



**Economic Instruments for
Sustainable Development**
Improving the External and Working Environments
Part 1



EUROPEAN FOUNDATION
for the Improvement of Living and Working Conditions

Economic Instruments for Sustainable Development

The European Foundation for the Improvement of Living and Working Conditions is an autonomous body of the European Union, created to assist the formulation of future policy on social and work-related matters. Further information can be found at the Foundation's Web site at <http://www.eurofound.ie>

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Foreword

The move towards sustainable development is one of the main challenges of the European Union. It is a key principle of the Fifth Environmental Policy and Action Programme that environmental concerns are taken fully into account from the outset in the development of other policies and programmes. Because of its structure, the European Foundation for the Improvement of Living and Working Conditions can play a unique role in this area by working with industry and being able to operate on the interface of the environment and working conditions.

Against this background, 'sustainable development' is one of the six key issues in the Foundation's programme for 1997-2000. The focus of the Foundation's activities on sustainable development is sustainable production and consumption. In order to deal with these issues, the Foundation has launched a number of initiatives with the aim of providing improved instruments for employers and employees in order to support their activities in improving efficiency of their companies in an economic and ecological sustainable way. The instruments on which the Foundation is focusing are design methodologies, training needs and economic incentives.

This publication examines the use of economic instruments to improve the quality of both working life and living conditions. In particular, the report examines the links between economic incentives in these two areas and how policy interventions can be made mutually reinforcing. With this interface, the Foundation is entering a new territory where no previous studies have been carried out.

It is our hope that this report will contribute to the debate among employers, employees and policy makers on improved ways forward to a sustainable future.

Henrik Litske and Jørn Pedersen are the Foundation's Research Managers responsible for the project.

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Contents

	Page
Foreword	v
Participants in the Project	vii
Chapter 1 Introduction	1
Context	1
Objectives	4
Outline	4
Chapter 2 Economic Instruments for the External Environment: Existing Measures and Issues for the Future	5
Introduction	5
Existing economic instruments	6
Removal of market distortions (including subsidies) which are environmentally destructive and economically inefficient	6
Assignment of property rights	7
Coase Theorem	8
Non-policy implemented market incentives	9
Transferable development rights	9
Tradeable permits	10
Charges and taxes	11
Subsidies	13

	Voluntary approaches	13
	Liability systems and performance bonds	15
	Information	16
	Issues for the future	18
Chapter 3	Economic Instruments for the Workplace:	
	Existing Measures and Issues for the Future	21
	Introduction	21
	Market failure	21
	Existing economic instruments	23
	Insurance premium discounts/penalties based on historic claims experience	23
	Premium discounts/bonuses based on good health and safety planning	25
	Subsidies towards investment in health and safety	26
	Issues for the future	28
	Incentives and on-site inspections	28
	Economic incentives to set health and safety programmes in train	28
	Linking other fiscal assistance to good health and safety/good environmental performance	29
	Targeting	29
	Mentoring	29
	Economic incentives within the workplace	29
	From health and safety plans to reality	29
	Should incentives aim only at improvements beyond the statutory level?	30
	Potential for applying other environmental economic instruments to health and safety	30
Chapter 4	Linkages Between the External Environment and Health and Safety:	
	A Case Study	33
	Introduction	33
	Conflicts and complementarities	33
	Methodology	35
	Results	36
	Dairy industry	36
	Textiles industry	38
	Chemical industry	40
	Construction industry	42
	Conclusions	43



Chapter 5	Employment Issues related to External Environmental and Health and Safety Policy	47
	Introduction	47
	Relationship between market-based incentives for environmental quality and employment	47
	Relationship between incentives for health and safety, and employment	51
	Relationship between incentive-based approaches to conserve environmental endowments, health and safety, and employment	52
Chapter 6	Conclusions	55
	Economic instruments and the environment	55
	Economic instruments and the workplace	57
	Links between environmental and health and safety policy	58
	Small and Medium-sized Enterprises (SMEs)	60
	Employment issues	61
	Areas for future research	62
	Glossary	63
	Bibliography	65



Chapter 1

Introduction

Two key components of people's quality of life are the quality of the environment in which they live and the quality of the environment in which they work. This report examines the use of economic instruments to improve both of these components and looks at the linkages between them and how policy interventions in both areas can be made mutually reinforcing. In addition, a framework is developed for the analysis of the employment impact of such interventions by policy makers.

Context

In the context of this report, the external environment means those parts of our physical and psychological endowment which we somehow share, which are 'open access'. It is precisely this shared nature of many environmental endowments which threatens their quality and character.

In a market system, goods are allocated by the price mechanism. In a free market, the price of a good is determined by the demand for, and supply of, that good. Price is, therefore, a reflection of society's willingness to pay for, or the valuation it places on, the good in question. However, the shared nature of many environmental assets (such as air, the atmosphere and water resources) means that they are not owned and so do not have a price. When goods are seen as free, they are overused. Thus, the market fails to protect environmental assets adequately.

For example, if a chemical factory pollutes a river which imposes a cost on the fishing industry downstream, this cost will not be reflected in the cost of producing chemicals. Thus, the price of the chemicals will not reflect the true cost to society of producing chemicals. In this case, the economy will produce more chemicals and use more of the environmental asset than is socially

efficient. When a cost is imposed upon those other than the person or business that produces the cost, this is known as an 'external cost'. Unless some mechanism is found to 'internalize' an externality, it will cause a misuse of society's scarce resources.

In many cases, the market also fails to provide an adequate level of health and safety in the workplace. When an accident occurs, only part of the cost of the injury or fatality is borne by the employer; the rest is borne by the state, the insurers and the individual (European Foundation for the Improvement of Living and Working Conditions, 1994b). Costs imposed on the state are borne by the citizens of that state, often in the form of increased social insurance, and costs imposed on the insurance companies are also passed on in the form of higher premiums, which can result in higher prices for a company's products. Thus, occupational accidents and diseases produce a form of external cost, just as pollution does.

The emphasis of environmental policy in the 1970s and early 1980s was on the management of environmental resources by the imposition of institutional measures aimed at directing the environmental performance of companies. This approach is known as *regulation* or 'command and control'. An ambient standard is set such that companies are permitted to produce a certain level of pollution. Non-compliance results in penalties, usually in the form of legal action and/or fines or liability for correction of environmental damage. This approach is still prominent in most countries.

In the 1980s and 1990s, policy makers became interested in *economic instruments* (also known as market-based or fiscal instruments) in order to control pollution. This approach uses the power of incentives to encourage individuals, acting more or less in their own best interests, to interact with the environment in a way which is in the best interests of society. Economists had noticed as far back as the 1920s that the market fails because there is no price to reflect the value of the environment and so it is overused. Their prescription — known as the 'Polluter Pays Principle' — was to create a set of surrogate prices (for example, through taxation or direct charges per unit of pollution) such that individuals and companies pay for the pollution they produce. Those who pollute less are rewarded financially since they avoid having to pay for their use of the environment. Thus, economic instruments shift the property right from the polluters to the victims.

Policy makers became sympathetic to this approach of economic instruments for a number of reasons. Firstly, regulation had not been as effective as imagined. It was costly to bring companies to court and, in some cases, the probability of prosecution and the level of the fine were not sufficient to encourage compliance. In the free-market era of Reagan and Thatcher, the use of decentralized, market-oriented approaches became more acceptable. In addition, policy makers became more open to alternatives to regulation.

The strongest argument for the use of economic instruments is that they minimize the cost to society of reducing environmental damage. With an economic instrument, such as a charge on emissions, the company or individual can decide on the level of pollution they produce. A



company with a very high cost of abatement will pollute relatively more since it is cheaper than paying the charge, while a company with a relatively low cost of abatement will pollute relatively less since abatement is less costly than paying the charge. Under regulation, each company pollutes the same amount. Therefore, there is no incentive for the company which faces lower costs of abatement to undertake more of the clean-up, so the reduction in emissions is made at a greater cost to society. Thus, economic instruments minimize costs, while regulation generally does not. Economic instruments also provide an incentive for companies to abate more than required by law. Under regulation, companies will abate only as much as the standard set by the authorities. A further advantage of some economic instruments is that they generate revenue. It is sometimes suggested that this revenue can be used to reduce other taxes which are distortionary.

While still an unacceptable concept to some environmentalists, economists believe that there is an 'acceptable' or optimal level of pollution in most cases¹. Pollution is normally an input into the production process, i.e. it is the byproduct of producing a good or service which is of benefit to society. In many cases, therefore, a certain amount of pollution is considered to be an acceptable tradeoff in exchange for these goods and services. In the case of health and safety at work, the idea of an optimal amount of injury and death is unacceptable to most people. However, a minimum amount of risk is accepted by all humans (otherwise we would not go out our front door, let alone cross the road). For this reason, minimum health and safety standards are set. However, economic incentives can be created to improve health and safety in the workplace beyond this minimum standard. Just like the economists' approach to environmental management, the power of incentives can be used to promote better health and safety practice. The principal technique suggested is the relation of insurance premiums to the health and safety records of companies.

It is important to note that economic instruments generally require a regulatory framework in order to be effective. For example, in the case of environmental taxes, property rights must be assigned so that the polluter must pay for environmental damage and a law is required to ensure that the polluter is made to pay the taxes.

Environmental policy can impact on another area of people's quality of life — their income. Addressing environmental issues may involve a cost in terms of employment and competitiveness, both of which have implications for household incomes. Similarly, health and safety policy may also impose costs on companies. However, given that compensation for accidents and the burden on the health service are both funded out of taxes and social insurance contributions, health and safety policy can make a positive contribution to national income.

¹ In some cases (such as highly dangerous nuclear pollution), the optimal level of pollution will be zero because the costs of the damage would be orders of magnitude higher than the benefits.

Objectives

A substantial literature exists which examines the use, potential and effectiveness of economic instruments to manage and improve the external environment. In addition, much research has been carried out examining the use of economic incentives to improve health and safety in the working environment. The European Foundation for the Improvement of Living and Working Conditions has produced nine reports exploring the use of economic instruments in both these areas (see Bibliography).

The purpose of this current report is:

- to provide a synthesis of economic instruments in the areas of the external environment and health and safety;
- to study the possible impact of external, environment-oriented economic instruments on the working environment and vice versa, and the scope for a more integrated and balanced approach to the use of such instruments in both areas;
- to develop a theoretical and conceptual framework for the assessment of the employment impact of economic incentives for sustainable development.

Outline

- Chapter 2 provides a synthesis of existing measures and future issues in regard to the use of economic instruments in the area of the external environment.
- Chapter 3 explores the potential of such instruments in the area of the work environment.
- Chapter 4 examines conflicts between incentives for the protection of the external environment and the improvement of health and safety in the work environment, and also examines the scope for a more integrated and balanced approach using a Focus Group.
- Chapter 5 provides a framework for the analysis of the employment impact of environmental and health and safety policy.
- Chapter 6 concludes the report, summarizing key points from each chapter and making recommendations for future research.



Chapter 2

Economic Instruments for the External Environment: Existing Measures and Issues for the Future

Introduction

Economic activities generate different types of pressure on the external environment, such as input demands, pollution of water flows by waste and spatial intrusions into natural areas. The impact of these pressures are external to those who decide on the appropriate level of economic activities. Costs to society can result since the capacity of environmental resources to assimilate such pressures leads to reduced capacity of the external environment to satisfy all our needs.

Ever since environmental quality and the use of sustainable resources became areas of political concern in the late 1970s and early 1980s, policy makers have searched for tools with which to achieve socially optimal allocation and use of resources. Environmental policy tools attempt to alter societal processes in order that they remain compatible with environmental objectives. Such policy tools compensate for the failure of the market to assign correct values to the use of environmental resources. They can direct environmental performance, allocate property rights over the external environment or internalize the cost of resource use (where agents consider the impacts of their resource use when deciding on the appropriate level of economic activity). These environmental policy tools include:

- regulation or command and control;
- removal of environmentally and economically damaging subsidies;
- assignment of property rights, including tradeable permits and development rights;
- voluntary approaches;
- emission charges and taxes;
- provision of information;

- assignment of liability;
- institutional creation and/or development.

This report focuses on economic instruments. Those available for the management of the external environment are outlined below.

Existing Economic Instruments

Certain options are made more or less financially attractive by the application of economic instruments. Environmental concerns become internalized by altering the context in which agents operate. In contrast to regulation, economic instruments allow agents freedom to respond to certain stimuli in a way that they themselves think is beneficial and which represents a more sustainable use of resources. This type of approach — of influencing the decisions of economic agents, consumers, producers and investors — gained support on an international scale at the 1987 UNCED Conference and was later advocated in the EU Fifth Environmental Action Programme (see Box 2.1).

Box 2.1. EU Position on Economic Instruments

The Fifth Environmental Action Programme states: ‘In order to get prices right and to create market-based incentives 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 Communication *Economic Growth and the Environment* (European Commission, 1994c) states: ‘In our economy, economic decisions are to a large extent taken on the basis of price signals. As customers adjust their purchase decisions to price changes and companies determine product design, technological development and the organization of their production processes to a large degree as a function of market prices, it is essential that these prices correctly reflect the full costs and benefits to individuals and to society . . . Environmental taxes will prove to be one of the more effective policy responses in a significant number of cases.’

The Delors’ White Paper on *Growth, Competitiveness and Employment* (European Commission, 1993b) advocates the replacement of taxes on labour with environmental taxation to benefit from the ‘double dividend’.

Source: European Environment Agency (1996)

Removal of Market Distortions (including subsidies) which are Environmentally Destructive and Economically Inefficient

To reduce environmental degradation, the starting point is to reverse what is often called ‘government failure’. Most governments provide fiscal incentives (soft loans, tax allowances) and some combination of price and grant support to develop particular assets. The results can be both economically inefficient and environmentally destructive. This may apply in cases such as the provision of incentives to promote otherwise uncompetitive domestic industry and/or to attract mobile capital.

Box 2.2. EU Agricultural Policy

Agricultural policy has been the most heavily subsidized sectoral policy supported by the European Union. The environmentally relevant support has been of two types — price protection and subsidies for intensification (e.g. grants to drain or otherwise clear land for intensification of production; headage payments). These policies have had a number of negative environmental effects:

- Intensification: Increased output per unit area. This has imposed such problems as nutrient run-off and enrichment (pollution) of fresh waters; pollution (nitrification) of ground water; increased waste storage and disposal; increased abstraction of water for irrigation and other uses; and greater use of pesticides.
- Extensification: Cultivation of areas for grassland, wine, olive and forest production of semi-wild areas, wetlands, scrub woodlands, rough grazing land, uplands, which would not otherwise have been brought into production, with resulting losses in terms of erosion and biodiversity.

In the McSharry reforms of the CAP in 1992, a number of changes were introduced which diminished some of these perverse incentives. Price support was reduced, as were subsidies for development, while direct income support (unrelated to output) was increased. A series of accompanying *environmental protection* measures were introduced, to promote the use of farming practices which reduce pollution, support extensification, protection of landscape and countryside, provision of public access and leisure activities, education and training of farmers in environmental protection and upkeep of the countryside. Building on these reforms, *Agenda 2000* (European Commission, 1997) proposes a 20 per cent cut in the intervention price of cereals in 2000, coupled with an area payment, and a 30 per cent cut in the price guarantee for beef by between 2000 and 2002 compensated by direct income payments. A similar approach has been put forward for the dairy sector, involving a 10 per cent cut in average support prices by 2006. The objective is to improve the competitiveness of the EU, to provide stable incomes and a fair standard of living for the agricultural community, and to make agricultural production more compatible with the environment.

The ‘simple’ solution to the subsidization of environmentally damaging activity is to eliminate the subsidies. However, these subsidies have created powerful advocates who wish to retain them, especially (but not exclusively) amongst the beneficiaries. The short-term social and economic implications of their removal can be very painful for affected regions and countries will feel that their competitiveness will be threatened if they are precluded from competing with subsidies for the growth sectors of the global economy. Another issue is the fact that there may be large losses incurred by a country or region which unilaterally reduces or eliminates subsidies which attract mobile investment.

Assignment of Property Rights

For economic instruments to work, property rights must first be established. Does the victim of pollution have a right to a clean environment — the Polluter Pays Principle (PPP)? Or does the polluter have a right to pollute — the Victim Pays Principle (VPP)? In the cases below, we assume the PPP.

Coase Theorem

There is one case where explicit intervention by policy makers is not required even if pollution exists. This was pointed out by the Nobel Prize winner Ronald Coase. He suggested that government intervention would not be needed if property rights are assigned and the perpetrators and victims of pollution can negotiate.

If property rights are assigned to the perpetrator, the victim will pay the perpetrator not to pollute so long as the benefits of abatement outweigh the costs; otherwise the victim will put up with the pollution. If the victim has the property right such that the Polluter Pays Principle is in force, the polluter will pay the victim compensation so long as the costs of abatement are greater than the benefits to the victim; otherwise the perpetrator will abate. In this way, the most efficient outcome is achieved without intervention (see Box 2.3).

Box 2.3. The 1991 Water Bank, California

In most countries and regions where a large proportion of the water supply is used for irrigation, the following difficulty arises. The water is nominally owned by the State, but the farmers have rights to traditional allocations which gives them a sort of de facto property entitlement. They receive the water free or at substantially below the price which the water would fetch on the open market. Because they have free or very low-cost water, they use it at the margin in uses which yield very low value.

Such was the situation in California in 1991 when a Water Bank was established, operated by the State Department of Water Resources. In February of that year, purchases from sellers of water were negotiated at a fixed price of \$100/1000 M³. Purchases ceased in April 1991.

Thirty per cent of the transferred water was needed for carriage water to provide salt protection in the Sacramento Delta. At this price, plus the transportation cost from the delta, the Water Bank sold 488 million M³. Three-quarters of the water was sold to urban agencies at a cost, including transportation, of over \$185/M³. The water was purchased mainly from farmers — 50 per cent from irrigation water which they would otherwise have consumed and 33 per cent in the form of exchanging their surface water rights for ground water rights and selling the surface water to the Bank.

The demand was obtained from a committee representing urban and agricultural purchasers. There were far fewer purchasers than suppliers, but the fixed price approach eliminated potential market power of purchasers. The estimated critical needs dropped from 769 million M³ before the Bank was fully operational to 601 million M³ after — an indication as to how responsive to price such needs can be. The transfers generated an estimated net income and employment gain for the economy (as a result of transferring from lower to higher value uses) of \$106 million and 3,741 jobs respectively. Note, however, that jobs did move out of the water exporting regions, but the gain in the importing regions more than compensated for such losses.

Source: Howitt (1994)

A simple example of the Coase Theorem is the case of a polluting chemical factory located upstream from a food factory on a river. If the pollution coming down the river imposes a cost of ECU 1 million per annum on the food factory and the cost to clean up the pollution at source is only ECU 0.5 million, gains from negotiation exist. If property rights are assigned and negotiation can take place, then a solution can be reached as follows:

Case 1: The chemical factory is entitled to pollute (VPP); the food factory can pay the chemical factory half ECU 0.5 million to clean up the pollution and thus save a further ECU 0.5 million.

Case 2: The food plant is entitled to clean water (PPP); the chemical plant will spend ECU 0.5 million to clean up. This is because the food plant will not accept in payment anything less than ECU 1 million to put up with the pollution since the pollution imposes a cost of ECU 1 million on the food factory.

The Coasian solution is generally the exception. Even if property rights can be assigned, transaction costs may act as a wedge. This happens frequently in practice. Most environmental problems involve many polluters and/or many victims. The costs of negotiation can sometimes be overcome by the use of representative organizations, such as residents' associations. In addition, there may be a 'free rider' problem: taking the case of noise from a factory (where the factory has the right to pollute), there is an incentive for a villager who is affected not to contribute to a collection for a muffler to reduce the noise since if the other villagers contribute, he or she will benefit from the reduced noise for free.

Non-Policy Implemented Market Incentives

There may be other reasons why companies address the environmental impact of production without government intervention. Such reasons include the importance of a 'green' image (which can help sell a company's product) and of being a 'good neighbour' (so the local community is more forthcoming in accepting a company's operation). The environmental record of a company is of particular importance when it is trying to find a location for a new plant. These non-policy implemented market incentives often result from improved education of consumers and better provision of information.

Transferable Development Rights

The key to channelling development in an efficient and equitable fashion seems to lie in separating the market for the right to develop land from the right to use it. *Transferable Development Rights* (TDR) work as follows: in a certain jurisdiction (for example, a county or region), areas where development should be limited or prohibited are identified according to certain criteria (such as uniqueness of landscape, species protection, conservation of ecosystem processes, role in flood control, conservation of farmland); these are called sending areas. Also identified are areas where development is to be facilitated and encouraged; these are called receiving areas. Development rights are identified as follows: the land-owners in the sending areas are given development units, designated per unit area (for example, one residential unit of a certain size per 10 acres), but these can only be exercised in the receiving zone. If developers in the receiving zone wish to exceed the standard densities (or other norms to be defined) in the receiving zone, then they must purchase the right to do so in the development rights market.

The legal instrument developed to transfer development rights in the USA is an easement document and a deed of transfer, which are recorded and approved by the Planning Board.

(Banach and Canavan, 1989). Two areas in the USA (Montgomery County in Maryland and the Pinelands in New Jersey) have successfully implemented a TDR programme.

Tradeable Permits

In a tradeable permit system, permits to emit a specified volume of pollution are traded in the marketplace. The total amount issued is set so that the environmental objective will be achieved (see Box 2.4). Trades can take place within a plant, within companies (bubbling) or among different companies (offsetting). Earned credits can sometimes be saved for later use (called banking).

The ability to trade in the marketplace has the following advantages:

- the price of the permits expresses the scarcity value of the assimilative capacity being used;
- those companies with high marginal costs of control can ‘buy’ reductions from those for whom reductions are cheaper, thus promoting cost-savings and innovation. New entrants can then come into the area by ‘buying out’ enough permits to meet their requirements.

Box 2.4. The US Acid Rain Programme

A tradeable permit scheme was introduced in the USA to apply to sulphur-emitting electricity generating plants, based on tons of sulphur dioxide (SO₂) emitted. When trading started in early 1993, the price per ton of SO₂ was about \$175. The volume of trading was very modest at first, until early 1995 when trading began on a serious scale. As the volume of trading increased, the price per ton traded declined, falling to as low as \$75 in February 1996. The price then recovered, reaching \$100 in February 1997. Most of the trading is done privately, but the USEPA still sells a small quantity at auction.

Reduction in emissions attributable to trading amounted to 3.88 million tons, from a total pre-1995 emission level of approx. 9 million tons. The marginal costs per ton removed increased at an increasing rate as the reduction achieved approached 4 million tons.

The costs were substantially less than expected, in part because a parallel deregulation of the rail system — connecting the low sulphur coal-producing area in Utah (Powder River Basin) with the Eastern electricity generating plants — substantially reduced the costs of purchasing low sulphur coal.

Source: Ellerman (1997)

Most of the experience with tradeable permits comes from the USA. However, there is some European experience, notably the use of trades to achieve reductions in the production of ozone-depleting substances (CFCs and halons). This enabled the chemical companies to concentrate production and shift to substitutes (Klaassen, 1997). Høiby (1997) reports on the design for a scheme of SO₂ trading in Norway; the main incentive driving this proposal is the quid pro quo of abolishing the existing SO₂ tax on mineral oil. Bohm (1997) reports on an experiment in Nordic countries where the costs of unilateral compliance by the year 2000 with the CO₂ target are compared with the costs of achieving the same by allowing trades between Denmark, Finland,

Norway and Sweden. Joint implementation would succeed in reducing compliance costs by 50 per cent.

Charges and Taxes

An environmental tax or charge imposes an obligation on users to pay for the use of environmental resources. Charges and taxes in environmental policy bring the costs of pollution and of using environmental resources into the prices of goods and services produced by economic activities. As with other economic instruments, environmental taxes and charges provide an incentive for the cheapest means of preventing pollution to be implemented first and, therefore, offer the prospect of meeting environmental objectives more cost-effectively than total reliance on regulation.

The key difference between taxes and charges, and the other economic instruments described so far is that they generate revenue. Therefore, they can contribute to the costs of environmental monitoring and control. It has been suggested that the revenue can be used to reduce the tax burden on labour, thereby reducing unemployment (known as the 'double dividend').

There has been a widespread and increasing use of taxes and charges in the environmental field during the past five or six years, primarily in Scandinavia, Belgium, France, Germany, the Netherlands and the UK. There is increased scope for the use of taxes and charges since they could be used to reduce pollution from point source emissions and hard-to-regulate sources. The 1996 report by the European Environment Agency (EEA) on environmental taxes documents both the range of measures which apply across the world (including fiscal environmental taxes, incentive charges, cost-covering charges and ear-marked charges) and their effectiveness.

The EEA suggests that the taxes evaluated exhibited environmental benefits and appeared to be cost-effective, particularly those taxes levied on air pollution in Sweden and water pollution tax in Denmark, as well as NO_x charge and tax differentiation schemes for vehicle fuels in Sweden. Some practice and experience is outlined in Box 2.5.

Box 2.5. Examples of Emissions and Waste-related Charges

Sulphur tax in Sweden

This tax came into force in 1991 and is levied on coal, peat and oil at a rate of ECU 3,500 per tonne of sulphur emitted.

Some results

- Tax revenue of ECU 34 million generated;
- Sulphur content of heavy fuel oil decreased from 0.65 per cent to 0.50 per cent;
- Sulphur emissions reduced by 6,000 tonnes annually;
- Efficiency of sulphur removal improved at some coal and peat installations.

continued

Nitrogen oxides tax in Sweden

This tax was introduced in 1990 and came into force in 1992. It is charged on large and medium-sized boilers at a rate of ECU 4,500 per tonne of NO_x emitted. The charge is assessed directly on emissions and monitoring costs are high (ECU 35,000 per plant per annum). The charges are refunded to the plants that pay it in proportion to the amount of useful energy they produce, thus creating an incentive not to waste energy.

Some results

- In the plants concerned, average emissions have dropped from approximately 150 mg NO_x/MJ in 1990 to approximately 99 mg NO_x/MJ fuel in 1992;
- Emissions in total have dropped from 24,000 tonnes in 1990 to about 15,300 tonnes in 1992.

Waste charge in Denmark

This charge was designed to reduce waste generation and increase recycling and reuse.

Some results

- Reused fraction of demolition waste increased from 12 per cent to 82 per cent;
- Waste reuse and recycling generally increased by 20-30 per cent from 1985-1993.

Taxes in UK

A land-fill tax has been introduced in the UK. Reduction in waste volumes and increased recycling and reuse are being reported.

Sources: Bergman *et al* (1993); European Environment Agency (1996)

Despite the wide range of taxes and charges being employed, they still play only a marginal role in environmental management and policy. Perhaps the most fundamental reason is the unpopularity of taxation. Some political barriers to implementation include:

- perceived impact on competitiveness;
- perceived impact on low income groups;
- perceived conflict between national taxes and the EU or world trade rules;
- the EU unanimity rule when voting on fiscal measures;
- perceptions that the taxes have to be high to work;
- perceived conflict between changing behaviour and maintaining revenues;
- existing subsidies and regulation that damage the environment.

According to the EEA (1996), these barriers can be removed by:

- the removal of perverse subsidies and regulations;
- careful design and mitigation measures;
- use of taxes and revenues as part of a policy package and green tax reform;
- gradual implementation;
- extensive consultation and information.

In addition, Europe finds itself in a difficult position with regard to the use of taxes and charges since there is an inability to apply Europe-wide fiscal measures for the environment (as a result of the unanimity rule) and Single Market imperatives make it very difficult to apply such measures at the level of Member States. Within countries, also, there is an interesting 'geography of opposition' to environmental taxation. 'Green Tax Commissions', reporting on their experiences, state that much of the political difficulties arise not from a fear of uncompetitiveness in general, but from specific instances of a small number of financially vulnerable plants in isolated regions with limited, or no alternative, employment opportunities which would be adversely affected by a carbon or other type tax.

Subsidies

Another approach to reducing pollution is to give subsidies to companies if they do not pollute. Understandably, this is often advocated by the polluters. The difficulty with this approach is that, while an individual company may pollute less, the availability of subsidies may attract companies into the industry and thereby increase industrial pollution. In addition, it may encourage companies to increase pollution prior to assessment so that they can avail of a higher subsidy.

Voluntary Approaches

Voluntary agreements, as the name implies, are agreements whereby an individual company or group of companies make a commitment to operate in a certain way and/or achieve certain qualitative or quantitative objectives so that environmental performance is improved. The number of such agreements has been increasing at EU national and sub-national level, particularly in the Netherlands and Germany (see Box 2.6).

This idea of voluntary agreements has had its most complete expression in Japan, where thousands of agreements have been made between local communities and their local factories, with the latter agreeing to achieve particular objectives, often with local government acting as mediator and guarantor.

In Europe, voluntary agreements tend to be used more often in countries where environmental polices have matured and where there is a tradition of consensus-building, negotiation and decentralization, usually found where pollution occurs most. Because voluntary agreements have been presented by various lobbies as an alternative to charges or taxes, there is considerable suspicion that they are favoured precisely because they are likely to be more symbolic than real in effect.

Storey (1996) recognizes four categories of voluntary agreement:

- target-based (required to meet a quantified target);
- performance-based (required to meet certain operating standards);

- cooperative R&D to meet environmental objectives;
- monitoring and reporting (agreement to provide particular monitoring and ensuing data).

A recent report by the EEA on environmental agreements (EA) concludes that:

There is a need for the setting of clear targets, for greater transparency during negotiation, for more implementation and evaluation of EAs and for the introduction of reliable monitoring and reporting arrangements. Few evaluations of EAs, whether ex-ante or ex-post, have been made and there is little literature available on their use. As a result, it is in most cases not possible to make a quantitative assessment of the environmental effectiveness of the agreements due to the lack of reliable monitoring data and consistent reporting. This prevents comparisons being made between the current situation and what is most likely to have happened if no agreement had been concluded. Some wider benefits are found, including environmental improvements on situation prior to the agreements and the encouragement of environmental management in business.

Such agreements appear to be most useful as complements to other policy instruments such as regulations and fiscal instruments, where they make a valuable contribution in terms of their ability to raise awareness, create consensus and provide a forum for information sharing among parties. The absence of monitoring and reporting restrictions damages credibility of the instruments and denies accountability. This also makes ex-post studies of effectiveness difficult, as do the variations in the agreements examined in terms of their objectives and approaches, and variations in cultural, political, economic and environmental contexts in which they operate. Ideally, effectiveness should be judged against an alternative policy scenario or a business-as-usual scenario. This can often be speculative due to the absence of data. Evaluation of such agreements is also difficult as they are new and relevant empirical and theoretical analysis is scarce.

Box 2.6. Voluntary Approaches — The Rhine Contract

The Rhine Contract was made between the Municipality of Rotterdam and a number of polluters of the Rhine, including the German Association of Chemical Industries (VCI, representing 600 companies), Duisburger Kupferhütte, Berzelius, Deutsch Giessdraht, and Ara Pro Rheno. The objective was to meet certain reductions in toxic emissions by the year 2010.

The base line was established in 1985 by the Amsterdam-based International Centre of Water Studies and agreed by industry. Cooperation was facilitated by the finding in 1988 by the Netherlands Supreme Court (Hoge Raad) against the company MDPA (French Potassium Mines) in a case taken by Dutch nursery companies on the basis that MDPA's emissions of chloride to the Rhine in Alsace, France (which reached a peak of 22 million tonnes) was contributing to damaging saltwater pollution in the Netherlands. After 14 years of litigation, the Dutch court made a judgment against MDPA, in spite of the fact that the French company had a valid licence to emit from the French authorities. This case established the principle that transfrontier polluters could be sued successfully across frontiers, notwithstanding their compliance with the law in their own jurisdiction.

The contracts negotiated between Amsterdam and the parties are, in many respects, confidential. The essential characteristic, however, is the waiver of claims by Rotterdam for damages if the contracts

continued

(aimed at an overall reduction of 70-90 per cent in toxic emissions) are fulfilled. The mode of resolving disputes varies. There are indications, based on periodic monitoring, that the objectives specified will be reached.

Source: van Dunné (1996)

The use and effectiveness of voluntary approaches is linked to the use of information as a policy instrument. This applies particularly in the USA where, for example, the 30/50 Programme invites companies who are reporting toxic releases under the Toxics Release Inventory (TRI) to commit to substantial percentage reductions in emissions. In Europe, the Environmental Management and Auditing Scheme (EMAS) provides a voluntary register whereby companies must establish an environmental policy, conduct an environmental review of sites, set and implement environmental improvement programmes and an environmental management system, as well as have their policy and sites reviewed and their improvement and management system examined to verify that requirements are met.

Liability Systems and Performance Bonds

The following are examples of liability systems:

- legal liability for environmental damages is facilitated; for example, the costs of fully restoring a fishery would be payable if the polluter(s) who damaged the fishery were identified;
- private or citizen enforcement actions are facilitated, whereby an individual can bring private enforcement actions against a polluter; in the USA, 'Superfund' legislation attempts to levy funds for clean up of 'vintage' toxic waste damages.

Examples of performance bonds include:

- funds, which are independently held, are set aside by resource extraction companies to make good any damages imposed as a result of ore extraction;
- provision of refunds for users of bottles and cans, or for cars to be scrapped, on their return to the supplier or other intermediary.

The law in most countries is moving to increase liability for damage and to facilitate court action in this regard. Mining companies in many jurisdictions are being required to post performance bonds pending satisfactory environmental and related performance.

A number of countries, including Belgium, Canada, Finland, Norway, Portugal and Sweden, have levied taxes or charges on containers which are not part of a refund system or are non-reusable.

Information

Such approaches as education, information and training can change the perception and priorities within the decision-making framework of an agent. This internalizes environmental awareness/responsibility into individual decisions by applying pressure indirectly or otherwise. Tietenberg (1997) identifies the elements of an information strategy as follows:

- environmental risks must be identified (amount emitted, degree of exposure, sensitivity to exposure);
- reliable information must be assured, with penalties for misleading;
- information must be disseminated in a timely fashion and in a form which is usable by and accessible to the community;
- what can be done with information must be defined. In the case of a polluting company, this could include: a switch by consumers away from environmentally damaging products; selling (or not buying) stock in the relevant companies; difficulties in hiring very skilled and mobile labour; legal action by individuals or citizen groups; legislative change; and private enforcement actions.

For markets to work in the public interest, consumers and producers alike must be adequately informed. Without adequate information, environmental custodianship will not succeed. Both parties need this information: the perpetrators, to show them the implications of their actions, to identify more environmentally benign actions and to encourage them to be more environmentally benign; and the general public, especially those affected by environmental degradation, to show them the effects and sources of the pollution. Indeed, an informed citizenry has long been regarded not only as the cornerstone of a democratic society, but also as a prerequisite for effective environmental management.

There is a literature which assesses the performance implications of specific information transmission schemes. For example, the Toxics Release Inventory (TRI) has been implemented in the USA, whereby companies must file annual reports, to a consistent and readily understood format, about the volume and character of specific categories of emissions.

Germany has an eco-label scheme, which entitles certain products that have met specific criteria to carry the 'Blue Angel' label. Oosterhuis *et al* (1996) cite work on the assessment of this scheme in Germany and indications are that it has been successful in the case of some products (such as paper products, building machines, toy machines, detergents and DIY paints), but not others (such as batteries and professional paints). Tietenberg (1997) notes that 13 utilities in the USA are selling 'green electricity', under which scheme the consumer is asked to pay a premium of up to 15 per cent of the normal bill; in return, the utility acquires renewable energy sources according to a formula.

There is a range of EU initiatives which address the use of information as a policy instrument. The European Environment Agency has been established specifically to: '... provide the Community and the Member States with objective, reliable and comparable information at

European level enabling them to take the requisite measures to protect the environment, to assess the results of such measures and to ensure that the public is properly informed about the state of the environment'. [Article 1.1, Regulation 1210/90]

Member States are required to implement mechanisms for ensuring public access to environmental data. Article 3.1 of the EU Directive on Freedom of Access to Information on the Environment (90/313/EEC) states: '. . . shall ensure that public authorities are required to make available information relating to the environment to any natural or legal person at his request, and without having to prove an interest'.

The Council Directive concerning Integrated Pollution Prevention and Control (96/61/EC) requires the issuing of a permit detailing the pollution limits and control procedures for emissions to all media for a wide range of industrial and related activities. In regard to information, its Article 15 states: 'Member States shall take the necessary measures to ensure that applications for permits for new installations or for substantial changes are made available for an appropriate period of time to the public, to enable it to comment on them before the competent authority reaches its decision . . . The results of monitoring of releases . . . must be made available to the public . . . An inventory of the principal emissions and sources responsible shall be published every three years by the Commission on the basis of the data supplied by the Member States. The Commission shall establish the format and particulars needed for the transmission of information in accordance with procedures laid down in Article 19.'

While progress is being made, it is clear that, with a few exceptions, Europe is not sufficiently informed in regard to either the state of the environment, the sources or pressures, or the efficacy of policy interventions, to operate effectively. In addition to inadequacies in information per se, there is also a deficit in the understanding by the public of environmental processes and acquiring this will take time.

Information on environmental performance also has the potential to either help or hinder commercial success. This is the principle behind the EMAS and eco-label schemes at EU level, whereby an imprimatur (concerning the quality of environmental management and of environmental products, respectively) is provided to companies on the principle that this may give them a commercial edge in some markets. Perhaps more fundamentally, the World Business Council for Sustainable Development has advocated that members of the investment community factor environmental issues into their investment recommendations, on the basis that companies which take eco-efficiency seriously are likely to be more financially efficient¹.

¹ Reported by Roger Cowe in 'Be Greener today and get richer tomorrow, say multinationals', *The Guardian*, Saturday, 24 May 1997, p. 28.

Issues for the Future

The internalization of externalities is now an established concern of the Ministers of the Environment and Finance in the majority of European countries. In the 1990s, the use of economic instruments (particularly green taxes) for environmental control increased. This more balanced approach to managing the environment is regarded as having the potential to be more cost-effective and has been driven by increasing awareness of the power of markets, the limitations of environmental regulations and the need for increasing revenue to finance the demand for more environmental infrastructure.

There is still more scope in countries for introducing economic instruments. The challenge is to adapt what has been learned from existing economic instruments and apply this to national circumstances. Fears about competitiveness and distribution are common. In the absence of national harmonization, countries have an incentive to introduce exemptions and concessions which, in their view, will safeguard industry. In addition, the distributional consequences of economic instruments must be addressed. (These, however, are not limited to economic instruments.)

The future research agenda should concentrate on setting targets using environmental valuation and more and better evaluation of economic instruments in terms of effectiveness and cost efficiency. Guidelines on the evaluation of economic instruments should be built into the policy process. The potential of environmental taxes to broaden the tax base should be explored, as should the implications of tax harmonization. There is a need for more studies to assess the efficiency of economic instruments.

Environmental policy-making will move toward strategies to combat multiple pollutants/multiple effects, where the interconnections in nature are exploited to devise cost-effective strategies for dealing with the same few pollutants, such as acid rain, eutrophication, and global warming from sulphur dioxide, nitrogen oxides and volatile organic compounds. Economic instruments are applicable to more actors and more capable of affecting resource flows.

Efforts should be made to increase the political acceptability of environmental taxes by integrating environmental issues into overall tax reform. In this way, the public will not see green taxation as double taxation.

The use of information strategies (public or private attempts to increase the availability of information on pollution) will form the basis of the third wave of pollution control policy. The sheer number of substances to be managed and the absence of an adequate regulatory infrastructure should see increased investment in the provision of information. The costs of information collection are falling, while the need for more regulatory tools is increasing. Thus falling costs and rising benefits suggest that it is desirable to take another look at using information strategies as an instrument for managing the environment.

Environmental agreements provide a basis for environmental policy where regulatory or fiscal instruments would be difficult to administer. Implementation agreements complement regulatory policy by relying on sanctions or the threat of alternative instruments as back-up. Voluntary agreements also provide a framework for proactive environmental policy and are suitable for long-term targets, limited sources of pollution, sectors which face limited competition and cases where few opportunities exist for free-riders.



Chapter 3

Economic Instruments for the Workplace: Existing Measures and Issues for the Future

Introduction

The importance of health and safety at work as a basic human right is underlined by Article 19 of the EU Charter for Basic Social Rights of Workers. The Framework Directive of EU Council Directive 89/391/EEC sets out the basic European law to give effect to this principle. It has been followed by further directives dealing, for example, with standards in the workplace; workplace equipment; personal protective equipment; manual handling of loads; VDUs; safety signage; chemical, physical and biological agents; carcinogens; pregnant and nursing mothers; physical agents and noise; and safety on mobile sites.

Safety and good health at work is in everyone's overall interest — workers who may be at risk of death or injury; management who face costs of lost production, compensation claims or large insurance premiums; those living in the environment affected by an enterprise who may be at risk from the environmental consequences of unsafe production, accidents or polluting discharges; and the wider society which picks up a share of the costs through social security cover against occupational injuries and diseases.

Market Failure

As in the case of environmental protection, the market alone will not deliver optimum results in terms of workplace health and safety. This is for a number of reasons, including:

- Information deficit: If companies and employees are inadequately informed of the health and safety implications of their work conditions, they may underinvest in protective measures. If

companies are unaware or uncertain of the potential pay-off from investing in health and safety (such as reduced insurance costs, lower claims costs and reduced downtime), they will underinvest in health and safety improvements.

- Labour market imperfections: Workers in high-risk jobs, in principle, should be paid higher wages than those in lower risk jobs of equivalent skill. But because of imperfections in the labour market, the risk factor is rarely adequately reflected in remuneration.
- External costs: Society as a whole bears a share of the costs of poor health and safety practice through health and rehabilitation costs. Workers' families also suffer from the effects of ill health and injuries to the breadwinners. These costs are not borne by the enterprise, reducing the direct costs to the enterprise of unsafe work practices.
- Principal/agent problem: Employers are primarily responsible for devising health and safety programmes, but it is primarily workers who are at risk. Although the EU Framework Directive provides for worker involvement in health and safety, and that employees can walk off unsafe work sites, in practice some employees in risky jobs may have little influence on the quality of their employer's health and safety systems. Conversely, employer-led programmes require strong worker support if safety routines are to be implemented in practice on the shop floor.

There is an analogy here to the 'Polluter Pays Principle' in environmental management. In the case of the workplace, it is the employer, not the workers or victims of occupational accidents or illness, who should bear the cost of poor health and safety practice.

The benefits of reducing risks and thus the overall incidence of accidents or illness are clear at a macro level. But they may be far less clear at the micro level, where individual managements or workers may rely on luck rather than on an active safety strategy. In some cases even, there can be a deliberate assumption of risk through excitement-seeking or 'macho' behaviour (Apter, 1992) or because the management is prepared to accept a given level of risk.

It is a natural human reaction not to face up to risk, to pretend it does not exist. 'It can't happen to me' is an all too frequent response to risk. The temptation is to cut corners, to get a job done quickly rather than safely, to continue to use an unsafe machine rather than replace it. In the short term, the unsafe route may be apparently cheaper. While the potential benefits of good safety practice may be unknown, the potential costs are more readily measurable, such as those of:

- specialist assessment of risks;
- modifications to plant or machinery;
- personal protection equipment for staff;
- staff training;
- safer production methods may slow production.

Economic incentives can internalize the external benefits of good practice and encourage investment in good safety practice.



Achieving safety in the workplace stems from good safety management, where health and safety is taken as seriously as any other management goal. Good safety management is more about having a consistent policy to minimize risk, rather than concentrating on particular equipment or processes. This means ensuring that systems are in place to identify risk and to minimize it, to train workers and management in safe practices, to identify minimum-risk work practices and to ensure that safety guidelines are actually followed in the workplace.

Preparing a health and safety programme requires an enterprise to make an in-depth analysis of its work practices and how they are organized. A possible beneficial side effect of this exercise is that more effective ways of working may emerge, giving rise to reduced production costs or enhanced quality. (The companies in the case study covered in Chapter 4 of this report found implementing new management systems tended to result in cost savings.)

Most accidents are preventable by, for example, applying existing knowledge or techniques, identifying and remedying the weak link in a chain, or by simply taking safety seriously. Purely random events, such as lightning strikes, are more likely to lead to accidents where there are no fail-safe systems in operation.

Existing Economic Instruments

The work to date of the European Foundation for the Improvement of Living and Working Conditions has highlighted key features for economic incentives to promote health and safety in the workplace. These include:

- well-designed incentives can bring improvements in the working environment, where both the size of the incentive and the conditions of payment show tangible links between improved health and safety practice and the resulting reward;
- incentives should take account of the effect of statistical fluctuations on small and medium-sized enterprises (SME);
- incentives based on historic performance alone will have only a limited impact on preventive work;
- incentives should point forward, promoting efforts not results.

Existing economic incentives for safety and health in the workplace are outlined below.

Insurance Premium Discounts/Penalties based on Historic Claims Experience

The positive or negative loading of insurance premiums based on previous claims experience is the most common type of economic incentive used in relation to workplace safety and health. Private insurers invariably risk-load the premiums they charge.

Risk-rating is also a feature of many state-run social security systems providing cover for occupational risks, as in Belgium, France, Italy, Luxembourg and the new Polish system, and in the Canadian systems. In Ireland and Greece, however, the state social security system does not

differentiate its premiums by risk, while in the UK the state-funded occupational injuries and illnesses programme is funded from general taxation.

In general, risk-rating based on claims experience in national systems takes into account both sectoral experience and the claims record of the individual enterprise. In some cases, risk-rating applies only to the sector (for example, in Luxembourg, and in Denmark for SMEs). In Finland, the enterprise can opt for either sectoral loading or individual loading. Some state systems, as in Belgium, have flat-rate premiums for industrial illnesses, but risk-rated premiums for injuries.

Advantages

Insurance premiums related to historic claims experience is the most widely used and readily understood method of creating incentives for better safety and health practice. It is cheap to administer and it is transparent. Competition among insurance companies can help ensure equalization of actuarial risk and premium charged.

Limitations

Rewarding luck or effort? Claims experience in individual enterprises can be significantly affected by statistical fluctuations, particularly in the case of SMEs. Statistical 'good luck' can also mask serious lapses in health and safety practice, or negligible health and safety prevention. Economic incentives based on claims experience alone may penalize high claims arising from purely random events (in situations where either the occurrence of an event or its severity is related to random occurrence and not poor risk-minimization strategy at the enterprise) and reward the careless but lucky. In taking the past as a proxy for current and future risk, these incentives do not address the effectiveness of current preventive behaviour. Ideally, premium assessment and reward should be based on future risk.

Cost of claims not a perfect guide to risk of injury/ill-health: Better claims management as well as reduced risks of accidents may reduce observed claims levels. That an accident or injury occurs will tend to reflect poor health and safety practice. The actual cost of claims may reflect the local compensation culture and award system, as well as the actual risk level in the enterprise. The severity and duration of injuries are liable to purely chance fluctuations (for example, whether an object falling from a height falls on a worker's finger or on his full body).

Delayed and uncertain link between health and safety investment and economic return: Investment in a health and safety programme may appear to carry an uncertain return for the individual company, a return which will be delayed until measurable improvements in the performance of either the company or the sector results in improved claims experience, with resulting lower premiums. However, a health and safety programme which may show little apparent economic return if undertaken in isolation may lead to tangible results in overall health and safety performance, as well as sectoral premiums, if undertaken on a sectoral basis with companies operating together (see Box 3.1).



Box 3.1 A sectoral health and safety programme that paid off

In 1988, the Irish Independent Concrete Manufacturer's Association set up a group liability insurance scheme for its members linked to a risk management safety programme. The safety programme included targeting the managing director of each company to encourage them to take personal responsibility for health and safety; the involvement of a Safety Officer specifically for the industry; an employee-training programme developed specifically for the concrete products industry; the publication of safety guidelines; and at least three physical audits per plant per year.

Structures were put in place to involve member companies directly in the settlement and management of claims, ensuring a transparent link between risks and cost. The Association retained at least 40 per cent of the premium in a mutual fund, out of which it would settle a percentage of claims involving the members in the settlement and management of claims. The surplus would be available for distribution. No claims could be settled without the agreement of the individual member and of the group liability insurance company owned and managed by the members. A full-time Safety Officer to the industry has now been funded out of the profits of the scheme.

An award scheme has now been introduced and outright winners and merit achievers receive an automatic reduction in their liability insurance for the coming year.

After eight years, the programme has resulted in a reduction in both the frequency and severity of accidents and in consequential claims. The cost of liability insurance has been reduced — from a typical rate in 1988 of 2.55 per cent of turnover to approximately 1.1 per cent of turnover by 1997, with some members who have had an accident-free history paying as low as 0.5 per cent.

Premium Discounts/Bonuses based on Good Health and Safety Planning

The Canadian systems have given a lead in this type of incentive. Some examples are given below, as well as a scheme operating in France.

Alberta: Work Injury Reduction Programme (WIRP)

Participation in WIRP is voluntary, but it has been targeted at companies where claims costs have been high due to their size or accident record. In this programme, companies undertake to improve their health and safety management and to undergo a health and safety audit. This is focused on the following management areas:

- corporate leadership;
- operations;
- human resources;
- facilities and services;
- administration;
- health and safety information and promotion.

Significant refunds or surcharges can be received based on the health and safety audit. A survey of participants has indicated that financial incentives were central to their decision to participate in the WIRP scheme and that they have improved their health and safety programmes as a result of participation.

Ontario: Workwell Programme

As with Alberta's WIRP, this programme is based on developing and assessing health and safety management, including:

- management commitment;
- internal communication of health and safety rules;
- formal training of management and employees;
- written standards and procedures;
- a functioning health and safety committee;
- inclusion of health and safety performance in employee appraisals;
- analysis and documentation of potential hazards;
- frequent and comprehensive workplace inspections;
- written accident investigation procedures;
- claims management programme.

Companies with a history of good performance are evaluated and may receive refunds for demonstrated excellence in health and safety management. Similarly, companies with a poor record are evaluated and advised on improvements. If they fail a second assessment, held three months later, they face surcharges.

British Columbia: Periodic incentives

The Workers Compensation Board has offered cash bonuses on an occasional basis following health and safety audits, for example, in the mid-1980s a programme in the construction industry.

France: Premium reductions for special measures

Small and medium-sized enterprises (SMEs) can qualify for a reduction in the sectoral rate if they take special health and safety measures.

Advantages: Such programmes link economic incentives to direct promotion of improved health and safety practice, and hands-on advice. They highlight directly the connection between additional health and safety effort and economic return.

Limitations: On-site health and safety audits are intrinsically more expensive to administer than desk-based calculations based on historic accident or claims data. Such audits may also require a degree of judgement which is not required in the application of a predetermined formula to sectoral and company statistics. The basis for assessing the level of bonus or penalty may therefore be less transparent.

Subsidies towards Investment in Health and Safety

France: Loans/Grants

Loans and grants in France can be made by the regional insurance funds (CRAM) to support specific measures. These are aimed at achieving better than average protection and involve experimentation in methods of prevention. There is also a scheme at national level of special 1 to



3-year contracts with industry associations for SMEs which undertake to raise health and safety standards beyond the minimum required by law. They receive advance funding, which is converted to a grant on reaching the objectives of the contract. Almost 8,000 of these contracts were in place in 1995.

While subsidies are the most favoured economic instrument, they may attract more companies into the industry. If this occurs, it is possible that, perversely, the number of accidents in a company declines but the total number of accidents in the industry increases.

Non-policy implemented market incentives

It may not be necessary to intervene in markets to encourage health and safety where incentives already exist. These incentives include the avoidance by the company of costs associated with downtime, unhappy workers and damage to the product or plant. In addition, there may be some commercial advantage to the company of having a good health and safety record.

New models of economic incentives

The expert team of the European Foundation for the Improvement of Living and Working Conditions (hereafter called the Foundation) has developed an innovative economic incentive model to improve the working environment (see Box 3.2). It has also examined the parallels and divergences of this model from the current French system in order to test the practicality of its proposal.

Box 3.2. An Innovative Economic Incentive Model to improve the Working Environment

The Foundation's proposal places a clear emphasis on identifying future as well as past risk and on rewarding effort at risk reduction. The key elements of the model are:

- premium reduction in the context of compulsory industrial injury insurance, related to particular efforts to reduce risk beyond those required by law;
- a gross premium based on calculating maximum assessed risk (most current insurance is based on average risk), with the following three elements:
 - a) a base component, covering administration costs and solidarity with regard to purely random elements;
 - b) a sector-related component, related to maximum risk within the sector;
 - c) a work function-related component, related to maximum risk for the job.
- companies can earn bonuses (reductions in the gross premium) for different types of effort, such as:
 - a) sub-bonus for enterprises which make efforts by comparison with their competitors: reduces work function element of premium;
 - b) sub-bonus for efforts related to shared problems of a sector or type of work: may reduce sector or work function element of premium;
 - c) sub-bonus relating to effort on specific problems of enterprise.

continued

- funding of prevention consultants for SMEs;
- investment aid (for example, through prevention contract for significant investment in improving workplace health and safety);
- a label like a Quality Mark for workplaces which had reached high standards of health and safety practice; this could also be helpful in promoting corporate image in the marketplace.

Source: European Foundation for the Improvement of Living and Working Conditions (1995a)

Issues for the Future

Incentives and On-site Inspections

On-site health and safety advice and audits are expensive. Regulatory authorities operate on systems of random inspections and targeted interventions, as well as on active encouragement of companies and industries to take ownership of their own health and safety programmes. It is not possible to have a health and safety inspector on every building site or every factory floor.

Incentive systems which measure effort not results (such as Alberta's WIRP) are posited on on-site assessments and inspections. As programmes of this kind grow in scale, they will face issues like how to target inspector resources or how to get sectors to self-assess and self-police their own efforts. Given the large number of companies involved, the SME sector creates major logistical problems for programmes based on systematic on-site inspection. In France, only 6 per cent of enterprises are visited each year by inspectors checking preventative measures. If sectors can develop peer support and self-audit or peer-audit mechanisms, this type of incentive will become more feasible. Improved cooperation between the preventative arm of the insurers and of the national authority for occupational health and safety could also be of benefit, in maximizing the number of enterprises offered on-site prevention advice.

Companies are also subject to environmental audits from national bodies. There is scope for a pooling of inspection resources where there is a strong degree of overlap between the elements of an audit on workplace health and safety and on environmental health and safety.

Economic Incentives to set Health and Safety Programmes in train

Sectoral health and safety programmes can yield benefits to members when they lead to fewer accidents and claims and, therefore, to lower premiums. There can be a free-rider problem to the extent that the premium of a SME is largely based on sectoral rather than individual performance. The uncertainty about the return may cloud the potential economic gains. Ultimately, such schemes can be self-supporting if the economic gains are shared among the members. However, it may require seed funding to get such schemes underway.



Linking Other Fiscal Assistance to Good Health and Safety/ Good Environmental Performance

General financial encouragement to enterprises (such as through development grants, soft loans and training subsidies) can be used to leverage specific improvements in health and safety practice. One method is to specify particular investments in the health and safety area to be funded from such grants or subsidies. Another is to refuse any general grant-aid to companies which do not meet with target standards of good health and safety practice.

Belgian law provides that larger companies can only do business with companies which have an acceptable health and safety performance. One initiative in Ireland is seeking to limit the award of public building contracts to only those companies compliant with health and safety standards.

Targeting

The most effective use of resources is to deploy them strategically where problems are worst — whether that be companies with the worst health and safety record or the dirtiest industries. There may be synergies from cross-referencing enterprises on both dimensions to target those for which an integrated workplace and environmental health and safety programme would yield most dividends.

Mentoring

If health and safety management is the key to better health and safety performance, mentoring programmes can prove beneficial. Such programmes involve acknowledged leaders taking weaker enterprises ‘under their wing’ to teach them. In Ireland, for example, the Health and Safety Authority operates a ‘good neighbour’ scheme, in which companies with a standard of excellence in health and safety management play a role in mentoring health and safety practice with associated enterprises (such as neighbouring companies or sub-suppliers).

Economic Incentives within the Workplace

Economic incentives within the workplace (such as payment by piecework) may be in conflict with best health and safety practice. If workers are rewarded for reaching production goals that are inconsistent with the safest level of performance, such economic incentives would clearly run against best practice. If good health and safety practice is not recognized (as in promotion or bonus payments), then that, too, would send clear economic signals to the workforce. Thus, the achievement of health and safety goals depends on developing a health and safety culture from the top to the bottom of an enterprise, whereby management sets goals, develops programmes and, critically, rewards good health and safety practice by workers.

From Health and Safety Plans to Reality

Improving health and safety performance can require significant changes in organizational and individual practice. Health and safety programmes are of little effect if workers at shop-floor level do not ‘own’ the safety culture. Behaviour modification techniques, using positive feedback, are a promising new approach in safety management (Saari, 1996).

Should Incentives aim only at Improvements beyond the Statutory Level?

While European and national legislation set out minimum standards of health and safety practice, it would be wrong to assume that these are adhered to in all cases or that the use of economic instruments is only appropriate to investments to achieve health and safety standards above the legal minimum. The results given in Box 3.3 suggest that there is considerable scope for improving the quality of health and safety practice, particularly in smaller companies. Given that Ireland has the second-best record in the EU in terms of reported accidents, it is likely that the deficiencies in health and safety planning seen in Irish SMEs are mirrored in SMEs in other European countries.

Potential for applying Other Environmental Economic Instruments to Health and Safety

Chapter 2 of this report examined the large range of economic instruments available to environmental policy makers. The principal instruments that have not been applied to health and safety are taxes and tradeable permits. The objective of these measures is to encourage reductions in environmental damage to be made where it is cheapest to do so. A tax on accidents — the idea that a company could pay rather than implement better health and safety procedures — would probably be unacceptable to the public for moral reasons. Using tradeable permits for health and safety would allow a company to pay another company to make a greater reduction in accidents so that the first company would not have to reduce its accident rate. This is likely to be equally unacceptable. However, it is acceptable to put resources into reducing accidents where it is likely to have greatest effect and the best use of economic instruments is to reward companies for continuous improvement beyond a minimum standard.

Box 3.3. Compliance with Health and Safety Law

Irish Health and Safety law requires each enterprise to have a Safety Statement, Safety Consultation arrangements and an appointed Safety Representative for employees. Enterprises not having a Safety Statement, which identifies risks and sets out a targeted programme to address risk, are unlikely to have an effective safety programme in place. The following figures show the results of official inspections into safety management in 1995 and 1996:

	1995	1996
Workplaces checked	7809	8372
Percentage with Safety Statement	51%	59%
Percentage with adequate Safety Statement	30%	32%
<i>With Safety Statement (by number employed)</i>		
0-11	39%	49%
12-50	75%	79%
Over 50	94%	94%
<i>With Safety Consultation (by number employed)</i>		
0-11	58%	58%
12-50	80%	76%
Over 50	93%	91%

continued



	1995	1996
<i>Safety Representative appointed</i>		
0-11	17%	14%
12-50	45%	38%
Over 50	82%	74%
<i>Sectoral Compliance — percentage Safety Statements in</i>		
Agriculture and forestry	12%	10%
Fishing	23%	24%
Mining and quarrying	75%	67%
Manufacturing	59%	64%
Public utilities	34%	42%
Construction	59%	66%
Retail and wholesale	32%	43%
Transport, storage, communications	67%	73%
Finance	83%	84%
Real estate, other business	56%	55%
Public administration and defence	83%	88%
Education	74%	68%
Health and social work	71%	72%
Other community and personal services	48%	52%

These figures clearly demonstrate the link between company size and compliance. The two sectors with particularly low compliance (farming and fishing) are characterized by a high level of self-employment; they also have the highest death rates of any sector. Some intrinsically lower risk sectors (with a preponderance of desk work, finance and public administration) had higher compliance than high risk sectors (such as mining and quarrying, construction, and manufacturing). Publicly owned sectors (such as public administration, healthcare and, in particular, public utilities) had far from total compliance rates, raising issues about appropriate incentive instruments for companies not facing normal market disciplines.



Chapter 4

Linkages Between the External Environment and Health and Safety: A Case Study

Introduction

Chapters 2 and 3 of this report have shown how economic instruments can be used to address issues in both the external environmental and in health and safety in the workplace. However, the linkages that exist between these areas can have implications for the use of economic instruments. The objective of this chapter is to examine:

- conflicts between initiatives to improve health and safety within a company and the environmental impact of the company, and vice versa;
- complementarities between initiatives to improve health and safety within companies and initiatives to improve the environmental impact of companies;
- whether incentive mechanisms can be used to encourage such complementary initiatives;
- whether environmental and/or health and safety policy damages competitiveness.

Conflicts and Complementarities

Conflicts arise where an initiative to improve health and safety in the workplace has adverse consequences for the environment, and vice versa. An example of such a conflict could exist where a company produces harmful emissions. To comply with environmental regulations or to minimize the cost of compliance with an environmental tax or charge, the company will treat the pollutants on site. This treatment process may have direct implications for the health and safety of the employees. Policies to encourage health and safety within the company could encourage the implementation of an improved extraction process, which would allow the pollutant to be removed quickly and safely from the workplace. However, this could increase the environmental

costs of the company's production. Similarly, an initiative to improve health and safety within a company which produces a large amount of waste may simply transfer the health and safety risks to the contractor who removes the waste.

Conflicts can also arise as a result of the budget constraints facing a company. The company must decide where the funds are best spent — in improving the working environment of its employees or in reducing the environmental impact of its production. In the home and workplace, for example, improved ventilation to reduce dangerous levels of radon gas can conflict with efforts to improve energy efficiency.

Complementarities arise when an initiative to address an environmental issue has the side effect of improving health and safety, or vice versa. For example, a tax on the use of pesticides in farming will have a beneficial effect on the environment, while also perhaps reducing the health risks to farm workers, all else being equal. If local authorities charge less for recyclable waste and thereby encourage householders to sort waste prior to collection, this would remove the need to sort waste after collection and thereby reduce the risk of injury to the workers who would otherwise have to sort it. Incentives which improve safety practice in construction can have beneficial effects on the environment in terms of lowering the risk to public health and safety. Reduced risk of falling scaffolding or explosions during road works will be of benefit to both the workers and the public. Complementarity may also be possible in expenditure by companies on environmental and health and safety initiatives. Costs may be additive but, if an initiative in one area has a positive effect in another, then cost savings can be made.

The systematic approach to health and safety characterized by managements which take workplace health and safety seriously is also likely to characterize their approach to issues of environmental health and safety. In industries or processes which could significantly affect the external as well as the internal working environment, reduced risk on-site will lead to reduced risk off-site, and vice versa. For example, a chemical plant with an excellent safety programme will minimize the risk of accidents whose consequences could include both injury to workers and environmentally damaging emissions. Cleaner technologies are likely to bring health benefits to workers as well as to the wider community.

There are also situations where there may be little overlap between the external and working environments. Industrial processes involving either systematic or occasional accidental discharges to the external environment are likely to show the highest potential for a double effect of particular actions on both the working and external environment. Service businesses of a purely administrative kind (such as banking or telesales) are unlikely to impact significantly on the external environment.

Certain important occupational health issues (for example, eyestrain at VDUs, repetitive strain injury or back injury due to faulty manual handling) have little obvious link to environmental risk. Lowering stress in the workplace, however, may lower the risk of accidents; varying monotonous work routines is one example of this.



Box 4.1. Example of Link between Environment and Health and Safety

SELCHP is a waste-to-energy plant, burning domestic waste to generate electricity. The company is managed on behalf of a number of London local authorities and is located in a built-up area. In order to minimize the likelihood of an accident, which could cause a release of dioxins in the neighbourhood, there is a programme of continuous renewal and replacement of all parts before the end of their normal life.

This safety programme, aimed at the external environment, is likely to pay off also in terms of fewer risks to workers from faulty plant.

An interesting Danish study reports on the Mamint Project, which investigates to what extent the work of enterprises on external environment and working environment could be integrated (Kamp, 1997). The study tracked the efforts in these two fields of one small and two medium-sized companies over a period of one and a half to two years. Areas where integration offered most promise was in relation to purchase storage, handling, waste management and disposal of chemicals; development and planning of technology; and purchase of materials. Key differences in organizational culture and values in relation to the two fields emerged from the study. The working environment was seen as the area of interest for employees (where they are actively involved), whereas the external environment remained very much a management responsibility, with limited employee input or ownership. Integrated management of the two fields is clearly a complex task, with a learning process involved which may be best facilitated through experiments and project-oriented working methods.

Methodology

In order to explore the linkages between the external environment and health and safety in the workplace, a focus group was convened in the Environmental Institute at University College Dublin on Friday, 13 March 1998. Focus groups are a well-established method of obtaining qualitative data through semi-structured group discussion. Compared to questionnaire-type surveys, they allow a more in-depth exploration of issues and minimize potential ambiguities. The limitations of the small number of participants are offset to an extent by the greater richness of the insights provided through more open-ended discussion and group interaction. However, because of the small number of participants, the results are not necessarily representative and this should be borne in mind when interpreting the findings.

The resources for the project were relatively small. To make the best use of funds, the researchers decided to focus on four industries which were identified as having possible links between the environmental and health and safety profile of companies. The industries chosen were chemicals, construction, textiles and food processing (dairy). Two countries were also chosen — Germany and Ireland. Germany has a recent history of strict environmental regulation, whereas in Ireland it has been less so. Ideally, a number of focus groups would have been convened and a number of countries examined. However, the budget did not allow for this. Details of the companies are not provided for reasons of confidentiality; suffice it to say that just two of the companies were

SMEs. Due to the short duration and limited budget of the project, it was not possible to have a separate focus group on SMEs alone.

A representative attended from each industry in each country. In the main, these representatives were technical personnel. While the focus was on the companies, representatives of the Irish Environmental Protection Agency and the Health and Safety Authority also attended, to represent the views of the regulator. The authors of this report were also in attendance.

In advance of the meeting, a questionnaire was completed by the participants. This provided the framework for discussions and was divided into three sections:

- Issues and initiatives in the area of the environment in the company/industry in question, the incentives for implementing these initiatives and the impact on health and safety in the company and on competitiveness.
- Issues and initiatives in the area of health and safety in the company/industry in question, the incentives for implementing these initiatives and the impact on the environmental profile of the company and on competitiveness.
- Scope for initiatives that address both environmental and health and safety aspects of production.

Results

Dairy Industry

Environmental issues in the dairy industry relate to effluent (sludge) discharges, air emissions resulting from the discharge of milk powder into the atmosphere, the production of solid waste in the form of packaging, noise pollution and energy use.

The Irish company in question is part of the Environmental Management and Audit Scheme (EMAS), referred to in Chapter 2. The reasons for the environmental initiatives of the Irish company were primarily due to efforts to comply with various environmental standards and thereby attain accreditation. The accreditation by the National Standards Authority was considered to be essential for the business. In addition, the anticipation of the introduction of Integrated Pollution Control (IPC) licences by the Environmental Protection Agency (EPA) was a strong motivating factor, as was the anticipation of further EU regulations. To date, only effluent has been licensed by the local authority, but it is anticipated that IPC licences will be issued for all environmental impacts. The role of management systems was stressed as constant improvements are demanded in order to keep accreditation for standards. No explicit economic instruments are in place, but a subsidy for having an environmental consultant carry out an environmental audit was provided. (The audit would have been done anyway in anticipation of stricter regulations.) While EMAS is voluntary, there is a financial incentive involved since the EMAS auditors are recognized by the EPA; thus a separate audit is not required, saving the company money. Non-policy implemented market incentives were also considered to be important, particularly the creation of 'green' and 'good neighbour' images.



The German dairy products company had the same environmental issues as the Irish. Apart from voluntary compliance with EMAS, the principal driving force has been economic instruments in the form of increased charges for water, waste water and energy. In Germany, charges for waste water depend on both the volume of waste water produced and the extent to which it is polluted (the BOD load). Depending on the local authority, the marginal cost of waste water production may rise. (In Ireland, most local authorities charge only by volume and not by the extent to which the waste water is polluted, so there is an incentive to reduce volume but to increase the pollution load.) Another economic incentive in Germany is the provision of capital subsidies of 20 per cent. While these do not just apply to machinery to improve the environmental performance of companies, they do make it cheaper to do so. Non-policy implemented market incentives include a desire to have a 'green' image due to customer pressure. The German company in question has increased its production of organic produce, which is supplied to supermarkets, to 5 per cent of general turnover. These supermarkets require good environmental performance and, without an environmental management system in place, sales to these supermarkets would not be sustainable.

Regulations were also the driving force behind health and safety improvements in the dairy industry. Other incentives were cheaper insurance, worker pressure, reduction in days lost and a good safety image. The initiatives taken include the integration of health and safety into the management system, the improvement of procedures for responding to accidents, improved training and the placing of safety personnel in every plant.

The impact of environmental initiatives on health and safety in the Irish company was positive since the introduction of an environmental management system required the detailed documentation of emergency procedures. Procedures have been put in place for leaks of gas and ammonia, among others, and these will also assist health and safety should there be an accident. Addressing noise pollution has had a beneficial effect on the work environment.

In the German company, the change in environmental management systems had a positive impact on health and safety in the company, mainly relating to the improved procedures for handling dangerous substances. Health and safety initiatives have also had a positive effect on the environmental profile of the company, particularly in terms of better hygiene and noise abatement. Once again, the examination of management systems tends to highlight more efficient actions that can be taken in other areas, such as in relation to the environment.

It is difficult to isolate the effect of environmental initiatives on the competitiveness of the company. However, on balance, in the Irish company, it seems that the effect has been positive. Good management requires good environmental management, and vice versa. Examining the management system as a result of re-organizing environmental management provided opportunities to improve efficiency in other areas and this has resulted in savings. While compliance with strict standards does impose costs, these new management systems in general force companies to analyse costs, resulting in possible savings in other areas. The effect of a

good management system and an on-line computer system in the Irish company has had a positive effect on productivity because the company now has a greater knowledge of costs.

In the German company, the introduction of increased charges for energy, water and waste water provided the incentive to examine the use of such inputs. It was found that substantial cost savings could be made by reducing usage. If anything, such incentives have been good for the competitive position of the company. The company has its own environmental quality mark and goods carrying this have a price premium of between 10 and 20 per cent. Thus, environmental policy and increased environmental awareness have improved the company's competitive position. Health and safety initiatives have had an unambiguously positive effect on profitability through reduced accidents, protection of the product, a more contented workforce and a better image for the company.

In both the Irish and German companies, further improvements could be made by integrating quality, environmental and health and safety management systems. This would decrease the costs of compliance and highlight areas where cost savings could be made.

Textiles Industry

In the manufacture of textiles, the environmental issues relate to the use of toxic chemicals, production of waste water, noise pollution and air pollution. The Irish company implemented EMAS and paid particular attention to improving awareness of environmental issues among the workers. There was no change of process, materials or machinery. Rather, there was an improvement in the management of existing processes.

The German company's initiatives were to substitute non-toxic chemicals for toxic ones, to replace gas-powered noisy trucks with quieter electric trucks, to implement quality standards, to upgrade machinery for dyeing (so that the volume of dye could be reduced tenfold, thereby reducing the amount that goes into the drains), to reduce water use and to reduce the use of particularly odorous chemicals. The company produced less waste water than before, but the waste water it produces is more heavily polluted and, therefore, results in a higher charge per unit. In addition, the company is beginning to implement EMAS.

The initiatives in the Irish company are as a result of anticipating the introduction of IPC licencing. No economic instruments are in place. However, the creation of a 'green' image was seen as important from the point of view of promoting the quality of the garments and as a result of consumer awareness of the environment.

German initiatives were mainly the result of the imposition of command and control measures in the form of Federal emission laws for exhaust, noise and smell, waste laws and waste water laws, and fines for non-compliance. Economic instruments in place relate to the charge on waste water by volume and level of pollution load. The company in question has recently installed new waste water treatment machinery and is investigating the reuse of waste produced from brushing, raising or sueding the fabric, as well as the production of energy through incineration. A further



economic incentive is the possible availability of a subsidy should companies come together to implement a new environmental management system voluntarily.

The Irish company believes that economic incentives could be used to encourage improvement in two ways: through subsidies for research and development in the area of environmental technology and through linking public liability insurance to performance or effort. Other incentives could be a code of practice and an environmental quality mark. The German company envisages that it will move to having an integrated management system which will address quality, environmental impact and health and safety of production. Consumer pressure is less strong in the textile industry than it is in the dairy industry. However, evidence of some consumer awareness can be seen in pressure on companies who have been found to use child labour.

In the German company, regulation is the motivating factor behind health and safety improvements. In addition, health and safety inspectors examine any new machine installed. There is one economic instrument operating via insurance, whereby the company paid a lower premium as a result of installing a sprinkler system in case of fire. Some other measures resulted in a reduction in employer's liability insurance. (In Germany, insurance is levied on each industry, so the industry group monitors accidents and implements safety rules in order to reduce its premium.) Good relations with the trade union were also considered an important incentive to reduce accidents; regular meetings are required by law. The initiatives undertaken were to place dyestuffs in a central storage area (rather than all over the plant) and to improve safety in transport. Dye is pumped from the central storage area directly to the machines, so there is no need for people to handle the chemicals or dyestuffs. In addition, a safety commission comes together every three months to discuss safety issues.

In the Irish company, it was felt that environmental action has had a positive effect on health and safety. In the German company, this has also been the case, particularly as a result of the reduction in the use of toxic and odorous chemicals. Air quality within and outside the company improved. In addition, improved fire precaution in relation to chemicals reduced the risk of injury to workers and of environmental damage. The company is investigating the possibility of installing an underground basin so that, if a fire breaks out in the chemical storage facility, the water used by the fire services will not be discharged into the environment. Health and safety initiatives improved the environmental performance of the company, and vice versa; they are both mutually reinforcing and the influence of one on the other is not any stronger.

The Irish company believes that environmental initiatives are likely to improve competitiveness as consumer awareness of the environment increases. The German company believes that addressing environmental issues has, if anything, had a positive effect on competitiveness since the chemicals and processes in use now are cheaper than prior to addressing the environmental issues involved. However, the payback in terms of reduced energy use has not been so great, since the industry is very energy-intensive. It is likely that health and safety initiatives have a positive effect on competitiveness by reducing the potential for damage to the plant and days lost due to accidents, and by improving the contentedness of the workforce.

Chemical Industry

The principal environmental hazard in the chemical industry is the problem of spillage. This can take place in a number of ways: gas leaks into the air, emissions to water, and fire. In Ireland, initiatives to reduce such environmental impact have been the result of quite strict regulations which have been in place for some time and licences are issued by local authorities for air, water, waste and effluent emissions. The industry is also anticipating the introduction of the IPC licence, but expect that this will not impose significant costs due to the high level of existing regulation. Other incentives are cost savings. The Irish company in question has installed a combined heat and power plant to improve savings in energy. This is a 'win-win' initiative because it is not only beneficial for the environment but also improves the profitability of the company. A 'good neighbour' policy was also important to the company, so that there would be no opposition to its location. The company regularly consults with local residents' associations and endeavours to make the plant more visually attractive. Management systems have been the key vehicle for improving the environmental impact of the company, while also providing cost savings.

The German chemicals company experienced similar environmental issues as the Irish. Efforts to address these issues are through the implementation of EMAS and the introduction of new cleaner technology. This has been in an effort to reduce energy and water consumption and to increase recycling. In addition, there is an effort to substitute hazardous substances with less dangerous ones. The result has been a substantial drop in effluent discharge. Incentives to address environmental issues have come in the form of regulation. However, this has involved complex documentation. The company envisages that there will be some payoff in terms of efficiency of re-organizing management systems, but as yet they do not have figures to prove this. Apart from economic instruments related to water, there are few such instruments used. However, investment in a treatment plant for effluent can be offset against sewage taxes. Non-policy implemented market incentives in the form of 'green' and 'good neighbour' images are also considered important incentives for good environmental practice. In addition, customers often require evidence of environmental management systems.

The link between environmental initiatives and health and safety in the workplace is strongly positive in the chemical industry. Some procedures to reduce the likelihood of accidental emissions will be of benefit to the workers and to the local environment. However, there can also be conflicts. Accidents are very costly to companies in terms of damage, so environmental, health and safety, and quality management are integrated. The Irish company felt that health and safety initiatives are largely driven by a 'carrot' since improvements in health and safety reduce the risk of losses due to downtime, whereas environmental initiatives tend to be driven by the 'stick' of regulations. Interestingly, therefore, health and safety initiatives tend to have a positive effect on the environmental impact of the company, whereas environmental regulations do not tend to improve health and safety in the workplace since best health and safety practice is in the interests of the company and so is done anyway. In both the Irish and German companies, management systems to improve efficiency drive improvements in health and safety and



environmental benefits are a product of this. Better documentation contributed to improvements in both health and safety and the environment.

While health and safety initiatives are not likely to harm competitiveness and may be positive, it is generally thought in the chemical industry that environmental regulation imposes costs on the industry and there are few opportunities to recoup them (unlike, for example, the dairy industry). One exception is the case of energy saving. Like textiles, the chemical industry is global and there are areas outside Europe which have much lower regulatory standards and so have a cost advantage. The German company in question has implemented some processes which involved the substitution of less dangerous inputs; these are also less expensive and so cost savings have resulted which have actually enhanced the competitive position of the company. However, in general, addressing environmental issues involves a change in processes and in machinery, which is expensive. There are few niche areas where ‘environmentally friendly’ chemicals are profitable (for example, the healthcare industry, where both a good environmental and health and safety image is important).

Health and safety issues in chemicals involve monitoring dangerous substances, fire prevention and control and asset protection. The principal initiatives involve improved information, training and internal auditing. The principal incentives come from dangerous substance regulations. Economic instruments do not play a role in Germany. However, in Ireland, in addition to command and control instruments, insurance costs are related to performance and thereby act as an economic instrument. Other incentives are to have a good health and safety image, to reduce downtime, to reduce damage to the plant and to have a happier workforce with a resultant improved productivity. Workers are generally highly skilled and lost time is, therefore, very costly. The Irish company uses safety bonus schemes as reinforcement. It is likely that the costs of health and safety initiatives are lower than those for environmental initiatives since they do not involve such expensive changes in technical processes.

As in the other industries, the key to good environmental and health and safety practice is good management. If your house is kept in order, you will have a good quality product, efficient production methods and a low level of accidents. Therefore, you will have happy neighbours, a contented workforce with a low level of days lost and satisfied customers.

Unlike in the case of environmental initiatives, there is a clear and positive relationship between good health and safety practice and profitability in the chemical industry. A lower accident rate will involve savings and so help competitiveness. In Germany, internal auditing and EMAS are the key initiatives that can have a double benefit — in terms of health and safety and the environment.

Construction Industry

The Irish construction company stressed that, unlike other industries represented, construction has particularly low barriers to entry. This causes difficulties in relation to regulation because of the relative ease with which a small operator can set up business. In addition, the site on which the operation takes place varies. Environmental issues are a relatively new concern in the construction industry in Ireland. They relate to the increasing lack of landfill availability and the consequent need for recycling building products, the new packaging regulations in Ireland and the consequent voluntary agreement known as REPAK, and the removal of hazardous waste from sites. Economic incentives, apart from fines, do not exist. The anticipation of the introduction of stricter regulations is driving the industry to examine environmental issues.

In Germany, the issues are similar but came to light earlier. The handling of contaminated material on sites is a significant issue, as is the use of environmentally friendly building materials. The initiatives undertaken by the German company were to develop an environmental policy, to expand knowledge as to how to comply with the regulations (particularly on hazardous waste sites), to select materials and machinery more carefully and to implement an environmental management system. The 'stick' in the case of Germany is regulatory action regarding landfills and waste management. These regulations are more strict than in Ireland. Companies constructing private homes can benefit from a 'green' or 'energy saving' image. Economic incentives to recycle and to avoid landfill could play an important role. A quality mark would be most useful at the point of interview prior to the awarding of a contract. This would be beneficial in both the environmental and the health and safety areas.

Health and safety regulation is far more advanced than environmental regulation in the construction industry. The size of the industry, the small size of some contractors and the lack of barriers to entry make monitoring health and safety practice extremely difficult. In Germany, incentives for improved health and safety in construction stem from regulation and the necessity to comply with minimum standards in order to receive insurance. There is also a safety bonus scheme in insurance. When a company is above the average accident level, it gets a refund. Non-policy implemented market incentives include the avoidance of the cost of workforce delay of projects due to accidents. The initiatives undertaken involve improved management systems and improved equipment as a result of equipment safety regulation. In Ireland, regulatory rules have been the driving force. Economic incentives include safety bonus schemes in insurance. Other incentives include the recognition of a good safety image.

Apart from the strong links between public safety and the safety of workers in certain areas of construction, at this stage it is not considered that there are links between health and safety and the environment in Irish construction. In Germany, proper control of materials can also benefit health and safety. However, there is a conflict where environmental regulations encourage the recycling of building materials, which involves a danger to the workers concerned. Another example is the use of asbestos in buildings. While this will improve the energy efficiency of a building, it may conflict with the health and safety of the workers. Complementary initiatives include treating hazardous material on site, thereby reducing the risk to public safety during



transport. The bonus system could be arranged so that rewards for environmental and health and safety practice can be coordinated. The links between health and safety will depend very much on the type of construction.

The lack of barriers to entry into the construction industry makes it relatively difficult to ensure that regulations are complied with and, therefore, there may be an effect on competitiveness if all companies do not comply with the regulations. The larger companies are likely to take the lead. It will be harder to monitor smaller companies. The extent to which charges for landfill (if they were to be introduced, as in the UK) would be passed on to the customer will have implications for profitability. In Germany, the integration of the environment, quality and health and safety into one management system is required in order to win certain contracts. Thus, the German company in question was put in a better competitive position by developing expertise in this area. The Irish company is beginning to take an active interest in monitoring safety, for without a good safety record it will become harder to win contracts. Thus, the competitive position of companies which have a good record and are complying with legislation is improved. At present, the tendering procedure does not detail the environmental impact and a change in this would be beneficial.

Conclusions

The findings below are based on the results of a small focus group. Therefore, they are not necessarily applicable to other companies. It is also important to note that the study focused on areas where there were links between health and safety and the external environment. In many cases there is no link.

- In the countries concerned, Ireland and Germany, environmental policy makers rely predominantly on regulation rather than on economic instruments. However, non-policy implemented market incentives are very important, such as a 'green' and/or 'good neighbour' image as a result of environmental initiatives, and reduced downtime and a more contented workforce as a result of health and safety initiatives. Quality marks for good environmental and health and safety practice would assist companies to reap the rewards of good practice, particularly in those industries where competition is with companies in countries where regulation is less strict. Having environmental and health and safety best practice as part of the tendering process could prove to be a strong incentive.
- Management systems are the key. Good environmental and health and safety practice tends to go hand-in-hand with the quality of production. However, regulation and economic instruments provide the incentive for companies to improve management systems. Economic instruments for environmental protection are more acceptable to companies than regulation since they reward companies for continuous improvement. In addition, because they allow companies to choose their level of pollution, companies can make improvements at their own pace and avoid making drastic changes in practices as new regulations come into force. Predictably, the economic instrument most preferred is the subsidy.

- Reductions in insurance premiums based on health and safety performance can, and are, used as economic instruments. However, their effectiveness depends on the industry and the country in question. In Ireland, where there is a high rate of litigation, insurance costs are high and so make up a significant enough portion of total costs to make increased effort worthwhile when the premium is linked to performance or effort. The possibility of being able to self-insure also provides an incentive since it tends to involve substantial cost savings.
- The provision of information by policy makers can be a particularly powerful instrument. In their efforts to comply with environmental and health and safety regulations, many of the companies realized that most of the initiatives they undertook should have been done even in the absence of regulation since they improved efficiency. Such ‘win-win’ scenarios are beneficial to society on two fronts — cheaper products and a better environment/fewer accidents. The reason that companies do not undertake these initiatives without intervention is due to asymmetric information. Companies do not realize that through the implementation of better management practice it is possible to make savings which improve their competitiveness. This is of particular importance in the case of SMEs which may not have the resources to investigate fully the most efficient means of addressing environmental issues. (It is clear that there are economies of scale in terms of the administrative costs of complying with regulation.) Assistance from policy makers in recognizing these benefits will strengthen the incentive to change. An additional advantage of improving information or providing assistance to companies is that, if the companies discover other advantages of addressing environmental and/or health and safety issues, the scale of the economic incentive may not need to be so high. The actual scale required will depend on the cost to the company of addressing the issue.
- Generally, for the companies participating in this case study, initiatives in both the environment and in health and safety had a zero or positive effect on the other area. Only in isolated cases was there a conflict. However, there is a concern that increasing preoccupation with environmental issues may be detrimental to health and safety in the workplace. The key to ensuring that initiatives are mutually reinforcing is to encourage companies to have an integrated management system in place. Either regulation or economic instruments can provide the incentive.
- The link between the environment and health and safety does not, in itself, strengthen the argument for the use of economic instruments over regulation. However, as discussed in Chapters 2 and 3, the advantages of using economic instruments rather than regulation in appropriate circumstances do not rely on this link.
- There is a need for coordination between environmental and health and safety authorities in order to reduce risk of conflict, to minimize cost of compliance, to encourage compliance and to make the most of complementarities. Integrated audits of environmental and health and safety impacts would reduce the cost of compliance to companies and, most likely, the monitoring cost to regulators. In addition, many regulations and economic instruments have a positive effect on both areas, so there is some duplication. Closer cooperation between regulators would assist in avoiding the creation of conflicts and making incentives mutually



reinforcing. In addition, it would reduce the cost of compliance for companies and thereby increase the likelihood of compliance. The cost savings would be of particular importance to SMEs. A joint standard covering quality, environmental and health and safety matters would be beneficial, particularly now that customers are increasingly demanding that companies have accreditation. By having a joint standard, the areas concerned would reinforce one another.

- One suggestion is that environmental and health and safety regulators be combined. However, it is thought by the authors that this may lead to compromises in areas where there is conflict and thus it is better to have separate authorities who, while cooperating, also ‘fight their corner’.
- In most of the companies in question, environmental regulation has not had an adverse effect on competitiveness due to the identification of cost savings when improved management systems were put in place and as a result of consumer demand for better standards. However, this is not applicable to all industries. In industries which compete worldwide (such as textiles), standards vary considerably and so the costs of higher standards in these industries are greater than in an industry such as dairy products, where trade tends to be more local within Europe.
- Good health and safety practice tends to enhance the performance of a company. However, it will depend upon the industry in question. In the chemical industry, for example, companies are particularly concerned with best practice in health and safety since the potential loss of profits is high if workers are injured or the workforce is not content or there is an increase in downtime or damage to the plant. In such industries, government intervention is required less. In a less skilled industry, such as construction, which also has a larger proportion of small companies, greater incentives are needed. In relation to the environment, regulation and/or economic instruments are generally a requirement in all industries in order to encourage better performance.

Introduction

There are three key questions in regard to the interface between the use of market-based incentives, environmental quality, health and safety, and employment:

- Does the use of market-based incentives to express the scarcity value of environmental endowments help or hinder employment?
- Does the use of market-based interventions, which are designed to stimulate cost-effective and economically efficient provision of health and safety measures, help or hinder employment?
- Are these related, i.e. does the use of market-based instruments in regard to environmental endowments have any effect on health and safety, or vice versa, and thereby on employment?

Relationship between Market-based Incentives for Environmental Quality and Employment

1. Tradeable permits have been applied almost exclusively in the USA (Convery, 1998). Since their introduction as effective policy instruments in the early 1990s, the USA has been at or close to full employment, so that employment per se has not been a political or analytical issue.

However, evidence has been adduced to indicate that the use of tradeable permits has achieved environmental targets at costs considerably below those which would have been incurred by the alternative instrument which was in prospect, namely 'command and control'. There is, therefore, a presumption that tradeable permits are an employment-friendly instrument and that

they free up resources which would have been tied up in environmental control for use in other activities. However, we have no direct evidence in this regard because of the lack of USA interest in the subject, as noted above.

2. There is now an extensive literature on most aspects of the environment-employment debate as it pertains to past environmental policies, which were almost exclusively ‘command and control’.

Much of this literature is summarized in OECD (1997) in a survey compiled by Rolf-U. Sprenger, while Robson (1998) summarizes some paired comparisons of companies in the same industry subjected to differing environmental regimes, mainly of a ‘command and control’ nature.

These past policies are almost exclusively of the ‘command and control’ and subsidy character, and so do not inform us directly of the employment impact of market-based systems. The evidence indicates that:

- the net effects on employment of environmental measures already taken are likely to be modest and probably positive;
- there is evidence that some ‘dirty’ industries (primary metal processing and highly toxic chemical production such as asbestos) have located new capacity in environmentally less-demanding sites (sometimes called ‘pollution havens’). But the extent of this seems very modest in overall effect. There are concerns, however, that certain industries (such as metal refining, oil refining, cement production, pulp and paper, and commodity chemicals) may over time migrate to developing countries.

3. In regard to the employment implications of taxes and charges, the empirical evidence from the past is modest because these instruments have not been long in use and such evidence as there is is ‘masked’ by a wide variety of other factors.

There is an extensive literature focused on the future, using models, both econometric and general equilibrium, to assess the likely impact on employment of applying taxes and charges. This work was stimulated by a number of coincident forces, including the European Commission’s proposal to apply a carbon energy tax and recycle the proceeds in the form of reduced payroll taxes; the rising unemployment in the EU; and the linking of employment and sustainability in the Delors’ White Paper. The findings of Koopman (1994) are characteristic of this work (see Box 5.1).

**Box 5.1. Economic Effects for the EC of a 1% of GDP General Reduction in Social Security
Contribution Rates financed in a Budget Neutral Manner by a CO₂ Energy Tax**

Impact Category	Effects after 1st Year	Effects after 4th Year	Effects after 7th Year
Private Consumption	0.1	0.3	1.3
Current Balance (% of GDP)	-0.2	0	-0.1
Investment	0.5	0	-0.2
GDP	0.4	0.5	1.0
Unemployment	-0.3	-0.9	-0.9
Employment	0.3	1.0	1.0
CPI	0.0	0.3	-0.7

Source: Koopman (1994)

The impacts on private consumption, GDP and employment are all modest, but positive.

In a detailed examination of sectoral and macro economic responses to three scenarios — the reference (no action), implementation of policies in the pipeline and an integrated strategy mobilizing market-based instruments — it was concluded that the market-based strategies would yield significant environmental and economic gains over the other two strategies (European Commission, 1994b). But to every action there is an equal and opposite reaction. Double-dividend revisionists emerged and argued that, under certain assumptions, the effects of carbon energy taxes and recycling could be damaging to the economy.

There is now an extensive literature which examines this issue in a partial or general equilibrium context, and which draws conclusions based both on the basis of theoretical models and on quantitative analysis. The most complete rendering of such work in Europe was provided in 13 papers presented at the ‘International Workshop on Environmental Taxation, Revenue Recycling and Unemployment’, at the Fondazione Eni Enrico Mattei, Milan; this work has been summarized by Brunello (1995). These papers demonstrate that the outcome of such analyses depends on the assumptions made, in particular the assumptions as to how labour markets work. If the market for labour is reasonably competitive, in the sense that entry and exit is easy, and monopoly power by suppliers and demanders is limited, then the labour market will ‘clear’ and the economy should tend anyway towards full employment.

These conditions are presumed to be approximated in the USA, where unemployment in recent years has been much lower than in Europe and where the ‘double dividend’ debate is not on the policy or intellectual agenda. If it is assumed that the labour market is perfectly competitive, then the double dividend is a chimera. But if there are rigidities (as is certainly the case in parts of Europe), then it seems likely that, in the short term, there will be an employment dividend as a result of a recycled carbon energy tax. But in the long term, such rigidities become less relevant, as real wages adjust to the ‘gain’ represented by the fiscal transfer from environment to labour. The short term is not explicitly defined, but for the unemployed worker, it can seem very long

indeed. It is clear that, in Europe, the linkage between environmental taxation, overall tax policy and employment is an important policy concern.

The papers reviewed by Brunello all implicitly demonstrate that the understanding of how labour markets work in practice, the responsiveness of environmental performance to charges and the substitutability of other factors of production by labour in the short and long term are still very imperfectly understood.

In addition to this pan-European work, there are also a number of country reports. Examples include Norway (Norwegian Green Tax Commission, 1996), Sweden (Swedish Green Tax Commission, 1997) and Nordic Council of Ministers (1996), as well as sectoral analyses, such as those reported by Robson (1998).

As a subset of the above arguments, there is broad agreement that environmental ‘command and control’ policies as implemented in the past, and market-based policies as a prospective policy for the future, will not be inimical to international competitiveness (Barker and Köhler, 1998).

4. The influence of environmental policy in shaping performance in the labour market or in environmental quality is modest compared with other structural adjustments.

The relatively good labour market performance in the UK, the Netherlands, Denmark and Ireland owes little to environmental policy. The (good) greenhouse gas performance of the UK and Germany over the past decade similarly owes nothing to environmental policy. Privatization and commercialization of a drastically reduced coal industry and the emergence of North Sea natural gas as a major source of primary energy account for the UK situation. The salient features of Germany’s success were restructuring following unification and exposure to markets.

The degree of flexibility in labour markets, the size of the tax and social security ‘wedge’, the productivity of labour reflected in education and skill levels, and the rate of exchange — all these are primary shapers of labour market performance.

5. Interest groups dominate debate.

A selection of losers and winners in Germany of a carbon energy tax recycled to reduce payroll taxes on labour are summarised in Table 5.1.



Table 5.1. Effects of a Carbon Tax, recycled as reduced payroll taxes, on sectoral prices in Germany

Sector	Price Change (% over base)
Losers	
Iron and Steel	8.0
Cellulose, Pulp and Paper	4.0
Chemical products	2.7
Quarrying	2.2
Glass	2.2
Winners	
Government services	-1.4
Postal services and Communications	-1.3
Insurance services	-0.6
Wholesale services	-0.5
Electrotechnical products	-0.3

Source: Ekins and Speck (1998)

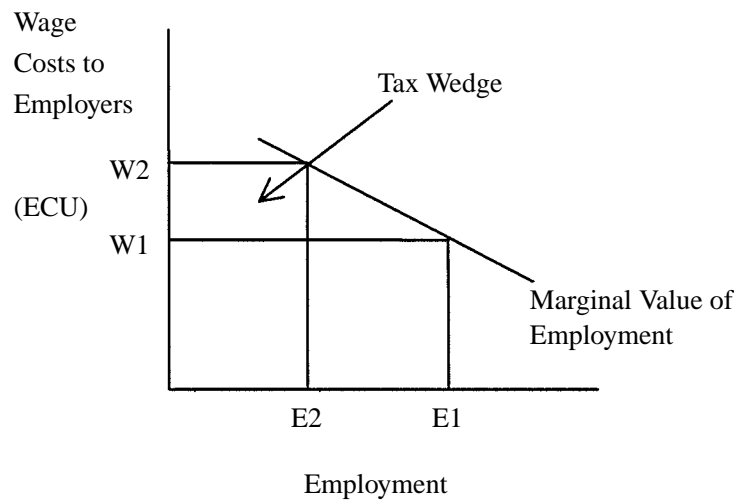
The fact that losses are concentrated on a few key sectors and regions, with a few large companies, while the winners are more diffuse, may explain why the likely losers have dominated the competitiveness debate. This also shapes the ‘geography of opposition’, where particular regions have a disproportionate share of their economy dependent on high-energy consumption sectors.

6. Interest in the subject of interaction between environmental economic instruments and employment levels is positively correlated with the rate of unemployment.

In the USA, with full employment, this subject is hardly discussed. In parts of Europe, with high unemployment, it has become a political and intellectual preoccupation.

Relationship between Incentives for Health and Safety, and Employment

7. To the extent that health and safety costs are borne in the form of payroll taxes, such that employers have to pay relatively higher wages to give the same take-home pay to workers, we would expect them to act as a ‘wedge’ creating a gap between what wage costs and employment would be (W1 and E1) in the absence of the health and safety payroll tax, and what it would be with such a tax (W2 and E2). Everything else being equal, the result is lower employment (see Figure 5.1).

Figure 5.1. *Effects of the Tax Wedge on Employment*

8. To the extent that incentive-based approaches can help avoid this wedge, then they will also be employment-enhancing.

Relationship between Incentive-based Approaches to conserve Environmental Endowments, Health and Safety, and Employment

9. Under certain conditions, the social partners have demonstrated that they can work together within a company or a sector to address health and safety issues simultaneously within the workplace and environmental challenges without.

A number of case studies of social, and indeed wider, partnership directed at environmental improvement have been documented: Kingo (1994) outlined how one of the largest biotech companies in the world, located in Denmark, has addressed both its environmental challenges and the perceptions of them by adopting a very proactive strategy involving:

- development of an eco-productivity index (for raw materials, water and energy) as an indicator of sustainable development; the index increases if the company is able to produce more output per unit of input;
- achievement of environmental targets (22 are specified);
- development of a total quality system;
- involvement of stakeholders in the process, including employees, neighbours, pupils, students and NGOs, as well as provision of feedback.



In BASF in Germany, very explicit attention is devoted to achieving effective worker involvement (see Box 5.2).

Box 5.2. The BASF Case of Worker Participation in Environmental Management and Policy

Malle (1994) outlines the overall situation in Germany and summarizes the works agreement concluded at BASF AG in March 1993, whereby:

‘Any matters relating to protection of the environment are discussed at meetings of a newly established environment committee which are held regularly under the chairmanship of the respective board member. It is made sure that representatives of the employees are informed promptly in the event of operational failures. They are invited to join the negotiations with the authorities . . . Environmental questions are discussed at the regular safety meetings with the health and safety representatives of the plants . . . These agreements have been proving to be worthwhile for about a year and a half.’

Malle also notes that employees are involved directly in a Chemical Advisory Council to the Ministry of the Environment in the State of Rhineland-Palatinate. In addition to providing the opportunity to participate in discussions on improving the work environment, environmental standards and the like, views on proposed legislation can be provided at an early stage.

Neither of these initiatives seems to be directly related to the use or non-use of market-based incentives.

10. There are some key areas where there seems to be operational and employment-related synergy, including:

- Development of indicator-related information, especially where this relates to materials flow.
- Improved efficiency in the use of partnership ‘overhead’; if the social partners are going to invest time and effort in addressing health and safety issues, the marginal costs of also addressing the environmental effects will be low.
- More efficient use of management expertise. The skills and imperatives involved in achieving cost-effective health and safety are likely to be the same as those needed to ensure that environmental quality imperatives are achieved — the total quality package.
- Use of market-based instruments is likely to reduce the inputs per unit of output; other things being equal, increased parsimony should also enhance health and safety.
- For SMEs, there seems to be an especially compelling argument for the integration of environmental and health and safety policy. In these companies, management overhead is a scarce resource and, if the total of such costs can be reduced by integration, their competitiveness and employment potential can be improved.



Chapter 6

Conclusions

The main objective of this report was to examine the linkages between two key components of people's quality of life — the quality of the environment in which they live and the quality of the environment in which they work. In addition, the report examines the availability and use of economic instruments in both areas and their impact upon employment. Separate chapters examine the use of economic instruments in both areas and highlight issues which will arise in the future. The links between the environment and health and safety, and between policy initiatives in both areas, were examined using a focus group of representatives from German and Irish companies. Finally, a framework was developed for the analysis of the employment impact of policy initiatives in the environment and health and safety.

Economic Instruments and the Environment

- A range of economic instruments exists to correct for the failure of the market to protect environmental assets (see Chapter 2). In the main, these instruments 'ration' the environment by charging those who use it. Economic instruments in use include charges and taxes on pollution, tradeable pollution permits, transferable development rights, subsidies, voluntary environmental agreements and performance bonds.
- At EU level, the principle of charging users for pollution is enshrined in the Polluter Pays Principle. Such instruments are increasingly recognized as being more effective and efficient than regulation in many areas. Environmental taxes and charges are also recognized for their revenue-generating capacity.
- There is still more scope for the use of economic instruments in almost all EU countries. The challenge is to determine from existing application where economic instruments work best and where they do not.

- Research in the area needs to focus more on the basis for the level of environmental taxes, i.e. setting targets using environmental valuation. The basis for environmental taxes and charges tends to be made on a second-best, 'two-step' approach, in which an ambient standard is set and then taxes and charges are used to meet that standard. While this is usually more efficient than using regulation, it would be preferable to base charges on the costs and benefits of pollution control.
- Fears about the negative effects of such instruments on competitiveness are largely unfounded in many industries. These fears could be reduced by the provision of better information by government. While hypothecation ('ear-marking' of funds) is not generally a good idea, the raising of revenue through environmental taxes could justify more funding for information provision. Fears about the effect of such instruments on competitiveness will also be allayed if taxes are introduced at an EU level and if special attention is paid to those industries which compete with companies outside Europe. The introduction of EU-wide taxes is complicated by sovereignty issues.
- Efforts to harmonize taxes across Europe may have the positive effect of easing companies' concerns about their competitiveness. However, the harmonizing of 'green' taxes is not necessarily efficient. A tax on pollution should be based on the damage that pollution does to the environment and the costs of control. This may vary by country and, if so, a uniform tax rate, while perhaps more acceptable, will not be optimal.
- Guidelines on the evaluation of economic instruments, in terms of effectiveness and efficiency, should be built into the policy process.
- The implications of broadening the tax base through the introduction of environmental taxes should be explored. In particular, efforts should be made to avoid double taxation. If the public sees environmental taxes being introduced without a consequent reduction elsewhere, the taxes will be seen as revenue-generating rather than distortion-correcting. This is likely to lead to opposition.
- Distributional issues need to be examined before any environmental tax is introduced. There are 'fair' and 'unfair' ways of introducing such taxes. Distributional issues should not be used as an excuse to avoid the implementation of economic instruments. Distributional issues also arise when using regulation.
- Voluntary environmental agreements provide a basis for environmental policy where regulatory or other economic instruments would be difficult to administer. Implementation agreements complement regulatory policy by relying on sanctions or threat of alternative instruments as back-up. Voluntary agreements also provide a framework for proactive environmental policy. They are suitable for long-term targets, limited sources of pollution, sectors that face limited competition and where few opportunities exist for free-riders.



Economic Instruments and the Workplace

- Economic instruments in the workplace endeavour to internalize the external benefits of better health and safety (see Chapter 3). Without intervention, the company does not capture all the benefits and therefore will tend to underinvest in health and safety. The principal economic instruments relate to insurance and include linking the insurance premium to performance, premium discounts/bonuses for good health and safety planning and insurance ‘penalties’ for major accidents. Other economic instruments are voluntary agreements and subsidies for better health and safety.
- The European Foundation for the Improvement of Living and Working Conditions has identified a set of key elements for a new forward-looking approach to the issue of economic incentives to improve the working environment. Compulsory industrial injury insurance is envisaged as the vehicle for these incentives but, unlike existing schemes, premiums are linked to present and future risks rather than to past experience. A range of bonuses is proposed for companies that make agreed improvements to working conditions.
- Economic instruments are generally used as an incentive for companies to reduce accidents below a certain minimum standard. Reductions in insurance premiums based on health and safety performance can, and are, used as economic instruments. However, their effectiveness depends on the industry and the country in question. In Ireland, where there is a high rate of litigation, insurance costs are high and so make up a significant enough portion of total costs to make increased effort worthwhile when the premium is linked to performance or effort. The possibility of being able to self-insure also provides an incentive since it tends to involve substantial cost savings.
- A larger range of instruments is available to environmental policy makers than to health and safety policy makers. This is partly due to economic instruments being a relatively new concept in health and safety, and partly due to moral issues arising over ‘optimal accidents’. The principal instruments that have not been applied to health and safety are taxes and tradeable permits. In environmental policy-making, the objective of these measures is to encourage reductions in environmental damage to be made where it is cheapest to do so. A tax on accidents — the idea that a company could pay rather than implement better health and safety procedures — would probably be unacceptable to the public for moral reasons. Using tradeable permits for health and safety would allow a company to pay another company to make a greater reduction in accidents so that the first company would not have to reduce its accident rate. This is likely to be equally unacceptable.
- While the above approaches may be unacceptable, it is clear that resources should be put into reducing accidents where it is likely to have greatest effect.
- On-site safety advice and safety audits are expensive. Regulatory authorities operate on systems of random inspections and targeted interventions, as well as active encouragement of companies and industries to take ownership of their own safety programmes. It is not possible to have a safety inspector on every building site or every factory floor. Incentive

systems which measure effort not results are posited on on-site assessments and inspections. As programmes of this kind grow in scale, they will face issues like how to target inspector resources or how to get sectors to self-assess and self-police their own efforts.

- The SME sector, given the large number of companies involved, creates major logistical problems for programmes based on systematic on-site inspection. If sectors can develop peer support and self-audit or peer audit mechanisms, this type of incentive will become more feasible.
- Sectoral health and safety programmes can yield benefits to members when they lead to fewer accidents and claims and, therefore, to lower premiums. There can be a free-rider problem to the extent that the premium of a SME is largely based on sectoral rather than individual performance. The uncertainty about the return may cloud the potential economic gains. Small companies may prefer the known cost of paying premiums rather than the unknown cost and unforeseeable returns of implementing a safety programme. Ultimately, such schemes can be self-supporting if the economic gains are shared among the members. However, it may require seed funding to get such schemes underway, as well as improved information on the benefits of such schemes.
- A possible strategy is to link general business incentives (such as development grants and tax breaks) to achievement of a minimum standard of compliance with environmental performance or health and safety rules. For example, a certificate on safety standards could be awarded from an independent professional. This could also apply to environmental standards. This strategy is particularly relevant when related to the significant EU supports now being aimed at the SME sector.
- If health and safety management is the key to better health and safety performance, mentoring programmes can prove beneficial. Such programmes involve acknowledged leaders taking weaker enterprises ‘under their wing’ to teach them.

Links between Environmental and Health and Safety Policy

The summary below consists of findings based mostly on the case study undertaken for this report (see Chapter 4). Due to the small sample of companies involved in the study’s focus group, the results are not necessarily applicable to all companies. In addition, the study focused on areas where there is likely to be a link between the external environment and health and safety. In many cases, there may be no link.

- Generally, initiatives in both the environment and in health and safety have a zero or positive effect on the other area. Only in isolated cases is there a conflict. In areas of conflict, the balance of power between the environmental and health and safety officers can be crucial in determining the outcome.
- However, there is a concern that increasing preoccupation with environmental issues may be detrimental to health and safety in the workplace. The key to ensuring that initiatives are

mutually reinforcing is to encourage companies to have an integrated management system in place. Either regulation or economic instruments can provide the incentive.

- The link between the environment and health and safety does not, in itself, strengthen the argument for the use of economic instruments over regulation. However, the advantages of using economic instruments rather than regulation in appropriate circumstances do not rely on this link.
- There is a need for coordination between environmental and health and safety authorities in order to reduce risk of conflict, to minimize cost of compliance, to encourage compliance and to make the most of complementarities. Integrated audits of environmental and health and safety impacts would reduce the cost of compliance to companies and, most likely, the monitoring cost to regulators. In addition, many regulations and economic instruments have a positive effect on both areas, so there is some duplication. Closer cooperation between regulators would assist in avoiding the creation of conflicts and making incentives mutually reinforcing. In addition, it would reduce the cost of compliance for companies and thereby increase the likelihood of compliance. The cost savings would be of particular importance to SMEs. A joint standard covering quality, environmental and health and safety matters would be beneficial, particularly now that customers are increasingly demanding that companies have accreditation. By having a joint standard, the areas concerned would reinforce one another.
- The suggestion that environmental and health and safety regulators be combined is not favoured since it may lead to compromises in areas where there is conflict. Thus it is better to have separate authorities who, while cooperating, also 'fight their corner'.
- Encouraging companies to implement good management systems is the key. Good environmental and health and safety practice tends to go hand-in-hand with the quality of production. However, regulation and economic instruments provide the incentive for companies to improve management systems. Economic instruments for environmental protection are more acceptable to companies than regulation since they reward companies for continuous improvement. In addition, because they allow companies to choose their level of pollution, companies can make improvements at their own pace and avoid making drastic changes in practices as new regulations come into force.
- The provision of information by policy makers can be a particularly powerful instrument. In their efforts to comply with environmental and health and safety regulations, many companies come to realize that most of the initiatives they are undertaking should have been done even in the absence of regulation since they improved efficiency. Such 'win-win' scenarios are beneficial to society on two fronts — cheaper products and a better environment/fewer accidents. The reason that companies do not undertake these initiatives without intervention is due to asymmetric information. Companies do not realize that through the implementation of better management practice it is possible to make savings which improve their competitiveness. This is of particular importance in the case of SMEs which may not have the resources to investigate fully the most efficient means of addressing

environmental issues. Assistance from policy makers in recognizing these benefits will strengthen the incentive to change.

- An additional advantage of improving information or providing assistance to companies is that, if the companies discover other advantages of addressing environmental and/or health and safety issues, the scale of the economic incentive may not need to be so high. The actual scale required will depend on the cost to the company of addressing the issue.
- Non-policy implemented market incentives are very important, such as a 'green' and/or 'good neighbour' image as a result of environmental initiatives, and reduced downtime and a more contented workforce as a result of health and safety initiatives. Quality marks for good environmental and health and safety practice would assist companies to reap the rewards of good practice, particularly in those industries where competition is with companies in countries where regulation is less strict.
- While good health and safety practice tends to enhance the performance of a company, the extent to which it does depends upon the industry in question. In the chemical industry, for example, companies are particularly concerned with best practice in health and safety since the potential loss of profits is high if workers are injured or the workforce is not content or there is an increase in downtime or damage to the plant. In such industries, government intervention is required less. In a less skilled industry, such as construction, which also has a larger proportion of small companies, greater incentives are needed. In relation to the environment, regulation and/or economic instruments are generally a requirement in all industries in order to encourage better performance.
- The evaluation and assessment of risk in relation to the environment and health and safety is not consistent.
- The tendering process could be a particularly powerful economic instrument were good environmental and health and safety standards to become key components of a successful tender.

Small and Medium-sized Enterprises (SMEs)

- Issues of good environmental and health and safety management tend to be more problematic for SMEs and particularly microbusinesses. With fewer personnel, it is unlikely that they will have a management function dedicated to environmental or health and safety issues. There can be significant economies of scale in this area, whether in-house or bought in. Buying in preventive expertise through environmental or health and safety audits by qualified personnel may be a disproportionate cost to small companies. While ECU 500 per monthly audit may be a trivial outlay for a large company, it would be significant for a SME.
- SMEs may be slower to see the potential economic gains from good preventive practice. If the underlying average risk and level of safety practice were the same for a large and a small company in the same sector (on average, 3 per cent of employees per year injured or suffering from occupational illness), then a company employing 1,000 workers is statistically

unlikely to escape such injuries or illness, while a company employing only 10 people is statistically likely to suffer none in any given year. Lucky experience in the past may cloud the perception of risk.

- Interesting programmes have been developed in Poland geared at the specific needs of SMEs, providing information, risk assessment and advice on personal protective equipment, as well as promoting a user-friendly approach to health and safety management.
- The design of economic incentives should, therefore, ideally include subprogrammes aimed at the specific difficulties and obstacles to optimal behaviour experienced in the SME sector.

Employment Issues

- The effect of past environmental regulation on competitiveness and employment has been examined in detail in a number of studies. The results suggest that, in most cases, the net effect of such policies is likely to be modest and probably positive. However, there is evidence that some 'dirty' industries have located new capacity in environmentally less-demanding countries.
- The results of the focus group also suggest that environmental regulation has not had an adverse effect on competitiveness due to the identification of cost savings when improved management systems were put in place and as a result of consumer demand for better standards. However, this is not applicable to all industries. In industries which compete worldwide (such as textiles), standards vary considerably and so the costs of higher standards in these industries are greater than in an industry such as dairy products, where trade tends to be more local within Europe.
- The empirical evidence of the effect of economic instruments on employment is largely based on modelling future effects, given that these instruments are a more recent phenomenon. Those studies which have focused on fiscal reform (whereby environmental taxes are used to replace labour taxes) suggest a modest gain from such initiatives. However, this 'double dividend' is hotly debated and is perhaps best avoided as a justification for environmental taxes. The taxes are justified on environmental grounds and it is likely that, on the whole, they will be more beneficial for competitiveness than equivalent regulation due to the minimizing of the costs of compliance.
- In terms of health and safety, the results of the focus group suggest that regulation generally has a positive effect on competitiveness due to the avoidance of such factors as a discontented workforce and/or a reduction in downtime and damage to the plant. This is particularly the case in industries where the consequences of such factors on profitability are great.
- The use of economic instruments, such as voluntary, incentivised insurance schemes, should have a positive effect on competitiveness since, if the rewards from such schemes were not in excess of the costs, the company would not undertake improvements. Therefore, there must be a gain to the company.

- Improved health and safety policy will be beneficial for employment since fewer accidents allow for a reduction in social insurance which, in effect, means a reduction in the tax on labour. The economy will also benefit through reduced healthcare expenditure.

Areas for Future Research

This study is a first step in exploring the linkages between the external and the working environments, and the potential use of economic instruments to make initiatives in both areas mutually reinforcing. It provides a framework for future research in the area by highlighting:

- the various economic instruments available to the policy maker;
- the future issues regarding the use of such instruments, including employment effects;
- the possible conflicts and complementarities between initiatives in the environment and in health and safety;
- the potential for policy instruments to avoid conflicts and take advantage of complementarities.

It is to be considered an exploratory study. Most of the findings regarding the linkages between the external and working environments are based on a small focus group. Future research is required to examine whether such findings are applicable to other companies, industries and countries.

Future research is needed to focus on the following:

- The micro effects of economic instruments: in the area of health and safety, for example, is there a significant Principal-Agent problem and how can this be addressed in the design of economic instruments?
- Target-setting, to research the optimal level of environmental quality and health and safety in companies and, using this information, to set the levels of economic incentives.
- The particular problems that face SMEs and how can these can be addressed in the design of economic instruments.
- Whether future members of the EU have different issues and requirements.
- An update of the information on economic incentives in operation, compiled in 1993 by the European Foundation for the Improvement of Living and Working Conditions (1994a).
- Studies on the efficiency of economic instruments in addressing both environmental and health and safety issues.
- Further testing and debate of the Foundation's approach to research on economic instruments.




Glossary

Command and control: *See* Regulation

Double dividend: Where revenues from an environmental tax are used to replace a distortionary tax, such as a tax on labour. If the environment is improved as a result and employment increases, this is a double dividend.

Economic incentives: Price signals from the marketplace, received by individuals or companies, which encourage or discourage them to engage in certain activities or behaviour.

Economic instruments: Instruments put in place by policy makers to alter market signals to encourage or discourage certain activities or behaviour. Examples of such economic, market-based instruments include reduced excise duties on unleaded petrol or increased insurance costs to companies with a poor safety record.

EMAS: Environmental Management and Audit Scheme

Fiscal instruments: A subset of economic instruments implemented through the fiscal system — via government spending or taxation. Examples include taxes on pollution or subsidies for improved health and safety.

Free-riding: Opting out of a voluntary agreement in order to avoid the costs of compliance, while at the same time endeavouring to appropriate the benefits produced by those complying with the agreement.

Government failure: When government intervention in the economy causes distortions which result in environmental degradation or discourage good health and safety practice.

Internalization of external costs: Government intervention to force people to pay the costs they impose on others (externalities), such as the damage they do to the environment or the costs they impose on society as a result of poor health and safety practice. *See also* Polluter Pays Principle.

Market-based incentives: *See* Economic incentives

Market-based instruments: *See* Economic instruments

Non-policy implemented incentives: Incentives provided by the market to individuals or companies to encourage them to act in a certain manner without the intervention of the policy maker. Examples include a 'green' image (which can help to sell a company's product and thereby encourage environmentally responsible behaviour) or the avoidance of damage to a plant or loss of productivity as a result of a lapse in health and safety practice.

Regulation: A method of improving health and safety and/or environmental performance via the setting of a standard. Non-compliance with the standard results in a penalty, usually in the form of legal action and/or fines.

Polluter Pays Principle: The opposite of the Victim Pays Principle, whereby internal costs are not externalized and the polluter, rather than the victim, bears the cost. *See also* Internalization of external costs.

Principal-agent problem: In relation to health and safety, this is where those who have the power to improve health and safety practice would not be the beneficiaries of such an improvement and, therefore, do not have any incentive to improve practice.

SMEs: Small and Medium-sized Enterprises

Victim Pays Principle: The opposite of the Polluter Pays Principle, whereby external costs are not internalized and the victim, rather than the polluter, bears the cost.




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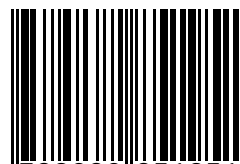
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