

## CH 18 CONCLUSIONS

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 has 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 competitiveness and employment are real. It therefore fulfils one of the Commission's intentions as noted in the 1997 Communication on Environmental Taxes and Charges:

*'The Commission, in cooperation with all interested parties, intends to continue to explore the avenue of environmental levies and charges by:*

- *Systematic collection of experience from Member States of the existing levies and charges.*
- *Systematic analysis of the environmental impact of the use of environmental taxes and charges within Member States.*
- *Systematic analysis of the impact of environmental taxes and charges on the internal market and the competitiveness of European industry.'*

It also stated, at the end of the Communication, that:

*'In order to assess the impact on the single 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'*

This study is part of the response to the concern to understand better the impact of these instruments such as have been used in the European Union.

In this conclusion therefore we present key insights on:

- Lessons on the use, and development of use, of taxes and charges
- Environmental Effects of the taxes and charges
- Impacts on cost and price
- Burden on the industry/consumers, equity issues and exemptions
- Revenue Raising Use of Taxes
- Impacts on the internal market
- Impacts on employment
- Environmental Effectiveness and Economic efficiency

## Development of use of environmental taxes and charges

### Overview of Use of Taxes in the EU

Environmental taxes and charges are increasingly being adopted in the EU as key instruments of environmental policy. If one takes only the taxes considered in this study, it appears that Northern European countries have more of these taxes in place than those of the South (hence, the apparent ‘Northern bias’ in the selection of taxes studies, as given in Table 1 below). A number of Central and Eastern European countries (CEECs) also have such instruments in place. Frequently in the past, the objectives in CEECs have been to ensure compliance with standards through the use of non-compliance fees or to raise revenue for Environmental Funds.

**Table E1: Selection of Taxes and Charges, and Countries for In-depth Analysis (Tier 2):**

<b>1) NO<sub>x</sub></b>	Sweden (S)	Spain (E): Galicia	France (F)
<b>2) Water Abstraction*</b>	The Netherlands (NL)	Denmark (DK)	
<b>3) Waste Water</b>	Denmark (DK)	The Netherlands (NL)	<b>Germany (D)</b>
<b>4) Pesticides</b>	Sweden (S)	<b>Denmark (Dk)</b>	Belgium (B)
<b>5) Fertiliser</b>	The Netherlands (NL)	Finland (FIN)	Sweden (S) and Austria (A)
<b>6) Landfill</b>	France (F)	<b>Britain (UK)</b>	Austria (A)
<b>7) Aggregates</b>	Denmark (DK)	Sweden (S)	Britain (UK)
<b>8) Packaging</b>	Finland (FIN)	Denmark (DK)	Sweden (S)
<b>9) Batteries</b>	Italy (I)	Belgium (B)	Hungary (HU)

*A Spanish regional abstraction charge case was also explored during the study, but later dropped because findings revealed that it was a regulation charge rather than an environmental levy.*

*Note: The analysis of the three taxes presented in bold was taken one step further, to a Tier 3 analysis, given that particular insights were worth exploring further.*

Certain taxes and charges (levies) are more widespread than others. Levies of one or other type for water and waste are prevalent across the EU (and some CEECs). However, levies on agricultural pollutants are not so widespread, and the same applies to aggregates and, somewhat surprisingly, NO<sub>x</sub> emissions.

Tax and charge rates adopted vary considerably across countries that have applied them, and the approach has generally been for countries to adopt levies unilaterally rather than implementing them in co-ordination with other countries. This has had implications for the level at which the levy is set (or ultimately reaches), the coverage of the levy, and very importantly the exemptions, and consequently the effect and effectiveness of the instrument.

Furthermore, in most countries, environmental taxes and charges have been implemented on a one by one basis, rather than as a package of taxes as part of green tax reforms. However, a policy preference for taxes over alternative instruments (regulation, voluntary agreements) is

noted in some countries, and over time this could be expected to have a similar effect to a strategy of green tax reforms.

Practice with taxes show that most were set at low rates (with the exception of some user charges, and ramped up over time. While many express concern at this “ratcheting effect”, it is often the case that the rates do not increase that significantly (in real terms over time) , as increased get blocked by government concern for the supposed fragility of specific industry sectors and lobbying by interest groups.

Environmental taxes and charges affect most sectors of the economy either directly or indirectly, as the costs implications pass through the economy, given that one sector taxes often provides goods or services as an (intermediate) input to the production of other sectors. The extent of the tax/charge signal, and the changes to other tax regimes given the revenues raised from the environmental taxes and charges, can change the incentive structures within the economy and lead to an accelerated structural change of the economy. The rate and extent of this change depends of course, of the scale of the taxes/charges and the sensitivity of the sectors/processes/products taxes. This issue explored in more detail below.

### **Environmental effects of the tax/charge**

On the whole the effect of taxes and charges on the environment cannot be said to be systematically significant, and only a sub-set of the taxes in place have so far led to significant environmental effects. This relates to the fact that some have a purely fiscal (revenue raising) role, with incentive effects more incidental. Furthermore, it is important to distinguish between the role of the tax/charge rate itself and the role of the use of revenues on environmental impact, as these are arguably two separate, though connected, decisions / instruments.

For those that prove to have some real effect on the pollutant / polluting product / natural resource use that they are addressing, this comes about due to a variety of reasons (and it is important to distinguish the effect related to the tax/charge, and the effect related to the use of the revenue):

- a) The price impact itself, through impact on (intermediate and final) consumer spending patterns;
- b) The price signal itself has an impact independent of the level of the tax, given that it indicates to the consumers that the item taxed is an environmental bad, or for natural resources, a limited environmental good.
- c) The effect of expectation of future price rises, and hence an anticipatory response. This builds on the fact that many taxes/charges are initially set low, and subsequently are "ramped up". The low early rates allow initial acceptance, and the rises move towards level where an incentive effect (or revenue raising effect) can be expected.
- d) The use of the revenues is often linked back to environmental expenditure, research to support the response to the tax; this is the case with the Swedish NO<sub>x</sub> tax, where all revenues are recycled back to the industry. Here it is often the revenue that leads to the bulk of the impact rather than the levy rate's role though price signals and incentives.

- e) Finally, where there is a tax and no revenue is used directly on environmental measures, the change in the tax structure (given that other taxes can be reduced to balance the new revenues – e.g. UK Landfill tax) of the economy can accelerate medium and long term structural changes to the economy (as noted in previous section), which can lead to reduced environmental impacts.

This does not necessarily mean that the tax in principle is ineffective, but rather that the current form, level and associated exemptions can make the tax less effective (see discussion on exemptions below).

On the basis of our review of environmental taxes, the following comments seem pertinent in respect of their environmental effect:

- Design is crucial. Furthermore, design has to be seen in the context of the particular purposes for which the instrument is to be used. The design of levies shows signs of becoming more imaginative and ambitious over time. The use of a levy on nutrient surpluses in the Netherlands is a good example, as is the Swedish refunded NO<sub>x</sub> charge and the Danish packaging tax based on life-cycle impacts. Norway (not included in this study) has recently introduced a tax on pesticides that is banded to reflect environmental harm. Other countries looking at pesticides taxes are investigating similar approaches;
- The level of the levy is also important. For obvious reasons, small levies may not have a great effect. On the other hand, the term ‘small’ needs to be seen in context. Taxes that are small in the macroeconomic sense may imply significant changes in the price of a specific good or service being subjected to the tax. This can prompt significant changes (as in the case of landfill taxes on construction wastes – see below);
- The environmental effects of taxes are compromised, almost universally (the only exception appears to be some fertiliser and pesticide taxes, and to some extent, the waste taxes) by the existence of exemptions. These exemptions are typically specified on the basis of anticipated competitiveness effects. The effect of broad exemptions is to render the tax less significant both in terms of environmental effects and in terms of promoting structural change in the economy. The fact that it is frequently those who are the largest producers / consumers of the product / service subject to the levy who are exempt obviously has severe consequences for the levy’s claim to be environmentally effective (or even for the tax to be implemented; see the Belgian pesticide tax discussion); and
- The use of revenues can play an important role in reinforcing the incentive signals that the levy is intended to convey, or can play a role as an alternative to the incentive signals (as this is not always the intention). The use of revenues to support action programmes in the case of fertiliser and pesticide taxes are potentially just as important as the price incentive itself. In the case of the UK landfill tax, some environmental projects have been supported by tax credits. In the Swedish NO<sub>x</sub> charge, revenues are refunded in such a way as the instrument promotes investments that improve efficiency of energy production per unit of NO<sub>x</sub> emitted.

Positive and significant environmental impacts, attributable to the tax /revenue package include:

- The refunded NOx charge in Sweden - the Swedish NOx tax led to a 4% emission reduction from 1992 to 1998 - although the environmental effect is more important than the figure suggests because the number of plants liable to pay the tax has doubled in 1998.
- Both Danish and Dutch water abstraction taxes, despite the mainly fiscal role. The Danish Abstraction Charge, complemented by awareness-raising campaigns, led to a 13% reduction in water consumption since the tax was introduced in 1994 and led to a total reduction of 26 % since 1989 as a result also of increased sewage fees
- The Dutch and German wastewater levies, though in the former, use of revenue has played a role, and in the latter, the link between the tax and standards has played a role in reducing emissions. The Dutch charge/revenue package allowed to reduce COD discharge into water by 90% while the German charge led to a 31% reduction in industrial waste water since 1981 and improved compliance with standards.
- The fertiliser levies have all had some effect though the impact of the levy package is difficult to pin down. The reduction in Austria was probably assisted by extension services (supported by revenue). The Swedish tax on Nitrogen continues to produce reductions in use - an estimate suggests that a 15%-20% reduction in fertiliser-N use in 1991/1992. The Dutch levy on surpluses is expected to have a significant effect on pollution. In Finland, the tax led to a 22% decrease in fertiliser use between the 1980s and the 1990s, due to a huge tax hike at the beginning of the 1990s.
- Both the Swedish and Danish pesticides taxes have seen reductions in use (and treatment frequency in Denmark). Revenues have probably played a role in Sweden and Denmark. The effect of reducing quantities of active ingredient has to be considered carefully since this may imply switch to low dose products which may be equally / more damaging (though advice prevent such switching where it is harmful);
- Landfill Taxes – increasing recycling and minimisation of commercial and industrial waste in the UK, possibly also in Austria too;

Positive and significant impacts, though not attributable to the tax/charge itself include:

Disposable Containers: for Sweden Collection Rate for returnable bottles is nearly 100<sup>1</sup> and More than 90% of Aluminium cans are collected and recycled; 70% of non returnable PET bottles are collected and material recycled and 100% returnable PET bottles are reused. Much of this is due to the legislation and environmental agreement in place for packaging waste

- Batteries: no evidence of reductions, though significantly higher collection and recycling - due to the existing of the schemes rather than tax (though the tax finances the administration of the scheme). Belgian battery recycling (under the BEBAT voluntary agreement) had increased under the scheme, allowing Belgium's obligations under the packaging Directive to be met;

<sup>1</sup> Managing the Environment – the Role of Economic Instruments (OECD)

- As regards aggregates, the positive effect in Denmark is probably related to the tax on landfill as much as the tax on raw materials – these have worked in tandem to increase recycling;

Lesser impacts (attributable to tax/charge schemes) noted include:

- NO<sub>x</sub> tax - In France, the tax has led to an average reduction of 27,000 tons NO<sub>x</sub> per year;
- The Austrian Manure and Fertiliser Tax led to an annual 0.8% decrease in fertiliser use;
- Landfill tax: no significant effect in respect of municipal waste in France or UK and limited effect in Austria;

It should be stated that ex post assessments continue to be frustrated by the lack of really good data and monitoring of the response of targeted actors to the instrument. Where one relies on time series data for the provision of ‘evidence’ of an effect and its magnitude, the length of the time series required to enable strong conclusions to be drawn makes it increasingly likely that other factors will complicate the picture. This is the case in almost every single levy that has been investigated and suggests the need for much more systematic evaluation of policy if we are to understand the full effects of policy. This does not mean that environmental levies have not been effective, merely that the degree to which one can attribute an effect to the levy (as opposed to other instruments) is difficult to resolve. Indeed, some would argue that it is almost impossible to fully disentangle the effect of a levy from the effect of economic and political measures and developments.

Tier 3 analysis has shown that irrespective of how effective a tax is (or is not), the chances of the instrument having a positive effect (and the negative effects being minimised) are enhanced when the tax is operating as part of a more comprehensive package. For example, the Danish pesticides tax is part of a more integrated approach to pesticides and has had some positive effects.

Whilst the above picture deals with ‘positive’ aspects on the environmental side, some consideration of the potential negative consequences is warranted:

- In the case of landfill taxes, we understand that in Denmark, as well as Austria and the UK, the effect on the construction and demolition industry has been to divert some materials to uses that may not be especially positive. The general point is worth making that when incentive structures change, the potential for avoiding the levy’s effects will be explored. This may require that additional regulatory resources are employed to ensure the tax has no negative effects;
- Where levies cannot properly target the cause / all causes of pollution, the risk remains that responses to the tax are not necessarily environmentally beneficial. Per kg taxes on pesticides may simply promote switching to low dose products that could be less benign environmentally. A charge on NO<sub>x</sub> emissions in the absence of taxes on other associated emissions may lead to investments in NO<sub>x</sub> abatement equipment that produce more emissions of other pollutants which are not subjected to the levy. Again, taxes on fertiliser may not necessarily reduce nitrate leaching if what is taxed is only what is sold. If manure

and compost is stored / applied inappropriately, the problems of nitrate pollution may not necessarily be solved by a tax on fertiliser at the point of sale.

### **Revenue Raising Use of Taxes**

The revenues raised by the taxes and charges analysed in this study, are not significant on a macroeconomic scale, representing only a small fraction of tax receipts, lagging far behind labour taxes, VAT and indeed also energy taxes / excise duties. The Landfill tax is the only (marginal) exception. However, the revenues do represent significant amounts of money at the sector or company level.

In some cases, the revenue was recycled to industry or total taxes were kept constant at a national level (e.g. revenue neutral). An example of the former is the NO<sub>x</sub> charge in Sweden where total revenues were recycled to payees, though with some industry receiving more back than others. An example of the latter is the UK landfill tax, where reductions in social security contributions balance the tax receipts.

For certain taxes and countries the taxes go directly to the national exchequer / budgets, and the economists' position is that this is more efficient than allocating the revenues to a particular use (earmarking/hypothecation). But the overall balance between fiscal taxes and hypothecated taxes seem to remain in favour of hypothecated taxes, or taxes with revenue recycling, as noted in an early OECD report, although in later years more fiscally tuned taxes have been introduced.

In some cases there are complete exemptions for the industries (conceived to be) most sensitive to the burden of the taxes/charges, limiting the amount of revenue raised by the instrument.

Examples on the use of revenues include:

- **Manure and Fertiliser:** the use of revenue is treated differently across countries. In the Netherlands, the revenues go to the state budget. In Finland the revenues are used to support exports (subsidies), and in Sweden, the environmental charge supported research and environmental related projects, but since 1994 the moneys have gone to the state budget but earmarked for environmental improvements in agriculture.
- **Landfill tax:** These are recycled - in France mainly to municipalities via funds/investments and to a lesser extent: private (waste) sector & research activities; in Austria for the clean up of contaminated sites and recycling to landfill sites for environmental investments; in the UK, partially to fund environmental projects (though mostly offset national insurance contributions).
- **Revenues from the tax on Disposable Containers** goes to the national exchequers in Finland, Denmark and Sweden.
- **Revenues from the charge on batteries,** goes to finance the BEBAT collection and recycling scheme in Belgium.

## Impacts on costs and prices

The environmental taxes and charges function, *inter alia*, through the impact that they have on price, if what is subject to the levy is a product or service, or costs, if what is subject to the levy is an input to, or emission from, a process. For most taxes / charges, the impact on the cost base is relatively small, but difficult to assess, even though the impact on prices paid for products and services can be relatively large in percentage terms.

Possible exceptions are the cases of the Danish pesticides tax and the Swedish fertiliser tax where what are significant price increases are affecting a significant share of the cost base. However, more generally, the 'low impact on cost / high impact on prices' characteristic suggests that prior to the introduction of levies, 'the environment' is under-priced (the market does not internalise damages). In some cases, especially levies on emissions, the tax may be insufficient to incentivise emissions abatement in itself (e.g. French NO<sub>x</sub> charge).

Areas where taxes/charges have a real impact on cost and on prices include:

- Landfill tax: In the UK, the tax accounts for 35% to 100% of the active waste landfill price; in France, some data suggests an average 6% to 15% tax share of the landfill price for municipal/household waste in 1998. The Austrian case suggest a similar share of price for best technology sites, and a 5% to 65% share for other sites;
- Pesticides tax: Very significant effect on insecticides prices in Denmark (54%); smaller but nevertheless significant impact on herbicides in Denmark (33%) and Belgium (45% on average, based on estimates). Wood preservatives prices would be highly affected by the tax in Belgium (50%) with only 3% in Denmark.
- Fertiliser taxes: in Finland the price of fertilisers increased by 72% (now abolished) and in Sweden, the tax represents about 20% of the fertiliser price (against 10% in 1984).

Areas with smaller impacts on price include:

- Batteries: The impact on price ranges from 1.7% of battery sale price in Italy to 5% in Belgium.
- Disposable containers: the only available data for Sweden suggests a maximum effect on prices of 3%.

In both of these cases, the levy rate was not intended primarily to discourage use of these products, but rather to pay for the collection and recycling schemes.

## Burden on the industry/consumers, equity issues and exemptions

The taxes and charges in place in the EU, directly and indirectly affect a range of sectors of the economy, including (noting prime sectors affected):

- NO<sub>x</sub>: Power Sector (S - net positive burden given recycling; F); Heat (F); H&P within industry (S: Pulp and pulp paper most affected)

- Abstraction Levies: Water companies & then Industry (NL) ' Households (Dk and Spain); and Irrigation Co-operatives (Galicia, Spain)
- Waste Water Taxes : Sewage treatment plants and then Industry (Dk, NI, D)
- Pesticides :Agriculture (S and Dk - in Belgium farmers exempted); Wood industry (B) and some low income households (B)
- Manure and Fertiliser Agricultural sector and fertiliser industry (NI, Fin, S and A, though intense pig and poultry farms in the Netherlands exempt until 2001).
- Landfill tax: All sectors producing waste (impact relative to waste amounts) except in France (mostly municipal waste). Burden ranging from Construction: 1% to Financial Services: 0.0001% for UK; municipalities face steep rising cost in landfill (e.g. France, UK and Austria).
- Aggregates tax: Cost is passed on the consumer, so little burden on the mining industry Very little difference in burden between sectors (Dk)
- Disposable Containers: Consumers, Soft and Alcoholic Drink Suppliers, Manufacturers of containers (Fin, Dk, S - with the exception of milk producers)
- Batteries: Consumers and then Battery Industry (able to pass through costs, therefore arguably no net burden): It, B, HU

*Distributional impacts (where poorer households face higher relative burden than richer households):* Few concerns were raised regarding distributional impacts, with the exception of concern on low income households in Belgium of taxes on household pesticides (this result is based on a survey for a fictive tax). In other words there was little sign of “(income) regressive taxation”, where the poorer households are hit harder than richer households (e.g. as a percentage of disposable income) – an issue that has caused severe political problems with energy /motor fuel taxes.

*Exemptions:* Exemptions are in place for most taxes and charges, reflecting argued concerns of the burden of taxes/charges on the specific sectors of the economy potentially affected by the tax/charge, and efforts to support particular activities. A major conclusion of this study is that exemptions seem to be in place whenever there is a concern that a particular sector will be burdened, and often in place even where the concerns are exaggerated.

Exemption thresholds are also often set, given the possibility of accurate measurements and monitoring, and concerns over the burden of monitoring. The Swedish NO<sub>x</sub> charge is a good example of the latter, as power plants below 50MW were exempt initially, though with the improvement of monitoring equipment, this threshold fell to 40MW and fell to 25MW in 1998.

An example of the former is the exemption of farmers under the abstraction charge in the Netherlands and Denmark. A striking finding is the exemption of farmers from the pesticide tax in Belgium (this led to setting up a small user charge in place of a tax), while this tax is primarily focused on agricultural users in Sweden and Denmark: this exemption was the result of lobbying, and led, indirectly to the failure of the Belgian tax.

There is no common pattern in the exemption scheme for landfill taxes, where no exemptions are set in Austria; various types of sites are exempted in France (among them, the controversial owner operated sites), and some specific industrial waste (dredging and mining) together with pet cemeteries in the UK.

The only cases with no exemptions in place are the fertiliser taxes, and the batteries tax in all the countries surveyed. In the case of the Dutch levy on mineral surpluses, exemptions are in place until 2001, but these will disappear after this date.

An overview of exemptions for each tax is presented below:

- **NO<sub>x</sub>:** Small Plant / plant where monitoring difficult: S: definition changed of the years given improvements in monitoring equipment; F small power plants and waste incineration plants exempt. In Spain (Galicia) emissions under a certain value were exempt.
- **Abstraction Charges:** Farmers (NL, Dk, and some farmers in E: Galicia). Industry has exemptions in Denmark, as do some water utilities in Spain
- **Manure and Fertiliser:** No exemptions in Fin, S and A, but arable farms in the Netherlands exempted until 2001.
- **Landfill tax:** No exemptions in Austria; in France some owner operated landfill sites, Community refuse return and Sorting Centers, and Transfer sites are exempt. In the UK Pet cemeteries; Dredging from inland waterways and harbours; Mining and quarrying waste are exempt.
- **Aggregates tax:** Dk: small commercial and non-commercial extractions are exempt;
- **Disposable Containers:** exemptions tend to related to containers re-used or recycled tin deposit refund schemes (Fl, B, S). Exemption in Sweden for milk containers and paper and card; reduction for reusable containers.
- **Pesticides tax:** In Belgium the farmers are exempt and only a small user charge is in place on household pesticide use.

**Equity:** The level of exemptions raises particular equity issues given the question of the winners and losers from polluting activity, and the lack of respect for the polluter pays principle. In short, there is an equity problem in that polluters do not pay sufficiently for the pollution, and often very little if their lobbying activities are effective and result in appropriate regulatory capture, whilst others pay the price of the burden of the pollution, whether individuals today (e.g. through NO<sub>x</sub> pollution), or individuals tomorrow / inter-generational equity (through lack of space left to future generations for land-filling), or nature itself (e.g. through irreversible impacts on eco-systems given aggregate mining). It is clear that taxes and charges are not the only instrument to redress the problems of equity, but they are a key, and despite growing interest, still under-utilised instrument.

### **Impacts on the internal market**

- There seem to have been few impacts of taxes on the internal market. The inability to implement any border taxes may affect the level of taxes as there are concerns in respect of product taxes (on pesticides and fertiliser) that high levels will lead to increased imports for own use. Similar issues have been raised in Austria and to some extent France in respect of landfill;
- However the effect of the internal market on the taxes has been real, given that several taxes were dropped in advance of joining the European Union, such as the fertiliser tax in Austria. It would be valuable to explore the reasons for why not all new Members adopted the same approach (Sweden retained its fertiliser tax), and what implications there are for the extensive tax schemes in the CEE applicant countries, given that accession is nearing for many.

### **Impacts on competition and trade**

The literature on the effects of environmental regulation on competitiveness appears to suggest that the effects of environmental regulation are not significant. This is interesting since arguably, levies allow flexibility of response among those targeted, the costs to specific enterprises of achieving a specified level of emissions reduction might be less. On the other hand, levies are paid on all units consumed / emitted. As such, they could be a greater burden on industry than regulatory approaches.

The minimal effect of environmental levies is, however, confirmed in this study. One can posit a number of reasons for this:

- Most significantly, to the extent that this study was intended to examine the hypothesis that environmental levies might affect competitiveness, the hypothesis is made largely untestable by the fact that in many cases where one might have been able to explore such a process at work, exemptions for the relevant sectors have been specified. A glance at the OECD database on environmental taxes reveals an enormous range of exemptions specified for the levies included therein (so this is more the effect of argued concerns for competition on the application of the levy)
- The exemptions specified presumably reflect real concerns that certain industrial sectors may be harmed. It is easier to estimate static cost increases resulting from the introduction of a levy than the dynamic gains that might be generated through response to the levy. Yet, it is widely appreciated that substantial X-inefficiency exists in industry and agriculture (and households), and that therefore, taxes can act as signalling mechanisms to promote adjustments that might not otherwise have occurred. These may present actors with 'eco-efficiency' benefits as opposed to costs. Paradoxically, therefore, there are reasons to believe that even some actors in the affected sectors may see some improvement in their competitiveness as long as they do not perceive the tax only as a static cost. Win-win effects are being sought in Denmark, where the pesticide tax is part of a package of policies aimed at optimising use. Win-win effects are also reported in response to the UK landfill tax;

- Following from the previous section, the impact on costs is not significant expressed in terms of company turnover / enterprise income even where the goods / service increases appreciably in price (in percentage terms). Consequently, the impact on competitiveness can be expected to be minimal;
- Some of the levies affect goods and services that are not widely traded. Landfill is a good example. The ability to market landfill services is unlikely to be affected, therefore, other than ‘within country’ where alternative treatments may become price competitive due to the levy. In these circumstances, the competitiveness effects are reduced to those enterprises which are most affected by the cost increases implied. Presumably, a switch to alternative treatments / techniques is one of the changes sought by the instrument;
- At the macroeconomic level, the levies we are examining are insignificant. The competitiveness of ‘a nation’ is nowhere an issue, the effects being restricted to the microeconomic level;
- Some of the levies are used in the context of more or less specific tax shifts. These tend to produce ‘winners’ and ‘losers’. In this way, they engender greater political support as well as minimising the effect on ‘country’ competitiveness. They become means of influencing structural change though altering relative factor prices (albeit, owing to the size of revenues, only at the margin).

Quite apart from the competitiveness issues at the sectoral level, there seems to be no concerns regarding competitiveness between the EU and trading partners for the taxes/charges levied. Part of this is due to the focused and restricted nature of the taxes/charges, part due to the industry structure, and part due to the exemptions discussed above. In the Dutch wastewater case, exempted industries were effectively assisted in making adjustments through revenue-supported advice. Frequently, what is being taxed is a production input (water) or a service (landfill) that is not widely traded so that the only competitiveness effects would occur through the effect on end-product prices. One can speculate that inducement effects may reduce any (small) negative impacts on producers competing in international markets. In addition, it should be recognised that foreign producers may be subject to taxes / regulations of their own.

Virtually all countries seek to exempt exports from taxation, and effectively tax imports at the same time where it is possible to do so. There are now ‘border tax adjustment’ mechanisms for embodied content of the emission / input subject to tax domestically. To our knowledge, the taxes are not applied in any discriminatory manner, but only on the same objective basis as that which is used to assess domestic products for taxation.

At a national level there are also few concerns, and these include:

- Impact on expected costs of foreseen pesticide tax on treated wood in Belgium, and concerns that CEE imports would be cheaper;
- In Finland, the tax on fertiliser was used for export subsidies, which improved the price competitiveness of some export products while the fertiliser industry became less competitive (relative to other sources of nutrient). The same situation appeared in Sweden

- The fear for a loss of competitiveness on the foreign market led to the exemption of raw materials for exports from the aggregate tax in Denmark.

Within countries, there are more concerns, though again none fundamentally significant. These concerns include:

- Tax effects on the choice between landfilling, incineration, recycling and composting. Though it could reasonably be argued that the tax is encouraging a more efficient allocation of waste to waste treatment/disposal routes, and that this structural change is to be welcomed.
- Tax effects through different tax treatments of different landfill sites has led to local trade issues (e.g. landfill moving to different landfills following the landfill tax imposition in Austria), and competition issues (abuse of dominant position by some operators in France, where some operators charged (illegally) their client (municipalities) an additional administrative fee to recover the tax.

### **Implications for Internal Market and Trade**

Taxes can be expected to alter trade flows in some way. This is not our concern here unless these changes result from the imposition of levies in such a way as the run counter to principles of the Single Market. In this context, we perceive that the following are important:

- 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 degree to which domestic industries are exempted;
- The manner in which revenues are refunded;
- 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.

Few of the taxes appear to have given rise to major concerns. The Danish pesticides tax was examined since it implied the use of revenues from a levy imposed upon domestic and foreign products for use domestically. However, the Commission ruled that this was acceptable owing to then fact that the revenue was used to support the objectives that the levy sought to achieve (and was not being used to support domestic producers of pesticides). The new Danish packaging tax appears to be a response to the concerns raised regarding its ban on the use of one-trip beverage containers.

Arguably, one would expect far greater concerns to arise in the context of product taxes than in any other type of levy. It is products that are widely traded and where levies are

established, they may be set on the basis of characteristics of products which are not generally required to be known by exporters in other Member States. Issues of proportionality then arise. It should come as no surprise that packaging taxes are the ones that are most often cited in respect of Single Market effects. This is true in the cases we have looked at, and this is leading to movements, exemplified by the Danish case, to a more ‘objective’ basis for the environmental levy. Ironically, life-cycle approaches are rarely regarded as entirely ‘objective’ and it seems unlikely that this attempt will stop the flow of complaints being faced by those with packaging taxes in place.

### **Impacts on employment**

An increasing amount of modelling of the macroeconomic consequences of environmental taxes has been undertaken but this usually concentrates on the taxes – energy and fuel - which are not the subject of this study. An exception is work carried out ex ante by Cambridge Econometrics on the UK landfill tax. The lessons of these studies for the taxes considered in this report are:

- 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; and
- 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.

For the taxes explicitly covered in this study, none of the 9 taxes present any evidence that there are significant negative impacts on employment due to the taxes being levied. Equally, although we suspect that there are reasons to believe that the taxes may have had net positive effects (especially in the case of increased employment in the labour intensive landfill tax supported recycling industry), there is no firm quantitative evidence to support this.

There are positive employment effects from the use of revenues, or from the way the revenue is recycled, but it is important to note that this is a different issue from the employment impact of the tax/charge in itself, which could be expected to be positive in the medium to long term, where the tax is on low labour intensity sectors. In some cases it is obvious that revenue used lead to jobs, but this is simplistic as a discussion of this nature would not present the net effects, taking into account the effects of substitution and effects through the economy.

### **Administrative Costs**

The administrative costs of policy implementation are frequently cited as a major advantage of environmental taxes and charges, and economic instruments more generally (relative to regulatory approaches). This is generally confirmed in this work. The exception is the Dutch levy on mineral surpluses. Having said that, the Dutch system could, it seems, be the most effective mechanism for addressing nitrate pollution, and it lends itself to extension to other areas.

Examples of administrative burdens include:

- NO<sub>x</sub>: In Sweden, the metering costs are estimated to approximately 3% of total charge paid, and indeed metering cost have dropped over the years. In France the administrative costs are thought to be small, if any.
- 4) Pesticides : For Sweden the costs are low
- 5) Manure and Fertiliser: These are reasonably high in the Netherlands (DFL 53.3 million per year or MEUR 24.2), though small in Finland and Austria - Approximately 0.8% of the tax revenues (SEK 0.5 million) for Finland and 0.7 to 1% of the tax accounting for ATS 10 million (EUR 0.7 million) in Austria
- 7) Aggregates tax: Seen as small for Denmark - In 1989 the cost was estimated to 752,000 DKK for the implementation of the tax and 1,135,000 DKK for the annual operation.

### **Summary: Are there areas of real concern for the EU?**

There do not seem to be any areas where the application of taxes raises real concern for the EU, for its Member States, or trading partners.

However, there is concern that the internal market increases the pressure to abolish taxes, given concerns, rightly or wrongly, in respect of losses in competitiveness. This is a particularly important issues given that the next entrants to the EU have extensive environmental tax and charges schemes in place and it is important to understand whether it makes sense to change these systems in advance of entrance to the EU internal market, and indeed, what the effects of their removal might be.

There is a further concern regarding the use of exemptions to treat competitiveness concerns, as it appears that where concerns are raised, exemptions are often granted. This suggests that environmental concerns might be sacrificed in order to avoid economic burdens and possible competitive effects. A deeper analysis of whether the exemptions are proportionate would

seem to be merited. The impression one gets is that Member States are all too ready (understandably perhaps) to implement these.

To the extent that this study seeks to understand the competitiveness effects of taxes, the exemptions make it difficult to put that hypothesis to a serious test. Arguably, this provides some rationale for a more active policy on environmental taxes to be pursued at the EU-wide level. This might level the playing field in respect of the Single Market and undermine the position of industrial interests in seeking exemptions. However at this stage, we can comment on the administrative costs. These tend to be small for the taxes and charges addressed. This would oppose arguments that suggest that the taxes/charges are inefficient - though this is only part of the equation.

### **Key Lessons For Future Environmental Tax Policy**

There are a number of lessons which appear to follow from our review:

- Design of the levy is important for obvious reasons. The more careful the design, the more likely it becomes that the effects will be positive. Design of the levy should consider use of revenues. It is clear that in some of the most successful schemes, notably the Swedish NO<sub>x</sub> charge, it is the link between the levy and the refunding mechanism that makes the instrument so effective. Unfortunately, arguments concerning revenue still occur between the Treasuries and environment ministries in Member States. If the goal is to improve the environment, Treasuries should take a more pragmatic approach to the use of these revenues since Commission law provides guidance as to the circumstances where such revenues can be used.
- Exemptions from levies are being granted too freely. This compromises environmental effectiveness and the structural changes in the economy that are being sought. It appears to be too easy for industry to argue in favour of exemptions given the fact in the absence of knowledge concerning the dynamic response of firms, assessment of levies' impact on industry frequently reduces to a static imposition of the tax burden on the affected sectors. Dynamic adjustments which minimise exposure to the tax are usually possible, and these have environmental benefits. Arguably, the rationale for exemptions would be reduced where all or part of the revenues generated by a levy were ear-marked for the provision of information to support the environmental objectives of the levy. Interestingly, this could encourage development of a more competitive industry. Over-playing this argument would run the risk of making these uses of revenue the subject of complaints concerning the presence of state aid under Article 87 of the Amsterdam Treaty (and formerly, under Article 92 of the Treaty of Rome), though this seems unlikely within the framework of the new EU Guidelines on State Aid for Environmental Protection setting out some conditions to allow state aid to promote environmental protection. The EU Guidelines also suggest that EU eco-tax harmonisation should be a priority to avoid competition problems due to tax reductions granted in other Member States. Note that generally, exemptions from environmental levies should be temporary and reduced over time. Another issue that could be considered is whether it would be useful for Article 87 of the Amsterdam Treaty to allow some form of transition finance to be taken from the revenues

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raised to assist in economic restructuring where specific, heavily polluting industries of regional significance are likely to be heavily affected by a tax (with potentially significant consequences in the regional context). This could go beyond support to environmental investments and could include, for example, funds for re-training;

- The taxes we have examined, though small in macroeconomic terms (and therefore of limited impact on the economy overall), can affect the goods, services and emissions subject to the tax in significant ways. This can produce quite surprising effects. Equally, it may lead to perverse effects as actors seek to reduce exposure to the tax. There is an argument for ensuring adequate regulatory capacity exists to ensure these ‘outlets’ are not abused;

The exemptions argument suggests the need for rather better co-ordination by countries within the EU (and OECD). Whilst not arguing for complete harmonisation, which past experience suggests would be extremely problematic, countries could benefit from co-ordination of their efforts and interests in implementing new environmental taxes and charges, not least since this may improve the design of instruments and enable countries to understand each other’s concerns in this evolving field. This co-ordination (and learning) might also reduce the chance that unnecessary exemptions will end up being agreed with industry, given that the more countries have such taxes in place, the weaker the rationale for exemptions (based on differential tax rates) becomes (since tax rates might converge).