
Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and its Member States

Final Report



in association with

CESAM

CLM

University of Gothenburg

UCD

IEEP

ECOTEC

13b Avenue de Tervuren

B-1040 Brussels

Tel: +322 743 89 49

Fax: +322 732 71 11

28-34 Albert Street

Birmingham B4 7UD

Tel: +44 121 616 36 00

Fax: +44 121 616 36 99

[Http://www.ECOTEC.com](http://www.ECOTEC.com)

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EXECUTIVE SUMMARY

(separate electronic document)

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ECONOMIC AND ENVIRONMENTAL IMPLICATIONS OF THE USE OF ENVIRONMENTAL TAXES AND CHARGES IN THE EUROPEAN UNION AND ITS MEMBER STATES

1.0 INTRODUCTION

This Draft Final report is being submitted by a consortium led by ECOTEC Research and Consulting and including Mikael Skou Andersen of CESAM (Denmark), CLM (Netherlands), University of Gothenburg (Sweden), University College Dublin (UCD) (Ireland), Stefan Speck, and the IEEP (Czech Republic). It is the second deliverable for the **Study on the Economic and Environmental Implications of the use of Environmental Taxes and Charges in the EU and its Member States** with DG ENV (Contact Ref: 34-3040/99/74628/MAR/B2), following Call for Tender Ref B1/ETU/980117).

1.1 Objectives

This study was launched in the context of the increasingly strong interest by policy makers across the EU in the use of economic instruments to address environmental objectives, and commonly raised arguments stating that taxes would have adverse impacts on competition and economic health.

This study explored whether taxes and charges have led to environmental benefits that the proponents of taxes would wish to see, and whether the concerns raised regarding competition are real. It therefore fulfils one of the Commission's intentions as noted in the 1997 Communication on Environmental Taxes and Charges.

As noted in the Terms of Reference (ToR) the key objectives of the study are to:

- 1. Offer a systematic collection of experience from Member States of Taxes and Charges.*
- 2. Carry out a systematic, in-depth, analysis of the environmental impact of the use of environmental taxes and charges within Member States.*
- 3. Carry out systematic analysis of the impact of environmental taxes and charges on the internal market; the competitiveness of European Industry; and employment.*

1.2 Scope and Definitions

1.2.1 Scope of the Study

The study called for analysis of taxes and charges, but excluded certain types of tax and charge from the study's scope. These were:

- Carbon and energy taxes and charges
- Fuel excise taxes;
- Vehicle taxes; and

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- Sulphur taxes.

Hence, we have focused on other environmental taxes and charges, covering the following pollution emissions, resource use and polluting products:

- Nitrogen Oxides (NO_x);
- Water Abstraction;
- Waste Water Discharge;
- Pesticides;
- Manure And Fertiliser;
- Landfill;
- Aggregates;
- Disposable Containers (Packaging); and
- Batteries.

The focus on these nine taxes and charge types has implications both for the methodology and the outcomes of the investigations since, as we shall see below, energy tax revenues generally represent a much greater share of GDP and total tax revenues than all other environmental taxes and charges combined.

The study has been carried out during 1999 and 2000 with the finalisation of this report in February 2001. The study analysis includes data where available and analysis of the situation up to 2000. Furthermore, the study has allowed a systematic collection and analysis of a wide range of different experience with the use of taxes and charges, offering both a broad overview of interest to general policy analysts as well as tax/charge specific in-depth analysis perhaps of interest to more selective experts. Readers are encouraged to view section 1.4 and the contents as a guide for which chapters will appeal to which audience.

1.2.2 Definition of Taxes and Charges

There is as yet no generally accepted definition of the term 'environmental taxes'. As the European Commission stated: '*In the area of environmental taxation, different meanings are often given to similar terms in different Member States, and no precise definitions are offered by EU legislation*' (EC 1997a, p.3). Hence, this is a somewhat problematic area, made more difficult by some of the technical language used, and the fact that different countries appear to work with different definitions. Below the key technical definitions are presented and explored, after which we present the study team's pragmatic conclusions as to what could be considered a working definition.

Different Definitions adopted to date

A communication elaborated by a working group consisting of experts from the European Commission, Eurostat and OECD defined an 'environmental tax' as 'a tax whose tax base is a physical unit (or a proxy of it) that has a proven specific negative impact on the environment' (OECD 1997 and EC 1997a). This defines an environmental tax by the 'tax

base'. An interesting aspect of this definition is that it takes no account of the intent of the tax. Hence, taxes which may be principally 'revenue raising' taxes are considered as environmental taxes under this definition – the intention is not regarded as important, even though it is likely to be important from the political point of view.

Further discussion of environmental taxes and charges, and the differences between the terms taxes, charges, fees, levies etc., can be found in a recent Eurostat publication (Eurostat 1999a) which emphasises that 'it is important to make the distinction between a tax as defined in the national accounts and other kinds of payments (e.g. fees) to general government'¹. From a national accounts point of view, taxes are compulsory, unrequited payments to general government. That is, a tax is clearly identified when the payment is compulsory (by the law), destined to the government and unrequited (i.e. without a counterpart flow)' (Eurostat 1999a, p.iii). Eurostat consider that the information related to taxes provided in public finance accounts on the one hand and the description of taxes in national text law (purpose of tax, tax base, etc.) on the other hand is relevant to the definition and identification of environmental taxes: 'The legal definition of taxes has an influence on how these can be used for environmental protection. The national accounts definition permits international comparisons and allows integration of tax data with the national accounts as well as with systems of integrated environmental and economic accounting' (Eurostat 1999a, p.iii).

Taxes and charges are not the same thing. The EC offers a characterisation of the two along these lines: 'The term "*taxes and charges*" should be understood to cover all compulsory, unrequited payments, whether the revenue accrues directly to the Government budget or is destined for particular purposes (e.g. earmarking)' (EC 1997a, pp.3-4). This EC publication also introduces the term 'levy' as follows '...the word *levy* will be used to cover "taxes and charges" ...' (EC 1997a, p.4). Under this definition, charges are implicitly defined as those compulsory unrequited payments for which there *is* a counterpart flow (since these are not taxes under the earlier EC definition). Charges are frequently used to cover the costs of the provision of specific services for which the revenue is intended. Environmental charges are those where the charge base is a physical unit, or proxy thereof, which is known to be harmful to the environment.

Environmental levies can also be classified according to the different functions they can perform. The classification used by Ekins and Speck (1999) distinguishes between the following types:

- *cost-covering charges*, whereby those making use of the environment contribute to or cover the cost of monitoring or controlling that use. The level of a cost-covering charge is determined by the service it is intended to deliver or the other purposes which the revenues will support.
- *incentive taxes*, which are levied purely with the intention of changing environmentally damaging behaviour, and without any intention to raise revenues. Indeed, the success of such

¹ The definition of taxes as unrequited payments to general government attracts special attention in some of the Central and Eastern European Countries that aim to join the EU since revenue generated from emission levies is earmarked for extra-budgetary funds (Environmental Funds). We return to this in Chapter 3.

a tax may be judged by the extent to which initial revenues from it fall, as behaviour changes.

- *revenue-raising taxes*, which may influence behaviour but still yield substantial revenues over and above those required for related environmental regulation.

Clearly these three types of environmental tax are not mutually exclusive: a cost-covering charge may have incentive effects, as may a revenue-raising tax, or the revenues from a revenue-raising tax may be partially used for related environmental purposes. This is where the distinction between taxes and charges becomes somewhat blurred. Strictly speaking, a charge should be used to provide a service in proportion to the charge payment, so the term ‘user charges’ is appropriate. Charges where revenue never enters the general budget but is earmarked for other purposes also exist, and it would seem that these differ from environmental taxes principally in the original destination of the revenue.

Another useful differentiation between environmental taxes is whether they are applied to emissions or products. Those in the former class are ‘payments that are directly related to the real or estimated pollution caused, whether emitted into air, water or on the soil, or due to the generation of noise’ (EC 1997a, p.4), while the latter ‘... are applied to raw materials and intermediate inputs, such as fertilisers, pesticides, natural gravel, and ground water, and on final consumer products such as batteries, one way packaging, car tyres and plastic bags’ (EC 1997a, p.4).

Study definition

It is clear from the above discussion that taxes and charges are different, though their clear definition is still somewhat blurred by the fact that different countries use different terms to describe otherwise similar instruments, and the terms are often used inter-changeably. In this study, we try to use the term “taxes” where the revenues go to the general budget, and “charges” where they raise revenues that are earmarked for a particular use, used for specific service provision, or for other activities when the revenue is not intended to reach the general budget. To facilitate presentation, we also use the term ‘levy’ to refer to both taxes and charges. Furthermore, where pertinent, we make reference to whether they are cost-covering charges, revenue raising taxes or incentive taxes.

1.3 Brief Overview of Methodological Approach

To obtain the required insights to fulfil the above objectives, the study has adopted a three tier analysis, with the first Tier (Tier 1) providing an overview of the use of taxes and charges. This provides the context for the main study analysis presented in Tier 2. Tier 2 provides a more detailed assessment of 9 types of taxes and charges, as noted in the proposal and agreed with the Steering Group. Some of the Tier 2 analysis highlighted the areas in three taxes/charges that could valuably be explored in yet greater depth. This more in-depth analysis is presented in Tier 3.

Chapter 2 presents the issues covered in the analysis and the method adopted in detail. A common analysis method was adopted for all taxes and charges to allow comparability across levy types. The work built on existing evaluations of taxes and charges, available information on levy rates, revenues and impacts, and included significant new analysis through qualitative and quantitative analysis of this data complemented by selective stakeholder consultation.

1.4 Structure of the Report

Tier 1

Chapter 2: Study Methodology and Tax / Charge Coverage

Chapter 3: Overview of Environmental Taxes and Charges in the EU

Chapter 4: Overview of The Use Of Economic Instruments In Central And Eastern European Countries (CEECs)

Tier 2

Chapters 5 to 13 provide insights into the use of the taxes / charges (levies) in the EU by type, and assessments of the levies in two to three Member States, as well as a brief summary of the levy specific conclusions on environmental effect, internal market, competition and employment aspects where possible. The chapter structure is as follows:

Chapter 5: Nitrogen Oxides (NO_x) Taxes and Charges

Chapter 6: Water Abstraction Charges;

Chapter 7: Waste Water Charges;

Chapter 8: Pesticides Taxes;

Chapter 9: Manure and Fertilisers Taxes;

Chapter 10: Landfill Taxes;

Chapter 11: Aggregates Taxes;

Chapter 12: Taxes / Charges on Packaging (Disposable Containers); and

Chapter 13: Taxes / Charges on Batteries.

This is followed by a summary chapter (Ch 14), presenting an overview table for each issue addressed (levy rates, impact on sectors, price effects, revenue raised etc) in Tier 2. These tables hopefully facilitate cross-levy comparison.

Tier 3

Chapters 15 to 17 include the more detailed investigations of the taxes chosen for this analysis, structured as follows:

Chapter 15: UK Landfill Tax

Chapter 16: German Waste Water Charge

Chapter 17: Danish Pesticides Tax

This is followed by Chapter 18 that presents the study conclusions, building on the insights from all three tiers of analysis.

Finally, separate annexes present the bibliography (Annex 1), a detailed description of the tier 2 analysis framework (Annex 2) complementing Chapter 2. Annex 3 presents a coverage of experience with levies in the Czech Republic, complementing Chapter 3. Finally Annex 4 provides some additional supporting discussion on the Quarry Products Association (QPA) voluntary initiative that was the alternative to the finally adopted tax - to the Tier 2 UK Aggregates tax discussion (see Chapter 11).

2.0 STUDY METHODOLOGY AND TAX COVERAGE

2.1 Introduction and tax coverage

This chapter presents a summary of the methodology adopted for the study and the coverage of taxes and charges. As explained in Chapter 1, the study has adopted a three-tiered approach to the analysis to obtain the required insights to fulfil the study objectives:

- **Tier 1:** a general overview of all taxes and charges in the EU, complemented by a comparative comment of the situation in Central and Eastern European Countries. This is presented in Chapters 3 and 4.
- **Tier 2:** a more detailed assessment of the 9 types of tax and charge types. The selection of taxes and charges proposed for this analysis, and subsequently agreed with the Steering Group, were those affecting NO_x; Water Abstraction; Waste Water Discharges; Pesticides; Manure and Fertiliser; Landfill; Aggregates Extraction; Disposable Containers; and Batteries.

Each of the nine different types of taxes and charges were examined in several countries to allow comparison. The chosen taxes are listed in Table 11. 7 levy types three countries were chosen, for the pesticides tax four countries, and for the abstraction charges two (the Spanish abstraction charge was dropped, as it is not truly an abstraction charge).

For each levy, a discussion of the overall application of the tax in the EU is presented, followed by the country specific in-depth analysis, and a summary of the main insights on the effect of these taxes on the environment, and on the internal market, competition and employment. The results of the evaluations are presented in Chapters 5 to 14.

Table 1: Tier 2 Tax Coverage

Tax/charge	Responsibility	MS	MS	MS
1) Nitrogen Oxides (NO _x)	University of Gothenburg	S	E ¹	F
2) Water Abstraction	M.S Anderson	NL	DK	-
3) Waste Water	M.S. Anderson	DK	NL	D
4) Pesticides	ECOTEC	S	DK	B
5) Manure and Fertilisers	CLM *	NL	FIN	S + A
6) Landfill	ECOTEC	F	UK	A
7) Aggregates	ECOTEC	DK	S	UK
8) Disposable Containers (Packaging)	ECOTEC	FIN	DK	S
9) Batteries	University College Dublin	I	B	HU

¹ Applies to Galicia only.

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- **Tier 3:** A more thorough investigative analysis of one country specific example of each of three different tax types. Here issues of particular interest highlighted from the tier 2 analysis were explored further. We have chosen to look at Abstraction Charges; a tax on Pesticides in Denmark; and the UK Landfill tax.

2.2 Methodology

In the Terms of Reference, there was a requirement to:

1. Offer a systematic collection of experience from Member States of Taxes and Charges.
2. Carry out a systematic, in-depth, analysis of the environmental impact of the use of environmental taxes and charges within Member States.
3. Analyse systematically the impact of environmental taxes and charges on the internal market; the competitiveness of European industry; and employment.

To help attain these objectives, the study team adopted the approach of systematically characterising all Tier 2 taxes according to the assessment framework presented in Box 1 and with the full questions notes presented in Annex 2.

Box 1: Structure for the Appraisal of Taxes and Charges - Question Prompter Structure

- Tax Design
- Process Development of the Tax.
- Organisational Roles
- Intentionality of Tax
- Revenue and Use of Revenue
- Portfolio of Policy Instruments – Complementarity and Substitutability of Taxes with other Instruments
- Environmental Effect (and Effectiveness if possible) of the Tax/Charge
- Effect on Producers and Consumers
- Equity and Distributional Effects
- Impacts on the Internal Market, Trade and Competition
- Impact on Employment
- Administrative Burden
- Data Availability and Reliability

As confirmed in an earlier Steering Group meeting, this "checklist" of questions was to support the process and not be the "end-in-itself". A "prose description" of each of the 27 Tier 2 taxes was to be presented, rather than a "completed questionnaire / pro-forma", and with linked issues falling under particular sections. To obtain the required insights, the team took the following steps:

- Build on existing studies of taxes and charges identified in Tier 1 (often already known to the team, and occasionally conducted by them);
- Build on existing evaluation studies;
- Seek data and information from relevant authorities associated with the tax;
- Carry out brief stakeholder consultations with the intention of filling gaps in our knowledge;
- Carry out selective quantitative analysis where data was readily available;
- Draw conclusions from the different approaches and impacts to taxes for each Tier 2 tax/charge type by comparing across countries in the EU;
- Draw conclusions from the different approaches and impacts to taxes across Tier 2 tax types;
- Carry out an assessment of the impact of taxes with respect to the EU Accession Countries; and
- Carry out more extensive consultation and data analysis, in Tier 3, with consultation focusing on key stakeholders indicated in Tier 2 to be those (likely to be) affected by the tax/charge in place.

2.3 Elaboration of Definitions and Investigative Steps

In order to explore the environmental and economic implications of taxes and charges and to answer the questions in Annex 2 in a consistent manner, clarification of the definitions was required for the study. The main points are noted below, issue by issue. The key issues explored (after the background description of the intention, design and development of the tax/charge) are:

- What is the effect of the tax /charge on the environment (Box 2)?
- What is the effect on consumers and producers (Box 3)?
- What is the effect on competition, the internal market and trade (Boxes 4 to 6)?
- What are the impacts on employment (Box 7)?
- Is the tax/charge economically efficient (Box 8)?

Box 2: What is the Effect of the Tax /Charge on the Environment ?

To answer this question the team sought to:

- Identify the changes in the environmental issue that the tax / charge sought to address - whether pollution levels (e.g. NOx emissions), levels of polluting product use (e.g. use of pesticides), or whether the use of natural resources (e.g. water abstracted) had fallen; when possible, the environmental effectiveness of the tax was assessed.
- Clarify the point of application of the tax / charge, its level, and its intentionality - whether it was intended to have environmental effects (and if so, were targets set for outcomes), or whether it was intended to raise revenue, or both;
- Assess the use and impact of the revenues - how are they spent, on what environmental sector/media, with what environmental effect when the linkage was possible;
- Clarify the other drivers that could lead to environmental improvements, so as to allow some clarification of the interaction of the direct price effects (on, e.g., demand), the signalling effect (part of which may be educative), the effects of expectations of future price increases, the effect of the use of revenue, and the complementary role of legislation or environmental agreements. An understanding of these different issues is needed to allow a fair judgement to be drawn as to the role of the tax / charge itself;
- Assess, through literature reviews, stakeholder consultation and own analysis of the data, what role the tax / charge had played in levels of emissions /polluting product reduction or reductions in natural resource use. A review of the estimates for the "elasticities of demand" for products and the price effect was also considered pertinent in assessing the impact on pollution / polluting product use.
- In some cases, valuable changes in technology or technique, and innovation, arise through the application of the tax and parallel measures. An attempt was made to identify these where they occurred.
- Did the tax / charge offer incentives that led to illegal tax avoidance measures? If so, to what extent were these anticipated, and why were they not addressed?

Box 3: What is the Effect of the Tax/Charge on Consumers and Producers?

This question requires an understanding of:

- Which are the sectors directly and indirectly affected by the tax/charge ? (by understanding the inter-relations of the primary and intermediate inputs to production)
- What is the point of application of the tax, and what is the impact of tax on costs to industry?
- What is the potential pass through of costs, what is the role of the taxed element in the costs of production, and hence what is the impact on price / tax burden relative to turnover (for certain taxes, where levied on final goods, the impact on price does not require an analysis of the previous steps)?
- What are the potential equity and distributional effects of the tax on households, for example?
- What are the exemptions from the tax / charge?
- How is the revenue used and what (if any) element is recycled to industry?

These questions need to be seen in the light of existing subsidies, whether explicit or implicit. This analysis forms a basis for the subsequent analysis of the impact on competitiveness and trade, and on employment. Within Tier 2, the analysis builds on existing information and data, complemented by stakeholder consultation. Within Tier 3, the analysis is broadened to include insights from other stakeholders and, where relevant, more quantitative analysis (e.g. share of tax on turnover, greater "engineering analysis" where the value chain is explored (quantified where possible)) and the role of taxes/charges seen in this more finely developed context.

Box 4: What was the Effect of the Tax/Charge on Competitiveness?

Where information was available, the team tried to distinguish between:

- (a) Competitiveness and trade issues within the Member States (MSs);
- (b) Competitiveness and trade issues across Member States; and
- (c) Competitiveness and trade issues between Member States and other (non-EU) trading partners.

Furthermore, it is important to distinguish between the variation in prices/costs across MSs due to taxes/charges and the natural variation of prices within the internal market (which are far from harmonised). This is important for drawing conclusions as to whether price differentials caused by the implementation of taxes and charges really are a significant determinant of a competitiveness effect. To assess the competitiveness effect it is important to:

- Assess the point of application of the tax / charge – whether on a raw material, intermediate input, or final consumer good (and retail / consumer price, inc. imports);
- Assess the affect of the tax/charge on the cost of the good / input to the production of the good - an element may be highly taxed (in percentage terms), but that element may represent only a small share of the overall input costs for the good, and hence any increase in the cost of production of the good concerned will be negligible;
- Identify the exemptions to the tax - the number and extent of the exemptions are clear indicators of (voiced) concern of competitiveness. While this does not necessarily imply that there would have been true competitive impacts, it highlights areas where some competitiveness impacts were believed to have been possible (or alternatively, it is suggestive of the lobbying power of specific fractions of industry);
- Understand the possible pass through of the costs to the final consumer. The structure of the market is important in this, as a competitive market will see little pass through, through a reduction in margins, while a less competitive market will see a higher pass through. This relates also the elasticities of supply and demand.

Within the analysis, therefore, the study team looked for information on:

- (a) the point of application of the tax;
- (b) which industries/sectors of the economy are directly or indirectly affected;
- (c) the impact on cost;
- (d) the impact on price;
- (e) the share of tax payments on turnover; and
- (f) the elasticity of demand.

In addition, stakeholder analysis and literature review helped to clarify the role of levy in this respect. The stakeholder analysis was focused on looking at the likely groups affected by the tax/charges, and determining whether these felt that there was an "issue". Clearly if the sectors of the economy most likely to be affected did not know of the tax or had no concerns of the effect of the tax then it signals the fact that there probably is not a problem.

The analysis does not just cover the possible "losers", but also needs to cover the "winners". Some sectors which stand to gain, at the margin, from any loss of competitiveness in sectors affected by the tax (foreign and domestic companies producing identical or substitute products). Furthermore, some sectors may gain through adaptive responses undertaken by actors in response to the tax. For example, domestic or foreign companies producing water conservation technologies may benefit from water charges (relative to the providers of water as a resource). Where taxes are introduced early (relative to the European position), this may generate 'first mover' advantages that can lead to new markets being exploited subsequently in other countries.

For those taxes where possible interesting competition effects did arise (and that is the case of only a few of the 9 tax types, partly because of the prevalence of exemptions), the Tier 3 analysis explores the issues further. Within the scope of the study we cannot assess the impact of exemptions and whether they are appropriate or not. This is a largely political question in which concerns for the need to improve environmental quality, the degree to which industry can influence government, and concerns over economic prosperity and associated employment, all require consideration. Note that employment issues may have a local / regional political dynamic where industries are concentrated in one area of a given country.

Box 5: What Was the Effect of the Tax/Charge on the Internal Market?

To answer this question, the study team looked at both the question of the (possible) affect of the tax / charge on the internal market, and also, the effect of the internal market on the tax/charge (since Internal Market rules can influence instrument design). We have tried to draw clear distinctions between ‘internal market’ effects and ‘price’ effects. We have considered the following as important guidelines in the consideration of the Internal Market:

- whether there is equal treatment of products of domestic and foreign origin;
- whether the instrument, possibly through its administration, imposes undue regulatory / labelling requirements on traded goods which are specific to the Member State;
- whether the instrument is ‘proportional’. Arguably, there may be circumstances where the magnitude of an environmental effect justifies an approach that does constrain the free flow of goods and services.

We have not considered changes in trade flows as necessarily of importance in the context of the Internal Market since we consider that these need not imply, or be the result of, *restrictions* on free movement of goods and services.

Effect of the tax and charge on the Internal market

- Whether there are any taxes or charges in place that create either barriers to the free movement of goods and services within the EU;
- Whether there are any taxes or charges in place whose design is such that it does not comply with EU internal market rules (e.g. proportionality); similarly, whether historically there have been any problems of legality for the Tier 2 taxes we are looking at;

To answer these questions the study team carried out a literature review and consulted key stakeholders – tax policy makers, and competition policy and the internal market experts.

Effect of the internal market on the tax and charge

- Whether countries have to implement taxes at a lower level than would have been preferred, given difficulties in imposing border taxes/restrictions and concerns that imports will compromise the environmental objectives of the tax (as well as affecting national industry);
- Whether countries decided to change the ways in which taxes/charges were levied and change the ways revenues were used, given the relation to the Internal Market.

To answer these questions the study team looked at which taxes were dropped in advance of countries becoming member of the EU and hence fully in the internal market (e.g. Austria, Finland and Sweden in the last wave), and explored through stakeholder consultation the reason for the abandonment of taxes/charges where this occurred.

Clearly the question regarding the internal market will be of some interest for the next round of accession to the EU from the CEE applicant countries and Cyprus and Malta.

Box 6: What was the Effect of the Tax/Charge on Trade?***Effect of the tax and charge on trade***

As with competition, it is important to distinguish between local trade effects, possible substitution effect for goods leading to different trade flows across sectors of the economy, and trade effects between MSs and their trading partners.

The question of trade overlaps with that of the Internal Market. If there are restrictions on the movement of goods and services, there will most likely be a trade effect. On the other hand, trade effects are about more than just Internal Market effects – they are also a reflection of changes in ‘competitiveness’.

Impacts of trade on the tax and charge

Questions considered were:

- Whether tax/charge measures were effectively applied to imports as well as domestic production, requiring new mechanisms to be put in place to ensure a consistent working tax.
- Whether concern over changes in trade in goods and services led to a reduction in the tax level, restriction of the rate of growth of the tax rate, or indeed complete abandonment of the tax/charge.
- Whether countries decided to change the ways in which taxes/charges were levied and changes the ways revenues were used, given perceived trade effects.

The study team looked at the answers to the questions on internal market and competition, and in light of any trade data available, and in light of comparisons of (pre-tax) prices of products across the EU Member States, and the comparative effect of taxes. This is particularly important when looking at products that are taxed – pesticides, fertiliser, batteries, bottles. The issues become more important for highly traded goods (e.g. pesticides taxes are more likely to lead to imports than say landfill taxes, though some (important) border effects might still occur).

The inter-relation of the different sectors of the economy as final and intermediate consumers of the products or services created by the other sectors of the economy is an important basis for understanding the possible direct and indirect trade / competition effects.

For Tier 2, we summarised anecdotal evidence from the stakeholder consultation, and evidence from existing evaluations on the impact on trade.

In Tier 3, a more detailed "engineering-analysis" was thought to be valuable: e.g. splitting turnover into wages, profits, taxes and intermediate inputs, and hence estimating the ratio of the increase in expenditure due to tax to (a) total turnover; and (b) to intermediate inputs only. This would help offer greater clarity on the tax burden, and implications for employment (squeeze on wages) and for competition (squeeze on profits);

Box 7: What Were the Impacts of the Tax/Charge on Employment ?

New taxes/charges are likely to generate winners and losers, and the aggregate macro-level picture might not always offer needed insights here. The winners will be in those sectors which benefit from the losses in competitiveness of others, or which arise due to new practices / techniques / technologies emerging in response to the new incentives, or through use of tax revenues (gains may outweigh benefits for some sectors in the context of a tax shift). The last of these will assist in offsetting any negative consequences implied by the introduction of the tax.

While some economists would argue that only the macro-picture is important (i.e. the net employment effects), others would argue that it is valuable to ascertain where positive and negative impacts will occur, even in the case where they do balance each other out.

The assessment at Tier 2 builds on existing literature and stakeholder consultation to assess areas of both positive and negative employment impacts. Employment impacts will look at firm/sector and macro-economic level impacts, and make comment on employment associated with the administration of the tax, where information is available.

The Tier 3 analysis looks more closely, where possible, at the inter-relation between costs of production, the relative roles of employment costs and costs of intermediate inputs, the increases in intermediate inputs to production given taxes on inputs, and possible insights into job losses. Similarly a clearer linkage between revenue raised and employment impacts will be drawn out. No simulation modelling of the economy and labour market can be carried out.

Box 8: Is the Tax/Charge Economically Efficient?

Regarding efficiency, the design of the policy instrument needs to be taken into account. This includes whether the instrument has been based upon an analysis of external costs and benefits associated with the pollutant / resource under discussion (and indeed, whether this could be done).

The issue of (hidden) subsidies is key to this analysis, and where information is available, a comparison of the environmental externalities (for pollution and polluting product use) is noted in Tier 2 where possible, and explored in Tier 3. For natural resource use (abstraction charges), the relative share of user charges of investment and operation and maintenance costs is noted and explored.

Both of these issues relate to the concept of existing distortions of the market, and therefore existing distortions to the allocative efficiency of the market. True allocative efficiency takes place where the tax/charge is set at a level where the tax rates reflect the damage/treatment costs, and where the natural resource charges reflects the investment and Operating and Management costs (principle of full cost recovery) and the natural resource scarcity. Hence, while the imposition of taxes and charges is often criticised for creating ‘distortions’ to the operation of the market, in fact, though they change the status quo, they may reduce existing distortions.

2.4 Concluding Comment

Clearly, not all questions could be answered in detail and some, in specific cases, cannot be answered at all with any authority. The aim has been, however, to provide an insight into specific taxes and their effects on the basis of information and data available to us. Given that information available varied in extent and quality across taxes, some of the Tier 2 and 3 tax/charge analysis could be carried out in greater depth than others. While the following chapter 3 presents an overview of the use of the taxes and charges in the EU, the Tier 2 (Chapters 5- 14) and Tier 3 (Chapters 15-17) analysis presents the possible description and conclusions given information availability.

TIER 1: OVERVIEW OF ENVIRONMENTAL TAXES AND CHARGES IN THE EUROPEAN UNION AND THE CEECs

3.0 OVERVIEW OF ENVIRONMENTAL TAXES AND CHARGES IN THE EU

3.1 Introduction

This Chapter presents an overview of existing taxes and charges, comprising both an updated overview of where the levies are used in the EU (complemented by Chapter 4 focus on CEEC countries) and a review of this experience, focusing on the key questions of the study, and providing a basis for subsequent Tier 2 and Tier 3 analysis. The overview and review have been focused mainly on the Tier 2 taxes and charges, given that much of the existing literature falls outside the scope of the study. Insights from the use of non-study levies are presented where they offer valuable points of comparison or context for the study levies.

Section 3.2 presents a discussion on the rationale for environmental levies, followed by a discussion on the evolution of policy on the use of economic instruments. Section 3.4 gives an overview of the taxes and charges applied, presented both as a summary tables across all levy types and Member States, as well as a prose discussion of where they have been applied. This is followed by an initial discussion, given the overview, on the impacts on employment (3.5), competitiveness effects (3.6), the relation of levies to trade concerns and the internal market.

This chapter draws heavily on two recent reports written by Ekins and Speck: Ekins and Speck, 2000, *Factor Tax Shifting*, A report for the European Commission Directorate General Joint Research Centre ‘Institute for Prospective Technological Studies’, Seville, Spain, forthcoming); and Speck and Ekins 2000, *Recent Trends in the Application of Economic Instruments in EU Member States plus Norway and Switzerland and an Overview of Economic instruments in Central and Eastern Europe*, A Report to DG Environment; European Commission (EC) 2000
http://europa.eu.int/comm/environment/enveco/env_database/database.htm).

3.2 Rationale for Environmental Levies

The rationale for the implementation of taxes and charges in environmental policy is based on the existence of environmental externalities; i.e. ‘untraded interdependencies’ that are side-effects of processes of production and consumption.

In theory, environmental levies are intended as a mechanism for ‘internalising’ these environmental costs by levying a tax or charge on the effects, or on the products or processes which are responsible for them (as proxies for these effects).

In practice, measurement of externalities is less than straightforward. The level at which levies (i.e. taxes and charges) should be set is therefore likely to remain somewhat controversial. What is not controversial, however, is the fact that paying ‘zero’ for activities

which produce environmental damage is too low a price to pay. The Polluter Pays Principle (PPP) recognises this, and suggests that polluters must pay for the consequences of their actions.

Levying a tax or a charge on the cause of the environmental damage gives an incentive to the taxpayer to reduce their liability to the tax / charge by reducing the cause of the environmental externalities. An incentive is imparted to producers / consumers to switch to alternative, less polluting products / processes. The incentive is a dynamic one – the incentive effect remains as long as the tax is in place. Note, however, that as long as there are externalities that go ‘unnoticed’ by the tax / charge system, it remains possible that the act of reducing the production of one set of externalities in response to a tax may increase production of others. The incentive effect of environmental levies is operative at all levels of the effect, compared to traditional command and control regulations where the incentive to reduce environmental harm ceases when the predefined regulatory standard has been achieved.

Pearce et al (2000) set out a typology of environmental policy instruments, distinguishing between whether or not the policy specifies the environmental goal to be achieved, and whether or not it specifies how the goal is to be achieved (see Table 1). Environmental taxes and charges occupy the bottom right hand cell, in which neither the target nor the means of achieving it are specified in advance. This gives maximum freedom of action to the actor responding to the policy, and limits the cost of the policy, at least in theory, to the level of the environmental tax or charge.

Table 1: A Typology of Environmental Policy Instruments

	Policy specifies the goal to be achieved	Policy does NOT specify the goal to be achieved
Policy specifies HOW goal is to be achieved	<i>Command and control Instruments</i>	<i>Technology-based standards*</i>
Policy does NOT specify HOW goal is to be Achieved	<i>Most standard setting Most negotiated agreements Emission trading schemes</i>	<i>Environmental taxes and Charges Other market-based instruments Public information</i>

Source: Pearce et al. 2000, p.39.

Note *: Here there is an apparent contradiction, as it seems not possible to specify how a goal is to be achieved, but at the same time not to specify the goal, if one is talking of the same specific goal. But there is no contradiction when we talk of general goal and specific goal.

3.3 Evolution of Policy

Environmental policy in the 1970s and 1980s was almost wholly driven by systems of regulation. However, it was increasingly recognised that traditional regulatory environmental policy, despite some successes, was not managing to prevent further unacceptable environmental damage, and it was feared that the costs of attempting to make it do so would be great. During the 1980s the emphasis changed and policy makers showed an interest in market-based instruments of environmental policy (for example, taxes, tradable permits or deposit refund schemes). An early indication of this change was the emphasis given to economic instruments in environmental policy by the report of the World Commission for Environment and Development in 1987.

Another impetus was provided in the early 1990s, when recession resulted in unemployment moving up the public policy agenda. Both these developments resulted in increased interest in the possibility that a ‘green tax reform’ (sometimes also called ecological tax reform, environmental fiscal reform), whereby environmental taxes replace taxes on labour or capital, could achieve an ‘environmental dividend’ of improved environmental quality and at the same time an ‘employment dividend’. The source of revenues could also be from auctioned tradable carbon emission permits.

In the context of the European Communities the new interest in economic instruments was both reflected in and amplified by the Commission’s Task Force Report on the environment and the internal market from 1989, the European Parliament’s hearing on economic instruments in June 1990, as well as the decision in Rome by the Environment Council in September 1990 to develop a proposal for a European carbon-energy tax. Both the European Council’s Dublin declaration from 1990, as well as the Fifth Environmental Action Programme from 1992 (EC 1992a) pointed more formally to the need to adopt such new approaches in the use of policy instruments, while the Delors’ White Paper on Growth, Competitiveness and Employment (EC 1993) emphasised the wider positive macro-economic implications of such an environmental policy:

‘The serious economic and social problems the Community currently faces are the result of some fundamental inefficiencies: an “under-use” of the quality and quantity of the labour force, combined with an “over-use” of natural and environmental resources’ (EC 1993, Chapter 10).

The interest in economic instruments has grown in recent years. At the international level, Principle 16 of the Rio Declaration on Environment and Development stated that:

‘National authorities should endeavour to promote the internalisation of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.’

The European Community's Fifth Environmental Action Programme, its 1996 Review, and the European Councils of Madrid (1995) and Florence (1996), have each called, in different ways, for greater use of economic or market-based instruments for the purpose of environmental policy. The Fifth Environmental Action Plan calls for a 'broadening and deepening' of the range of those currently in use as one of its specific priorities:

In order to get the prices right and to create market based instruments for environmentally friendly economic behaviour, the use of economic and fiscal instruments will have to constitute an increasingly important part of the overall approach. The fundamental aim of these instruments will be to internalise all external environmental costs incurred during the whole life-cycle of products... In line with the polluter pays principle, such charges should be progressively reoriented towards discouraging pollution at source and encouraging clean production processes'

The use of environmental fiscal instruments in environmental policy is a prominent feature of the move towards greater use of market-based instruments for environmental policy. Such a development is in accordance with the overall policy of the European Commission (EC): 'The Commission has several times given its support to an increased use of fiscal instruments to make environmental policy more efficient and cost-effective' (EC 1997a, p.1a).

The number of instruments in place in European member states has grown over time. By the mid-1990s, compared to a review that took place in 1989, the use of economic instruments in OECD Member States had increased by around 50 per cent (see EEA 1996; Forum for the Future 1998). However, a number of these were instruments whose objectives are not specifically environmental in the sense of their being given the task of reducing environmental harm (hence Opschoor and Vos' (1989) distinction between incentive based instruments and revenue raising instruments).

Typically, taxes may have been set at low levels in the past to raise revenue. Some of these have graduated from this revenue-raising role into instruments with objectives which are more specifically environmental. Equally, some charges have graduated into taxes as the revenues raised began to exceed the funds required to deliver services for which the original charge was meant to be the revenue source. Indeed, one could argue that the now widely recognised potential for taxes to improve environmental quality has conferred a greater degree of political legitimacy upon efforts to raise the level of those taxes that can be justified in these terms. Whether the revenue raising capacity of the instrument is increased or not will depend upon the responsiveness of those targeted by the tax or duty to the level at which it is set. An elastic response would reduce net revenue raised. However, a number of the instruments concerned appear to be characterised by relatively inelastic responses, generating more or less stable revenues as a result (but raising questions about the environmental effectiveness of those instruments where no earmarking of revenue occurs).

As to the performance of economic instruments, few really good, thorough evaluations currently exist.² The best evaluations so far relate to:

- the Dutch and German water charging schemes (de Savornin Lohman 1995; Kraemer 1995), which have met with some success;
- the Swedish NOx scheme (refunded emissions permits - see Sterner and Høglund 1997);
- the Swedish Environmental Protection Agency's fairly detailed evaluation of a number of instruments (SEPA 1997) many of which appear to have had considerable success;
- evaluations of the UK Landfill Tax which has, so far, raised as many questions regarding success or failure of the instrument as it has answered (EFILWC 1998; ECOTEC 2000);
- an evaluation of the Danish waste tax (and of municipal charging for household waste collection) (Skou-Andersen 1997);

The paucity of detailed evaluations was recognised by the OECD, whose 1992-1993 survey concluded that 'in 90 percent of the cases [of the use of economic instruments], information on incentive effects was inconclusive or unavailable' (OECD 1994, 13). A number of 'cross-the-board' evaluations exist, such as those for the EEA (1996), SEPA (1997) and the Danish EPA (COWI 1999), and these have tended to support the role of environmental taxes as effective instruments of policy. However, there is recognition of the need for comprehensive evaluations of instruments where they are being, or have been, introduced (Vos 1997; OECD 1997a). This is required so as to ensure that policy evolves in ways which enhance effectiveness, whilst the information generated can improve more general understanding of the way in which targeted actors respond to these instruments. Such policy evaluations will, however, demand resources for their proper conduct.

Evaluating the performance of environmental levies *ex post* is less than straightforward. The problem of the counterfactual (the use of an alternative instrument) always confronts would-be evaluators, posing the question, how can one know what the effect of a policy has been unless one has clear knowledge of what would have occurred in its absence? Such knowledge is rarely available, not least because the world we live in is a dynamic one in which new actors, and new policies emerge frustrating attempts to understand the impact attributable to a specific policy action.

This does not mean that we cannot know whether environmental levies work, rather it means that being absolutely clear about the extent of effects attributable to the levy itself requires special caution in respect of accounting for the effects of other policies operating in the same area, and the development of ongoing / new trends that affect the baseline from which the levy's effect is measured. It also means that much of the available evidence on the effect of environmental taxes is anecdotal. Hence, the application of environmental taxes and the practical consequences of their implementation are still a hotly debated issue on the political agenda.

² Equally, it could be said that this is true of all policy instruments and that to cast doubt on the effectiveness of such instruments on the basis of a lack of good evaluations is unfair.

This was recognised in the Commission’s Communication on Environmental Taxes and Charges, which to some extent forms the starting point of this study. In that Communication, the Commission made the following commitment:

‘In order to assess the impact on the Internal market and on environmental policy, the Commission plans to carry out an evaluation on economic and environmental implications of the use of these instruments and policy conclusions that can be drawn from this’

Politically, the introduction of environmental levies has not been without problems. It has been noted by Bressers and Huitema (1996) that whilst the models employed by economists imply a rather one-dimensional rationality in the approach to setting environmental policy, the realities being faced by policy makers are multi-dimensional, with a variety of interest groups seeking to have their own agendas reflected in policy making. A recent report on economic instruments for the UK Round Table for Sustainable Development, exhorted greater use of these instruments with its title *‘Not Too Difficult!’*, yet the level of action thus far, perhaps not only in the UK, suggests that political systems are not wholly conducive to the introduction of new levies.

The optimism which once prevailed regarding the use of these instruments has been tempered somewhat by questions of:

- the extent to which these measures have been applied in practice (if they are so good, why are they not used more widely?);
- the role of key industry lobbies in arguing either for exemptions or alternative modes of environmental policy;
- difficulties in putting theory into practice (most environmental problems do not lend themselves to some easy measurement of marginal external costs, marginal abatement costs, marginal reductions in net private benefit, etc., so that the possibility of setting taxes at the optimum (often known as Pigouvian) level quickly recedes); and
- the effectiveness of instruments (many instruments appear to have generated only inelastic behavioural responses - these may relate to problems of market structure, the availability of alternatives (or their perceived availability), and problems associated with technological ‘lock-in’).

The argument over whether to use either regulatory approaches or economic instruments, which at times seemed to be stigmatising regulatory approaches, has been replaced by a more pragmatic approach, asking what might be ‘the best’ approach to environmental policy making on specific issues rather than ideological “either-or” choices of instruments. It is now much more common to hear commentators arguing in favour of mixed approaches, with the choice of the instrument (or package of instruments / policy mix) made on the basis of the particular issue being addressed. This, perhaps, is a welcome adjustment since from an institutionally informed perspective, all markets are structured by a variety of forms of state action, of which regulations (typically, in the case of economic instruments, regulatory methods to prevent illegal tax evasion) often form an important component.

Related to the increasing interest in mixed approaches, the issue of how to use revenues raised has become increasingly important. Responses to a change in the level of an environmental levy are amenable to manipulation depending on the wider context (the policy background) in which the instrument is introduced. Instead of an unhypothecated tax, charges could be levied in order to fund complementary instruments designed to help those targeted by the charge to respond in the most desired manner at least cost.

Another use of environmental tax revenue which has become increasingly prominent involves reducing other distortionary taxes in the economy. Eco-tax reform seeks to shift the burden of taxation away from labour (i.e. 'goods') and more towards the production and consumption of pollutants, and environmentally damaging products and services (i.e. environmental 'bads') (IPPR 1997). Such reforms are underway in a number of European member states, some of which have set up Eco-tax Commissions (Gee, u.d. Hamilton, u.d.; Zonnekeyn u.d.). These not only help to increase the political acceptability of the instrument, but they can help to further employment objectives (particularly if the labour tax adjustment is targeted towards, for example, the lower paid). The most suitable taxes of this type are those that provide stable revenue, such as energy taxes and congestion charges on motor transport (neither of which is the subject of this study). As Table 2 below shows, the taxes considered in this study are relatively unimportant in the context of tax shifts. This will be discussed in greater detail below.

Table 2: Implemented and Proposed Tax Shifts in European Countries.

Country	Tax Shift		Revenue Shifted (% of total tax revenue)
	From	To	
Sweden 1990	Personal Income (reduction of labour taxes of around 4.3 percentage units) ³	Environmental and energy taxes including CO2 tax and SO2 tax	1.9 (environmental & energy taxes 18 bil SEK; 2 bil EUR)
Spain 1995	Personal Income	Motor Fuels	0.2
Denmark 1993, 1995 and 1998⁴	Personal Income, Employers' Social Security Contributions, Investment Incentives	Various (electricity, water, waste, cars), CO2 and SO2	2.5 (2.5 bil DKK; 340 mil EUR in 2000)
Netherlands 1996	Personal Income, Corporate Profits, Employers' Social Security Contributions	Energy and CO2 (Regulatory Tax on Energy)	0.8 (2.2 bil NLG; 1 bil Euros in 1998)
United Kingdom⁵ 1996	Employers' Social Security Contributions	Landfill	0.2 (450 mil UKL; 640 mil Euros in 1996)

³ The whole reform reduced the revenues generated by taxes levied on households and corporations to 21.3% of GDP in 1991 compared with 25.3% in 1989 (OECD 1994).

⁴ The reform in 1993 primarily concerned households, the reform in 1995 concerned industries and the latest reform in 1998 concerned both households and industries (Krog 1999).

Country	Tax Shift		Revenue Shifted (% of total tax revenue)
	From	To	
Finland 1997	Personal Income, Employers' Social Security Contributions	CO2 and Landfill	0.5
Italy 1999	Reduction of Employment Charges	CO2	0.2 ⁶ (around 600 mil Euros)
Germany 1999⁷	Social Security Contributions paid by employers & employees	Energy (mineral oils, natural gas and electricity)	0.6 (estimated) or a reduction by 0.8 % points ⁸ (8.4 bil DM; 4.3 bn EUR in 1999)
France 1999	Plans to reduce taxes on labour and employment	Generalised pollution tax (known as TGAP) ⁹	NA
Austria 1999 (proposed)	Employers' Social Security Contributions	Energy and Traffic-related (vehicle taxation)	up to 4.8 ¹⁰ (up to 50 bil ATS; 3.6 bil Euros)

Sources: Roodmann 1997 and EC 1999

3.4 Current Use of Environmental Taxes and Charges

Table 3 below outlines the current use of environmental taxes and charges in the EU as far as is known in the year 2000. The sections that follow comment, on some of the specific tax types we are considering in this report.

⁵ The Chancellor of the Exchequer announced in the 1999 Budget that the Government proposes to introduce a climate change levy on business use of energy from April 2001. The revenues (estimated to be 2.5 billion Euros) are intended to be recycled in full to business through cuts in employers' NIC and energy efficiency schemes.

⁶ The reduction of 0.2 per cent is based on total tax revenue of around 339 billion Euros in 1995.

⁷ This tax reform package will be implemented in April 1999.

⁸ The 0.8 percentage reduction refers to social security contributions, which will be reduced from 20.3% to 19.5%.

⁹ The French generalised pollution tax was created in 1999 grouping 17 environmental taxes on waste, water and air pollution together.

¹⁰ Total tax revenue was around 75.5 billion Euros in 1995.

Table 3: Overview of Environmental Taxes in the EU, 2000

Instruments	A	B	DK	FIN	F	D	EL	IRL	I	L	NL	P	E	S	UK
NOx charge					X				X				X ¹¹	X	
AGRICULTURAL INPUTS															
Pesticides		X	X	X										X	
Fertilisers	X ¹²		X ¹³	X ¹⁴							X ¹⁵			X	
OTHER GOODS – ECO TAXES															
Batteries	TBS	X	X			TBS			X					X	
Plastic carrier bags			X						X						
Disposable containers	DRS	X	X	X							DRS			X	
Tyres			X	X										X	
CFCs and/or halons			X												
Disposable cameras		X													
Lubricant oil charge			X	X					X				X	X	
Oil pollution charge				X	X										
Others	DRS ¹⁶	X ¹⁷	X ¹⁸		X ¹⁹				X ²⁰		X ²¹		X ²²	X ²³	

¹¹ Regional tax - Galicia¹² abolished¹³ tax on growth promoters¹⁴ abolished¹⁵ mineral surplus tax¹⁶ DRS covering lamp bulbs, refrigerators and freezers, packaging

Instruments	A	B	DK	FIN	F	D	EL	IRL	I	L	NL	P	E	S	UK
WASTE															
User charge	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Waste tax (landfill)	X	X	X	X	X	X			X		X			X	X
Hazardous waste tax / charge		X	X	X	X	X									
Others			X ²⁴	X ²⁵	X ²⁶						X ²⁷				
WATER															
User charges	X	X	X	X	X	X	X	X ²⁸	X	X	X	X	X	X	X
Water tax/Water abstraction tax/charge			X												
Waste water tax / charge		X	X	X	X	X		X	X	X	X		X	X	X
Others		X	X	X ²⁹	X ³⁰	X ³¹			X ³²		X ³³		X ³⁴		X ³⁵

¹⁷ package, surplus manure tax, , tax on heavy accidents, tax on ionising radiation

¹⁸ tax on chlorinated solvents, disposable tableware, light bulbs, tax on PVC (planned to be introduced in 2000), tax on phthalates (planned to be introduced in 2000), tax on junk mail (proposal stage) – DRS: reusable containers (beer and carbonated soft drinks)

¹⁹ packaging tax, paper tax, tax on mines, tax on natural sites

²⁰ packaging tax, aggregates tax (local)

²¹ surplus manure charge

²² eco-tax on tourism (Balearic islands – planned to be introduced in 2000)

²³ tax on natural gravel, abstraction charge (limestone, etc.), packaging charge, vehicle scrapping charge

²⁴ tax on electronic and electric waste (proposed)

²⁵ nuclear waste management charge

²⁶ tax on atmospheric emissions levied on incinerators

²⁷ waste charge ‘disposal of white and brown good decree’

²⁸ Local taxes not related to water consumption.

Instruments	A	B	DK	FIN	F	D	EL	IRL	I	L	NL	P	E	S	UK
Aggregates tax		X ³⁶	X											X	X ³⁷
AIR TRANSPORT															
Noise charge/others		X	X		X	X		X	X		X	X		X ³⁸	X ³⁹

x – economic instrument such as a tax or charge; DRS – deposit refund scheme; TBS – take back scheme¹

²⁹ fish management charge

³⁰ water abstraction charge

³¹ water abstraction charge (regional level)

³² water abstraction charge

³³ tax on groundwater (national level and regional level)

³⁴ water sanitation charge, water abstraction charge, charge on spills into coastal waters

³⁵ water abstraction charge

³⁶ regional level - Flanders

³⁷ proposed - will be introduced in tax year 2001/2002

³⁸ landing charge (levied on noise level) and tax on domestic air traffic

³⁹ air passenger duty

Water Related Taxes and Charges

User charges for water consumption and sewage treatment

A comprehensive comparison of user charges for water consumption and sewage treatment is almost impossible to carry out for several reasons. The biggest obstacle to such an analysis is the fact that such charges are levied at the regional or municipal level and are usually administered by public or private companies. However, the price level is regularly controlled by a public body. For example water companies are completely privatised in the UK but the water regulator, the Office of Water Services (OFWAT), announced price cuts for water charges which have to be implemented by the private water companies. A detailed analysis of water pricing for households, industry and agriculture can be found elsewhere (for example in the following OECD publications: OECD 1999a, OECD 1999b, OECD 1999c, OECD 1999d).

User charges for water are set in a wide variety of ways in different EU Member States. One of the reasons lies in the fact that water metering of household usage of water is still not widespread in different countries (OECD 1999a). A prerequisite for variable charging is a high penetration of water metering. Currently in Europe the water bill can be based on the value of the property (parts of the UK – Scotland and Northern Ireland), or on a combination of a flat fee and variable charging. Special tariff settings such as increasing block tariffs are also applied in some countries, for example in cities such as Athens, Barcelona and Zurich. In Ireland there is still a unique situation where domestic consumers pay nothing for water supply and wastewater treatment, because the costs for these services are part of local taxation.

Water services (provision of drinking water and wastewater treatment) are subject to VAT. But the VAT rates applied in the different countries differ in the sense that some countries levy the standard VAT rate on the user charges (for example, Sweden, Denmark and Finland) compared to a reduced VAT rate in other countries (Belgium, Germany, France).

Water taxes

Water taxes are quite complex and difficult to collate data on because of the different water management policies adopted in the EU Member States; i.e. the responsibilities of water management varies between the Member States. For example, state waters and regional waters are managed by different authorities in the Netherlands. Additionally, both public authorities have the power to levy water taxes. The Netherlands introduced a new tax on water supply in 2000. The tax is levied on water delivery of up to a maximum of 300 m³ per connection per year and the aim of the tax is to give a price signal for water saving. Apart from the Netherlands only Denmark has implemented this type of tax so far, in 1994, with only households subject to the tax payment.

The situation looks quite different if water effluent taxes are studied. These types of economic instruments are in widespread use in EU Member States. However, there are

several reasons why it is almost impossible to compare the water effluent taxes between countries and to discuss issues such as their relative environmental effectiveness and economic efficiency. For example, the political objective for the implementation of such a measure can be different in different countries, as can the tax regime (differing, for example, between sewage outflows to open water and those on water treatment plants) and the tax base (see for further information: EC 1996). However, other EU Member States, such as Spain, introduced water abstraction charges which have to be normally paid by companies (public and private) abstracting water either from groundwater or from surface waters.

Waste Related Taxes and Charges

User charges for waste collection and disposal

An analysis of user charges for waste collection and disposal is also very difficult to carry out for the same reasons as for user charges for water. The base for user charges in the waste sector can be quite heterogeneous. The charge base for households was the surface occupied in Italy until 1998. In 1999 a new regime of user charges was introduced and the user charges consists of two components; a fixed part depending on the waste disposal costs and a variable cost component which is proportional to the amount of waste produced by the household. A further obstacle to find comparable data for user charges is caused by differences in the national waste policies implemented in the countries analysed. Some countries, such as Switzerland, have adopted policies of variable rate charging schemes (i.e.: user-pay or pay-as-you-throw) for municipal solid waste management, while in the UK such schemes are not permitted by the Environment Act (1990).

Variable charging, or pay-as-you-throw systems, are coming into place in more and more municipalities. Estimates of the coverage of this instrument (1999 situation) were provided by BECO (1999) for four countries/regions:

- Flanders : more than 50 % of municipalities;
- Brussels : 14 % of municipalities;
- The Netherlands : 22 % of municipalities⁴⁰;
- France : less than 10 % of municipalities;
- Luxembourg : 4 % of municipalities.

In addition, recent data collected by ECOTEC suggests that in Italy, some 200 of 8000 municipalities in Italy are trialling user-pay systems, whilst large areas of Austria are known to use such schemes.

Waste taxes

Sweden followed other EU Member States by introducing a waste tax in January 2000. This tax was proposed by the Landfill Tax Commission in 1998. The comparison of waste tax

⁴⁰In The Netherlands, 58 % of municipalities levy a tax on household refuse, which is calculated on the basis of the number of persons in a household.

rates between different European countries shows big differences in the tax rates but also in the actual structure (see below). Different types of wastes can be subject to varied tax rates (Austria and United Kingdom) and the rates can also depend on the type of waste disposal. For example, wastes delivered to an incinerator are exempt from the tax in the Netherlands, while in Flanders (Belgium), Denmark and Norway the tax rates for waste delivered to an incinerator depend on energy recovery. Austria also applies different rates of tax depending upon the type of landfill. The overview in Table 5 shows the big differences in the waste taxes adopted in these selected countries and it also demonstrates some differences in waste management policies, such as the difference in the treatment of incineration.

The waste management policy implemented in Flanders follows the EU waste management hierarchy, which assesses landfilling as the least desired option and prefers waste recycling compared to incineration which is seen as the second least desired option, by considering the incentive effect of a tax: the recyclable stream of waste is subject to a tax rate of zero, incineration of waste is subject to a tax rate of 6.2 EUR per ton (with energy recovery) and the least desired option of landfilling faces the highest tax rate. The same approach is adopted in Denmark but with higher tax rates.

Table 4: Waste Taxes in Selected European Countries (in EUR per ton of waste).

	A	B: Flanders	DK	FIN	NL	S	UK
Tax rate	5.8 – 29.1			15	13.6 – 29.7	28.4	3.2-17.6
Tax rates depending on type of disposal activities							
Landfill		61	49.8				
Incineration (with energy recovery)		6.2	37.2		0		
Incineration (without energy recovery)		10.2	43.9		0		

In addition to those taxes listed above, landfill taxes in Italy are defined at a Regional level. Art. 24 of the National Waste Management Law (Decree 22/97), clearly sets out that it has to be higher or lower according to diversion rates met in each district. In Northern and Central Italy, landfill tax ranges between 10-25 €/tonne; some Regional authorities distinguish between mixed Municipal Solid Waste (MSW) (higher tax) and residual waste from municipalities where food waste gets separated at source (lower tax); In Southern Regions landfill-taxes are rapidly increasing (20-50 Euro/tonne) due to the difficult waste situation and the presence of a governmental Task Force committed to developing integrated waste management.

Agricultural Inputs

During the period 1997-2000 there have been some minor developments in respect of the introduction of new taxes on agricultural inputs, such as taxes on fertilisers and pesticides, or taxes on other goods, i.e. packaging taxes, oil pollution charges, etc. These developments have mainly taken place in the Northern European Member States.

Taxes in the agricultural sector are still not very common in EU Member States and are restricted to Scandinavian countries plus the Netherlands and Belgium. Again a forerunner in terms of new taxes is Denmark which introduced a tax on growth promoters in 1998. However, it is expected that growth promoters will be phased out in due course. Denmark increased the tax rates levied on agricultural inputs over the period 1997-2000. According to a report by the European Fertilisers Manufacturers' Association, the reduction in fertiliser use has been significant in the Netherlands and in Denmark. Both countries have large intensive rearing sectors and have implemented economic instruments in the agricultural sector (ENDS Daily 18/11/99).

Worthy of mention is the change in the structure of the pesticides tax in Norway (though Norway is not a subject of this study). Changes introduced in 1999 are based on the estimation of a standard dose (per unit of area per year) for each pesticide separately. The pesticides are put into different bands according to the health and environmental risk and the tax levied on them is differentiated between the risk classes. Proposals for a UK pesticides tax followed a similar desire to band different pesticides into groups with differing potentials to cause harm, but the proposals have not been carried through.

Other Environment-related Taxes and Economic Instruments

The use of environmental economic instruments other than taxes and charges in EU Member States may be briefly noted. In Spain there are proposals to introduce an eco-tax on tourism in the Balearic Islands. The objective of this economic instrument is to alleviate the environmental impact of mass tourism, and the tax is to be levied on all visitors regardless of whether they stay in hotels, apartments or campsites on the islands (ENDS Daily 25/05/00).

Deposit-refund schemes and take-back schemes are implemented in a number of countries but these schemes are not analysed in detail here. The former type of scheme (in, for example, Austria and the Netherlands) is levied particularly on disposable containers to reduce packaging waste and discourage its improper disposal. The latter schemes have been introduced, for example, for batteries in Austria and Germany, to ensure their collection and environmentally sound treatment. The consideration of producer responsibility in the area of waste management will be of greater importance in future years, with draft EU Directives on end-of-life vehicles, batteries and waste electrical and electronic equipment (WEEE) in the pipeline. Producer responsibility places on producers the obligation to collect and recycle a (high) proportion of their products at the end of their lives (ENDS Daily 13/06/00). Deposit refund schemes are likely to be especially appropriate mechanisms for ensuring proper disposal of hazardous wastes (or for vehicle take-back – Sweden has a vehicle scrapping charge-refund mechanism in place)

Earmarking of Taxes

The issue of earmarking (tying revenue raised to a specific purpose), which is also called 'hypothecation', receives more and more attention in the political agenda. Earmarked taxes include the Swedish NO_x tax where revenues generated from the NO_x tax are refunded to the

plants according to their energy production, so that relatively energy-efficient companies receive a greater refund than the amount of tax they pay (see Tier 2 study).

There are arguments for and against earmarking. An argument in favour of earmarking is that it can be seen as a tool which makes people aware of the services and benefits provided by the public sector, and their associated costs (Spackman 1997). The traditional argument against earmarking is that it can weaken the sensible management of expenditure priorities in overall environmental policy and therefore can prevent the allocation of scarce resources in an efficient way.

Environmental Fiscal Reforms

The number of EU Member States implementing environmental fiscal reform programmes has increased during the last three years. The Nordic countries started with such programmes in the early 1990s by shifting taxes from labour (personal income, social security contributions, etc.) to the use of the environment (energy taxes, CO₂ taxes but also taxes on water and waste, etc.).

In the UK, revenues generated for the tax shift programmes have been collected via different environmental taxes. In 1996 a landfill tax was introduced, and in 2001 and 2002, levies on energy and aggregates, respectively, will be implemented. The revenues from all these economic instruments are mainly used for the reduction of employers' social security contributions. It may be expected that the UK policy will lead to a greater reduction in the wage costs paid by employers (per unit of tax revenue) than the German policy (in which the tax revenues are also used to reduce the social security contributions of employees).

The French government planned to introduce in the Budget for 2000 additional environmental taxes within the framework of the general tax on polluting activities (TGAP). The revenues generated from these new taxes would compensate for the reduction in payroll taxes for low-wage workers and would be used to support the introduction of the 35 hour working week, starting in January 2000, by giving subsidies to companies which implement the 35 hour working week of 4,000 FF; 610 EUR per worker. However, this proposal was recently struck down by a Court Decision because it violates the equity principle enshrined in the French Constitution⁴¹. The French Government also plans to implement an energy/CO₂ levy in 2001, which will be levied on energy consumed by the business sector.

In addition to these two countries, new initiatives have been developed in Germany and Sweden, but these are concerned with energy and fuel taxes which are outside the scope of this study.

⁴¹ At the time of writing, it was unclear whether France will introduce the TGAP.

3.5.1.5 *Employment Effects of Environmental Taxes*

There is relatively little in the literature concerning the employment effects of the environmental levies for the taxes and charges covered under this study. The principle reason for this is that they tend to be small. Most of the modelling of the employment effects of environmental levies has been undertaken in the context of energy / carbon taxes and / or tax shifts more generally. The fact that the modelling tends to be on a macroeconomic level explains why the types of tax we are looking at, generally small ones, are, for the most part, not given much space in this literature. Most of the taxes we are looking at are not specifically related to tax shifts.

Some tax reforms target income taxes as a way of reducing high marginal tax rates, or of compensating households for an increase in environmental taxes, or both. The Swedish tax reform in 1990-91 led to a significant reduction of income taxes and a decrease of the tax wedge⁴² by around 10% between 1989 and 1991 (Ministry of Finance 1997, p.9). An evaluation study concluded that 'the decrease of the tax wedge had contributed to an increase of hours worked by around 1 percent. The reduced marginal taxes seem to have induced employed people to work more' (Ministry of Finance 1997, p.9). This reform package was clearly aimed at compensating households for the increase in environmental taxes. A similar policy was adopted by the Finnish Government in its 1997 energy tax reform. The taxation of electricity led to an increase in the electricity bills for households and as a compensation measure general income taxes were reduced. Such compensation measures can also be found in the Dutch policy: revenues generated by the regulatory tax on energy use introduced in 1996 are earmarked and they are recycled proportionately back to households and industry.

Another form of tax shift involves the reduction of employers' social security contributions (SSCs). One study by Cambridge Econometrics (CE) suggests that when employers' SSCs are reduced, real wage costs fall in the short term, leading to a long term reduction in the relative prices of labour-intensive goods and services (CE 1998, p.26). CE concludes that 'reductions in employers' taxes reduce real labour costs after allowing for full responses of prices and wage rates; the lower labour costs lead to an increase in employment' (CE 1998, p.27).

The type of recycling measure adopted within an ecological tax reform (ETR) programme is of great importance and largely determines the actual effects of an ETR. There is widespread agreement that such a reform package should not increase the overall tax burden but should decrease taxes on so-called 'goods' such as labour. The reduction of employers' SSCs falls into this category since these contributions 'act essentially as a tax on employment and thereby could be seen as a harmful economic disincentive to employ people' (CE 1998, p.47). Such a policy of reducing the employers' SSCs was recommended by the Norwegian Green Tax Commission; 'because a reduction of these [employers' SSCs] will have the most direct and immediate effect on enterprises' labour costs' (NGTC 1996, p.139).

⁴² A 'tax wedge' for an income tax is the difference between what an employer pays in wages and what the employee actually gets after tax.

Generally, the studies on tax-shifting show that at least no negative effects on employment can be expected. Indeed, a tax shift from employers' SSCs to environmental taxes may produce an economic dividend as well as an environmental dividend, but it is the latter which should be regarded as the main objective of the policy. The detailed outcome of the tax shift crucially depends on the recycling mechanism adopted. To increase employment, the most effective recycling strategy is to reduce employers' social security contributions. This form of recycling has a significantly more positive effect than a reduction in income tax rates.

Even the largest of environmental taxes – those on energy and fuel, which are not part of this study – are quite small relative to total revenues from the taxes on employed labour. They are also small compared to the revenues from employers' social security contributions, except in the case of Denmark and, to a lesser extent, Austria (see Table 5). The figure for Denmark should, however, be seen in the context of the Danish taxation system, since social expenditures are mainly funded by the general budget. These figures clearly demonstrate that the reductions in employers' SSCs from already implemented tax shifts are modest, so that a big increase in employment is unlikely to arise as a consequence of these tax shifts.

Table 5: Employers' SSCs and Taxes on Employed Labour vs. Revenues from Tax Shifts (Ekins and Speck 2000, forthcoming).

Country	Employers' SSCs in 1995 (MEUR)	Total Taxes on Employed Labour in 1995 (MEUR)	Total revenue from energy and environmental taxes (MEUR)	Revenue from tax shift in per cent of total employers' SSCs	Revenue from tax shift in per cent of total taxes on employed labour
Austria	13,100	41,714	3,600	27	8.6
Denmark	397	33,251	340 ⁴³	86	1
Germany	149,459	442,842	4,300	2.9	1
Italy	71,498	150,479	600	1	0.4
Netherlands	11,194	76,241	1,000 ⁴⁴	9	1.3
Sweden	21,153	56,408	2,000	9.5	3.5
UK	29,455	123,711	640	2	0.5

Source: Eurostat 1995 and authors' own calculations

It will be appreciated that the component attributable to taxes not related to energy is smaller still than Table 5 suggests. This is illustrated in Table 6 and Figure 1 below. Table 6 shows that environmental taxes (including those on transport) are a much smaller fraction of total tax revenue and GDP than energy taxes, the exceptions being Denmark and the Netherlands (where, arguably, progress in tax reform is proceeding relatively quickly).

⁴³ Only around 230 mil Euros of the total revenue are earmarked for reduction in employers' SSCs.

⁴⁴ Only a proportion of this figure is used to reduce employers' SSCs.

Figure 1 shows the revenues generated from all environmental taxes, with the fraction due to energy taxes, transport taxes and pollution taxes clearly distinguished. It clearly shows that the taxes and charges studied in this project are only of minor importance because more than 80 – 90% of revenues generated from environmental taxes come from energy and transport taxes.⁴⁵

Table 6: Environmental Taxes (excluding energy) and Energy Taxes as % of GDP and Total Taxation, 1995

	Environment		Energy	
	% GDP	% Tax Revenue	% GDP	% Tax Revenue
Austria	0.7	1.6	1.4	3.2
Belgium	0.5	1.1	1.6	3.4
Denmark	2.2	4.3	2.2	4.3
Germany	0.6	1.4	2.1	4.8
Greece	0.4	1.2	1.5	4.6
Finland	0.1	0.2	2.2	4.7
France	0.5	1.1	2.0	4.5
Ireland	1.4	4.0	1.8	5.2
Italy	0.5	1.2	3.1	7.7
Luxembourg	0.2	0.5	3.1	7.0
Netherlands	2.6	5.9	1.5	3.4
Portugal	0.1	0.3	3.0	8.4
Spain	1.0	2.7	1.9	5.2
Sweden	0.4	0.8	2.6	5.1
UK	0.6	1.7	2.2	6.3
EU 6	0.7	1.7	2.2	5.1
EU 9	0.7	1.7	2.2	5.2
EU 12	0.7	1.8	2.2	5.2
EU 15	0.7	1.7	2.2	5.2

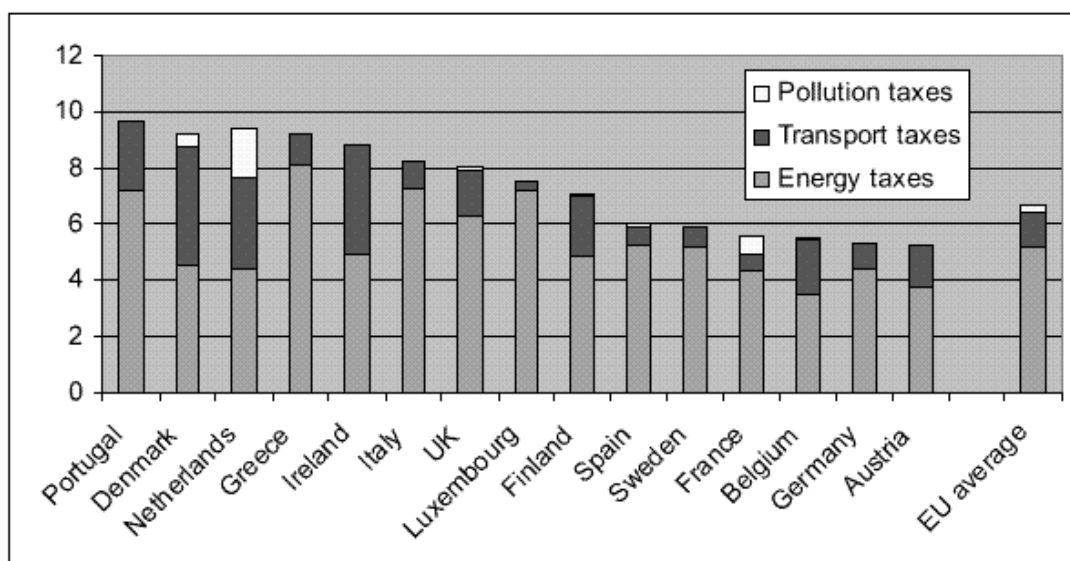
Source: Eurostat 1997

In almost all EU Member States with the exception of Austria, Luxembourg, Netherlands, Spain and Sweden, taxes on employed labour increased faster than energy and environment taxes in the period 1970 to 1995 (for a detailed discussion, see Ekins and Speck 2000 forthcoming). This report shows that in a number of countries (Belgium, France, Germany, Ireland, Italy and the UK) the share of energy and environment taxes in total tax revenues in 1970 was higher than it was in 1995. Comparing 1980 and 1995, however, this was only true for Finland and Ireland. For all countries except Greece, Ireland and Sweden this share increased between 1990 and 1995. In EU Member States as a whole the share of energy and environment taxes in total taxation declined slightly between 1970 and 1995, from 7.2% to 6.9%, although their share in GDP increased from 2.4% to 2.9%. From 1990 to 1995 the share of energy and environment taxes in both GDP and total taxation showed an increase.

⁴⁵ The analysis of energy and transport taxes were excluded by the tender documents.

This overview demonstrates that the environmental taxes and charges analysed in this report are of minor importance in terms of revenue generating, i.e. on the macroeconomic level. However, as explained above, the main purpose of these economic instruments is clearly not to raise revenue but to have an incentive effect in reducing environmental pollution. Figure 1 shows quite clearly that pollution taxes (i.e., taxes other than on energy and transport) are only introduced in 6 of the 15 EU Member States in 1997, but this has changed recently (EC 2000).

Figure 1: Revenues from Environmental Taxes as % of Total Revenues from Taxes and Social Contributions in 1997.



Source: European Environment Agency 2000.

It should be expected, therefore, that the taxes and charges we are looking at will tend to have impacts on employment that are really too small to measure – they will show up as ‘noise’ – through the macroeconomic models that are being used to trace the employment consequences of new taxes (whether revenue is used to offset other taxes or not). Indeed, unlike energy and transport taxes, many of the taxes affect specific sectors. Where they do have a more broadly distributed effect, the fact that the effect being distributed is such a small one, and it is being distributed so widely, means that impacts are quite difficult to pick up in a meaningful way.

What macroeconomic models may be able to do in the context of specific taxes is to indicate broad directions of effect, and this may be an especially useful way of fine-tuning the design of a tax package (where revenues are being recycled) so as to maximise the positive effects and minimise the undesirable ones (for a discussion in the context of the UK Landfill tax, see EF 1998). *Ex post* calculations of the employment effect of a tax shift are even more problematic. As with the question of environmental effectiveness, the question of the counterfactual again rears its awkward head. The difficulties in establishing a baseline, the large number of other influences on employment, and the relatively small revenues involved in tax shifts to date make such estimates difficult to make.

As far as we are aware, no systematic *ex post* study of a major tax shift has yet been attempted, nor indeed, that associated with a specific tax / charge (or other economic instrument). These points are well illustrated in the limited survey of waste disposal companies carried out by ECOTEC a year after the UK Landfill Tax had been introduced (EF 1998). The ECOTEC report comments on the small reduction in employers' SSCs (from 10.2% to 10%) that was involved; on other changes to employers' SSCs at the same time that would have obscured that due to the Landfill Tax revenues being recycled; and on the fact that different managers in companies are responsible for paying the Landfill Tax and SSCs, and that therefore the link between the two was often not appreciated.

However, ECOTEC also reports: 'One response from a Tax manager was suggestive of the more subtle contribution which such a reduction (in SSCs) may have on employment in the longer term. He pointed out that employment decisions are influenced most heavily by the number of sites they run. Decisions as to whether or not to invest in new sites will depend on whether or not the rate of return on capital exceeds a threshold level. To the extent that lower employment costs play a role in making such investments more likely, the NICs (SSCs) reduction will have an impact on employment.' (EF 1998, p.69) This is precisely the kind of effect that may be expected to be picked up in *ex ante* modelling, but there is no way of validating the results *ex post* when so many other factors would have to be controlled for in the *ex ante* approach (modelling has the advantage of being able to switch policies on and off rather more easily).

All of these factors suggest that, even without detailed investigation, the following outcomes in the ensuing investigations are likely:

- The employment impacts of these taxes and charges can be expected to be small, as a direct consequence of the tax, given that the taxes are generally small and on a focused group. In addition, there is a potential employment impact from the use of the revenue, and for this the nature and extent of the impact on employment depends on the manner in which the revenues are used. Note, however, that it is entirely reasonable to suppose that a tax where revenue accrues to the general budget may have a net positive employment effect. This will be true if the argument runs that relatively low labour intensity sectors are being taxed, and that the revenue is either used to support higher labour intensity public services, or effectively offsets requirements to generate revenue from elsewhere, which also have greater employment intensity than those sectors affected by the environmental tax. In other words, taxes, in promoting structural adjustments in response to changing prices, can increase employment;
- Actually arriving at a figure for the employment effects is likely to be all but impossible. The best that can be done is to make plausible assumptions on the basis of more detailed knowledge of the workings of the tax, and the labour intensities of the different responses (in terms of new products / processes) and of the different economic sectors that the tax may promote. Here, it should be noted that it is entirely reasonable to suppose that a tax where revenue accrues to the general budget may have a net positive employment effect.
- The previous approach will fail to pick up the more dispersed macroeconomic effects of the tax, but these will be equally difficult to pick up (in a reliable quantitative sense) from

macroeconomic models owing to the small perturbations to the economy which the taxes we are looking at amount to.

3.61.6 Competitiveness Issues

Probably almost every environmental tax or charge introduced at the Member State level has been greeted with some concern by some sectors of industry / commerce. The key issue raised is usually that of ‘competitiveness.’

The argument runs that environmental taxes impose costs on industry, and that since the taxes are usually applied at the Member State level, industries in the Member State that imposes the tax will see their competitive position relative to other countries deteriorate. In our experience, the discussions concerning taxes in the pre-implementation phase tend to focus on the static costs of introducing a tax. Yet taxes, to the extent that they have an incentive effect, are intended to promote dynamic changes, and the use of revenue may support dynamic changes of the desired fashion. It is, however, notoriously difficult to understand the degree to which:

- a) New technologies, processes, and products will be used / consumed (i.e. the extent of the dynamic change); and
- b) What the actual costs will be to the targeted actors of adopting / purchasing these new technologies, processes and products.

With regard to b), the role of taxes as a ‘signalling’ mechanism can be important. It is increasingly well-appreciated that significant X-inefficiency exists within industry, and the inefficiency in the use of water, energy and generation of waste are generally quite well-studied. In addition, greater efficiencies in use of pesticides and manure / fertilisers are believed to be possible. To the extent that taxes do work as signalling mechanisms, the possibility exists that taxes prompt companies to re-appraise existing practices and improve levels of resource use efficiency to such an extent that they are ‘better off’ after the tax than they were before. This was certainly true of the response of some companies to the landfill tax in the UK (see EF 1998; ECOTEC 2000).

Other important issues that arise in this context are:

- the extent to which the good, or service being taxed, is widely traded itself, or is the consequence of activities which are undertaken by sectors where trade is important. Some taxes, for example, on aggregates and landfill, are less likely to have major competitiveness impacts because they are usually traded in spatially confined markets. Where what is taxed is not widely traded, the competitiveness impact is likely to be intra-country, altering the relative position of companies offering competing goods / services. Hence, landfill taxes may stimulate recycling / incineration, whilst aggregates taxes may stimulate the search for new materials to replace virgin material, such as recycled construction materials, and new materials such as cullet (recycled glass); and
- the degree to which the effects of taxes at the Member State level can be offset by administrative mechanisms which imply that exports are exempted from the tax and imports

are subject to it.⁴⁶ The Internal Market prevents the use of border taxes *per se*, but where imports of products require licences (as with some pesticides), taxes on the first sale or use of products become realistic possibilities, reducing the extent of competitiveness impacts. More difficult to address are the taxes on intermediate inputs / pollutants emitted in the context of production, since the inputs and the emissions are specific to company processes, making any form of tax adjustment less straightforward.

There is in fact little or no evidence that environmental policy in the past has had a negative effect on competitiveness. It is not noticeable that countries with higher environmental standards have lower economic performance, and studies investigating this hypothesis have not found the evidence to support it. Reviewing the reported effects of environmental policy on economic growth and employment, an OECD study in 1985 identifies several conflicting forces at work on the macroeconomy as a result of environmental programmes. First the extra investment and operating expenditure creates extra demand, boosting output and employment, which is further reinforced by the multiplier effect. However, in due course the costs of the programme feed through into higher prices which constrain GDP growth. Overall, the study concludes that the effect on growth is indeterminate, being positive in some studies and negative in others, while the effect on employment is positive. But overall: 'The main conclusion which emerges from [these results] is that the macroeconomic effect of environmental policies is relatively small. Indeed, most of the figures reported are in the range of a few tenths of a percentage point per year.' (OECD 1985, p.10)

A number of reasons have been put forward to explain why the economists' expectation that the costs of environmental policy would feed through into lower productivity and economic growth seems generally to have failed to materialise. The most important reason is that where a negative impact on competitiveness was expected, exemptions for the relevant industrial sectors were specified. Other reasons include: the low share of environmental costs in the cost base of most firms; the fact that improving environmental performance may save costs (on resource inputs and waste disposal – see above) as well as incurring them; and the possibility that environmental regulatory pressure will improve environmental management, and corporate management generally, stimulating innovation, product development and technical change. Debate continues as to the extent to which these factors can offset the costs of environmental policy (see Jaffe et al. 1995 for a survey)

It is also true that the effect on competitiveness will depend crucially on what government does with the revenues. But the generation of perhaps large revenues from the use of environmental resources for which no charge was previously made is certainly a major distinguishing feature of environmental taxes from regulation. If, therefore, environmental tax reform is to become a major strand of environmental policy, the issue of possible effects on competitiveness needs to be assessed afresh.

Competitiveness impacts or concerns of impacts are noted in the tier 2 tax/charges reviews, but it is worth noting that few go to the level of the courts (reflecting the fact that

⁴⁶ Note however that if the tax is already paid and the exemption has to be applied for, the tax can have an impact through its effect on cashflow.

competitiveness concerns are not that great for most levies and indeed addressed by exemptions for sensitive industry sectors. One exception concerns the French landfill tax, where the national competition court found some local landfill operators in breach of abuse of dominant position on the landfill market, by charging an administrative ‘fee’ to their client to recover the tax for which operators are liable. (See Tier 2: Chapter 10)

3.71.7 *Environmental Taxes and their impact on Trade and the Internal Market*

The overview of literature on environmental taxes and charges shows that the impact on trade and the Internal Market is not perceived as generally a problem for the environmental taxes and charges covered by this study.

However, the rise in interest in legal issues around environmental policy which impact upon trade has grown as awareness of trade and environment linkages has increased. High profile cases, such as the dolphin-tuna case highlighted during the last negotiations of the General Agreement on Tariffs and Trade, have only served to heighten interest, and the need to be aware of the linkages.

Generally the approach to assessing unfair trade impacts follows the approach: Where two products are similar or partially or potentially competing, in assessing the existence of discrimination, the European Court of Justice (ECJ) will consider:

- 1) whether the differentiation is based on objective criteria such as nature of the raw materials being used;⁴⁷
- 2) whether the tax pursues objectives which are themselves compatible with the Treaty and its secondary legislation;⁴⁸
- 3) the actual financial burden placed on the imported product compared to that imposed on the domestic product.⁴⁹ This suggests the ECJ will look behind prima facie non-discriminating measures to see the actual financial burden on imported products as compared to that on the similar domestic products;
- 4) whether the method of assessing the tax is applied equally to domestic and imported products. ;and
- 5) whether the detailed rules regarding the collection of the tax are applied equally to domestic and imported products.⁵⁰

Within the scope of this study, four cases of established linkages between environmental taxes and trade/Internal market have been identified and mainly concern disposable containers and Internal market issues related to the product character of bottles.

- **The (Case 302/86) Danish Bottles:** The Commission challenged the Danish law which provided for the establishment of deposit and return schemes for beer and soft drinks

⁴⁷ Id. para18(1)

⁴⁸ Id. para 18 (2)

⁴⁹ Id. para 19

⁵⁰ Commission Communication para 19

containers and required that the drinks be marketed in returnable containers which had to be approved by a Danish authority. Importers were allowed to market a certain specified quantity of beverages in non approved containers. At the time there was no EC legislation on packaging waste. (see Tier 2: Chapter 12)

- **The Swedish Packaging Tax:** the tax was abolished in 1994 with the introduction of EU packaging regulations. (See Tier 2: Chapter 12)
- **The Finish Packaging tax:** Complaints that the tax favours the refill bottles (which are likely to be domestic based) over recycled containers which are likely to be imported, have not been pursued by the European Commission as the tax rates are considered low. (See Tier2 :Chapter 12)

Cases of hampered competition between EU Member States include:

- **The Austrian tax on Fertilisers:** the tax was abolished in 1994, before joining the EU because competition with other EU member states was deemed to be hampered by the tax in place. (See Tier 2, Chapter 9).

The key issues from a legal point of view relate to:

- The freedom of movement of goods;
- The equality of treatment of domestic and foreign products / services;
- Potentially, the degree to which the tax affects only foreign products (though the objective basis for the levy is an equally important consideration);
- The manner in which revenues are refunded;
- The degree to which domestic industries are exempted;
- The imposition of disproportionate administrative burdens related to the administration of a tax; and
- Relatedly, the use of standards linked to levies which may themselves discriminate against foreign production, or be deemed disproportionate in then light of their effect on specific traded goods / services.

Where none of these is an issue, the tax will have economic effects – that is what it is intended to do – but from the perspective of the Internal Market, they need not give rise to any concerns.

4.0 OVERVIEW OF THE USE OF ECONOMIC INSTRUMENTS IN CENTRAL AND EASTERN EUROPEAN COUNTRIES (CEECs)⁵¹

The aim of this section is to present an overview of the use of economic instruments in the central and eastern European Countries, many of which will soon be EU Member States. While this was not an explicit ToR deliverable for the project, it was felt important to present the CEEC experience to allow the reader to compare practice. This chapter presents the overview, and is complemented by an in-depth analysis of the Hungarian batteries charge in Tier 2, and a detailed country description of the use of taxes and charges in the Czech Republic, presented in Annex 3. These sections combined highlights the fact that the tax and charge systems in the central and eastern European Countries (CEEC) is very developed, and many of the issues that affect taxes and charges in the EU Member States will also be of relevance to policy makers. The descriptions and discussions on CEEC taxes and charges presented here, aim to provide a starting point for discussions on competitiveness and internal market effects in the accession process.

4.1 Introduction

Economic instruments for environmental policy such as air emission charges and non-compliance fines were introduced in many (CEECs) as early as the 1970s. Under the state-owned enterprise and centrally planned price and accounting system, however, charges and fines were both levied and paid by the state. Consequently, there was little or no incentive for pollution abatement, and the charges did not directly achieve environmental goals. The objective of the charges was to shift revenues from the general budget to specially earmarked funds to be used by environmental authorities.

With the beginning of the transition to a market-based economy in 1990, several policy actions had an effect on the environment. First, subsidies to heavily polluting and inefficient industries were terminated. In many countries, user prices were also introduced, or increased, in the water, and waste sectors which represented both an attempt to move towards instruments designed to convey environmental incentives, and a movement towards full cost-recovery mechanisms, both of which continue to be goals in these sectors today. In nearly all cases, pollution charge systems were modified and emerged as real costs to producers and consumers. The value of the environmental charges was also apparent to environmental policy-makers who recognised the need to generate revenue for investment in the environmental sector.

In the past few years, the use of economic instruments in environmental policy in Central and Eastern European Countries has been driven by the EU Accession process. Additionally, previously existing economic instruments, in particular air emission charges and fines, continue to contribute substantial revenues earmarked for necessary environmental expenditures in CEECs. However, a review of 1999 tax rates and tax revenue spending programs shows that distinctions continue to exist between CEECs and EU Members (REC

⁵¹ This Chapter is based on reports written by McNicholas and Speck (1999) and work carried out by the Regional Environmental Center for Central and Eastern Europe (REC 1999 and REC 2000).

1999). These distinctions are also reported in the latest review studying the implementation of economic instruments in environmental policy (REC 2000). Some of the specific characteristics in the context of economic instruments implemented in CEECs are highlighted below focusing on four of the tier 2 taxes analysed for the EU Member States; i.e. Nitrogen Oxides (NO_x) charges, water abstraction charges, waste water charges and aggregates taxes, i.e. taxes on mining activities. The main aim is to describe the basic structure of the system of taxation implemented in CEECs and to show that there is widespread use of these economic instruments in CEECs. However, it should be taken into account that the description of these economic instruments says nothing about their environmental effectiveness and economic efficiency. Answers to these issues can only be found in a more detailed analysis.

4.2 Air Pollution Charges – Example of Nitrogen Oxides (NO_x) Taxes

Central and Eastern European countries have previous experience with emission levies, the primary pollutants being SO₂, NO_x, and solid particles/particulates, as pollution levies and non-compliance fees were introduced in many countries as early as the 1970s. In the 1990s these charges were re-designed and polluters were confronted with the real costs of the charges as subsidies from central budgets were phased-out. The transfer of enterprises from public to private sector control has also strengthened to incentive mechanism conveyed by the price system more generally.

The taxation system applied in CEECs is different from the taxation system in EU Member States because emission charges are frequently introduced in conjunction with a permit system: a base charge rate is applied to all pollution within the permitted level and a penalty rate is added for pollution above that level (the so-called ‘non-compliance fee’). Large point-source polluters (combustion plants, heavy industry) are the principle targets of these instruments. The charges and the non-compliance fees are intended to raise revenues and encourage cost-effective abatement below the permitted level. The non-compliance fees are intended to provide incentives to reduce pollution to permitted levels and therefore play a regulatory role. Such a system of emission charges in conjunction with non-compliance fees is in place in six of the ten CEE Accession countries, i.e. in the Czech Republic, Estonia, Latvia, Lithuania, Poland and Slovakia. In three CEECs, i.e. Bulgaria, Hungary and Romania, no emission charges have been introduced. Non-compliance fees and the rates of these fees vary by category and case of violation. Pollutants such as NO_x, SO₂, VOC, are not addressed through any form of economic instrument in Slovenia, yet Slovenia is a forerunner in the implementation of a CO₂ tax in CEECs.

Table 7 below shows the magnitude of the charge rates and the rates of the non-compliance fees, which can be up to 10 times higher than the emission charge rates (for example in Estonia and Poland). This system of emission charges in conjunction with non-compliance fees for pollution above a certain level can have a clear incentive effect if administered properly. Such schemes were introduced for more than 100 pollutants in some of the countries in the region. The actual sizes of these rates are, at least for some of the countries such as Lithuania and Poland, comparable to the rates implemented in France and Italy.

Table 7: Charge Rate for NO_x Emission Taxes and Non-compliance Fees

Country	Emission charge EUR per ton NO_x	Non-compliance fee EUR per ton NO_x
Bulgaria		120 (NC)
Czech Republic	22 (EC)	33 (NC)
Estonia	6.7 (EC)	67 (NC)
Hungary		applies but varies
Latvia	16.1 (EC)	48.3 (NC)
Lithuania	90.3 (EC)	applies but varies
Poland	80 (EC)	800 (NC)
Romania		applies but varies
Slovakia	18.2 (EC)	applies but varies
Slovenia	not applicable	
EU Member State		
France	22.9 (ET)	
Italy	105 (ET)	
Sweden	4630 (RET)	

Source: REC 2000 and EC 2000

Notes: EC – emission charge; NC – non compliance fee; ET – emission tax; RET – Refunded emission tax. The distinction between ‘EC’ and ‘ET’ relates mainly to how the generated revenues are being used. In the former case the revenues are being earmarked for environmental funds and the latter case the generated revenues are part of the federal budget.

The development and implementation of air pollution charges varies both in comprehensiveness and success throughout the region. Attention has been given to the revenue raising function of these economic instruments rather than their ability to provide incentives to polluters to reduce environmental pollution. This can be attributed to budgetary pressures in CEECs which have severely restricted the public financing of environmental investments. Moreover, much experience had been gained within environmental ministries regarding these types of charges, and, as industry and municipalities recognise the potential environment-related financial support from earmarked funds, these charges are often more politically attractive. For this reason, economic instruments have now become the main revenue source for state/municipal environmental funds which exist in most countries in the region (OECD, 1999).

The situation regarding the implementation of air pollution charges in CEECs merits some attention when compared with the development in EU Member States where emission taxes are only introduced in a small number of countries. The assessment of effectiveness and efficiency of economic instruments in general is a very complex task not only in CEECs but also in EU Member States. However, the specific situation of CEECs makes the task even more complicated, since the economies are still very much in a transition which has been more or less turbulent in different countries. Problems arise because of the re-structuring of

the administration and institutions, and because the administration of some of these economic instruments implemented in the region is less than optimal in certain cases. For example a large numbers of pollutants are chargeable, and exemption schemes available for polluters may cause enforcement difficulties. In addition, there is a lack of reliable data collection. The problems associated with levying charges on a large number of pollutants has disappeared in some countries because the tax schemes have been changed recently so that only the major air pollutants are covered by charges.

4.3 Water Abstraction Tax / Charge

The use of water abstraction taxes is widespread in CEECs. 8 out of the ten EU Accession countries in the region have implemented this type of economic instrument. Table 8 below gives information concerning their taxes and their rates.

Table 8: Water Abstraction Taxes Implemented in CEECs

Country	Water abstraction tax/charge	Tax rates (1999)
Bulgaria	Not applicable	Not applicable
Czech Republic	<ul style="list-style-type: none"> ■ Surface water ■ ground water 	<ul style="list-style-type: none"> ■ rates are set by river basin management company ■ 0.05 EUR/m³
Estonia	All sources	<ul style="list-style-type: none"> ■ between 0.0019 EUR/m³ and 0.96 EUR/m³ depending on water source and use of water
Hungary	All sources	<ul style="list-style-type: none"> ■ between 0.006 EUR/m³ and 0.04 EUR/m³ depending on use of water
Latvia	<ul style="list-style-type: none"> ■ surface water ■ ground water 	<ul style="list-style-type: none"> ■ 0.003 EUR/m³ ■ 0.016 EUR/m³ rate for mineral water is between 0.08 EUR/m³ and 0.161 EUR/m³
Lithuania	<ul style="list-style-type: none"> ■ surface water ■ ground water 	<ul style="list-style-type: none"> ■ rate depends on the use of water ■ 0.009 EUR/m³ (households); 0.02 EUR/m³ (industry) and 1.22 EUR/m³ (mineral water)
Poland	<ul style="list-style-type: none"> ■ surface water ■ ground water 	<ul style="list-style-type: none"> ■ 0.027 EUR/m³ ■ 0.08 EUR/m³
Romania	<ul style="list-style-type: none"> ■ surface water ■ ground water 	<ul style="list-style-type: none"> ■ 0.005 EUR/m³ – 0.0006 EUR/m³ (Danube) ■ 0.006 EUR/m³
Slovakia	<ul style="list-style-type: none"> ■ surface water ■ ground water 	<ul style="list-style-type: none"> ■ 0.5 EUR/m³ ■ 0.02 EUR/m³ for public water supply and 0.5 EUR/m³ for other uses
Slovenia	Not applicable	Not applicable

Source: REC 2000

These economic instruments are similar in that the revenues generated are mainly earmarked for environmental funds and / or river basin authorities, i.e. the revenues are usually used for investments in infrastructure measures. As mentioned above environmental policy and the need for environmental investments are driven by the EU Accession Process and compliance with EU Directives.

4.4 Waste Water Charges (Trade Effluent Taxes/Charges)

Waste water charges have been introduced in all 10 Central and Eastern European Countries aiming to join the EU. The scheme of these taxes and charges does not show big differences compared to the schemes adopted in EU Member States (see Table 9). The schemes adopted show similarities to the taxation of air emissions.

Table 9: Waste Water Charges in CEE

Country	Waste water charge	Tax base	Use of revenue
Bulgaria	Above certain pollution limits	Pollutants and / or volume of waste water	National and regional environmental funds
Czech Republic	Above certain pollution limits	Pollutants: COD, mercury, cadmium, etc.	Environmental fund
Estonia	Charge and NCF ^x	Pollutants: BOD7, suspended solids, phosphorous, etc.	Earmarked for environmental measures
Hungary	No charge but NCF ^{xx}	Rate of NCF depends on toxicity, etc.	General budget but revenue is earmarked
Latvia	Charge and NCF		National and municipal environmental funds
Lithuania	Charge and NCF	Pollutants: BOD, suspended solids, etc.	Environmental funds
Poland	Charge and NCF	Pollutants: BOD, suspended solids, etc.	Environmental funds
Romania	Charge and NCF	Pollutants: BOD, suspended solids and difference between direct and indirect disposal	Central budget but revenue is earmarked for water fund
Slovakia	Charge and NCF	Pollutants: BOD, inorganic salts, etc.	Environmental fund
Slovenia	Charge	Pollutants: COD, phosphorous, etc.	Central budget

Source: REC 2000

Notes: NCF – water pollution non-compliance fee

^x the non-compliance fee is ten times higher than the charge rates; ^{xx} the rate of the NCF is 3 times the rate of the waste water charge for exceeding the limit and 12 times the rate for illegal dumping or no reporting

4.5 Aggregates Taxes - Taxes on Mining

The majority of Accession countries have implemented economic instruments for mining activities (see Table 10). The actual design of these taxes is quite varied ranging from taxing the area of mining activities to *ad valorem* taxes, and taxes which are based on the quantity of materials extracted. Quite interesting is the fact that, for example, Estonia, Poland and Lithuania are levying taxes on the extraction of energy products. This type of taxation scheme cannot be found in the EU where relatively few countries have introduced such a tax scheme (see Chapter 2 above). Revenues generated from these taxes are partly earmarked for environmental funds (Poland) but mainly are part of the central budget.

Table 10: Taxes on Mining Implemented in CEECs

Country	Mining tax rate	Tax base	Materials and comments
Bulgaria	Range between 0.015 EUR/m ³ and 0.46 EUR/m ³	cubic meter of materials extracted	Quarry, sand, gravel, clay, pit
Czech Republic		area of mining	Additional a tax on certain raw materials applied; rate: up to 10% of market price
Estonia	Range between 0.06 EUR/m ³ and 0.32 EUR/m ³	cubic meter of materials extracted	Sand, cement limestone, gravel, peat; the extraction of oil shale is also subject to a charge: 0.26 EUR/ton
Hungary	2-15% of sales price	ad valorem tax	
Latvia	Range between 0.08 EUR/m ³ and 0.40 EUR/m ³	cubic meter of materials extracted	Soil, sand, gravel, dolomite
Lithuania	20 % of sales price for oil, 0.07 EUR/m ³ – 11.55 EUR/m ³ (amber)	ad valorem tax for oil and cubic meter for other minerals	Oil, sand, amber, peat dolomite, clay, limestone
Poland	Between 2% and 10% of sales price	ad valorem tax	Coal, gas, oil, salt, other minerals
Romania	Not applicable		
Slovakia	114 EUR/km ² /year; 0.3 – 10% of current market value of extracted minerals	<ul style="list-style-type: none"> ■ area of land mined ■ ad valorem tax (minerals) 	
Slovenia	Not applicable		

Source: REC 2000

4.6 Conclusion

The system of environmental taxes has not been without its problems in CEECs. However, over the past decade, solutions to overcome some of these deficiencies have been developed and certain successes have been achieved with the charge systems in some countries. The following modifications implemented in recent years are likely to have assisted the implementation and effectiveness of pollution charges (McNicholas and Speck 1999):

- reduction of the number of pollutants covered and overall simplification of the charge rate system;
- collection of pollution payments has been included in existing tax structure resulting in higher collection efficiency;
- late payments are charged interest and are collected by tax inspectorates;
- charge rates have been phased-in via announced percentage increases;
- charge rates have been linked to inflation;
- charge rates have been increased to promote abatement measures; and
- penalty rates have been introduced with substantial multipliers to provide incentive for pollution reduction.

As mentioned above the earmarking of environmental charges in CEECs is widespread in CEECs and this is partly a reflection of investment needs. These investment needs are, in turn, driven by the accession process and the fact that the CEE applicant countries have to accept the “*acquis communautaire*” in the accession process to the European Union. As far as the “*environmental acquis*” is concerned, most of the obligations can be found in Directives and the harmonisation of the environmental protection legislation is one of the priorities for the accession countries. Legal transposition of approximately 300 legal acts is not a sufficient condition for harmonisation. The EU Directives impose requirements related to specific technologies, provision of particular services and administrative structures resulting in high investment costs. Part of these investments will be covered by the European Community through the EU pre-accession Financing instruments, such as ISPA⁵², PHARE⁵³ and SAPARD⁵⁴. However, the greater share has to be, and will be, borne by the candidate countries themselves, in particular via the revenues generated by environmental charges and collected in environmental funds.

In the context of the accession process adopting European Union environmental law, economic instruments prove to be of great interest. Not only can they be seen as a response to the actual financial needs for the necessary investments but they also constitute an original tool for the approximation process itself at its different stages (transposition, implementation, enforcement). The use of economic instruments in CEECs for the legal approximation fits

⁵² Pre-accession instrument for structural policies.

⁵³ Poland and Hungary Assistance for the reconstruction of the Economy (PHARE) based on regulation 3906/89 of 18 December 1989 (See JOCE L375 of 23 December 1989). Originally addressed to Poland and Hungary PHARE has been extended in 1996 to include 13 partner countries from the region.

⁵⁴ Special Accession Program for Agriculture and Rural Development.

within a cross-disciplinary approach. The traditional dichotomy between economic instruments and “command and control” instruments i.e. regulatory instruments, is becoming increasingly obsolete. Economic instruments can have no existence without a legal framework. On the other hand legal norms like directives can be more effective thanks to economic instruments (Hequet 2000). Generally, EC Directives do not require that Member States and Candidate countries to have implemented specific taxes and charges with the exception of the minimum excise duties for mineral oil products (Directive 92/82/EEC) which sets minimum excise taxes for mineral oil products (petrol, gas oil, heavy fuel oil, LPG and kerosene). Therefore it does not seem that Candidate countries have to introduce new environmental taxes. However, many of them have to extend the tax base in the context of the above mentioned EC Directive on mineral oil products. It also looks quite unlikely that these Accession countries will have to abandon some of the existing economic instruments for environmental policy on the basis of EU legislation. EU countries have implemented similar environmental taxes and charges to those which can be found in CEECs.

One of the biggest challenges some of the CEECs will face is the question concerning the future of environmental funds. There is widespread agreement that the last useful public role of CEE funds in their current form may be for implementing the investment-heavy Directives, such as the Urban Waste Water Treatment Directive (UWWTD), Integrated Pollution Prevention Directive (IPPC), Landfill Directive, etc. The uncertainty of the role of environmental funds in the future has to be seen in the context of discussions concerning state aid, i.e. subsidies, in particular regarding Article 87 of the EC Treaty. A crucial question is whether environmental funds comply with the EC Guidelines on State Aid for Environmental Protection (94/C72/03) which are currently being under revision. The implications of them not doing so raise serious issues for the way in which investment heavy Directives can possibly be implemented.

TIER 2

**ANALYSIS OF SPECIFIC TAXES AND CHARGES IN THE EU
MEMBER STATES**
