per category and subcategories depending on the number of axles\(^{(75)}\) and maximum permissible gross laden weight. The rates vary between a minimum of 31 ecus\(^{(74)}\) and a maximum of 537 ecus per annum, but there are provisions enabling France, Greece, Italy, Portugal and Spain to apply rates that are lower than but not less than 50% of the minimum (not beyond the end of 1997), and further reduced rates and exemptions are authorized for certain public service vehicles or vehicles whose main occupation is not the carriage of goods and which therefore do not have an effect on competition.

The system introduced by the directive broadened the tax base for the tax in question in most of the Member States - of a group of nine countries studied\(^{(75)}\), only France and the United Kingdom had a tax based on the number of axles\(^{(75)}\), while the other countries based their taxes on either the gross weight, the unladen weight or the carrying capacity.

**Intern** of substance, rather than harmonizing national taxes, the Community legislation restricts the tax rates to the lowest level and the principle of nationality, on the basis of which the vehicle is taxed only in the state in which it is registered, remains unchanged.

However, during its parliamentary scrutiny of the directive, the European Parliament adopted a number of amendments, which were rejected by the Commission and the Council, empowering the Member States to reimburse some or all of the tax on the basis of the number of kilometres driven on toll-charging motorways. The amendments pointed to a tax on actual use, and thereby heralded Member States' interest in reducing costs for transport undertakings.

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\(^{(71)}\) In 1995, the Commission estimated that two million vehicles fell within the scope of the directive, of which 22.35% were registered in Germany, 20.56% in France, 15.36% in the United Kingdom and 7.71% in both Spain and Italy. For a more detailed statistical breakdown of the fleet of vehicles with a fiscal horsepower of over 12 tonnes, see Table 1 at the end of this Chapter.

\(^{(72)}\) These taxes are listed in Article 3, which was incorporated into Annex 6 A of the Treaty of Accession of Norway, Austria, Finland and Sweden. The taxes are as follows: Belgium: *taxe de circulation sur les véhicules automotrices/verkeerstreiling op de autovervaardigers, Denemark: vognstiftelse af motorkøretøjer mv*.; Germany and Austria: *Kraftfahrzeugsteuer*; Greece: *Tασσα αναμονέας*; Spain: *impuesto sobre vehículos de tracción mecánica* and (solely as regards the amount of the levies charged for motor vehicles) *impuesto sobre actividades económicas*; France: *tare spéciale sur certains véhicules routiers* and *tare différentielle sur les véhicules à moteur*; Ireland: *vehicle excise duty*; Italy: *tassa automobilistica* and (additionally del 5% sulla tassa automobilistica); Luxembourg: *tare sur les véhicules automoteurs*; Netherlands: *motorrijtuigenbelasting*; Portugal: *imposto de camionagem* and *imposto de circulação*; Finland: *varsinaisen ajoneuvovero/egentilich fordonsskatt*; Sweden: *fordonsskatt* and United Kingdom: *vehicle excise duty*.

\(^{(73)}\) Instead of axles, air suspension or other suspension systems may be taken into consideration as a criterion for taxation, including inter alia those systems recognized as equivalent to air suspension pursuant to Directive 92/7/EEC on weights, dimensions and certain technical characteristics of certain road vehicles.

\(^{(74)}\) Vehicles with two axles and a maximum permissible gross laden weight of less than 13 tonnes are subject to a zero rate of tax.

\(^{(75)}\) Belgium, Denmark, Germany, France, Ireland, Italy, Luxembourg, the Netherlands and the United Kingdom. T. Merzenich (*op. cit.* pp. 60-83) gives an analysis of the different national systems.

\(^{(76)}\) The *tare spéciale sur certains véhicules routiers* in France and the *vehicle excise duty* in the United Kingdom.
The directive has so far been transposed into 8 Member States\(^7\). However, this should not be interpreted as negligence on the part of the other 7 Member States, but rather as the result of the uncertainty surrounding the fate of the directive, given that the European Parliament has instigated proceedings against the Council to have the directive revoked and, in any case, three of the countries which have not yet transposed it\(^7\) are precisely the countries which apply the highest rates. Most of the Member States currently apply rates that are higher than the minimum laid down in the directive, even though the directive temporarily authorizes five Member States to apply rates that are 50\% of the minimum\(^7\). However, the different forms of legislation which still exist in the various Member States prevent the directive from eliminating all distortions of competition, which was the intention of the Community legislators. The Commission estimates that revenue from the vehicle tax harmonized by the directive amounts to 5 billion ecus\(^8\).

8. **Proposal to amend Community legislation**

The 1993 directive had a turbulent existence. It was revoked by a judgment of the Court of Justice following proceedings instigated by the European Parliament on the grounds that the legislative procedure had been flawed, but its effects have been maintained in force pending the adoption of a new directive. The Commission has accordingly submitted a proposal\(^8\) on which the European Parliament's Committee on Transport and Tourism has already adopted a report\(^9\).

The thinking behind the Commission proposal, in line with the Green Paper on taxation in the transport sector\(^\)\(^8\), is to focus to a greater extent on actual use of infrastructure. This will have an important spin-off for vehicle taxes, which are the least related to actual use. With this in mind, the directive refers to the "Euro" classification of vehicles, which enables the rate of the charge to reflect more accurately the real negative externalities occasioned by the vehicle. The introduction of a user charge also allows for the possibility of further reductions.

It should be pointed out that the Commission’s approach reflects the wishes of the European Parliament, which called for the harmonization of vehicle tax rates for all motor vehicles, not just commercial vehicles, urging the Member States to **take account of the materials from which the vehicle is made, fuel consumption, potential emissions, noise levels, damage to the roads and vehicle safety as important criteria in the calculation of the tax rate**\(^8\).
The Commission proposal makes changes to the 1993 legislation by introducing maximum rates alongside the minimum rates. It also lays down further criteria for calculating national rates in line with the "Euro" classification of vehicles. The rates for "Euro I" vehicles must be at least 10% higher than those for "Euro II" vehicles, and the rates for "non-Euro" vehicles must be another 10% higher than the former, to which the Community rate-band refers. Generally speaking, national rates must fall within the Community band, but there is an important derogation to the minimum rate: the circulation tax may be lower in those Member States which apply a user charge system meeting the requirements of the directive.

In its report and the amendments tabled to the proposal, the European Parliament's Committee on Transport and Tourism declared that it was opposed to the introduction of maximum rates and to the derogation to the minimum rates where a system of user charges is applied, and proposed that the minimum rates be doubled. The committee also considered that the system proposed by the Commission was far too complicated. Such opposition to the derogation may at first seem to contradict Parliament's proposal, which it put forward when examining Directive 93/89/EEC, that Member States should be able to reimburse all or part of the tax on the basis of the number of kilometres driven on toll-charging motorways. In actual fact, given that the derogation proposed by the Commission operates by means of a predetermined reduction of the rate, it would lead to distortions between the undertakings of countries which apply a user charge system and other undertakings, without putting into effect the principle of charging for the use that vehicles really make of infrastructures.

Table III/1 - The fleet of vehicles with a fiscal horsepower of over 12 tonnes used for the carriage of goods

<table>
<thead>
<tr>
<th>STATE</th>
<th>VEHICLE FLEET</th>
<th>PERCENTAGE OF EU TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>74440</td>
<td>3.64</td>
</tr>
<tr>
<td>Denmark</td>
<td>52 817</td>
<td>2.59</td>
</tr>
<tr>
<td>Germany</td>
<td>457 438</td>
<td>22.35</td>
</tr>
<tr>
<td>Greece</td>
<td>57 143</td>
<td>2.78</td>
</tr>
<tr>
<td>Spain</td>
<td>157 591</td>
<td>7.71</td>
</tr>
<tr>
<td>France</td>
<td>420 458</td>
<td>20.56</td>
</tr>
<tr>
<td>Ireland</td>
<td>20 407</td>
<td>1.00</td>
</tr>
<tr>
<td>Italy</td>
<td>164 584</td>
<td>8.05</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>4 344</td>
<td>0.21</td>
</tr>
<tr>
<td>Austria</td>
<td>59 902</td>
<td>2.93</td>
</tr>
<tr>
<td>Netherlands</td>
<td>107 602</td>
<td>5.25</td>
</tr>
<tr>
<td>Portugal</td>
<td>64 953</td>
<td>3.17</td>
</tr>
<tr>
<td>Finland</td>
<td>31 786</td>
<td>1.55</td>
</tr>
<tr>
<td>Sweden</td>
<td>59 019</td>
<td>2.88</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>314 282</td>
<td>15.36</td>
</tr>
<tr>
<td><strong>European Union</strong></td>
<td><strong>2 046 766</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: C. DELEPIERE-DRAMAIS Les recettes consécutives aux taxes annuelles, péages et droits d'usages sur les véhicules lourds effectuant du transport de marchandises par route dans l'Union européenne (a study carried out on behalf of the Commission’s Directorate-General for Budgets in 1997).
CHAPTER IV
MOTOR FUEL TAXES

1. The legal nature of motor fuel taxes

Under the fiscal systems in all the Member States, motor fuel taxes are indirect taxes levied on the manufacture or consumption of mineral oils intended to fulfil the energy requirements of vehicle traction engines. Even when, as is generally the case, it is the producer who is liable for the tax, the transitive nature\(^{(86)}\) of indirect taxes means that the final consumer bears a greater cost and, from an economic point of view, is therefore the real taxpayer\(^{(87)}\).

As we shall see later\(^{(88)}\), there are various types of taxes on motor fuels, chief of which is VAT, the indirect tax levied on goods and services in a neutral manner with regard to the number of transactions. However, this is an \textit{ad valorem} tax and is therefore not suited to the purpose of internalizing costs in relation to physical amounts. The latter function is usually performed by excise duties, which are also indirect taxes but are more versatile from the point of view of the taxation criterion.

However, there is also a \textit{contributive}\(^{(89)}\) element in motor fuel excise duties. In one area of German law, this tax is therefore linked to the financing of road infrastructure by earmarking part of the revenue from such duties for that specific purpose\(^{(90)}\).

2. The economic role of motor fuel taxes: the specific problems involving air transport

In economic terms motor fuel, and hence the excise duty incorporated into the price of motor fuel, is a cost that is borne directly by the carrier and therefore varies in proportion to the number of kilometres travelled. The classic economics theory allows the variation in demand for a good or a service to be assessed in terms of the variations in its price, once the elasticity of demand in relation

\(^{(86)}\) Sainz de Bujanda believes that the transitive nature of an indirect tax distinguishes it from a direct tax. See ESCUELA DE LA HACIENDA PUBLICA Compendio de derecho financiero y sistema fiscal español, Madrid (no date of publication given). p. 84.

\(^{(87)}\) In this connection see also T. MERZENICH. op. cit. p. 33, who quotes from the second sentence of Article 1(2) of the German Mineralölsteuergesetz.

\(^{(88)}\) See section three of this chapter.

\(^{(89)}\) In the sense of the German notion of \textit{Beitrag}, as already discussed in section one of the previous chapter.

\(^{(90)}\) As described by K. TIPKE and J. LANG in Steuerrecht, Cologne 1991 and quoted in T. MERZENICH, op. cit. p. 33.
Fiscal measures in the transport sector

to price is known, which is different depending on whether the transport involves persons or goods.\(^1\)

Motor fuel excise duties are therefore a typical static measure according to the sustainable economy theory. This has meant that state decision-makers - and not only in the EU - have come to use this tax as a means of applying the polluter-pays principle - for the most part, their approach consists in raising excise duties on motor fuels to a level which makes it possible to internalize by this means the external costs relating to air quality in accordance with the criteria set out in chapter one.

Excise duties on motor fuels are also a tax on all modes of transport, except where the relevant legislation provides for derogations. If the calculation of externalities is correct, the tax burden of excise duties on each mode of transport will be differentiated on the basis of the content of the polluting substances. While the other transport taxes mainly, although not exclusively, concern road haulage operators, excise duties on motor fuels particularly affect air transport, because of the special characteristics of this mode of transport.

The first of these is the nature and behaviour of the emissions caused by air transport: nitrogen oxide, the main emission, produces ozone in the troposphere and destroys it in the stratosphere, and its effects at cruising altitude are unknown (12 000 - 15 000 m). The second distinctive feature is the considerable variation in emissions during the various flight phases, as the following table shows:\(^3\):

<table>
<thead>
<tr>
<th>Operation</th>
<th>Engine speed</th>
<th>CO</th>
<th>HC</th>
<th>NO(_x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>5</td>
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<td>20</td>
<td>5</td>
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<td>5</td>
<td>2</td>
<td>10</td>
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<td>Cruising</td>
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<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Take-off</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>40</td>
</tr>
</tbody>
</table>

While carbon monoxide and hydrocarbon emissions are present at low engine speeds, nitrogen oxide emissions increase in line with speed and so, bearing in mind the duration of each type of engine speed during the flight, it is clear that nitrogen oxides are emitted mainly at high speeds. It follows that taxation of motor fuels, as far as nitrogen oxides are concerned, will have a considerable extraterritorial impact with regard to the country imposing the tax and a strong global impact, even

\(^1\) An intersectoral analysis, with dual entry matrices, is given in the OECD publication Implementation strategies for environmental taxes, Paris 1996, p. 58 (section 4.1), which appears to give a more detailed assessment of the effects of 'ecotaxes' and hence also of the effects of an increase in motor fuel excise duties. However, the survey focuses on energy products rather than motor fuels.


\(^3\) Source: The UK National Society for Clean Air, (reproduced in ibid. p. 128). The engine speed is expressed as a percentage, while emissions are expressed in the number of grammes per kilogramme.
though air transport accounts for only 4-5% of pollutant emissions caused by nitrogen oxides worldwide\(^{4}\).

This situation highlights the need for harmonization at international level of excise duties on motor fuels used in air transport; however, this is opposed by the developing countries\(^{5}\) which have the same reservations about environmental taxes on air transport as they do about the approach to economic growth postulated by the sustainable economy theory.

3. Motor fuel taxes: a general picture

Motor fuels are generally one of the highest taxed goods in the industrialized countries, and there is a vast array of taxes or levies of various kinds used for this purpose – including not only excise duties but also VAT, general taxes on consumer goods, levies on the constitution of fuel stocks and eco-taxes. Each country uses one or more of these instruments, with different rates and innumerable variations.

**VAT** is intended to be neutral as regards the number of transactions involving a good, and is therefore by definition a tax on the final consumer, who cannot pass it on in the manner of transport operators or those using transport services for business or professional purposes. In theory, therefore, it only affects households, but in some countries it cannot be completely passed on to the final consumer. In Portugal, for example, reimbursement of VAT is limited in most cases to 50%, while in Denmark VAT on purchases and operating costs, including fuel operating costs, is non-deductible for vehicles seating less than 9 people. However, in the US and Australia, at federal level at least, there is no VAT at all nor are there any general consumer taxes\(^{6}\). The VAT rate on motor fuels in nearly all countries varies from 3% to 25%.

**Excise duties** are a form of tax levied in all the industrialized countries, albeit according to different criteria. Generally speaking, the tax is levied on the basis of the quantity rather than the value of the motor fuel, while the rate depends on the type of fuel. However, even here there are varying approaches depending on the different national situations – in many European countries, taxes on diesel are lower than those on petrol, as diesel is used mainly by commercial vehicles. In the US, where motor fuel taxes are levied by the state, and are therefore not applied uniformly throughout federal territory, the reverse is true, and is accounted for by the higher costs of building and maintaining motorways occasioned by such vehicles. It is therefore a means of internalizing the external costs. In some countries, there is further differentiation of rates on petrol depending on

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\(^{4}\) Source: Lufthansa, 1992 estimates, reproduced in TOUBIANA op. cit. p. 128. Hydrocarbon and carbon monoxide emissions from air transport account for around half of all such emissions. According to the same estimates, road transport accounts for 50% of nitrogen oxide emissions and over 70% of the other two combined, and is by far the leading source of emissions out of all the sources mentioned in the estimates (power stations, industry, other economic activities and households).

\(^{5}\) J. TOUBIANA, op. cit. p. 129.

whether it is leaded or unleaded\footnote{Ibid p. 18.} - this differentiation has largely contributed to the now-widespread use of unleaded petrol.

\textbf{Special levies} are various kinds of taxes which some countries impose on motor fuels. They may be supposedly \textit{environmental} but still have a more \textit{economic} purpose, such as those on fuel stocks, or a more \textit{financial} purpose in that they are intended to finance infrastructures. However, such taxes have little impact on the overall revenue resulting from motor fuel taxes.

As far as relating a tax to external effects is concerned, motor fuel taxes are linked more closely to emissions and actual use of infrastructure than vehicle taxes, but they are not totally free of distortions which work to the disadvantage of the smaller countries - for example, a small country can be easily crossed by a vehicle coming from abroad which does not necessarily need to refuel in that country and therefore makes no contribution either to infrastructure costs or the costs of overcoming pollution in the country. The same distortion can occur within a country when the tax is levied by a regional government authority or when some or all of the tasks relating to infrastructure or de-polluting measures are entrusted to departments other than those which receive the excise duties on motor fuels.

\section*{4. Environmental taxes on motor fuels: some examples\footnote{Ibid. pp. 28-40 (which forms the basis for this section of our working paper).}}

In many countries, \textit{special environmental taxes} are not specifically targeted at motor fuels but at energy products which produce CO$_2$, and in some cases such taxes have been introduced as part of a more wide-ranging reform of all taxes on such products. That is a correct environmental approach to the fiscal instrument, as it ensures that environmental protection is not used solely as a means of justifying financial objectives. Some European countries (Denmark, Norway, the Netherlands, Finland and Sweden) provide good examples of this approach.

In \textit{1992 Denmark} introduced a tax on CO\textsubscript{2}, emissions mainly produced by energy use. However, the tax was also aimed at having an impact on industrial production processes, which probably justified the exemption from taxes of motor fuels intended for maritime and air transport. For that reason, petrol, which had previously been subject to different rates of tax depending on whether it was leaded or unleaded, was subject to an environmental tax as well as excise duties based on the same criteria, namely, a fixed amount on every litre purchased.

\textbf{Norway} levies taxes on emissions of CO\textsubscript{2}, SO\textsubscript{2}, and lead. As far as petrol is concerned, the first and third of these substances are taxed more heavily. Although lead-free petrol is also taxed, it is subject to different rates depending on how much SO\textsubscript{2} is contained in the various products. The same applies to the SO\textsubscript{2} content of diesel oil, which is exempt from tax where the level of SO\textsubscript{2} is less than 0.05 \%. A feature of the Norwegian system is the importance of environmental taxes for the state budget, which reflects the genuinely environmental approach of Norway's fiscal system. A special
regional tax on motor fuels was introduced in 1992 in Tromso to finance new infrastructures. However, a debate appears to be under way in Norway about taxing motor fuels as, according to more recent calculations, this is too punitive in relation to the long-term marginal costs.

The Netherlands introduced an eco-tax on motor fuels and heating fuel back in 1988, and earmarked the revenue from such taxes for financing environmental measures. Two years later CO₂ emissions became a taxable factor. In 1992 the taxes were reformed, resulting in two fundamental changes: the criteria used for taxing each product were based equally on energy value and carbon content. The revenue from such taxes was once more entered in the general state budget, thereby meaning that it was no longer necessarily earmarked for a particular environmental purpose.

Finland reformed its excise duties on motor fuels in 1994, while the environmental tax was differentiated according to the type of product, resulting in a 4:6 ratio of energy value to carbon content. Maritime and air transport are exempt from this tax.

In 1990 Sweden undertook a comprehensive reform of taxes on energy products aimed at making emissions the main taxable factor. The tax rates are differentiated according to the type of energy product and are proportional to quantity, and no mode of transport is exempt.

5. Community harmonization

For the time being excise duties on mineral oils are the only form of tax on energy products to have been harmonized, following two directives adopted in 1992 - one on the harmonization of the structures of excise duties on mineral oils and the other on the approximation of the rates of such duties. The two directives designate as mineral oils for tax purposes a range of fuels on the basis of the Community nomenclature, including petrol, diesel and kerosene and any other "product intended for use, offered for sale or used as motor fuel, or as an additive or extender in motor fuels". Lastly, mineral oils in respect of which there has been no approximation are subject to excise duties "if intended for use, offered for sale or used as heating fuel or motor fuel". In that case, the rate is the same as that for heating fuel and motor fuel for equivalent motors. The rates are fixed on the basis of a quantity of 1000 litres at a temperature of 15℃.

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A. HERVICK and S. BRATHEN Norway in Charging for the use of urban roads, "97th Round Table on Transport Economics". Paris (ECMT) 1994, p. 21. The preferred solution appears to be to tax motor fuels rather than to impose urban road tolls, as fuel taxes are easier and less costly to collect.

Ibid. p. 12.

A tax on fuel stocks is still in force in the Netherlands.

On 17 March 1997 the Commission submitted a proposal for a directive (97/7/EC) on restructuring the Community framework for the taxation of energy products in OJ C 139, 6.5.1997, p. 14 or, with the accompanying report, in COM(97) 30.


Article 2(3) of Directive 92/81/EEC.

Article 2(2) of Directive 92/81/EEC.
Mineral oils not used as fuel or for heating purposes are exempt from excise duties, as are motor fuels for air transport and maritime transport, including fishing vessels but excluding leisure aircraft and pleasure craft. Member States may also provide for exemptions from or reduced rates of excise duties for motor fuels and heating fuel for particular purposes, including inland waterway transport (again excluding pleasure craft), rail transport, the production, development, testing and maintenance of aircraft and ships and the dredging of inland waterways and ports.

The minimum rates are set separately at Community level for leaded and unleaded petrol, diesel, petroleum gas and kerosene. The rate for unleaded petrol must in any case be lower than that for leaded petrol.

The minimum rates, expressed in ecus, are reviewed every two years (by the end of each calendar year) by decision of the Council and converted into the national currencies on the basis of an annually determined exchange rate. The Member States have adopted higher rates, in some cases significantly higher, than the rates laid down at Community level, which in any case have remained at the levels originally set by the directive, i.e. 337 ecus for leaded petrol, 287 ecus for unleaded petrol and 245 ecus for diesel.

6. Guidelines for reforming Community legislation

The European Council held in Essen in 1994 made its position known on the general issue of environmental taxes, declaring that:

"The European Council has taken note of the Commission's intention of submitting guidelines to enable every Member State to apply a CO₂ energy tax on the basis of common parameters if it so desires. The Ecofin Council is being instructed to consider appropriate parameters."

Following on from this decisive statement, the Council of Environment Ministers, meeting on 16 December 1994, adopted "common conclusions whereby EU Environment Ministers confirmed the need for fiscal measures and sent a clear signal to the Ecofin Council to define the term of Community supervision of a CO₂ energy tax based on the harmonization of excise systems, following the optional path opened by the European Summit in Essen. The prospect of a Directive in this area is therefore on hold, but the pragmatic solution which comes from this compromise enables envisaging an action by eleven Member States in this area by bypassing the fundamental opposition of the United Kingdom which may introduce national autonomous measures with the same purpose. Other delegations (Spain, Luxembourg, Portugal) have joined the UK to underline in a joint declaration that assessment of the need to introduce a CO₂ energy tax remains within the competence of each Member State. According to Environment Ministers, the aspects of competitiveness and economic development will also have to preside over the preparation of this

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(107) Directive 92/82/EEC. Unlike the rates for petrol, these rates are differentiated according to use, i.e. (1) as motor fuel; (2) for certain industrial and commercial applications; (3) for heating purposes.

(108) The rates in force in January 1997 in the different Member States for unleaded petrol and diesel are given in Table III at the end of this chapter.

Fiscal measures in the transport sector

joint canvas which they recommend introducing gradually, retaining the possibility of also imposing other sources of energy\(^{(110)}\).

On the same occasion a joint declaration issued by 10 Member States (i.e. all except Spain and Italy) called on the Commission to submit a proposal for a directive on targets for reducing the energy consumption of motor vehicles between 1997 and 2005\(^{(111)}\). This was endorsed by the Council on 23 June 1995\(^{(112)}\).

It was as a result of these requests that the Commission published on 20 December 1995 its communication entitled A Community strategy to reduce CO\(_2\) emissions from passenger cars and improve fuel economy\(^{(113)}\). As far as motor fuels are concerned, the Commission document suggests that the fiscal measure needed in order to achieve the consumption reduction targets set for 2005 (5.1/100 km for new petrol cars and 4.5 1/100 km for diesel cars) consists in gradually increasing the price of petrol by about 110% and the price of diesel by about 150% in real terms. These increases are based on the assumption that increasing taxes is the only instrument used to achieve those targets.

However, in addition to the fact that, as pointed out in connection with vehicle taxes, future costs are not fully taken into account by consumers when choosing a new vehicle, an increase in taxes on mineral oils has the adverse effect of taxing all vehicles indiscriminately and not just the less fuel-efficient vehicles, and creates distributional inequity in that it particularly affects the less well-off members of society and the inhabitants of regions which are less well-served in terms of transport facilities (generally public transport) which offer an alternative to private cars\(^{(114)}\).

The Council of Environment Ministers endorsed the Commission's targets, and in March 1997 the Commission submitted a proposal for a directive on restructuring the Community framework for the taxation of energy products\(^{(115)}\) which provided for excise duties on all energy products to be harmonized, with the minimum Community rates for motor fuels to be increased as follows: 417 ecus for petrol, with the Member States having total freedom to apply differentiated rates of excise duty on leaded or unleaded petrol, with the proviso that the rates for leaded petrol must be higher than those for unleaded petrol; 310 ecus for diesel and kerosene\(^{(116)}\); 141 ecus per tonne of liquid petroleum gas; and 2.9 ecus per gigajoule of natural gas.

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\(^{(110)}\) Extract taken from the Agence Europe bulletin of 17 December 1994 (No. 6381 n.s.), p. 9. The bold text corresponds to italics, underlining or quotation marks in the Agence Europe text.

\(^{(111)}\) Ibid

\(^{(112)}\) See the Agence Europe bulletin of 24 June 1995.

\(^{(113)}\) COM(95) 689, whose proposals on vehicle taxes were outlined in the previous chapter.

\(^{(114)}\) Ibid, p. 18-19.


\(^{(116)}\) It should be pointed out that excise duties are set per 1000 litres at 15°C for petrol, diesel and kerosene.
Fiscal measures in the transport sector

7. The European Parliament's position

In April 1997 Parliament delivered its opinion on the Commission communication on a Community strategy to reduce CO₂ emissions. The EP stressed the importance of a rise in excise duties on motor fuels and called for such fiscal measures to form part of a wider series of measures, including the introduction of graduated limit values in the directives on the type-approval of motor vehicles so as to achieve the consumption targets outlined in the Commission strategy by 2005. The key point in the EP's resolution is paragraph 8, which "calls on the Commission to take its initial steps further, so that the establishment of CO₂ limit values and tax incentives become part of an overall strategy using a combination of measures, thereby making use of the potential for reducing CO₂ emissions in the vehicle itself, during its use and throughout its entire life-cycle".

The explanatory statement of the report by the Committee on the Environment, Public Health and Consumer Protection provides technical clarification of the European Parliament's position and raises other issues. Above all, it gives a clearer indication of Parliament's view of the Commission document - although the EP's opinion is generally favourable, the explanatory statement contains the following paragraph "It is the belief of the rapporteur, and of experts consulted by her, that the approaches suggested in the Communication, although well-meaning, are far too tentative to have any valid effect".

Recommendation 1 on fiscal measures is of particular interest in the context of this working document: "...market forces can be used to reduce fuel consumption and modify attitudes towards unnecessary fun driving via fuel taxes, differential vehicle purchase taxes, or circulation taxes but (we) stress the fact that tax penalties should be matched by tax rewards for ultra-clean, ultra-safe, high-fuel-economy cars...". In short, the proposal which follows from this line of reasoning and from the social arguments outlined in the Commission communication is concerned more with vehicle taxes than with fuel taxes, suggesting "a tax banded in such a way that the three-litre car would be free of vehicle tax". Other fiscal or parafiscal measures are set out in Recommendation 2 and concern the subsidies given in some Member States to people coming to work by car, such as free parking or tax concessions to buy cars.

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(117) Resolution of 10 April 1997 on the Commission communication on a Community strategy to reduce CO₂, emissions, etc. At the time of writing (19 August 1997), the minutes of the sitting of 10 April 1997 had not yet been published.

(118) A4-0117/97 of 25 March 1997 - rapporteur: Mrs Laura Gonzalez Alvarez.

(119) See the previous section of this working document.
Table IV/1 - Excise duties on unleaded petrol and diesel in the Member States in January 1997, expressed in ecus per 1 000 litres at 15°C

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<tr>
<th>Member State</th>
<th>Excise duties on unleaded petrol</th>
<th>Excise duties on diesel</th>
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<tr>
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<tr>
<td>Austria</td>
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<tr>
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<tr>
<td>Sweden</td>
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<tr>
<td>United Kingdom</td>
<td>501</td>
<td>501</td>
</tr>
<tr>
<td>Minimum Community</td>
<td>287</td>
<td>245</td>
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</table>

Source: COM (97) 30
CHAPTER V
TOLLS AND USER CHARGES

1. Legal nature

This chapter looks at various measures which are all targeted at the same objective (i.e. the internalization of externalities) but which differ as far as their legal nature is concerned. To clarify matters, it is first of all necessary to distinguish between tolls and user charges, and the following definitions contained in the relevant Community directive" therefore serve a useful purpose:

"- toll means payment of a specified amount for a vehicle travelling the distance between two points on the infrastructure referred to in Article 7(d); the amount shall be based on the distance travelled and on the category of the vehicle;

- user charges means payment of a specified amount conferring the right for a vehicle to use for a given period the infrastructures referred to in Article 7(d)."

In other words, a toll is commensurate with the actual use of an infrastructure, while a user charge is commensurate with the potential use of an infrastructure.

The term specified amount as applied to these two levies avoids describing them as taxes, leaving it up to the Member States to decide on the legal status which best suits their own national systems. Generally speaking, the levies will be in the nature of a tax, but we would point to one exception: tolls charged by a private operator may in fact be considered to be the contractual payment for the use of the infrastructure. This "private sector-oriented" concept must, however, exist in the various national systems and will also depend on the nature of the relationship between the operator, the infrastructure and the public authorities.

(120) Directive 93/89/EEC on the application by Member States of taxes on certain vehicles used for the carriage of goods by road and tolls and charges for the use of certain infrastructures in OJ L 279, 12.11.1993, p. 32.

(121) Motorways or other multilane roads with characteristics similar to motorways, bridges, tunnels and mountain passes or, in a Member State where no general network of motorways or dual carriageways exists, the highest category of road in that State.

(122) The proposal for a directive (COM(96) 331) to replace the existing directive repeats these definitions but adds to the list of infrastructures in respect of which tolls and user charges may be levied sensitive routes, i.e. infrastructures which pose particular traffic congestion problems or which have a substantially negative impact on the quality of air and noise levels in surrounding areas.

(123) These different types of relationships are outlined in the document published by the European Parliament's DG IV entitled The financing of trans-European transport networks in the 'Transport Series', E4 1997. See Chapter I, section 6 of that document for the legal issues involved and Chapter VI which deals with the economic issues. We would point out, for the benefit of our readers, that there are three basic arrangements involving private constructors and the public authorities, as identified in the Anglo-Saxon world: B.O.O. (Build, Own, Operate), where a private sector operator owns the infrastructure, as in the case of Eurotunnel; B.O.O.T. (Build, Own, Operate, Transfer), where the private constructor owns the infrastructure during the period of operation then transfers ownership at the end of that period; and B.O.T. (Build Operate, Transfer), the most common arrangement, where the constructor is responsible for the operation of the infrastructure, which is publicly-owned, for a given period after which its operation is transferred to the public sector. All these schemes provide for the infrastructure to be built using private capital.
Insofar as it is a tax, a toll is a levy. The issue is more complex when it comes to user charges - generally speaking, on the basis of the definition quoted earlier, a user charge can be considered as a levy in that it relates to a specific infrastructure or series of infrastructures. However, when it applies to vehicles registered in a Member State for the use of the whole road network in that country's territory\(^{(124)}\), we are probably talking about a contribution, at least in the sense of the term *Beitrag* in German law\(^{(125)}\).

2. Arrangements for taxing\(^{(126)}\) infrastructure use: general aspects

Using public road infrastructures free of charge is fundamental to freedom of movement, which is a basic principle of the constitutional laws of traditional democracies. The general public is therefore generally reluctant to pay for the use of infrastructures, such use being deemed to be a right in cases where the infrastructures are not privately-run, and states are wary of charging for the use of state infrastructure either because such measures are unpopular or because they wish to avoid any accusation of infringing their constitutions.

However, the gradual increase in the costs of building and operating road infrastructures since the beginning of the post-war period and, in more recent years, the growing popularity of the sustainable economy theory have meant that the issue of charging for transport infrastructures has had to be addressed, or at any rate borne in mind, when debating public policies in the transport sector. Nor is it unreasonable to suppose that some Member States have chosen to entrust the building of motorways, even when financed by public money, to bodies that are not part of their public administration, generally under a private sector scheme, precisely in order to make it easier to justify charges for the use of such infrastructure\(^{(127)}\).

The situation is gradually evolving, and the idea of charging for car journeys in urban areas, mainly town centres, which are most prone to traffic congestion or where public transport offers an efficient alternative to private transport, is starting to be considered. Indeed, urban traffic is an area in which the main purpose of charging fees is not to finance infrastructure but to regulate traffic by discouraging the use of cars.

However, it is precisely when it comes to urban areas that charging faces the main obstacle, as regards both public acceptance and the purely technical side. As far as the former is concerned, it is important to remember that road users tend to do more of their driving in towns than outside towns. Nearly all human activities require a journey - for example, going to school or work, doing the shopping, going to the theatre, etc. - and it is therefore only natural that any restriction or any cost is unwelcome not only to those who must make the journey but also to those who are concerned by that journey, in that they are waiting for their customers or employees to arrive. Of course, non-

\(^{(124)}\) This possibility is provided for in Article 7(c) of Directive 93/89/EEC.
\(^{(125)}\) See Chapter II, section 2.
\(^{(126)}\) It would actually be more correct to speak of charging for infrastructure, as the fee payable by users is not always a form of tax, but the term *taxation* is now commonly used.
\(^{(127)}\) In France and Italy, for example, motorways are generally operated by privately-run companies that are wholly, or almost wholly, public-owned.
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pecuniary restrictions are also unwelcome in urban areas, as well as actual tolls. However, the resentment caused by such restrictions is linked to the unfair situation which may arise between residents and non-residents, when the system of levying tolls and charges does not allow for equal treatment of both these categories.

The unpopularity of taxation of infrastructures probably stems from the public's fear that it will lead to a reduction in purchasing power, particularly for the less well-off. It is true, moreover, that traffic and transport experts and administrative authorities do not take proper account of the effect such taxation has on family budgets.

Banister\(^{128}\) looks at the weekly expenditure of families in London, which reveals that average expenditure on transport amounts to £39.70 (15.4% of disposable income), of which €34.12 (13.2%) goes on cars (half of which is spent on maintenance and use) and only €5.58 (2.2%) on public transport. On the basis of these figures, Banister formulates the hypothesis that urban transport in London should be taxed at a rate of £4 for each car journey.

Accordingly, five car journeys each week would entail additional expenditure of £20, higher than the expenditure in absolute terms on public transport for all income groups\(^{129}\) and the expenditure on transport of families with a weekly income of up to £175. It would therefore amount to a substantial increase in the proportion spent on transport by higher-income families, to the extent that the increase would be less than a third of the total only in the case of families with a weekly income of over €375.

Banister proposes various solutions, of which those which do not have an effect on transport habits are as follows: increasing families' income\(^{130}\) by at least £1 000 per annum or restructuring (a euphemism for reducing) their expenditure at the expense of other items such as food and accommodation, which does not seem acceptable.

On the technical side, which is of particular importance for the question of fair treatment of residents and non-residents, a key issue is to ensure that the collection of charges does not lead to further congestion and bottlenecks.

Taxing mobility usually fulfils two different purposes: regulating traffic in urban areas and financing major transport routes. However, the situation is not so clear cut - for example, the financing objective is increasingly pursued even in the case of urban infrastructures. The latter are the most problematic when it comes to taxation, in terms of the systems used and the technical means employed, and the following sections of this chapter will therefore concentrate mainly on the solutions devised for urban areas.

These fall into two main categories - use-related and non-use-related. The latter are calculated on the basis of the categories of potential road users, such as residents of certain areas, business operators, traders, etc. It is difficult to give a comprehensive definition of these forms of taxation.

\(^{128}\) D. BANISTER United Kingdom in 97th Round Table on Transport Economics, Paris - ECMT: 1994, pp. 131-133.
\(^{129}\) Ranging from a minimum of £1.54 to a maximum of £15.76.
\(^{130}\) Which could be achieved by applying the principle of fiscal neutrality through a reduction in income tax (Author's note).
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but it can be said that they generally fall into the category of contributions, if not indirect taxes, and appear to be intended to to provide revenue rather than to regulate traffic.

Use-related taxes** are most suited to the purpose of internalizing external costs and limiting traffic, and can take several forms, the most simple and widespread of which - but also the most atypical, in that it does not directly affect mobility - is the payment of parking fees which, as the name suggests, are charged for leaving a vehicle in a given area.

3. Fee-charging car parks

The first experiments with taxing urban infrastructures involved car parks, with the aim of discouraging the use of cars to travel to work, so that people would leave their cars unused all day until they came home. Parking fees, which are easily collected, represent a work-related cost which, beyond a certain point, induces people to stop using their cars. As traffic in town centres is heaviest just before or just after office-closing times, charging fees can lead to a reduction in peaktime traffic.

To be effective, parking fees must be charged at the market rate and based on such parameters as the property value of offices, laboratories and shopping centres in the area in question, which would result in considerably higher rates than those normally charged. However, an alternative to this pricing method could be the different types of parking used in Paris, where a distinction is made between nighttime parking, daytime parking, temporary parking and goods parking. Nighttime parking is typically required by residents, and should not be discouraged, as there is a need to ensure that the city centre does not become deresidentialized. This type of parking, which covers not only nighttime but also the whole weekend, is therefore free. Daytime parking is typically required by those going to work in the city centre and, as it is of long duration, it must be discouraged by various means, including very high fees for stays of over two hours. However, for the same reasons which apply to nighttime parking, it is also necessary to encourage residents, who are therefore allowed to park their cars in a residential area for a daily fee of FF 15. For stays of less than two hours there is temporary parking, which is typically required by those visiting the area for shopping or entertainment purposes. Such visitors are essential in order to keep the area "alive", and should not therefore be discouraged. As they cannot be distinguished from other users, the overall purpose can be achieved by charging parking fees in relation to the length of stay, with a sharp increase for

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*(131)* A particular form of non-use-related taxation is the versement transport calculated on the basis of the wage mass of employees. This versement is applied in some towns and cities in France.

*(132)* One school of thought (for example, H.D.P. POL in his paper The Netherlands in 97th Round Table on Transport Economics, op. cit., p. 73) classifies infrastructure-related taxation arrangements into two subcategories: taxes on the total journey travelled and taxes on certain stretches of the journey. The former include motor fuel taxes and vehicle taxes. In line with the notion of infrastructure taxes used in this working document (see section one of this chapter), such charges cannot count as taxation of infrastructure and therefore the above-mentioned distinction is not taken into account. According to that distinction, the taxes referred to hereafter in the text are levied on certain stretches of the journey.

*(133)* A car is used for between 48 and 72 minutes a day on average and is parked for between 5 and 6 hours a day on average in a place other than a person's home. These figures, which probably refer to the United Kingdom, are taken from D. BANISTER United Kingdom in 97th Round Table on Transport Economics, op. cit. p. 125.

*(134)* Ibid. p. 125.
stays above two hours. Other reductions must be applied in the case of goods parking, which is necessary for the economic life of the city centre.135

However, charging fees for parking has not yielded the desired results, as in many countries employers have ended up footing the bill for parking and, in some cases, traders provide parking for their customers. Even where this has not happened, fee-charging parking has its limitations. Firstly, it has no effect on transit traffic, nor does it discriminate between those who use a congested street and those who use an uncongested street, and so does not influence users’ travel habits, which is nevertheless one of the objectives of urban traffic policies. From a strictly economic viewpoint, it does not internalize the costs of road infrastructure, unless parking fees are particularly high or rates are differentiated according to the length of the stay in such a way as to penalize those coming into the parking area using the road network during peak times.

Despite these considerations, the charging of parking fees is the most widely used instrument for taxing urban infrastructure. It is the preferred option of city authorities because of the ease with which the charge can be collected and its fairness, in that it applies not only to the residents136 of central districts but to anyone going there. Lastly, it is an embryonic form of fee-charging zone.

4. Fee-charging zones

This is a scheme involving a restricted area, access to which is conditional upon payment of a toll, which may vary depending on the time or distance travelled within the area, or a user charge entitling users to unlimited access for a given period of time. Like the use of parking fees, this form of taxation has the advantage of fairness and offers other advantages, including a more direct link with the actual use of the infrastructure and, in particular, a direct effect on all forms of traffic, including transit traffic.

There are, of course, disadvantages to this system which are outlined by Banister137, who is critical of, if not opposed to, such a tax. They include the risk that economic activities may shift away from town centres, with a subsequent loss in property values. This would lead to a development of out-of-town areas, in that businesses driven out of the town centre would set up on larger sites. There would therefore be a greater need to travel to and from these areas, and energy consumption would therefore increase. This would also have repercussions for the public transport network, which would have to provide extensive coverage of a wider area. In other words, fee-charging zones would shift congestion to other places, which Banister believes could be avoided by establishing a flexible zone whose boundaries could be adjusted depending on the degree of congestion.

These criticisms, which point to a way round the disadvantages, are not at all convincing. In particular, past experience of fee-charging zone schemes has not so far provided any evidence of substantial shifts in economic activities towards out-of-town areas, although this could be the result

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136 Indeed, it can be said that charging fees for parking actually favours residents if, as often happens, they are granted reductions on or even exempted altogether from payment of such fees.
137 United Kingdom. op. cit. pp. 136-138.
of setting rates too low. Even if massive relocation were to occur, the larger area used by businesses should avoid congestion and therefore enable vehicles to be used more efficiently in terms of energy consumption, which would offset the increased consumption due to the greater distances to be travelled. The same is true of public transport.

In Norway\textsuperscript{130}, where fee-charging zones have been introduced more widely than anywhere else, such schemes are the responsibility of local authorities and are basically aimed at raising money for the financing of new infrastructures\textsuperscript{130}. This is backed by the central government's commitment to transferring funds for the same purpose which match the revenue thus raised. However, the general public proved hostile to the scheme, probably because the implementing arrangements did not ensure equal treatment of residents and non-residents (which such a charging system is meant to do), so that residents were penalized, and also because, for topographical reasons, it was not possible to levy charges on all journeys in Oslo.

The subsequent traffic improvements have led to a change of heart among the general public\textsuperscript{131}, although they have probably not quite lived up to expectations. There has been little change for the better as far as peak-time traffic is concerned, and this is due to the low rates charged, the lack of any differentiation based on length of stay and, above all, because there have been several rate reductions. In all, traffic has decreased by around 5-6\%. However, the scheme has been highly satisfactory in financial terms.

A form of user charge for a given zone is applied in Singapore, which operates an interesting and highly detailed \textit{Area Licensing Scheme (ALS)}\textsuperscript{140}. Naturally, the relationship between the fee levied and actual use is less direct in a scheme involving user charges for a given area, but collection of such charges is easier.

5. Taxation using tolls

A third system of taxation, which is more easily applicable even to extra-urban transport, is the taxation of individual stretches of road or road infrastructures, usually by means of tolls. This is the system of taxation most widely used on European motorways. In Norway, this has included fee-charging zone schemes, so that the access routes to large cities are also subject to taxation.

In terms of its relation to actual infrastructure use, this system of taxation is the most suitable, and is therefore most faithful to the principle of internalizing external costs. It does not discriminate between residents and non-residents or between national and foreign motorists in non-urban transport and, furthermore, as it is directly linked to infrastructure use, it is a very good means of

\begin{itemize}
\item \textsuperscript{130} The section on Norway is based on the text by A. HERVICK and S. BRATHEN. \textit{Norway...}, op. cit. pp. 24-25.
\item \textsuperscript{131} The relevant tax revenue is therefore earmarked for a specific purpose.
\item \textsuperscript{140} However, the improvement in the traffic situation in Oslo appears to be due more to the opening of a new tunnel, which has considerably reduced bottlenecks.
\item \textsuperscript{141} The Singapore \textit{Area Licensing Scheme} is part of a complex system of road transport taxation which, in some respects, would be incompatible with certain principles enshrined in the constitutions of European countries - for example, the restrictions on ownership, whereby the purchase of a car is subject to administrative authorization based on a quota system. However, one measure which has aroused interest in Europe is the exemption from tolls of cars carrying at least four passengers.
\end{itemize}

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influencing users' behaviour when it comes to choosing journeys\(^\text{142}\). By modulating traffic in space (mostly the distance travelled) and in time (the number of hours, particularly for urban infrastructure)\(^*\), demand is adjusted to supply by means of market rather than regulatory mechanisms.

One interesting example is to be found in the Netherlands, where the Transport Minister recently proposed to introduce a toll for access to the centre of large cities such as Amsterdam, Rotterdam, Utrecht and The Hague between 6 a.m. and 10 a.m. The scheme, which is due to come into force in 2001, is expected to reduce traffic by 15% and, by way of compensation, the circulation tax will be reduced\(^\text{144}\).

The financing difficulties experienced by the Community Member States and the industrialized countries in general mean that private capital is increasingly sought when it comes to building new infrastructures\(^\text{145}\). To that end, tolls are a means of achieving a return on private capital, where the infrastructure is operated under a concession scheme, or of recouping the investment if the infrastructure is financed using public money. It is precisely for the latter reason that the public authorities are so interested in toll schemes, but, if too much emphasis is placed on this aspect, there is a risk that toll rates will be determined with financial objectives in mind rather than with a view to internalization, to the detriment of the latter.

Juggling the twin objectives of money-raising and influencing users' behaviour can be summed up thus: in order to have a real influence, the toll must be sufficiently high to discourage use of the route which needs to be "decongested" by inducing motorists to change their habits. If the toll is also aimed at recouping the investment in the infrastructure, however, it must not be so high as to reduce traffic as that would reduce the infrastructure's profitability\(^\text{146}\). Moreover, a drastic reduction in traffic on congested roads can lead to congestion on toll-free roads.

The central problem of any toll policy is therefore to decide on the optimum toll rate for achieving the desired objectives while ensuring that this does not have negative repercussions for other sections of the road network. Modulating traffic patterns over the course of the day can help to balance these different requirements. Where different authorities or different operators are responsible for competing infrastructures, it will be necessary to coordinate their pricing policies.

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\(^{142}\) The Commission's Directorate-General for Transport has launched the Eurotoll project, which will begin in 1998 using both theoretical and empirical (the study of specific cases) methods and analyse the effects which tolls have on transport demand, behaviour and, in particular, price elasticity and the segmentation of demand, acceptability criteria and the socio-economic impact of different toll rates.

\(^{143}\) An experiment is under way on a French motorway (the A 14) for a further modulation in traffic—namely, exempting cars used in car-sharing schemes from payment of tolls. On the basis of a subscription, one daily return journey from Mondays to Fridays is free of charge for cars carrying at least three people.

\(^{144}\) According to various newspaper reports in the Netherlands on 4 July 1997. The Dutch scheme will be dealt with in more detail in section 7 of this chapter.


\(^{146}\) The problems of the profitability of a given infrastructure for a private investor were examined in Chapter VI (section 8 in particular) of the EP (DGIV) paper The financing of trans-European transport network. op. cit.
6. **Community legislation**: tolls and user charges in general

The notion of user charges and tolls under the directive on the charging of infrastructure costs has already been illustrated, and on that occasion we discussed the various infrastructures to which such charges apply. The principles enshrined in the directive on the charging of infrastructure costs are as follows:

- **the incompatibility** between user charges and tolls, except in the case of tolls levied on bridges, tunnels and mountain passes on sections of the network subject to user charges;

- **non-discrimination** between carriers on national grounds, except in the case of user charges imposed on motor vehicles registered in certain disadvantaged Member States under a common system and, following consultations with the Commission, special arrangements for traffic in border areas;

- **proportionality** of rates, which are linked to the duration of use in the case of user charges and the costs of building, operating and developing the infrastructure network in the case of tolls. In the case of user charges, an upper limit of 1 250 ecus is also set, within which national rates may be set in relation to the national vehicle tax;

- **interoperability** (which will be looked at in more detail in the next section), which consists of two different factors: the procedures for applying and collecting infrastructure taxes must be such as to cause as little hindrance as possible to the free flow of traffic, and the Member States must cooperate to establish methods for hauliers to pay user charges outside the Member States in which they are applied.

A Member State may provide that vehicles registered in that State shall be subject to user charges for the **use** of the whole road network, on the basis of annual rates alone.

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(14) See Chapter III, section 7, for an outline of the background to and general aspects of Directive 93/89/EEC.

(148) See section 1 of this chapter.

(149) The principles and special arrangements governing user charges for vehicles registered in the Member State imposing the charges are set out in Article 7 of the directive.

(150) This is a temporary derogation in force until the end of 1997. The common system of user charges will be examined later.

(151) The derogations in question are provided for in Article 8(e) and Article 9 respectively (Directive 93/89/EEC).

(152) Therefore without being limited to use of infrastructures, as illustrated earlier in section 1 of this chapter.
7. **The proposal to replace the existing Community directive**

The Commission's new proposal introduces two major changes in respect of user charges, namely, *sensitive routes* and *new charging criteria*.

**Sensitive routes** are infrastructures on which there may be particular traffic congestion, according to the criteria usually used, or where the traffic may have particularly adverse effects on the environment according to the criteria laid down in Article 2 of the directive on *ambient air quality assessment and management*. Sensitive routes must also have adequate rail and inland waterway transport services to which operators must have open access, and measures must be taken to combat atmospheric pollution along those routes. Sensitive routes are designated by the Member States, which inform the Commission of the reasons why they are thus sensitive, the method of calculating the user charges and tolls imposed and the measures taken to combat the causes which have led to them being designated as "sensitive".

Sensitive routes are an extension of the principle of applying tolls and user charges which fully achieves the environmental objectives of the sustainable economy and also adds an environmental dimension to a directive whose fundamental aim was more obviously to avoid distortions of competition among the haulage operators of the various Member States.

In line with the general underlying principle of the new proposal to link charges more closely to external costs, the maximum rates for user charges are set so as to link the classification of a vehicle within the "Euro" categories with the damage caused to the road surface. This in turn is based on classifying three types of damage depending on the vehicle's suspension system, the number of axles and the maximum permissible gross laden weight. Based on that mechanism, the maximum rates for user charges vary from 750 ecus annually for Class One "Euro" vehicles to 2 000 ecus for Class Three "non-Euro" vehicles. The proposal also introduces minimum rates (half the maximum rates), and establishes the amounts of the monthly, weekly and daily rates in proportion to the annual rate. It is also possible on sensitive routes to impose a daily user charge, where this is duly justified, of up to 15 ecus provided no tolls are imposed on those routes.

The proposal also introduces changes to the criteria governing tolls. The generic link to the cost of constructing, operating and developing the infrastructure is replaced by the criterion of setting tolls at a level such that the revenue thus generated does not exceed those costs plus a rate of return equivalent to that which can be realized by similar investment projects and to the internalization of external costs at a maximum rate of 0.03 ecus per kilometre, or up to 0.5 ecus per kilometre in the case of sensitive routes.

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153 See Chapter III, section 8, for an outline of the general aspects of the proposal which is still under consideration.
155 See Chapter III, section 8.
156 See Annex 2 of the proposal (COM(96) 331).
157 1/12, 1/50 and 1/250 respectively.
The general approach to the question of user charges and tolls reflects the wishes expressed in a European Parliament resolution\(^{(159)}\) which called for "**differentiation of user charges for HGVs as a function of the damage they do to the roads and the atmospheric emissions they produce**" and, as far as sensitive routes are concerned, "**higher charges for the financing of alternative solutions**"\(^{(160)}\). However, the European Parliament also called for such routes to be designated by Community law\(^{(161)}\).

The explanatory statement of the report\(^{(162)}\) on the proposed directive echoes Parliament's previous position and considers that the internalization of external costs in toll systems cannot be achieved unless internalization criteria have first been laid down at Community level. The report is generally in favour of extending the system of user charges, allowing Member States to exceed the maximum rates.

### 8. The common system of user charges

With a view to interoperability, the directive stipulates that two or more Member States may set up a **common system** of user charges which other Member States may join. This system shall be subject to the principles described earlier and shall apply to the network of all the Member States, which shall share the income from the user charges in accordance with predetermined criteria. The new proposal makes no changes to the rules governing the common system.

Even before the entry into force of the directive, five Member States\(^{(163)}\) have signed an agreement which essentially complies with the principles of the common system and establishes user charges on an annual, monthly, weekly and daily basis, and lays down rules governing the allocation of the income in a manner which is simple but which probably does not really reflect the actual use of the various national sections of the network. The income is divided in accordance with three criteria which apply, respectively, to user charges levied in each participating state on the vehicles registered in that state, user charges levied in each state on the vehicles registered in the other states which are members of the scheme (which are deemed to be the proceeds of the state which collects them\(^{(164)}\)) and user charges levied in states which are not members of the common system, which are allocated according to a fixed system\(^{(165)}\). Belgium, Denmark and (in the case of motor vehicles used by transport undertakings) Luxembourg have made use of the right to impose annual user charges only on vehicles registered in their country.

The agreement has been considered a success, to the extent that Sweden and Finland are thinking of joining, but the **common** system of user charges should be seen as an intermediate stage leading

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\(^{(160)}\) Ibid., paragraph 23.

\(^{(161)}\) Ibid., paragraph 23.

\(^{(162)}\) A4 0243/97 of 4 July 1997.

\(^{(163)}\) Germany, Denmark and the three Benelux countries.

\(^{(164)}\) The two criteria are kept separate, as in the case of the second criterion, a provision exists whereby the share due to each state may be subject to rectification depending on the number of kilometres travelled by the respective vehicles on the network of the state in which they are registered. In practice, however, this provision is rarely applied.

\(^{(165)}\) 1% for Luxembourg, 4% for Denmark, 9% for the Netherlands, 13% for Belgium and 73% for Germany.
eventually to a more integrated system which applies throughout Community territory and which corresponds more closely to the real use that each user makes of the roads. This basically means gradually replacing user charges by tolls. If this is to be achieved, greater harmonization of rates and the general rules is needed and payment systems must become genuinely interoperable, inter alia by using properly developed technologies.

9. Interoperability of payment systems: the contractual side

Earlier on tolls were described as the taxation of individual sections or infrastructures of the road network. This definition applies very well to urban tolls and is an accurate reflection of the current situation on the extra-urban road network, but the advantages of tolls would appear to lie in a system of network tolls, which requires the payment and collection systems used by the various infrastructure operators to be interoperable.

Toll systems must be interoperable at three levels: the contractual, procedural and technical levels. The first of these consists in drawing up a common strategy to be applied by the various operators and authorities as regards the services provided for users and the information to be managed in common. The second and third concern the technological side.

As far as the contractual side is concerned, the requirements of the users and the operators must be borne in mind. The former require continuity of service, i.e. to be able to go from one infrastructure to another irrespective of the number of different operators involved (infrastructural interoperability) and of the particular situations, which must not prevent or be a hindrance to use of the infrastructure (functional and temporal interoperability), choice of the form of payment and privacy, i.e. the payment system must not be used as a means of monitoring users' movements.

The operators, for their part, require security of income, i.e. a system which guarantees that the proceeds from the tolls are properly and quickly distributed between the operators, and autonomy in all matters pertaining to the payment and collection of tolls.

Lastly, both parties require certainty in the transaction, i.e. the guarantee that neither of them is the victim of fraud through avoidance of payment, user substitution or incorrect payment of the toll.

Of all these various requirements, the choice of the form of payment deserves to be looked at more closely, as it ties in with that of certainty in the transaction. A distinction may be made between forms of payment based on the time of payment in relation to use of the service: immediate payment, advance payment and deferred payment.

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(166) For this analysis of the agreement on the common system the author has drawn on the text of the lecture entitled Accord relatif à la perception d'un droit d'usage pour l'utilisation de certaines routes par des véhicules utilitaires dans le cadre de la Directive 93/89/CEE du 25 octobre 1993 given by D. VAN VRECKEM, head of unit at the Commission, on 20 June 1997 at the annual congress of the Academy of European Law in Trier.

(167) This section is based on J. CAMUS L'interopérabilité des systèmes de télépéage en Europe in Autoroutes à péage en Europe, a section of the "Revue Générale des Routes et Autoroutes" 19 May 1997 (No. 751). pp. 21-25.
Immediate payment consists in paying at the very moment at which the user begins or ends his use of the infrastructure. This is the most typical form of toll, and may be effected even with unsophisticated technology. It has the advantage of guaranteeing the user's anonymity and certainty in the transaction.

Advance payment consists in acquiring the right of use (through a flat-rate subscription, for example) or purchasing cards, tokens, etc. entitling the holder to future use of the infrastructure. Here there is less certainty in the transaction, in that the cards or tokens may be stolen or forged, although anonymity is fully guaranteed.

Deferred payment consists in recording the occasion on which the infrastructure is used, billing the user and collecting payment from an account. It is a form of payment whose mechanism is similar to that of credit cards and does not guarantee anonymity or absolute certainty in the transaction or guard against possible fraud through user substitution.

Although it is technically possible to operate different prices, the author believes that there should be, if not a single rate for homogeneous infrastructures, at least a common pricing policy involving not only uniform methods of payment but also uniform criteria for setting the road network toll.

10. Technologies for the taxation of infrastructures: procedural and technical aspects

Technology is a crucial element when it comes to charging for the use of infrastructure, even leaving aside the question of interoperability, since such charging depends largely on the effectiveness of tolls, not only in terms of the costs of collection, which in some cases have proved so high as to equal the income generated, but also in terms of the traffic. It is necessary to ensure that traffic is not slowed down as, on busy stretches, this can lead to bottlenecks and congestion, thereby producing the very effects which charging for transport is meant to avoid. Tolling systems technology must therefore be directed at ensuring an efficient collection system, i.e. one which reduces fraud to a minimum, costs very little to run and does not hinder traffic. Clearly, the problems involved are different depending on whether tolls are being collected for extra-urban or urban traffic.

The technology traditionally used on motorways consists of entry and exit barriers. At the entry barriers tickets are distributed, generally by automatic ticket machines, to the vehicles passing through indicating the particular barrier at which the user began to use the infrastructure and any other information needed for the purposes of paying the toll. At the exit barriers the toll is calculated and collected generally by means of automatic equipment of varying degrees of sophistication. Staff are present at both types of barrier to monitor the operation of the system and intervene if problems arise.

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(168) The account may be administered by the operator or the user. In the former case, money will be paid into the account periodically by the user, giving rise to a hybrid form of payment in the sense that it will be preliminary as regards the deposit and deferred as regards the collection of the charge. In the latter case, a proper credit card is used.

(169) With electronic fee collection systems which record the passage of a vehicle by means of codes transmitted by on-board equipment there is a risk that the equipment can be manipulated in such a way that it transmits the codes of other users.

(170) Including criteria for differentiating rates depending on vehicles (power, weight, dimensions, emissions, etc.) and use (distance-based or time-based).
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occurs. Under this system vehicles must slow down and stop for the time needed to carry out the operations. The traditional system of tolls payment generally includes various forms of subscription which mean that users do not have to perform the necessary operations at every toll station but instead can pass through special, faster barriers where they are required to slow down only for the time it takes to check, by human or electronic means, whether they have a valid subscription. This adjunct to the traditional system means that the latter is probably still the most suitable system for infrastructure tolls.

Electronic fee collection (EFC) is the developing telematics- and informatics-based technology which allows for the interoperability of payment systems and means that no time is wasted (or at least very little time is required) in collecting tolls, and hence that queues are avoided. It is therefore essential for fee-charging zones in urban centres, where there is a particularly high risk of congestion.

In the previous section we mentioned the different aspects involved in the interoperability of toll payment systems and talked in particular about the contractual side, i.e. the definition of an integration strategy. The procedural aspect concerns technology and involves planning the structure of the system, i.e. the ways of processing the information needed in order to operate the system, while the technical aspect involves the choice of software and hardware.

The key issue in planning an interoperable system is the single-standard roadside-vehicle communication, which is currently the subject of the Community-funded VASCO research project. The communication standard actually dictates the extent to which the payment system is convenient for the user, i.e. the complexity of the manoeuvres which the motorist is required to carry out in order to be identified by the system at the barriers. Three standard solutions are proposed in this connection:

- **multi-lane no-stop EFC system** which does not require any manoeuvre;

- **dedicated no-stop lanes** which require vehicles to drive along a particular lane during which identification takes place;

- **dedicated lanes with stopping-points** which require vehicles to drive along a particular lane and to stop briefly to enable the driver to insert his card into an automatic reader.

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(171) One variation consists in paying tolls for stretches of a given route. In that case, the barriers are located along the motorway and the toll is charged on the basis of the distance travelled since the previous barrier. As well as reducing the link with the actual use of the infrastructure on the stretch in which the use began or ended, this method means that the number of queues to which the user is subject increases in line with the length of the total journey, and increases the queues formed when drivers join the motorway from access roads.

(172) The section on extra-urban electronic fee collection is based on J. Camus op. cit. and on Telematics applications for transport, a European Union publication for which no other references are given, which shows charts relating to the research projects under the framework research programme (1994-1998).

(173) Validation of dedicated Short-range Communications. The project is working on a standard drawn up by the European Committee for Standardization (CEN). As far as tolls are concerned, the Community also intends to develop a strategy for moving away from the existing systems and harmonizing the legal, institutional and financial framework and pricing parameters. In this connection, see the Commission communication on a Community strategy and framework for the deployment of road transport telematics in Europe and proposals for initial actions (COM(97) 223. point 3.2.
Clearly the first solution is to be aimed at, as it does not lead to any slowing down of traffic or any queues, which is even more important when it comes to urban infrastructures owing to the closer interconnection of roads.

It can be implemented by developing fixed installations but above all by developing on-board equipment for vehicles, the cost of which is expected to amount to 15-20% of construction cost by 2000. Suitable on-board equipment may make it possible to levy tolls without hindering traffic, but it is uncertain how acceptable it will be to motorists for economic reasons, either because of the cost of the equipment or because of the higher cost of a toll related to actual use as opposed to the more convenient user charges, where such charges exist.

There are currently several experiments under way in the Member States involving EFC systems. These are limited in terms of the number of users and, generally speaking, they are not fully interoperable. The Italian TELEPASS system, with 600 000 cards, is the most widespread in Europe and has the only centralized system of toll collection for all operators of the Autostrade company. In France TIS will make it possible to achieve genuine interoperability, enabling users to drive on the whole network and pay a single bill for all the stretches used irrespective of who operates those stretches.

An interesting experiment is the Dutch EFC scheme to be introduced in 2001 (when it is felt that the necessary technology will be available): "a small electronic device into which a smart card can be introduced will be installed behind the windscreen....The device communicates with equipment located on the entrance to the road. As soon as the car crosses the entry point, a sum is automatically deducted from the smart card's balance. The smart card memorizes the various payments so that the motorist has electronic proof of payment. In the event of failure to pay, for example if the balance on the smart card's account is insufficient, the car number-plate is recorded on video." The problem of "alternative methods of payment for those who do not travel regularly on EFC routes, for example, tourists" is not settled.

This scheme therefore involves a deferred payment system using an account administered by the operator and has the advantage of ensuring anonymity.

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(175) A. HERVIK S. BRAATHEIN op. cit., p. 25 which refers to the experiment in Oslo where there were problems in abolishing season tickets for access to the fee-charging zone and replacing them by a toll payable by electronic systems.

(176) There are 8 different local EFC systems in France which have distributed a total of 230 000 cards.


(178) MINISTERIE VAN VERKEER EN WATERSTRAAT *Rekening rijden*, Informatieblad 19 of September 1996. The question of occasional users is not raised in the following issue of *Informatieblad* (No. 19A) and it has not been possible to ascertain whether the question has been settled since then. The author points out that the problem would not arise if payment systems were made uniform at Community level.

(179) See section 6.
CONCLUSIONS

1. **Deciding on what tax instrument should be used to internalize costs**

The introduction asked the question: *can the internalisation of external costs best be achieved by taxing vehicles, fuel or the use of infrastructure?*

When looking at each type of tax we have discussed both their advantages and disadvantages.

The circulation tax has the advantage of **high elasticity** of the motor vehicle market" and **simplicity** when it comes to levying the tax, but **bears little relation to actual use** as the link between the vehicle and the tax is based on **nationality**. It should be pointed out, however, that elasticity concerns the purchase of motor vehicles, and when the purchase has already taken place it has no effect on the use of the tax and hence on the level of emissions, at least not to any significant extent.

The basic advantage of taxes on motor fuels is the **proportionality** of the charge to actual energy consumption, which approximates fairly well to emissions of toxic substances into the atmosphere. It can also be said that excise duties are **simple** to levy.

However, like vehicle taxes, excise duties are a **distortion of proper charging of costs** in line with actual use where refuelling takes place in a country other than that in which most of the journey is made. However, the greatest disadvantage of excise duties on motor fuels is probably the fact that such duties **take no account of the fuel-efficiency of vehicles**, which are **all indiscriminately taxed irrespective of their efficiency**, they lead to **distributional inequity** as they mainly affect the less well-off and they result in the **territorial penalization** of regions which are less well-served by public transport as an alternative to private cars. Indeed, a proper application of the sustainable economy theory does not agree with the Commission’s assessment that the latter two effects are

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(180) See Chapter III, section 4.
(181) See Chapter I, section 1.
(182) See Chapter III, section 3.
(183) See Chapter III, section 5.
(184) See Chapter IV, section 3.
(185) See Chapter IV, section 3. As illustrated in that section, such distortion in the charging of actual costs can also occur within a given country.
(186) See Chapter IV, section 6.
(187) In fact the taxes are differentiated depending on consumption, but equivalent levels of consumption can lead to polluting emissions.
(188) See Chapter IV, section 6.
disadvantages\(^{(189)}\), in that the road user produces environmental damage and uses infrastructure irrespective of his social condition or the degree of transport in the region in which he travels\(^{(190)}\), and the external costs he causes must be correctly charged to him. The sustainable economy theory maintains that fiscal neutrality is the answer to any objections about such disadvantages\(^{(191)}\).

Taxing infrastructure use has the undeniable advantage of being a means of passing on external costs more correctly in differing degrees in the form of user charges and tolls, which allow for the tax to be related exactly to actual use. The problems raised by such taxes are legal, being identical or similar to the problems discussed earlier in respect of taxes on motor fuels, and technical.

The legal problem concerns the compatibility of such taxes with the constitutional principle of freedom of movement. At Community level, recognition of environmental protection as an EU objective gets round this problem but, as far as national law is concerned, each state must solve it in accordance with its own legal system. The obligation to implement Community directives may help to solve the legal problems at national level.

We discussed the question of distributional equity when looking at the studies made by D. Banister\(^{(192)}\). Here again, the answer lies in a correct application of the principle of fiscal neutrality. There is also the question of discrimination between residents and non-residents, which mainly involves user charges in urban areas but could also apply to non-urban areas if user charges were more generally applied\(^{(193)}\). This is similar to the problem of territorial penalization, which was mentioned earlier. Here again, the answer might be to apply the sustainable economy theory and the principle of fiscal neutrality more strictly. However, fears that historic city centres might lose their distinctive character often leads municipal authorities to allow special exemptions or operate differentiated tariffs\(^{(194)}\).

The technical problem lies in the need to develop suitable technologies for levying the taxes, especially tolls (which are the best form of such tax), without slowing down traffic and creating congestion, in other words, without exacerbating the very situations the taxes are designed to redress. The technical issues were thoroughly discussed in the previous chapter, and we saw how research and development in this sector are at an advanced stage and how tolls may therefore be considered a feasible form of taxation in the medium term, probably around the start of the new millenium.

\(^{(189)}\) Commission communication entitled A Community strategy to reduce CO\(_2\) emissions from passenger cars and improve fuel economy - COM(95) 689, pp. 18-19.

\(^{(190)}\) See Chapter I, section 5 for the position which the sustainable economy theory propounds in respect of regional aid.

\(^{(191)}\) See Chapter II, section 5.

\(^{(192)}\) See Chapter V, section 2.

\(^{(193)}\) For example, if sensitive areas were designated.

\(^{(194)}\) See Chapter V, section 3.
Fiscal measures in the transport sector

The close link between tolls and infrastructure means that tolls are particularly suited to the internalization of infrastructure costs, which in any case already occurs under the current systems and in the case of tolls which are not actually a type of tax, where the infrastructure operator is a private entity. However, it is possible to introduce an environmental damage internalization component into tolls, which would certainly be in the nature of a tax, and this is the thinking behind the proposal currently under consideration by the Community institutions in that, in establishing the principle of a link between tolls, infrastructure costs and a normal profit margin, it also provides for a further element in the calculation consisting of the internalization, within certain limits, of the external costs. The "synallagmatic" nature of the principle of linking tolls to costs and the taxation component of the additional element in the calculation is therefore clear. It should be pointed out, however, that the limits which the proposal for a directive introduces for this element are incompatible with the proper application of the sustainable economy theory, which advocates complete internalization of external costs. If Community limits must be imposed the approach taken by the report of the European Parliament's Committee on Transport and Tourism is preferable in that it stresses the need for harmonization at Community level.

Naturally, the internalization of external costs cannot be achieved solely by means of tolls; instead it must be achieved by a mixture of tax measures of the kind discussed in this working document so as to balance out the various advantages and disadvantages. However, with a sustainable economy in mind, priority must be given to the method which ensures the most direct link with actual use of infrastructure. For example, user charges are the best way of ensuring that those living in a fee-charging zone or a sensitive area are not excessively penalized by such a tax, while motor fuel and vehicle taxes make it possible to internalize external costs for that part of the network which cannot be subject to charges.

2. Fiscal neutrality and Community harmonization

General application of the sustainable economy theory in the transport sector would lead to an increased tax burden not only for commercial operators but also for private users, which would be bad for economic growth. It should therefore be offset on the basis of the principle of fiscal neutrality which has been mentioned on several occasions throughout this document. However, this must not lead to budget rigidities, which might be the result if environmental taxes are offset by economic incentives. It follows that the widespread introduction of taxes on transport should implement the principle of fiscal neutrality through cuts in other taxes so that it can be incorporated painlessly into the system of taxation and, more generally, the system of public finances.

\[^{195}\] See Chapter V, section 7.
\[^{196}\] See Chapter V, section 7.
\[^{197}\] See Chapter II, section 4. It might seem at first sight as though compensatory incentives are not incompatible with the general purpose principle of state budgets which prevents budget rigidities, but if fiscal neutrality is to be properly applied this means that internalization levies should be fully paid back into the economic system, and thereby creates rigidities even if the general purpose principle is complied with.
It is on this basis that we repeat the second question raised in the introduction: *can the harmonization of taxes on transport play a significant role in providing an alternative revenue to that derived from other taxes, in particular taxes on labour?*

Our research does not allow for an answer to this question, which lies outside the area covered by this document in that it concerns the general structure of the tax system. However, the principle of fiscal neutrality according to the criteria outlined earlier means that the question of tax measures in the transport sector is linked to the more general issue of fiscal harmonization in the European Union now being discussed by the Community institutions.
1. Sources

The basic documents on tram-European networks policy are the acts of the various Community institutions which are usually available in all the Community languages.

Chief of these is the Treaty on European Union of which there are several editions. The edition used for the purposes of this working document is the version published by OOPEC entitled European Union, Selected instruments taken from the Treaties, Volume I, Luxembourg 1993.

The Official Journals of the European Communities contain the regulations, proposals for regulations and European Parliament resolutions. The references to each document quoted are given in the footnotes.

Various Commission communications already quoted in the document are of particular interest. The references are as follows:

- Communication on a Community strategy to reduce CO₂ emissions from passenger cars and improve fuel economy (COM(95) 689 final). This document is a brave attempt to tackle the vexed question of taxing carbon dioxide, an idea that has now been more or less abandoned, at least in the form advocated in the communication, which conceptually speaking, is a forerunner of the Green Paper mentioned below;

- Green Paper entitled "Towards fair and efficient pricing in transport" (COM(95) 691, which was also published by OOPEC in the series Bulletin of the European Union, Supplement No. 2/96 ISBN 92-827-7013-3. This is a crucial document which sets out the "state of the art" ideas on internalization and outlines the Commission's general approach to this matter;

- Communication on environmental taxes and charges in the single market (COM(97) 9), which outlines a recent decision on a highly sensitive issue similar to that dealt with in this working document. It provides a detailed picture of Community case-law in this field.

We would also draw attention to the Commission communication entitled The European Union's tax policy (COM(96) 546), which outlines the acquis communautaire and the Commission's policies in this area.

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(198) The Office for Official Publications of the European Community.
References to the European Parliament's resolutions are given in the footnotes. They are repeated here with a reference to the session document containing the explanatory statement of the report by the relevant committee\textsuperscript{199}.

For the decisions taken by the various European Councils we have used the press releases issued by the President-in-Office of the Council which are contained in the Bulletin of Activities of the European Parliament published by the EP's DGI.

2. Publications of international organizations

The literature used included several publications\textsuperscript{200} by the OECD and the ECMT\textsuperscript{201} - a sign of the interest which these organizations take in the subject in question:

- ECMT *Charging for the use of urban roads*, Report of the 97th Round Table on Transport Economics, Paris 1994 ISBN 92-821-1195-6. This contains three papers on the experiences in this field in Norway and the United Kingdom (Hervik and Braten, Banister) which were widely used in this document and a more general paper on the Netherlands by H.D.P. Pol;

- ECMT *Transport economics: past trends and future prospects*, Report of the 100th Round Table on Transport Economics, Paris 1995 ISBN 92-821-1208-X. This contains various papers on transport economics including one on *Environment, external effects and prices* which is of particular interest for this document;

- OECD *Environmental taxes in OECD countries*, Paris 1995 ISBN 92-64-14489-7. This document outlines the experiences of the OECD member states and naturally is not confined to the transport sector;

- OECD *Implementation strategies for environmental taxes*, Paris 1996 ISBN 92-64-14686-5. This supplements the previous study with an analysis of the problem and the various aspects of a comprehensive strategy of taxing external effects.

\textsuperscript{199} Session documents are not published.

\textsuperscript{200} All the publications listed here are available in both French and English.

\textsuperscript{201} European Conference of Ministers of Transport, whose secretariat is linked to that of the OECD which is therefore also responsible for distributing ECMT publications.
3. Theoretical and miscellaneous literature

The following papers are some of the most recent and important theoretical studies to emerge from the wide range of literature available on the subject:

- A. BONNAFOUS, *Coûts environnementaux de transport routier et tarification d'usage des infrastructures* in "Transports" 1994 (368), p. 406. This paper, which is quoted in Chapter I of our working document, gives a systematic analysis of the various external costs and the resulting effects on supply and demand;

- J. TOUBIANA, *Transport aérien et principe pollueur-payeur* in "Transports" 1996 (376), p. 127. This paper maintains that air transport plays only a small part in atmospheric pollution;

- R. PRUD'HOME, *Le coût économique d'une forte hausse de la fiscalité des carburants* in "Transports" 1997 (381), p. 5. This looks at the advantages and disadvantages of a rise in excise duties on motor fuels on the French transport market;


A special issue entitled *Aubroutes à péage en Europe* published by the "Revue Générale des Routes et Autoroutes" on 19 May 1997 (751) contains many different articles on the subject of infrastructure charging and provides an overview of the problems involved in operating toll systems, focusing particularly on the development of telematics payment systems.