"1992"

THE ENVIRONMENTAL DIMENSION

TASK FORCE REPORT ON THE ENVIRONMENT AND THE INTERNAL MARKET

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NOTE : This Report was requested by the Commission of the European Communities.
Any views expressed in this Report are solely the responsibility of the Task Force;
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ENVIRONMENT AND THE INTERNAL MARKET

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PREFACE

The year 1992 has assumed considerable importance for the future development of the European Community. Technically, it represents a target date for implementation of a series of measures, set out in a Commission White Paper, which will eliminate barriers to movement between Member States. In a broader sense, it sets the future course for the Community over the next decade and beyond, covering not only the completion of the Internal Market by removal of the remaining intra Community barriers, but also a "social" dimension which includes -inter alia- protection (and improvement) of the environment.

There is a general and increasing concern that full account should be taken of environmental considerations in setting the course for the Community in the years ahead. Reflecting this concern, Community environment ministers have requested that the Commission undertake a thorough review of the environmental dimension of 1992 and to report back to the Council in due course.

To assist its work on this subject, the Commission has convened a Task Force, chaired by a Commission official, and including independent experts from across the Community. The Task Force's terms of reference were to identify and consider the implications of the environmental issues arising from the completion of the Internal Market and other developments within the Community, up to 1992 and beyond.
Following the environment ministers meeting in October 1988, the Task Force held eight meetings between December 1988 and September 1989, and was assisted in its deliberations by experts, from the Commission services and elsewhere, who were invited to make presentations on relevant issues (these experts are listed in Appendix).

A technical secretariat was responsible for the organisation of meetings, coordination of the Task Force work programme and the drafting of "synthesis" papers and the preparation of preliminary drafts of the final report.

The present Report represents the outcome of the Task Force's work and is based on papers submitted by Task Force members, together with contributions received from a wide range of other sources.

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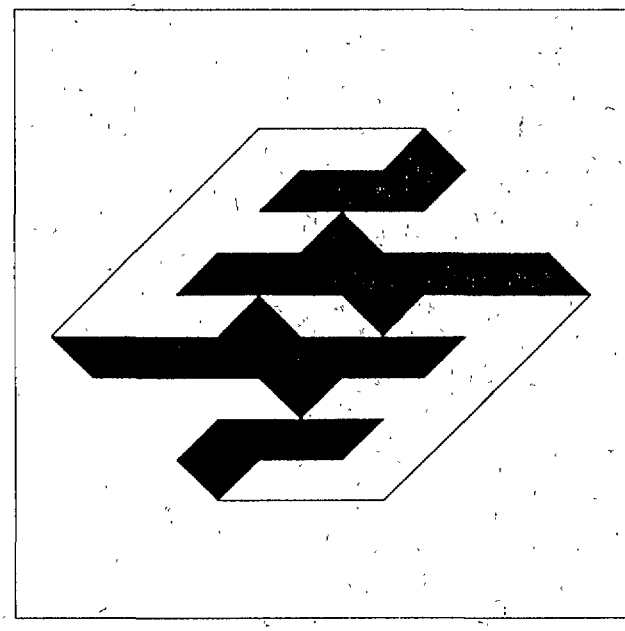

1992 and the Environment : Challenges and Opportunities

1. The Policy Context

The present report follows an initiative on the part of Community environment ministers at their meeting of 1-2 October 1988. Recognizing the need for an environmental perspective on developments within the Community in the context of "1992", ministers called on the Commission to report to the Council on the environmental dimension of the Single Market. Following this request, the Commission convened a group of independent experts in a Task Force, which was required by its terms of reference to identify the key issues and likely environmental impacts of the Single Market and to advise on the policy implications and measures which may be necessary.

The potential economic and social benefits of the Single Market for the Community's citizens have been well documented. Completion of the Internal Market will provide a powerful stimulus to economic growth, to the revitalization of industry, and to reduction in unemployment, in addition to less tangible benefits, in terms of political cooperation and cultural development.

Nevertheless, it cannot be assumed that the removal of barriers within the Community will automatically of itself give rise to the most beneficial outcome for the Community and its citizens. Policies are needed to manage the impacts of the Internal Market, to obtain the greatest overall advantage and to minimize adverse effects. The Community has indeed recognized this, with measures to harmonize the policies of Member States in those areas most affected by the removal of barriers within the Community, and in the increase in Structural Fund provision which will compensate those regions in which there is an adverse economic impact - in the short term - from completion of the Internal Market.

In the development of policies for the Internal Market it is important that the concepts of economic benefit and economic efficiency should be broadly defined, to encompass all factors with a significant influence upon the quality of life of the Community's citizens. A failure to take account of this wider perspective could, in the longer term, undermine the success of the Single Market. In this connection it was necessary to consider how specific measures associated with completion of the Internal Market are to be implemented in a manner which is consistent with achievement and maintenance of high environmental standards.

One important effect of "1992" is to accelerate economic growth, the environmental implications of which depend - inter alia - on environmental policies, the policy instruments which are available, and the nature and extent of their implementation. There is no evidence that growth directly resulting from completion of the Internal Market will, in principle, be more or less favourable to the environment than growth due to other causes: indeed it is in practice exceedingly difficult to distinguish the environmental impacts specifically associated with this additional growth. The importance of the Single Market is that by accelerating economic growth, it renders more acute issues which arise from the growth process.

Furthermore, the Single Market will set in train a fundamental restructuring of the Community economy which will involve a modernization and renewal of its infrastructure. In a sense this constitutes a "new beginning", since the Community will have a historic opportunity to ensure that these changes take full account of the environmental dimension.

2. The Environmental Impact of the Single Market

2.1 Sustainable Development in the Internal Market

It has become increasingly apparent that there is widespread public concern with environmental issues, which is reflected both in opinion polls and in the political process. Notwithstanding expenditures - both public and private - on remedial and preventive measures, environmental degradation has continued. In some areas critical loads for air, water and soil quality have been significantly exceeded, which poses serious threats to human health and safety as well to ecosystems. It is clear that policy makers can no longer ignore the environmental dimension: as the European Community has indeed explicitly recognized in the Treaty of Rome, (as amended by the Single European Act), which provides that environmental protection requirements shall be a component of the Community's other policies (Art. 130r) and which recognizes that there is an inextricable overlap between the Internal Market and the environment (Art. 100a (3)).

The European Community is now working towards completion of its Internal Market, with a target date of 1992 for introduction of measures necessary to remove barriers between Member States. This process will provide a powerful stimulus to economic activity, and its effects will be felt throughout the 1990s, and beyond. The Cecchini Report ("The Economics of 1992") estimates that the potential economic gains may be between 4½% and 7% of Community GNP. The removal of barriers within the Community will stimulate competition, reduce costs of production through exploitation of scale economies, and lead to greater efficiency and increased innovation.

This increase in economic activity has an environmental dimension. In the absence of any change in policies or technologies, there would be increases in pollution and in threats to the environment from land development. It is unlikely that environmental damage would increase uniformly pro rata with economic growth: the outcome would depend upon the types of economic activity which are stimulated by completion of the Internal Market, the nature and extent of their environmental impacts, and the spatial distribution of these impacts.

Moreover, it is in practice unlikely that policies and technologies would remain unchanged. The acceleration in economic growth will increase the pace of structural change and the rate at which newer - and less environmentally harmful - technologies are introduced. However, further threats to the environment would be perceived as calling into question the sustainability of the economic growth resulting from completion of the Internal Market. Accordingly, the Community (and Member States) must consider the nature of the policy response required to safeguard the environment and to ensure the sustainability of economic growth.

A central issue, therefore, is the linkage between economic growth and environmental impacts. The Task Force examined both the sectoral and the spatial distributions of environmental impacts in the light of economic changes which can be anticipated as a result of completion of the Internal Market. It is, however, important to note that given the constraints of time and resources detailed analyses were generally not possible: rather, the Task Force drew on available information to develop their conclusions in the key areas where action would be required.

The one exception was in the modelling of emissions of sulphur dioxide and nitrogen oxides, originating principally from the energy sector: this was undertaken as an illustrative exercise, showing how the linkage between economic growth and environmental impacts may be analyzed. This in turn indicates the challenge facing policy makers in seeking to change the nature of this linkage, but also shows that economic growth, by providing additional resources, can present opportunities for environmental improvement. This leads to a consideration of the environmental policy response to the completion of the Internal Market.

2.2 Environmental Impacts of the Internal Market - Static Effects

The environmental implications of the completion of the Internal Market can be analyzed from an economic and a spatial perspective. Following the Cecchini Report, static and dynamic economic effects may be distinguished: while the former deal with the effects of the suppression of barriers, the dynamic effects relate to changes resulting from increased competition - increased economic growth, more efficient use of factors of production and more rapid technological progress.

Completion of the Internal Market will have implications for existing policy instruments. The principal measures being undertaken to implement the Single Market include: the removal of border checks, the new concept of harmonization of technical standards and regulations, fiscal harmonization, the reduction of market entry barriers, and the opening up of public procurement.

These and other measures may have a considerable impact on environmental quality, since barriers still exist between Member States for the enforcement of national regulations to implement environmental policies.

Some examples:

* Border checks are used to control the movement of nuclear and hazardous waste and to meet obligations under International Treaties relating to the trade in rare and endangered species.

* Technical Standards and Regulations are used by Member States to ensure that products are environmentally acceptable.

* Fiscal provisions are used by some Member States to encourage environmentally positive behaviour, and to discourage the reverse.

To the extent that these barriers are removed or modified, and no alternative policy measures put in place, a number of additional environmental pressures is to be feared:

- There is a risk of large-scale waste tourism;

- The absence of Community product regulations could permit the Community wide circulation of products originating in countries without stringent product controls;

- The present proposals for tax harmonization could severely limit the use of fiscal measures for environmental management and stimulate pollution-intensive energy use;

- The opening-up of market entry would permit the entry of new-comers especially in the field of road haulage and air transportation. However, the favourable environmental effects of efficiency in the use of resources are likely to be outweighed by growth in demand, with consequent increases in environmental pressures;

- Removal of controls on the acquisition of land may have the effect of promoting developments with significant environmental consequences.

As the Internal Market programme has a considerable potential for negative impacts on environmental quality, there is a strong need to formulate an adequate policy response. Action is needed to ensure that full account is taken of these environmental implications when shaping the 1992 measures. Specific proposals have been suggested by the Task Force.

2.3 Environmental Impacts of the Internal Market - Dynamic Effects

In the environmental context the prospect of accelerated economic growth and changes in economic activity in sectors likely to have a significant environmental impact gives rise to a number of issues:

- the "linkage" between economic growth and environmental degradation and the nature of policy measures required to change this linkage;

- the opportunities presented by "1992" for use of cleaner processes and for more efficient use of resources, as a result of the accelerated renewal of the capital stock in the Community;

- the scope for a preventive approach to anticipate the environmental impacts of "1992";

- the variation between regions, and the particular problems of certain regions.

The Task Force would like to draw attention to the relationship between air pollution (and its effect on health, amenity, crops, forests, climate change) and the use of vehicles and electricity. Electricity generation and transport are major sources of air pollution, together accounting for around 60% of sulphur dioxide, 80% of nitrogen oxides, 55% of carbon dioxide and 40% of non-methane hydrocarbons.

A modelling exercise was undertaken for the Task Force (and is described in detail in Chapter 5 of the present Report). This uses the Commission's models which were employed in the analysis of the economic impact of completion of the Internal Market and the derived impact on energy demand and emissions. The results of this indicate that, notwithstanding the favourable impacts which can be expected to result from the implementation of existing environmental policies, the growth impact of the Internal Market is likely to cause atmospheric emissions of SO_2 and NO_x to increase respectively by 8-9% and 12-14% by 2010.

This exercise highlights the need for additional measures, particularly to increase energy efficiency and to respond to structural changes in the transport sector. The existing policy measures designed to curb emissions will indeed be overtaken by increases in the use of electricity and of vehicles, especially for the transport of goods. The harmonization of excises (and other taxes) may lead to a fall in fuel prices and prices of cars in certain countries which could further increase energy demand and vehicle use, leading to increases in emissions.

The Task Force is much concerned with the impact on the transport sector, which it considers the most important environmental impact of the Internal Market. Activity in this sector will be stimulated by supply side-effects, including liberalization of transport services, the projected decline in car prices, and the removal of barriers affecting the road freight industry; these changes, together with the stimulus to demand resulting from increased incomes and economic activity will result in considerable growth in the transport sector (for example, it is estimated that completion of the Internal Market will lead to an increase in transfrontier lorry traffic of between 30% and 50%).

The prospective increases in atmospheric emissions would have serious environmental consequences: Modelling of the with and without Internal Market cases shows that acid depositions are, in both cases, projected to exceed the present ecological standards in all Member States. Similarly, increases in carbon dioxide emissions must be avoided in the light of concerns over global climate change. Hence it is necessary to ensure that the level of emissions is reduced, rather than merely limited to present levels.

With respect to electricity generation, the Task Force is concerned at some suggestions that the use of nuclear power should be expanded in order to mitigate air pollution problems. Nuclear power at present accounts for about 30% of electricity production and less than 15% of total energy consumption in the EC. It is vulnerable as a sector to political sentiment (an accident could result in renewed calls for reductions in its use); issues of accidental risk, costs, decommissioning and waste disposal remain and are yet to be fully resolved.

With respect to water pollution, a number of rivers and coastal waters remain seriously polluted, and there is increasing concern over the impacts of pollution from diffuse sources (notably agriculture). There is also concern over the adequacy of treatment capacity for waste. It has been estimated that of the 150 m tonnes of industrial waste produced each year, around 25 m tonnes is hazardous. The capacity of incinerators for the treatment of hazardous waste in the Community is at present less than 2 m tonnes per annum.

Experience of the last twenty years suggests that there is a close relationship between economic growth and the quantities of domestic and commercial wastes produced. Therefore, unless action is taken to encourage resource recovery or waste minimization, further deterioration must be feared.

2.4 Environmental Impacts of the Internal Market - Spatial Effects

Measures to complete the Internal Market will have a regional impact. To the extent that 1992 improves the economic climate and stimulates growth, it provides one of the necessary conditions to restart the process of convergence between regions. However, evaluating the specific regional distribution of the effects of 1992 is clearly extremely difficult at this stage. The consequences for particular regions will depend on the extent to which their existing structure of economic activity and employment is sensitive to 1992, and the capacity of both the private and public sectors to react to the changes that occur.

These effects are both complex and uncertain. A given region may lose from the displacement of certain types of economic activity to other regions, although this loss could be counterbalanced by the inward movement of other forms of economic activity; the net effect could be positive or negative. In general, the Internal Market can be expected to lead to greater specialization and concentration of export-based activities in areas of "greater economic advantage" because it may be easier and more cost-effective to serve the Single Market from fewer sites. However, companies' location decisions will in practice be based on a complex set of factors which will include environmental regulations and also factors such as the state of infrastructure, location of existing and potential product markets and sources of inputs, as well as labour market factors such as training facilities and skill levels.

The Task Force noted that regional variations in environmental regulations could influence decisions by industry with regard to plant location. However, the influence of environmental considerations on the location of industry is expected to be limited in scale, since environmental costs generally represent a small proportion of overall production costs.

It appears that, other things being equal, there will be an intensification of industrial activity in certain locations as the impact of scale economies is realized. Due to the expected increase in production and pollution it must be feared that in certain regions and locations ambient quality standards will be exceeded.

Growth in road haulage will affect environmental conditions along the transportation corridors of the Community - particularly in terms of air quality, noise and the fabric of cities, towns and villages - giving rise to community severance. Expected growth of air transportation will increase environmental pressures in the vicinity of existing airports (noise zones) and may require land use for the construction of new airports.

Growth in tourism may increase development pressures in coastal areas, particularly those of the peripheral regions, and in mountain regions, notably the Alps.

a) Impacts on the Periphery

The geographically peripheral countries and regions of the Community have a preponderance of relatively undisturbed natural areas and habitats which, because of their character and uniqueness, are of international significance. There is a danger that the increased pressures engendered by the Single Market may lead to the disappearance of unique biotopes of major importance for wildlife. Some of these will be protected because they are of value for tourism or for other economic development purposes, and therefore qualify for support from the Structural Funds. However, other resources of great environmental significance for Europe will be too fragile to bear any value for "development", and will not therefore qualify for such support. They are very vulnerable, because they are of little "value" to the peripheral region concerned, and may well succumb to local exploitation pressures. The establishment of a special fund to help protect such environmental assets should be considered.

In recognition of the special adjustment problems facing the peripheral regions, the Community has provided that the Structural Funds available to them be doubled between now and 1992. The Task Force concluded that there is inadequate compliance with measures enacted by the Commission to ensure that the environmental effects of Structural Fund proposals are benign. It will be necessary to adopt appropriate policies to ensure that Structural Fund expenditure, and, more broadly, the economic development of peripheral regions, does not give rise to adverse environmental impacts, and to ensure that the implementation of these policies is not constrained by resource limitations (technical, administrative and financial) in peripheral countries.

Finally, the environmental problems of the periphery differ, in degree if not in character, from those of the rest of the Community. Many of the periphery's environmental problems have to do with land use - erosion, habitat destruction, visually destructive developments, etc. - which involve large numbers of individual actions which are technically difficult to monitor and control, and politically difficult to restrict.

Freeing the movement of capital and labour, and removing the restrictions on land acquisition, is likely to accelerate the already existing trend in the direction of multinational investment in farming, forestry, fisheries development (mainly mariculture) and tourism. Such investment can avoid severe negative environmental impacts if - and only if - an appropriate environmental management system is in place which guides investment to locations which can "absorb" investment.

The impacts of the Internal Market on industry in the periphery may in some circumstances be beneficial in environmental terms, since increased competitiveness is likely to accelerate the closure of old, already commercially marginal plant, which is also often among the most polluting.

b) Impact on Areas of Industrial Decline

The environmental effects of the Single Market on areas of industrial decline, or Traditional Industrial Regions (TIRs), will depend on the capacity of the regions to transform their economies and environments. In the worst case, a TIR could find itself with a collapsed industrial base, and with its derelict land and abandoned mines becoming a destination for waste disposal.

On the other hand, some TIRs will be able to take advantage of the opportunities provided by the Single Market. Experience indicates that, for a TIR to revive economically, it must achieve a high level of environmental quality. There could be a role for the Community in helping to finance this transformation in the physical character and skill profile of these regions, because investments on the scale required may not be forthcoming from the market.

c) Impact on central urban regions

Existing demographic and economic concentrations in large metropolitan areas will be exacerbated by relocation of population and industry as well as the substantial increase in movement of freight and people by road and in private vehicles. If appropriate action is not taken the development of new infrastructures (road and rail systems and airports) may lead to additional air pollution, noise and pressure on scarce open land, causing a substantial deterioration in the quality of life.

2.5 Is there a trade-off between environmental and economic objectives?

The Task Force stressed that the environment should be considered as a positive force and a necessary condition for economic development. A "traditional" view of the environment and its management is that environment is a problem; it costs money to maintain environmental quality, and this expenditure acts as a "drag" on economic development. A more positive view is now emerging, in which a high quality environment is seen as a very important element in attracting tourists, in providing a quality of life which attracts talented people and capital, and in providing conditions conducive to the success of certain environmentally sensitive sectors of industry. Countries which have taken the lead in improving their environment have tended to lead also in the development, production and sale of environmental equipment and management systems.

Econometric calculations which have been made in the framework of the Task Force's analyses show that for the Community as a whole the impact of additional environmental investments of 1% of GDP would have fairly neutral macro-economic impacts, with even a positive impact on GDP and employment in some Member States. While these traditional economic indicators do not of course take into account changes in environmental quality, the modelling work does show that environmental investments can in the medium term be financed without offsetting the economic benefits (as traditionally defined) of the Internal Market.

The Single Market also provides an opportunity for the Community to change the emphasis of its policies from regulation and control to a perspective which views a high quality environment as a key contributor to the Community's position in world trade, and sees the Community as a leader in the rapidly growing field of eco-industry and clean technologies.

3. Towards a new environmental policy mix

The creation of the Single Market, as well as the need to decouple economic growth from environmental degradation requires a fundamental review of existing environmental policy at EC level and in the Member States.

3.1 Towards breaking the link between economic growth and environmental degradation

Can a deterioration in the Community environment be prevented? The quality of the environment is the result of institutional arrangements which specify how the environment can be used and which incentives and rules are introduced into the market economy in order to prevent and reduce pollution. Consequently, the growth stimulus arising from the Internal Market is not necessarily associated with a deterioration in environmental quality. Incentives to reduce pollution can change the nature of the linkage between economic growth and environmental degradation.

Perhaps the main conclusion of the modelling exercise on air pollution is that without proper incentives, energy demand (and corresponding pollution) appears to be positively correlated with additional economic growth. The main policy lesson of the energy shortages of 1974 and 1979 may be that a proper incentive, such as higher energy prices, is critically important in breaking the link between economic growth and energy consumption. Only if the scarcity of natural resources is properly reflected in the use of price incentives and/or regulations, will economic growth associated with the completion of the Internal Market lead towards overall economic efficiency.

The completion of the Single European Market offers certain opportunities to enhance the environmental dimension in the economic development process.

a) The restructuring of industry and the increase in new investment can provide the framework for the integration of clean technologies. However, the Task Force noted that this change to cleaner technologies and products would not occur in the absence of an appropriate regulatory framework together with financial incentives (in particular, pollution charges and allocation of strict liability to all waste producers) which ensure full implementation of the Polluter Pays Principle, as defined in Section 2.2 below. Such incentives and regulations should be shaped so that industries and waste authorities are encouraged continually to improve their environmental performance; and in particular, encouragement should be given to the introduction, where possible, of integrated low waste technologies and products as opposed to "end-of-the-pipe" abatement solutions, but recognizing that "add on" pollution controls will continue to perform an important role.

b) Market entry and the opening of public procurement could facilitate the upgrading and more efficient operation of environmental infrastructure.

c) The economic benefits of the Internal Market could permit an increase in the proportion of investment undertaken for environmental protection purposes.

3.2 Basic principles for the development of a new environmental policy

In the context of the Internal Market, new environment policy mechanisms must be developed based on four essential principles:

1) the prevention principle, particularly to prevent irreversible damage to the environmental patrimony of the Community: this is a key principle of the Treaty, as amended by the Single European Act (Article 130r), and also of the Fourth Environmental Action Programme (para 2.1.1).

2) the Polluter Pays Principle (currently under review), which has to ensure the internalization of avoidance and damage cost in order to obtain a more cost-efficient application of Community environmental policy. This principle is reaffirmed in Art. 130r of the Treaty as amended by the Single European Act.

3) the subsidiarity principle i.e. the primary responsibility and decision-making competence should rest with the lowest possible level of authority of the political hierarchy (cfr. Art. 130r (4) of the Treaty as amended by the Single European Act).

4) the principle of economic efficiency and cost-effectiveness i.e. the choice of appropriate economic incentives to secure the achievement of existing environmental protection goals with the lowest possible costs for the economy (static efficiency criterion) and which also offer permanent incentives to further environmental improvements (dynamic efficiency criterion).

5) the principle of legal efficiency i.e. legal instruments used should be readily applicable and enforceable.

The application of the PPP as defined above is central to full integration of environmental considerations into decision-making, where possible using price mechanisms to provide an incentive to integrate environmental considerations into the production process.

In the framework of the Internal Market debate a central question relates to the subsidiarity principle i.e. the division of policy tasks between the Community and Member State level. Moreover, the question remains as to whether the outcome of a competitive process between national environmental regulations ("country of origin principle") can be satisfactory from an environmental point of view.

In an extreme scenario, each country would decide for itself what ambient environmental standards and strategies to follow. This would result in significant differences in environmental quality. Some countries could set very high quality standards while others could ignore the environment. The latter case would run counter to the spirit of the Treaty (Article 3(c)) which provides for the free movement of the citizens of the Community, implying an entitlement to minimum environmental standards throughout the Community,

irrespective of the location of residence or work place. On the other hand a country may choose to set very high ambient quality standards and therefore require product standards which are stricter than those of other countries; however, this would run counter to the rules of the Internal Market which provide for the free movement of goods (cf. Article 100a of the Treaty as amended by the Single European Act, which envisages the maintenance of uniform standards with only very restricted opportunities for national variations (Art. 100a (4)). Thus a complete decentralization of environmental policy following the subsidiarity principle may create a conflict between environmental objectives and the completion of the Internal Market.

The subsidiarity principle should therefore be adopted for environmental management but modified to provide (where possible) for: minimum ambient standards (as mandated already for some substances in existing Community regulations); international diffusion norms specifying the maximum international transfer of pollutants and provision for the protection of habitats of Community significance. Member States should be given maximum flexibility in choosing how to meet environmental standards, and should be free to impose environmental standards higher than the Community norm insofar as this is possible within the terms of the Treaty. Where it is scientifically or politically not feasible to define ambient standards or diffusion norms, international environmental policies should as a second best solution seek to coordinate the use of policy instruments such as emission standards.

Ambient quality standards (i.e. permitted concentrations for specified pollutants in air, water, soil) have been established for the purposes of protecting human health and amenity, property and the natural environment. They define the environmental quality target at which policy instruments are oriented. In some cases these standards relate to specified uses (e.g. drinking water). The levels at which they are established take account of scientific data; they also take account of the political preferences of the region, country (or group of countries) establishing the standards.

The European Community is an area of considerable diversity, with local needs. While the Community has an interest in ensuring that an appropriate framework exists for assessment of environmental impacts, how the protection of this diversity can best be undertaken is a matter to be decided at regional level. Similarly, matters of land use policy are local issues reflecting local needs and are best resolved through local planning and with the involvement of the local people.

It is therefore logical that differences in environmental endowments and in political preferences are reflected in the wish to go beyond the minimum ambient quality standards.

.3 The Use of Economic Instruments

The Task Force noted that economic or market instruments, such as environmental charges, tradeable permits, or other measures such as government-industry agreements are an appropriate tool for ensuring that the economic growth generated by the Internal Market takes account of environmental considerations. Since such instruments simulate the working of the market, they represent an approach which is fully consistent with the Single Market philosophy, which is based on market efficiency. It would therefore be surprising if, in a situation where great confidence is placed in market mechanisms, such mechanisms were not to be fully used for environmental protection.

Economic incentives can help to shape economic development towards environmentally clean technologies. Used in conjunction with regulations, economic incentives can provide a continuous incentive to the discharger to improve the quality of its discharges and to find new solutions for minimizing waste; they are more flexible, and should prove more cost-effective, than reliance on regulation alone.

The Task Force concluded that Member States should be allowed the freedom to levy taxes and/or charges in order to achieve specific environmental aims. It was felt that the Commission's plans to suppress fiscal barriers should not preclude the use of tax instruments for environmental purposes.

Moreover, in an integrated market - even in the absence of border controls - regulation may be permitted to cause market segmentation in certain cases where this can be justified on environmental grounds. This is envisaged by Article 100a (4), although the precise conditions in which it may be applied remain untested.

3.4 Emission Standards and Product Standards

Where ambient quality standards or international diffusion norms cannot be defined or implemented (for scientific reasons or because the cost would be excessive), then harmonization of traditional regulatory approaches such as emission and process standards becomes necessary.

The Task Force concluded that where a direct pricing approach for the use of the environment is not feasible - for example, where infrastructure and monitoring systems are not established - or when emissions at any level would be very damaging, or when irreversible damage may ensue before a pricing approach could be fully implemented - then it is necessary to adopt regulatory environmental instruments, such as emission and process standards and product norms.

For these cases, the Task Force concluded that a distinction should be made between substances that are particularly hazardous to health or the natural environment and all other contaminants. For the former extremely dangerous categories, there should be harmonization in the sense of banning ("black lists"). For the latter, less hazardous substances, for which no ambient quality standards can be defined but for which it is felt that their emissions or the risks involved should be reduced as far as possible, the Task Force concluded that instruments should be framed to allow dischargers a choice of the appropriate technology. Where possible, economic instruments should be linked to regulations; this is important in order to encourage continuous improvement.

The logic and legal principles of the Internal Market require that if a product is lawfully marketed in one Member State, it may also be marketed in any other Member State. However, conflicts may arise between the barrier-free Internal Market and the decentralization of ambient quality standards if that requires the application of stricter product regulations in a Member State. Such conflicts may be resolved in some cases through the application of the ruling in the "Danish bottles" case, but there does not at present appear to be a general solution applicable to every set of circumstances in which this conflict might arise. The obvious solution is to harmonize

producer standards under Article 100a, taking account of the environmental considerations, but this itself may lead to a similar conflict in the context of the application of Article 100a (4).

Where non-toxic pollutants are contained in consumer products, different national product standards may be allowed; in this case, it is possible to rely on the country-of-origin principle provided that full information is given to the consumer, and that there are no external effects consequent on the use and disposal of the product, other than on the consumer.

3.5 Transfrontier Pollution within the Community

Economic growth engendered by the Single Market may increase transfrontier pollution within the Community. This will be most likely if much of the growth occurs in the upper reaches of the main river systems, and to the windward side of the prevailing winds, and if the combination of Community and originating country policies are not effective in limiting emissions.

In conformity with the subsidiarity principle, the first step in addressing such problems should be to engage in bilateral or multilateral negotiations. Countries or regions have to agree on the ambient quality of an environmental system (air, water) when it crosses the border. Once an agreement is reached, it can be left to the national or regional authorities to decide which type of policy instruments they wish to use in order to stay within the international diffusion norm.

It is essential to have reliable estimates of the flows across boundaries, to have agreed procedures for negotiation, and to have a commitment to some form of binding arbitration if agreement cannot be reached. The Community should take the lead in developing the information and procedures which will lead to the effective management of cross-frontier pollution. These procedures should take account of the extended Polluter Pays Principle.

The Task Force stressed the importance of pricing solutions, whereby countries transferring pollution to other jurisdictions would compensate the latter pro rata. However, we recognize that other approaches may be more acceptable to the countries involved, and that they should be free to adopt whatever policy measures they agree on. If countries cannot agree, then a ruling should be sought from the Court of Justice.

3.6 International dimension

The completion of the Internal Market and accompanying changes in environmental policies will affect the international competitive position of the Community in world trade and investment, but it is at present uncertain how important this effect will be. Given this situation the Task Force concluded:

- that international reallocations of economic activity caused by international differences in environmental endowment should not be obstructed by policy initiatives (e.g. trade policy);

- that EC external environmental policy action should be based on the same policy principles as its internal environmental policy;

- that the completion of the Internal Market will have a positive effect on the bargaining position of the Community in attempts to obtain on a world scale respect for the enlarged Polluter Pays Principle.

The Task Force examined a number of specific issues relating to the impact of changes in the environmental policy of the EC for its trading partners.

The completion of the Internal Market will provide an enlarged market for Third World countries. For developing countries, particularly those with a special relationship with the EC (eg. the ACP countries) there should be increased opportunities for trade. However, there will be cases where Community-wide product standards may have the effect of restricting products that previously had access to individual countries; for example, restrictions might be imposed on the cadmium content in imported phosphate rock.

To the extent that changing patterns of trade may put pressure on developing countries there may be a case for directing Community Aid to help producers to meet the changed market conditions.

Such changed market conditions may - in part - arise from higher environmental standards within the Community; and there will in any case be market pressure to encourage trading partners to supply products which meet the higher standards. However, there will be no pressure arising from the Internal Market for partners to implement higher quality standards in their own countries; indeed the economic incentive will be to keep costs low and gain a competitive advantage by not investing in pollution control measures. Aid packages and trade agreements should envisage some minimal level of environmental protection in producer countries, and a programme of technology transfer will need to be implemented.

There is also a view that if the Community (and non-Community OECD members) are concerned about harm to the environment in the Third World countries (or the amount of pollution in Eastern bloc countries) then transfer payments will need to be made on the grounds that these countries are unable or unwilling to afford environmental protection to a level considered desirable by OECD countries and the Community. This issue is of particular relevance in relation to protection of tropical forestry and possible revenues which might be raised by the proposed "carbon-tax": the feasibility of such a scheme has recently been examined within the Commission services.

There is also the question of waste exports. A number of examples of the export of wastes (and especially hazardous wastes) to Third World countries have been highlighted in recent months. In principle, this is legitimate trade; in practice, the countries tend not to have the expertise or institutional structure to ensure the wastes are handled safely and the environment properly protected. In the framework of the ongoing Lomé negotiations strong mechanisms have to be foreseen to prevent the export of potentially hazardous wastes or products that are barred in the EC, unless there is evidence that they will be safely handled in the user countries.

The Task Force reached the general conclusion that a more detailed review of trade and environmental linkages should be undertaken, with a view to the development of a Community strategy for the exercise of global responsibilities in environmental matters.

4. The Way Forward

Completion of the Internal Market presents the Community with a challenge and also with opportunities. Economic development, particularly in the form of industrial activities, can give rise to environmental degradation; and the traditional view has to some extent been that economic growth runs counter to environmental interests. However, the new emphasis on sustainability of growth provides a means in principle for reconciling economic development and the environment. The preconditions for sustainable growth are that there should be strict environmental policies, restructuring of industries, and development of cleaner technologies. The completion of the Internal Market provides opportunities, and resources, to secure environmental improvement; the challenge for the Community is to devise and implement policies which ensure that the growth generated by the Internal Market is truly sustainable.

In achieving this, the Task Force recommended that priority should be given to:

(1) The active encouragement at Community level of the development and implementation of market mechanisms in order to shape the economic development of the Community in a way which will make efficient use of resources, keep to a minimum production of wastes, and, as far as possible, avoid negative environmental impacts; such mechanisms should include environmental charges and taxes, strict allocation of responsibility and liabilities as well as promoting the provision of information to permit consumers and members of the local community properly to evaluate environmental risks.

(2) Action to ensure that account is taken of the environmental implications of Community measures that are designed to complete the Internal Market: for example, it is important to avoid measures that increase emissions from use of vehicles and from other energy sources, and to introduce at the Community level those environmental product standards that are necessary to ensure a consistently high level of environmental protection.

(3) Concerns about the potential impact of the increased Structural Funds on natural areas of Community ecological significance. The effects of the Structural Funds on the environment should be carefully monitored and encouragement given to investments in pollution abatement and clean technologies. Particular account must be taken of environmental impacts in the following sectors: transport, agriculture and industry (including energy).

(4) Improvement in the Community's ability to monitor environmental quality (and the Single Market's effects thereon) and also to identify prospective impacts. The Commission will have to be provided with a well developed network for environmental data collection, in order to identify potential problems before they become serious, and to develop appropriate policies.

(5) Responding at a Community level to the increasingly important international environmental protection issues - global issues (including CFCs and climate change), regional issues (such as the Mediterranean) and the environmental problems facing the Third World (promotion of sustainable use of natural resources). The completion of the Internal Market will mean that the Community will become the most appropriate level for Member States to tackle these issues.

PART ONE

BACKGROUND

CHAPTER 1

INTRODUCTION

1.1 Objectives, Scope and Methodology

The year "1992" has assumed considerable significance in the agenda of the European Community. In one sense it denotes the process of removing barriers between Member States and the numerous technical measures which are necessary to prepare for a Community-wide Single Market. In another, broader, sense "1992" has come to symbolize the future progress of the Community on a number of fronts. In the years leading up to, and beyond, 1992 the Community will enjoy the benefits of economic growth, stimulated in no small measure by the realization of opportunities in a barrier-free Internal Market. On the other hand, to be truly beneficial to the Community as a whole, the processes of economic growth and structural change must be managed, to ensure that its undoubted potential benefits are not compromised by a failure to adopt a balanced perspective, taking proper account of all the impacts of "1992". Thus, a policy response is needed to ensure that the future development of the Community follows a course which is truly sustainable in the longer term.

In this context the environmental dimension constitutes a factor of considerable significance. Indeed the Treaty establishing the European Economic Community (as amended by the Single European Act) specifically requires the integration of an environmental component into all areas of Community policy. Community environment ministers have recognized the need for an environmental perspective on "1992": at their meeting of 1-2 October 1988, ministers called on the Commission to report to the Council on the environmental dimension of the Single Market. Following this request, the Commission convened a group of independent experts in a Task Force, which was required by its terms of reference to identify the key issues and likely environmental impacts of the Single Market, and to advise on policy implications and possible action.

The Task Force has interpreted its terms of reference in a broad sense and has considered the implications not only of the removal of barriers per se (which could be characterized as "static effects") but also the longer term developments which will come about - directly or indirectly - as a result of completion of the Internal Market (which can be described as dynamic impacts).

Although the distinction is conceptually clear, it is in practice difficult to distinguish between environmental impacts due to "static" and "dynamic" effects of the Internal Market and associated developments. Hence from the perspective of the Task Force the distinction, although a useful analytical device, may in the end be somewhat artificial. The Task Force sees the Community as undergoing a process of change, and the development of the Internal Market is one among a number of areas in which the Community will take action, following up the new impetus created by the Single European Act.

Already an important initiative has been taken, with the doubling of Community Structural Funds, to influence the pattern of economic activity in the Community. The Task Force sees its role as covering the implications of such developments which run in parallel with the completion of the Internal Market, and has given special attention to environmental issues in areas which are particularly affected, such as the peripheral regions of the Community.

The Task Force's approach and philosophy were shaped primarily by its terms of reference, but they were also influenced by the disciplinary background of its members, the time and resources available, and some underlying realities and constraints. With regard to disciplinary background, most Task Force members are environmental economists, who view environmental resources as scarce, valuable assets, whose value and scarcity are not - at present - adequately reflected in the price which producers and consumers pay for their use. In fact, for many users of the environment, their use is "free" to them. They have no incentive to economize. As long as this gap exists between the reality of scarcity on the one hand, and the incentives facing users on the other, our environmental assets will be squandered, and the economy will operate at less than optimum economic efficiency. This is the professional prism through which the Task Force viewed its task, recognizing also that the future is very uncertain, and that it is the totally unanticipated which frequently poses the greatest problems.

The Task Force has throughout been conscious of the importance of developing an integrated approach whereby the process of structural change would automatically incorporate an environmental dimension. It must be emphasized that economic growth is not synonymous with increases in human welfare, so that a proper system of resource management would pursue economic efficiency in a broad sense, having regard to the existence of benefits (and disbenefits) which are not measured in conventional accounting systems. Moreover, it is notable that the economic growth projections for the Community following completion of the Internal Market have not hitherto satisfactorily addressed the issue of long-term sustainability of this growth. While it is recognized that there are various concepts of sustainable development, for the purposes of the present report the Task Force has followed the Brundtland Report in defining sustainable development as an economic development which can meet "the needs of the present generation without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits - not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and the ability to absorb the effects on human activities" (World Commission on the Environment and Development, 1987, P. E.S. 7).

The Task Force drew as much as possible from studies - already completed or still in progress - concerning the Single Market and its projected effects. The Commission report "The Economics of 1992" (published in European Economy No 35, March 1988), which covered the body of work collectively - and popularly - known as the "Cecchini Report", comprised the fundamental starting point. The Cecchini Report represented a major contribution to the understanding of the implications of 1992, and the Task Force would not wish to diminish its importance in any way or to take issue with its central message that the removal of barriers potentially offers very considerable benefits to the Community, since it will stimulate competition and reduce industrial costs through the exploitation of scale economies, greater efficiency, structural adjustments and increased innovation.

However, as a basis for assessing environmental implications, the Cecchini Report has several limitations which are unavoidable consequences of its terms of reference. While the Report examines sectors of economic activity which are likely to be affected by the removal of barriers, it does not consider the wider implications at the sectoral level of the developments associated with "1992". Moreover, the Cecchini Report does not specify where growth (and decline) can be expected, and - in particular - it does not analyze the projected effects of the Single Market on the peripheral countries and regions of the Community. (These remarks are not intended as a criticism of the report per se; the Task Force fully understands and appreciates the limitations of time and data which necessitated the approach taken; this understanding and appreciation grew as the Task Force progressed through its own assignment).

The Task Force saw its work as in a sense complementing the Cecchini Report: while the analytical level is not comparable with that of the Cecchini Report, the present report does introduce a broader perspective. While the Cecchini Report is - thus far - the most significant appraisal of the Internal Market, its limitations are such that it does not constitute a comprehensive analysis of the economic impacts associated with 1992. The absence of such an economic analysis naturally created difficulties for the Task Force in undertaking its assessment of the environmental implications of economic changes. For example, the Report made no separate evaluation of the economic impacts in peripheral regions, which are of considerable environmental significance since they contain many of the Community's most fragile and unique environments. These environments are found in countries which badly need employment creating and wealth producing development, and which have limited financial and administrative resources available to conserve and manage their environmental endowment. In general the significance of environmental impacts depends to a great extent on where they occur. A factor of great significance therefore is the spatial distribution of the economic activities and changes in economic structures which lead to these environmental impacts. Since previous studies have not addressed this critically important variable, it was left to the Task Force to undertake its own assessments, on the basis of the information which was available.

It has to be recognized that any assessment of the impacts of "1992" are subject to a considerable degree of uncertainty. The Cecchini Report estimates are subject to margins of error of ±30%, and the Task Force cannot claim any greater degree of precision; indeed in some cases quantification was not possible with any degree of credibility.

In arriving at its best judgements the Task Force drew upon the following sources:

* Economic and environmental experts in Member States and in the Commission;
* Existing country, regional and sectoral studies, and drafts of work in progress when it was available;
* Frequent discussions within the Task Force of priorities, content, the methodology and implications, and the sharing of knowledge and experience of Task Force members;
* Desk studies on priority issues undertaken by Task Force members or other experts.

More extensive studies were commissioned to model the relationship between economic growth and environmental damage and to examine impacts in peripheral regions. The modelling work was not on a scale comparable to that of the Cecchini Report, and its environmental dimension was limited to a very narrow range of pollutants: nevertheless it was of considerable value in illustrating an analytical approach which links economic and environmental models. This approach provides insights into the issue of sustainability of economic growth, and would appear to merit further development. The studies of the periphery showed that the problems of these regions differ both in degree and in nature from those of the remainder of the Community; in particular, increases in expenditure from Community Structural Funds constitute another facet of "1992" which may be more significant, in economic and environmental terms, than the economic growth associated with the Internal Market.

In arriving at its conclusions, the Task Force was conscious that there are a number of issues on the larger European and world canvas which will shape our world regardless of the Single Market. These include:

* The ongoing GATT negotiations;
* Changes in the Common Agricultural Policy;
* The transitional process to full membership of Spain and Portugal, which for them is likely to be more significant in the short term than the Single Market;
* Developments in Eastern Europe, which have the potential for rapidly altering economies and environments.

There are other uncertainties related more specifically to the Single Market: How will key sections of the Single Act be interpreted and implemented? Will the Commission be given more resources and authority to help ensure implementation of Community Directives?

Notwithstanding the difficulties and limitations, the Task Force arrived at a number of important conclusions concerning the likely environmental impacts of the Single Market and their implications for policy. It is relatively easy to decry what is, and to state what should be. It is more difficult to identify the path whereby the desirable ends can be achieved. In making our recommendations we have tried to strike a balance between what is necessary and desirable, and what is practical and feasible.

The remainder of this chapter discusses the background against which the completion of the Internal Market, and the development of Community environmental policies, will proceed in the years ahead. Section 1.2 outlines the Commission proposals for the Internal Market and their likely economic impacts. Environmental issues have become a matter of increasing concern within the Community - perceptions of environmental problems and the present state of the Community environment are briefly discussed in Sections 1.3 and 1.4 respectively.

The present chapter (Part 1 of the report) discusses the background to the report; the subsequent chapters are grouped into two parts. Part 2 begins with an analysis, from an environmental perspective, of the effects of the various types of barriers which at present exist within the Community and the implications of their removal (Chapter 2). The environmental implications of the broader developments associated with 1992 are analyzed in terms of effects on various sectors of economic activity (Chapter 3) and in terms of the spatial distribution of environmental impacts (Chapter 4).

Completion of the Internal Market offers the prospect of a higher rate of economic growth; the challenge to the Community is to ensure that this growth truly benefits its citizens and is sustainable in the longer term: these issues are examined in Chapter 5 which focusses on the need for change in the linkage between economic growth (as conventionally measured) and environmental degradation. Chapter 6 summarizes the likely environmental impacts of 1992 developments, setting the scene for the consideration of issues arising from earlier chapters.

Part 3 of the report covers various aspects of the environmental policy response to "1992". Chapter 7 outlines the basis for existing Community policies, while Chapter 8 discusses the prospects for a preventive and decentralized approach to environmental policy in the Internal Market. Environmental industries (as discussed in Chapter 9) are of particular significance in the context of the present report, both as a sector of industry which will be affected by the removal of intra-Community barriers, and also in terms of their role in the implementation of Community environmental policies. Chapter 10 further examines the issue of sustainability of growth, examining the macro-economic impacts of environmental measures. Finally, Chapter 11 draws together various environmental issues arising from the Community's role in the world and its relations with non-Member States. The main points arising from the present report are summarized in Chapter 12.

1.2 Completion of the Internal Market

1.2.1 The Single European Act

The Treaty establishing the European Economic Community in 1957 provided for the development of a common market within the Community (Article 2) and assured the free movement of goods, persons, services and capital (Article 3). The Treaty also provided for the elimination of tariff and non-tariff barriers to movement between Member States (Articles 13 and 30) and for measures to harmonize the laws and regulations of Member States, insofar as these affected the establishment and functioning of the common market (Article 100). The development of the common market received a considerable impetus from the Single European Act which came into force in 1987 and introduced amendments to the original Treaty which - inter alia - set a target date of 31 December 1992 for completion of the Community's Internal Market (cf. Article 8a of the revised Treaty).

Although completion of the Internal Market has - rightly - received considerable attention as a major Community initiative, it is only one among a number of objectives set out in the Single European Act which together constitute a framework for the development of the Community in the years ahead. The objectives include :

- development of economic and social cohesion,
- improvements in health and safety of workers,
- strengthening of science and technology,
- economic and monetary cooperation, and,
- a set of environmental policy objectives.

With the passage of the Single European Act, the Community acquired, under Article 130r, an explicit legal basis for measures to preserve, protect and improve the environment, to protect human health and to ensure prudent and rational utilization of natural resources. Article 130r also provides that the environmental dimension is to be an integral component of Community policies, and this provision is reinforced in the context of the Internal Market by a requirement (in Article 100a) that Commission proposals should take as a base a high level of environmental protection.

This shows a recognition by the Community that economic growth (as traditionally defined) stimulated by the Internal Market must not give rise to adverse environmental impacts which would severely detract from the benefits of the Internal Market and call into question the long-term sustainability of the growth process.

1.2.2 The Commission White Paper

The Single Act presages a fundamental change in the context of Community policies : Article 8a of the revised Treaty describes the Internal Market as "an area without internal frontiers". This gives a very powerful impetus to harmonization, since the implication is that any regulations which depend for their effectiveness on frontier controls between Member States must be modified in a way which eliminates reliance on these controls.

To achieve the objective of a frontier-free Internal Market, the Commission in 1985 drew up a detailed programme and timetable for the completion of the Internal Market. This was set out in a White Paper, which contained a programme of almost 300 legislative proposals for directives to be agreed by the end of 1992, and which would require the removal of physical, technical and fiscal trade barriers.

The physical barriers to trade consist chiefly of customs posts at frontiers. The objective of measures proposed in the White Paper is to create conditions in which frontier controls within the Community would no longer be required and could therefore be abolished. In some cases this is to be done by removing the underlying causes which give rise to the controls, while in others it is a matter of finding alternatives to controls between Member States at frontiers, whereby the objectives previously achieved by the use of frontier controls - principally health protection and information collection - can be satisfied by other means. A number of proposals in the White Paper have a bearing on the implementation of environmental policies. These include proposals for the elimination of controls on transport authorizations, the removal of road transport quotas, the limitation of veterinary controls to places of origin and controls on veterinary and plant health certificates to the places of destination, followed by the further harmonization of veterinary and plant health standards and the use of the Community health mark for animal products.

To remove technical barriers the Commission proposes in the White Paper to pursue a new approach to technical harmonization and the approximation of national standards. The White Paper proposals cover a very wide range of products such as motor vehicles, tractors and agricultural machines, food, chemical and pharmaceutical products. The White Paper also proposed the opening-up of tendering for public contracts by prior information and publicity. In the area of financial services freedom to provide insurance was proposed and in the transport sector general liberalization. Complete liberalization of capital movements is also provided for. To harmonize intellectual and industrial property laws, the creation of a Community trade mark and a Community patent were proposed.

Since frontier controls are at present essential for the collection of indirect taxes, the White Paper proposed that there should be approximation of indirect tax provisions which would remove the need for border controls for fiscal purposes. The proposals are based on the principle that purchases and sales across borders should be treated in the same way as purchases and sales within a Member State. They also include an approximation of VAT and excise duties.

The progress of the various dossiers to June 1989 is summarized in Box 1A.

1.2.3 Major economic impacts of the completion of the Internal Market

The Cecchini Report's examination of the economic implications of completion of the Internal Market concluded that the removal of barriers within the Community will stimulate competition and reduce industrial costs through exploitation of scale economies, greater efficiency, structural adjustments and increased innovation. It was estimated that the potential gains might be very considerable - amounting to perhaps 7% of Community GDP. Box 1B shows the sources of these gains and the consequences in terms of effects on GDP, prices, employment, public finance and the Community's external balance.

The Cecchini Report's estimates of the macro-economic impacts of the completion of the Internal Market from the Cecchini Report are set out in Table 1.1. It should be emphasized that the figures in this table represent broad indications of the magnitude of the impacts and are subject to margins of error of ±30%. Moreover, it is assumed that the entire White Paper programme is implemented in one year; no explicit assumptions were made with respect to any social, sectoral, regional or environmental problems which may arise in the process. A distinction is made between a situation with no change in macro-economic policies and a scenario in which policy measures are introduced, aimed primarily at easing public finance and external balance constraints. For instance, an increase in government revenues resulting from completion of the Internal Market could be used for government investments which would accelerate growth and create additional employment, but would increase inflation. The figures in line B of Table 1.1 show the results of the application of policy measures to offset the short-term disinflationary impact of the Internal Market.

Table 1.1

Potential macro-economic consequences of completion of the Internal Market with and without accompanying economic policy measures (medium-term estimates for EUR 12)

	Economic impact on				
A. Without accompanying economic policy measures	GDP as %	Consumer prices as %	Employment (in mills)	Public deficit as % point of GDP	Ext. bal. as % point of GDP
a) elimination of frontier controls[1]	0.4	-1.0	0.2	-0.2	0.2
b) opening of public procurement	0.5	-1.4	0.4	-0.3	0.1
c) liberalization of financial services	1.5	-1.4	0.4	-1.1	0.3
d) supply side-effects	2.1	-2.3	0.8	-0.6	0.4
TOTAL	4.5	-6.1	1.8	-2.2	1.0
B. With accompanying economic policy measures	7.0	-4.5	5.0	-0.4	-0.2

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margin of error: ±30%

[1] including the elimination of differences in VAT and subsidy systems

Source: "The Economics of 1992", Tables 10.2.1, 10.2.2

As can be seen from Table 1.1, the extent of economic impacts would depend on the application of accompanying policy measures: GDP would grow by 4½-7%, 2-5 million jobs would be created, the public sector deficit would be reduced and the external trade position would improve. It is also notable from the table that nearly half the impact on GDP is due to supply-side effects rather than the direct effects of removal of barriers.

BOX 1.A

TABLE : PRESENT POSITION OF MEASURES FOR THE COMPLETION OF THE INTERNAL MARKET

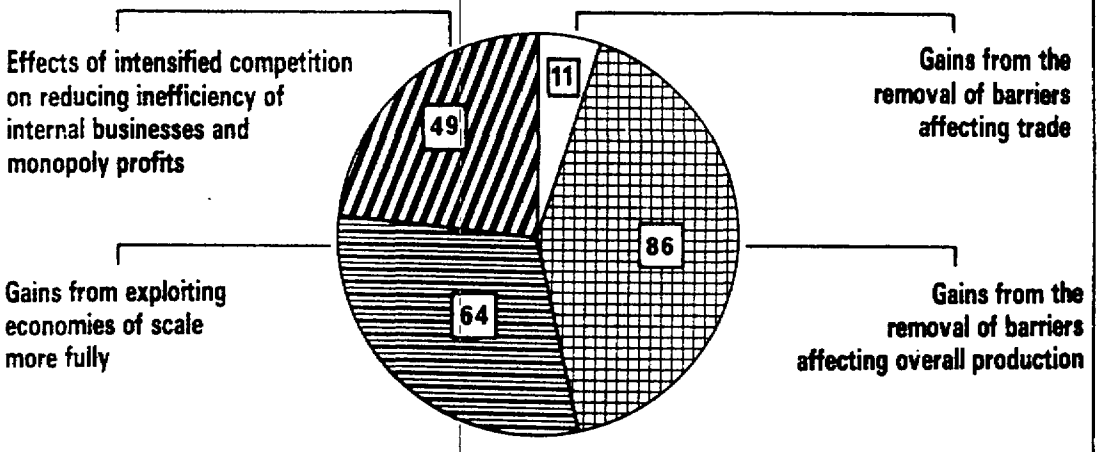
Measures \ Status	Initiatives and proposals which have been agreed in whole or part by both the Commission and the Council as of 31.05.89	Proposals for the completion of the internal market which the Commission has made to the Council but which have as yet not been approved by the Council	List of Commission proposals which are still to be made to the Council by the 31.12.92 in connection with the completion of the Internal Market	Total
Part 1 : The Removal of Physical Barriers				
I. Control of goods				
1. Various controls	5	3	2	10
2. Veterinary and phytosanitary controls	31	20	28	79
II. Control of individuals	3	4	1	8
Part 2 : The Removal of Technical Barriers				
I. Free movement of goods				
1. New approach in technical harmonization and standards	4	6	1	11
2. Sectorial proposals concerning approximation of laws				
2.1. Motor-vehicles	6	4		10
2.2. Tractors and agricultural machines	3			3
2.3. Food law	14	8		22
2.4. Pharmaceuticals and high-technology medicines	8	2	3	13
2.5. Chemical products	7	1		8
2.6. Construction and construction products	2			2
2.7. Other items	10			10
II. Public Procurement	1	4	1	6
III. Free Movement for Labour and the Professions	7	2	5	14
IV. Common Market for Services				
1. Financial services				
1.1. Banks	3	4		7
1.2. Insurance	3	6		9
1.3. Transactions in securities	4	2		6
2. Transport	4	5	3	12
3. New technologies and services	2	2	1	5
V. Capital movements	3			3
VI. Creation of Suitable Conditions for Industrial Cooperation				
1. Company law	1	6	1	8
2. Intellectual and Industrial property	2	6		8
3. Taxation (removing tax obstacles to cooperation between entreprises)		5		5
Part 3 The Removal of Fiscal Barriers				
1. V.A.T.	2	9	2	13
2. Excise duties	1	9	2	12
TOTAL	126*	108	50	284

Source IFO : Commission of the European Communities : 4th Report from the Commission to the Council and the European Parliament concerning the implementation of the White Paper. COM (89)311 final

BOX 1B

Potential gains from the completion of the European internal market: micro-economic estimates

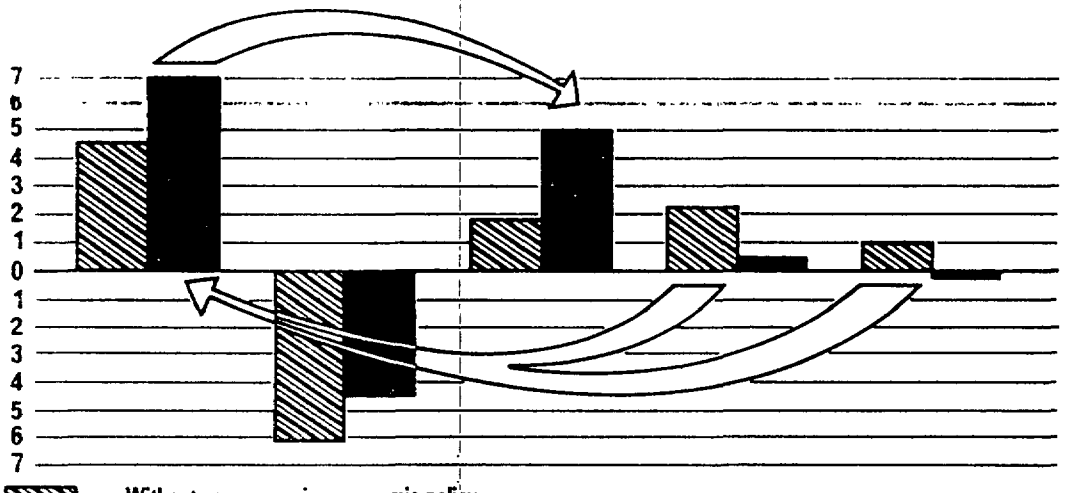
in billions of ECU, at 1988 value, for the 12 Community Member States *



Total: 210 billion ECU

* Average values estimated for a total within a range from 170 to 250 billion ECU (4.25 to 6.50 % of Community GDP).

Medium-term macro-economic consequences of market integration *



Without accompanying economic policy.

With accompanying economic policy, conducted in such a manner that the margins of manœuvre for the budget and external balances are used to support growth and employment (e.g. increased public investment, reduction in direct taxation).

* Simulations conducted on the Hermes and Interlink models. Margin of error: ±30 %.

Source: Commission of the European Communities.

1.2.4 Further Impacts and Policy Responses

The report on "The Economics of 1992" represents a valuable contribution to the understanding of the impact of the Internal Market and its importance in terms of the objectives of the Community. Nevertheless, while the estimates presented in the report are valid within its terms of reference, any inferences which may be drawn from them are subject to two very important qualifications:

- the estimated benefit of the Internal Market is a net benefit, which includes (but does not separately quantify) the effects on those who are adversely affected;

- no consideration is given to effects which cannot immediately be valued in monetary terms.

The economic impacts evaluated in "The Economics of 1992" related to a group of measures - the removal of barriers - which constitute only one facet (albeit a very important one) of a set of developments associated with the course of future progress of the Community to 1992, and beyond.

Furthermore, the Internal Market will not develop in a "policy vacuum": "The Economics of 1992" considers various macro-economic policy scenarios and takes account of adjustments in macro-economic policies to accompany the Internal Market (cf. Table 1.1, line B). The report notes the existence of policy instruments (in particular Community Structural Funds) which can serve as "an insurance policy to help initial losers recover" ("The Economics of 1992", p. 21); however, it does not acknowledge that, more generally, policies will be required to mitigate the unfavourable effects on particular sectors and regions arising from completion of the Internal Market.

The report should therefore be seen as a piece of economic analysis which develops projections showing the effects of removal of intra-Community barriers. There is no assessment of environmental impacts or consideration of environmental policy responses. It is the purpose of the present report to show how the environmental dimension can be taken into account as the Community moves towards 1992 and beyond.

1.3 Perception of major environmental problems

There is an increasing recognition that the Community environment represents an asset of considerable value. Recent years have seen environmental issues assume increasing prominence on the political agenda, both within the Community and on the world stage. This has been reflected in a series of European Council declarations, including the conclusion of the recent Madrid meeting (26-27 June 1989) that the Community must play an active role in environmental protection, both in terms of Community legislation and also of active participation in international initiatives. The conclusions of the recent world economic summit (held in July 1989) noted the "growing awareness throughout the world of the necessity to preserve better the global ecological balance", and the need for "decisive action ... to understand and protect the earth's ecological balance".

These commitments reflect increasing popular concern over the quality of the environment, and a growing public awareness of the importance of the environmental dimension in the economy. A survey of attitudes to environmental protection within the Community has shown a majority of respondents in all Member States as perceiving environmental protection as an urgent problem within the Community (cf. Box 1C). Public support for policies which protect and improve the environment is demonstrated by responses to Community-wide public opinion polls, published in Europeans and the Environment 1988. These showed that throughout the 1980s awareness of environmental problems was generally increasing. In 1988 nearly three quarters of respondents felt that environmental problems were "immediate and urgent". With this awareness a higher priority has been given to environmental protection: an overwhelming majority of those responding to the questionnaire felt that economic development should have an environmental dimension (See Table 1.2). While there was some variation between countries, the level of concern for environmental protection was generally high throughout the Community and was shared by respondents of different political persuasions, income levels and educational attainments. These public perceptions are also reflected in the attitudes of industry, which is increasingly aware of the environmental dimension in its activities; a survey undertaken in France in January 1989 covering 600 enterprises showed that the environment was generally regarded as a modern feature of industry, with half the respondents seeing environmental concerns as being of major importance for industry and two thirds believing that this importance will increase in the near future[1].

There is also evidence that the public in Member States strongly supports the concept of a common approach to environmental problems. A survey published in "Eurobaromètre" No 31 (June 1989) shows that over 90% of respondents supported the proposition that Community Member States should agree common rules for the protection of the environment.

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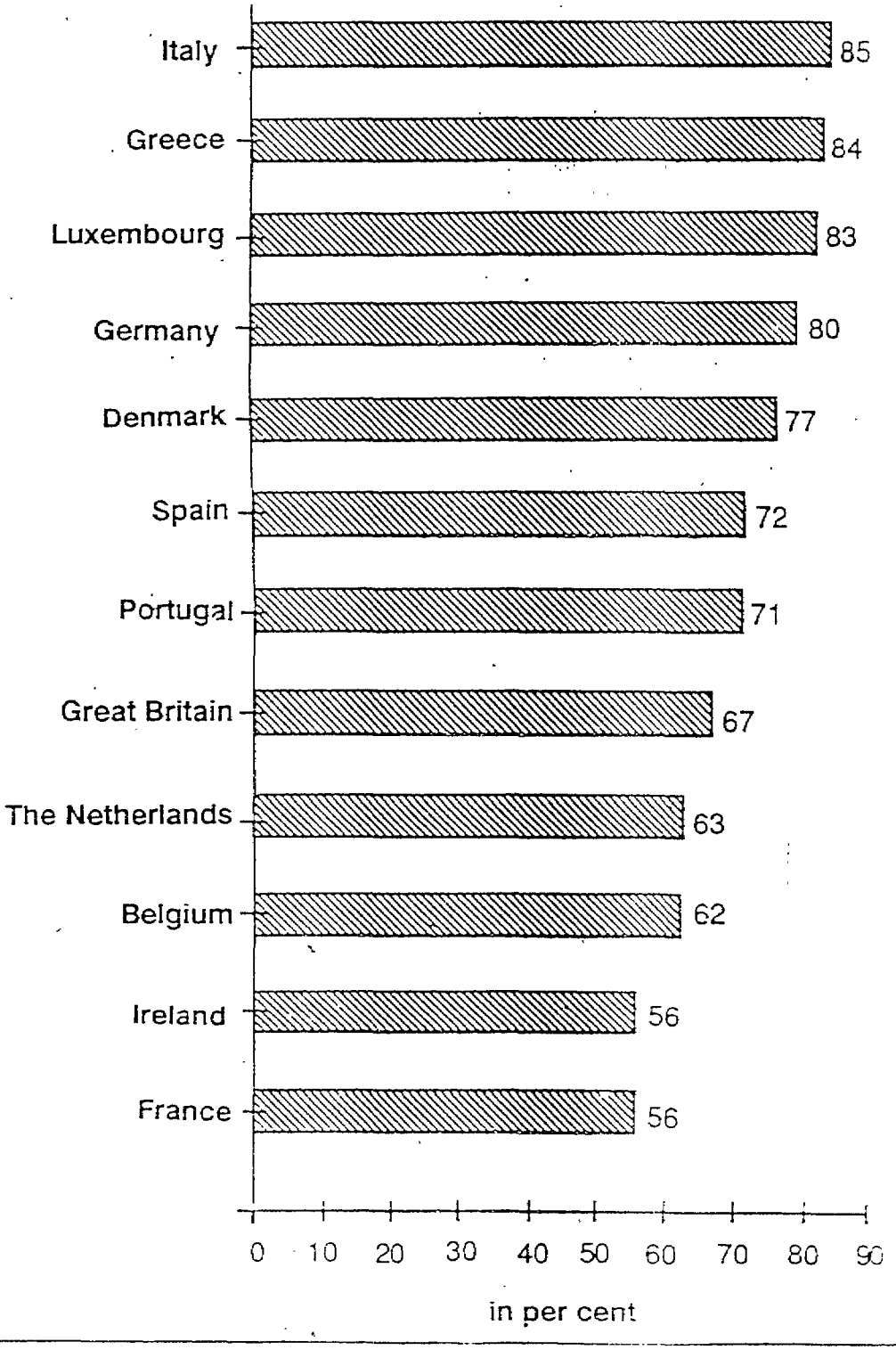
[1] "Les industriels français et l'environnement", sondage réalisé par le Gaz de France et le Secrétariat d'Etat auprès du premier ministre, chargé de l'environnement.

Box 1 C

COMPARISON OF THE IMPORTANCE OF ENVIRONMENTAL PROTECTION WITHIN THE EC

Seen as an urgent problem requiring immediate action in



Source: NOWEA, Düsseldorf, 1989

Table 1.2

Question: I am going to give you various opinions which are often expressed on environmental problems. With which of these opinions do you agree most?

	B	DK	D	GR	E	F	IRL	I	L	NL	P	UK	EURO 12
Economic development should take priority over environmental issues	10%	4	5	10	8	8	21	5	4	6	5	9	7
It is sometimes necessary to choose between economic development and the protection of the environment	39%	30	32	22	16	31	26	31	20	36	41	34	31
Protecting the environment and preserving natural resources are essential to economic development	39%	60	57	53	61	57	42	59	72	51	28	51	55
Don't know	12%	6	6	15	15	4	11	5	4	7	26	6	7
TOTAL	100%	100	100	100	100	100	100	100	100	100	100	100	100

Source: "The European and their Environment in 1988", C.E.C, Oct 19888

1.4 The Community Environment

The context of the future development of the European Community is one of considerable diversity, in terms of economic structure, culture, distribution of population, climate and landscape. There is great variation in environmental conditions, and in pressures - and potential pressures - on the environment, between rural and urban areas, between northern and southern regions of the Community, between mountain zones and lowlands and between inland and coastal regions. From northern Scotland to southern Spain, the Community covers a distance of some 3,600 km from north to south, and a similar distance east to west, from western Portugal to eastern Greece.

The Community contains a wide variety of climatic conditions, influenced by mountains and seas, and ranging from the cool moist maritime region of the northwest to the relatively dry and warm Mediterranean zone in the south. The topography ranges from the high mountains of the Alps to the broad lowlands of northern Germany, and from the fjords and cliffs of Scotland to the coastal lagoons of the Italian east coast. The soils are equally diverse: the soil map of the Community (on the small scale of 1:1,000,000) shows no fewer than 300 different types of soil, and the map of natural vegetation (scale 1:3,000,000) more than 200 types of vegetation. A major environmental problem, particularly in certain parts of the Community, is the impact of acid deposition on soils (See 5.3.4 below). Figure 1.1 shows the vulnerability of soils to acid deposition for six broad categories of soil, classified according to their buffering capacity - i.e. the extent to which acid depositions can be absorbed without serious adverse environmental effects.

Local variations in soils, topography, hydrology and climate can result in marked differences in the composition of vegetation within a small area. This factor, together with the complex history of climatic changes, has given rise to great diversity of species of animals and plants within the Community : there are more than 6,000 plant species, 100,000 invertebrate species, almost 600 bird species, approximately 130 mammal species and 60 species of freshwater fish. Figure 1.2 shows the distribution of threatened bird species within the Community: it is apparent that there is considerable regional variation, with a particular concentration in the newer Member States, Spain, Portugal and Greece. In broad terms this reflects both the greater ecological diversity of the southern regions of the Community, and the acuteness of conservation problems in these regions.

Against this background, economic activities give rise to environmental pressures, through use of natural resources and also resulting from the release of wastes to the environment, by emission to air and water and the dumping of solid wastes. The industrial development of regions in northwest Europe has had an environmental impact which is clearly illustrated by an examination of indicators of environmental quality. Rivers and coastal waters are generally of higher quality in the less industrialized peripheral regions than in the industrial areas at the geographical centre of the Community. Similarly, problems of air pollution (in terms both of emissions and ambient concentrations of atmospheric pollution) have tended to be more acute in the industrialized regions.

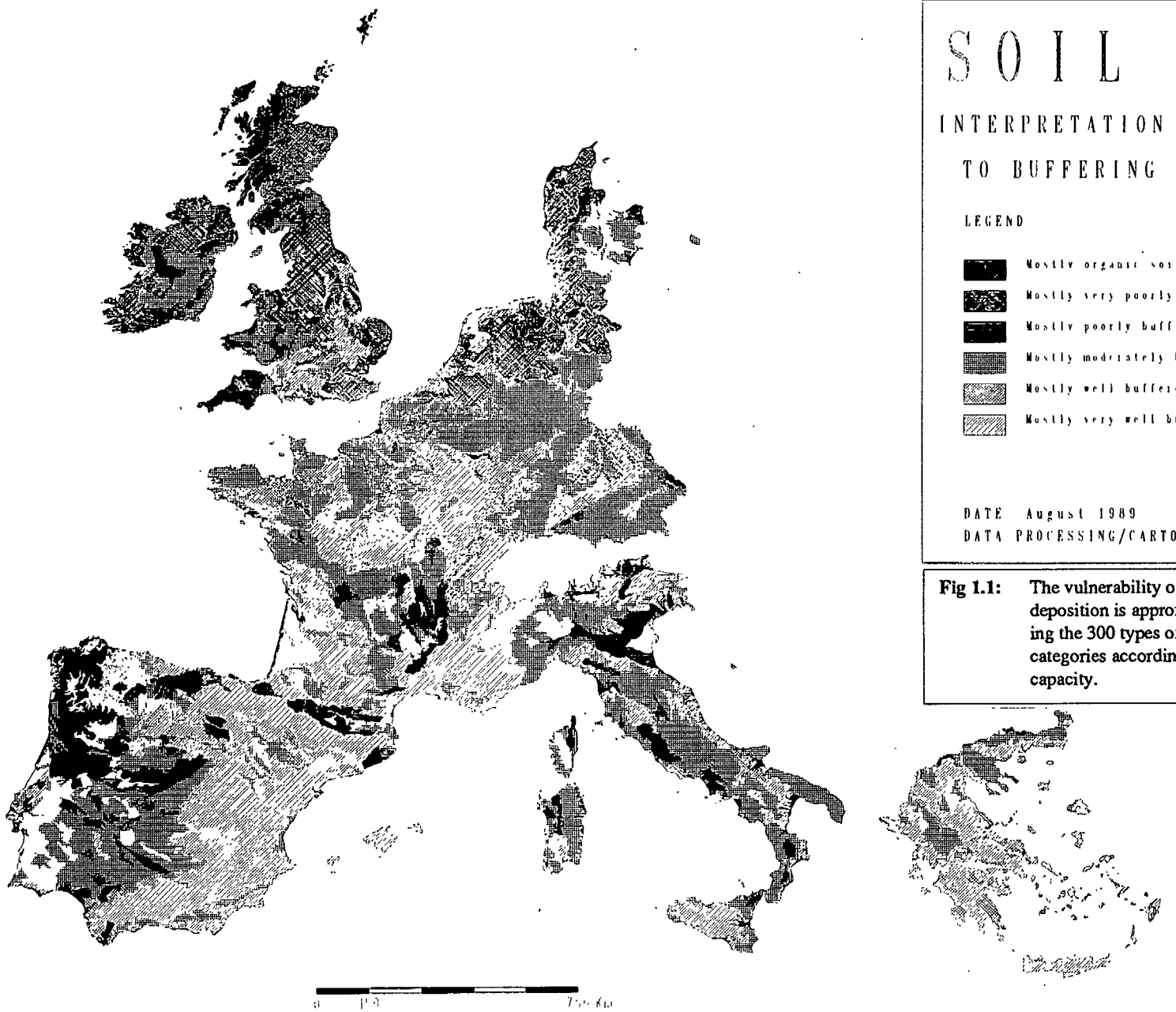


Fig 1.1: The vulnerability of soils to acid deposition is approximated by regrouping the 300 types of soils into six categories according to their buffering capacity.

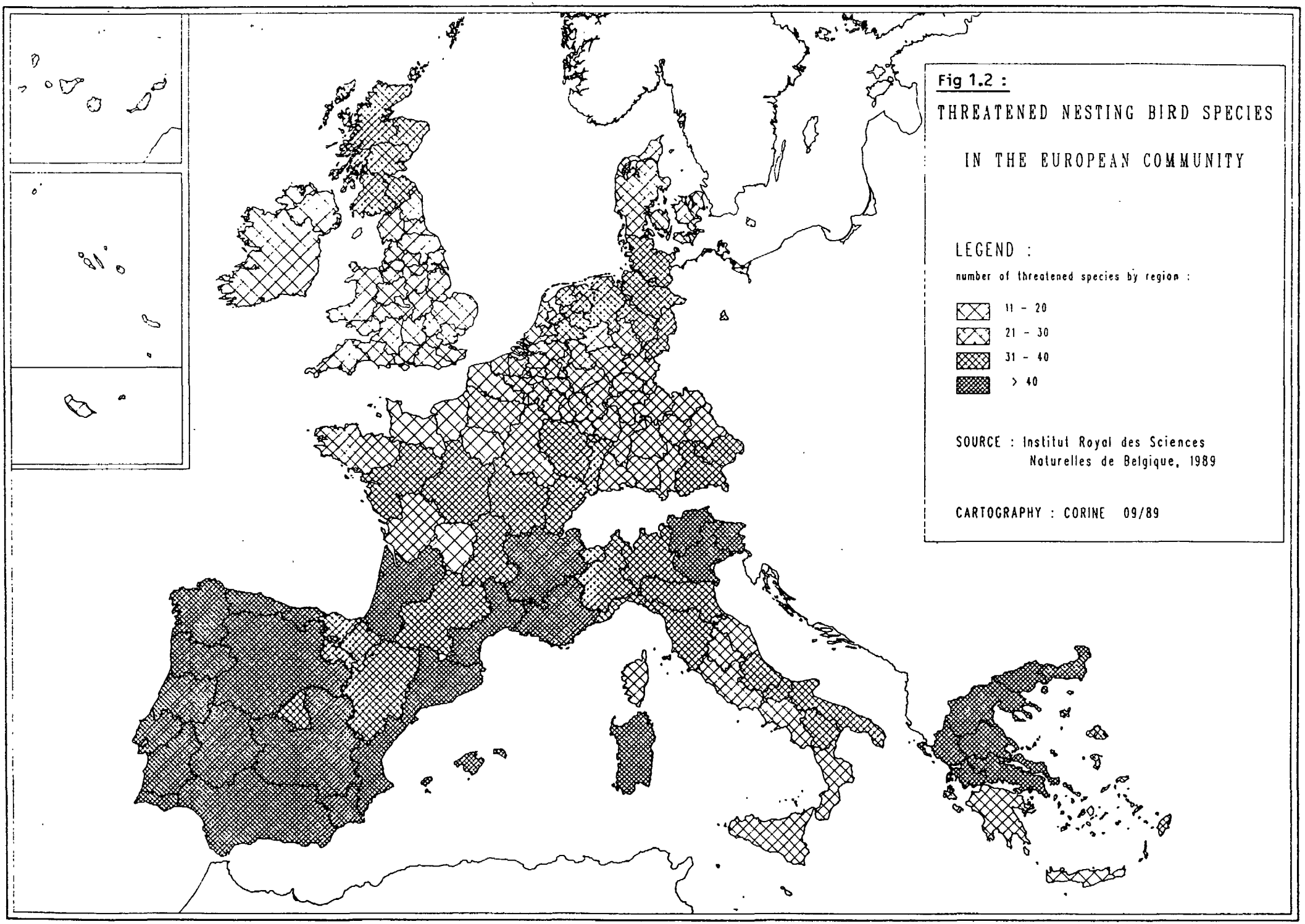


Fig 1.2 :
THREATENED NESTING BIRD SPECIES
IN THE EUROPEAN COMMUNITY
LEGEND :
number of threatened species by region :
11 - 20
21 - 30
31 - 40
> 40
SOURCE : Institut Royal des Sciences Naturelles de Belgique, 1989
CARTOGRAPHY : CORINE 09/89

A particular problem, especially in the more industrialized regions, is the presence and concentration of industrial plants which use, or produce, toxic and hazardous materials: the Community has recognized the need to manage risks of accidental damage to the environment from such plants and has instituted a directive to control such risks. [1]

A further type of environmental pressure is associated with agricultural activities. Certain types of crop have particularly strong environmental impacts, and in some areas intensive agriculture has become "quasi industrial", generating considerable volumes of wastes: a notable example is intensive pig farming (see Section 3.3.5 and Figure 3.3 below).

Land use has considerable environmental implications, both in the central regions of the Community and in the periphery. Urban growth gives rise to particular pressures both in terms of the environment within cities and of reduction in land available for other purposes. A growing concern, especially in the periphery, is the development of tourism which increases pressure on infrastructure and gives rise to issues of land use planning, pollution and protection of biotopes. Biotopes important for nature conservation are concentrated in the less populated areas and contain many rare and endangered species, the preservation of which is a matter of Community interest; one example is illustrated by Figure 1.3, which shows biotope areas and the density of the resident population in Portugal. Clearly, as is shown in this figure, coastal biotopes are an exception, since coastal areas generally have a high degree of development and urbanization. This gives rise to conflicting pressures on land use, which may be difficult to resolve.

The stimulus to economic growth provided by the Single Market has potential environmental impacts which arise against a background of longer term trends in environmental quality and in the perceived significance of various forms of environmental impact. These trends present a mixed pattern: evidence from the 1986 Community report on the state of the environment suggests that some forms of air pollution are in decline (for example, emissions of smoke and sulphur dioxide), while others have increased (for example, emissions of carbon dioxide, nitrogen oxides and hydrocarbons). The effects on the receiving environment - in terms of acidification, forest dieback and climatic change - remain problematical. For water pollution the pattern is similarly mixed: a number of parameters indicate an improvement in the situation (for example levels of conductivity, chloride, ammonium, BOD5, COD, detergents and, to a lesser extent, phosphates), and concerns remain over pollution from dangerous substances and nutrients, and also marine pollution - particularly oil pollution in the North Sea - and concentrations of heavy metals and other pollutants in coastal waters.

There is also continuing pressure associated with land use development and intensive agriculture. This has implications for wildlife habitats, particularly those located in wetlands, ancient woodlands, natural grassland and coastal habitats; this pressure, together with other factors such as the use of pesticides and deliberate and accidental killing, has caused species to be threatened with extinction.

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[1] Directive 85/501/EEC, 24.6.1982 on the major accident hazards of certain industrial activities (O.J. L 85, 28.3.1986)

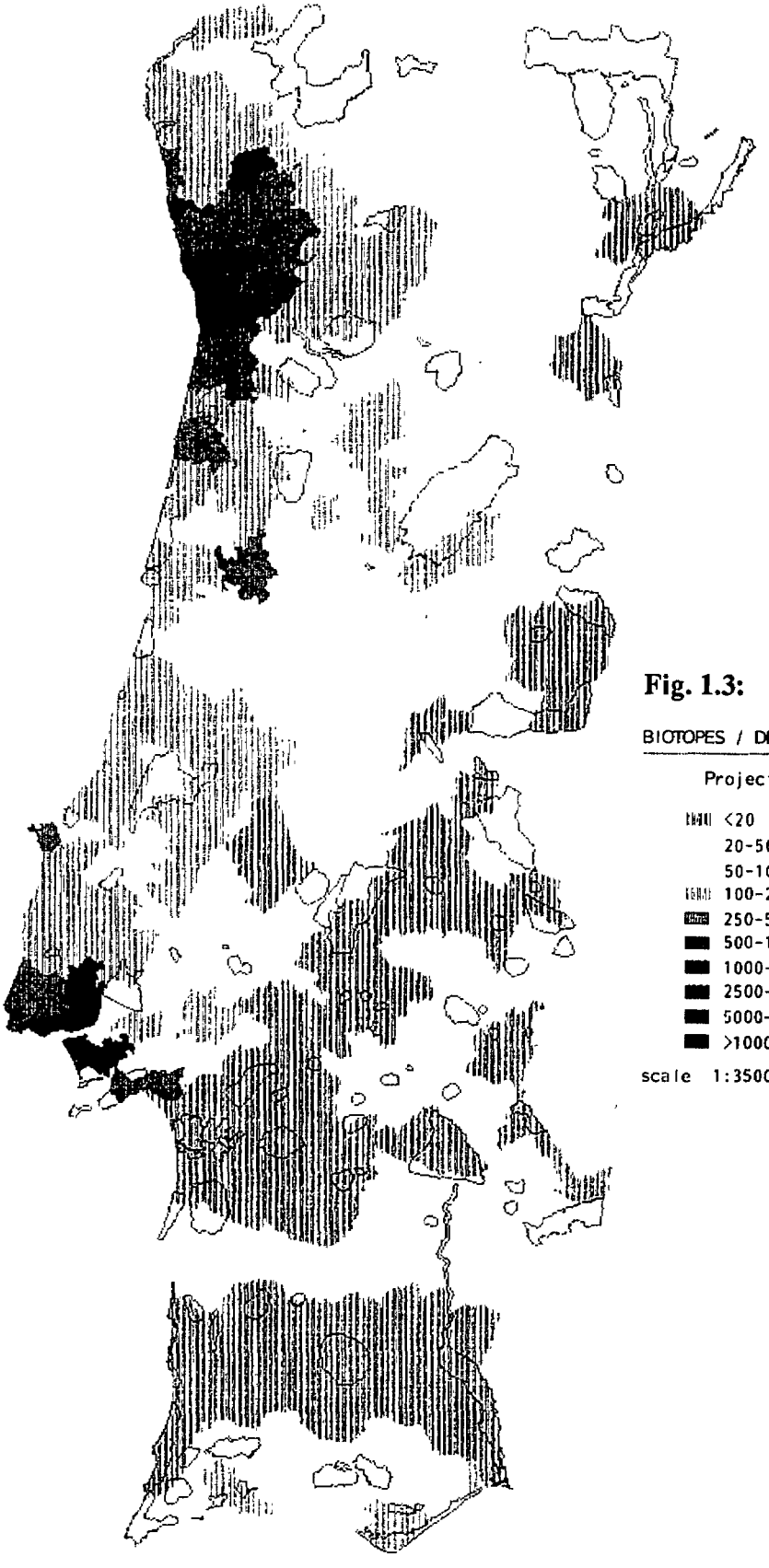

Fig. 1.3:

BIOTOPES / DENSITY OF POPULATION

Project Land Cover

<20
20-50
50-100
100-250
250-500
500-1000
1000-2500
2500-5000
5000-10000
>10000 inhab. per sq. km

boundary of biotope

scale 1:3500000

A key issue in the context of the present report is the effect upon environmental trends of developments associated with the Single Market. It is possible for trends to be reinforced, or reversed, and in practice there would be a complex interaction of a variety of influences - including technological change, changes in economic structures and in the spatial distribution of economic activity, and changes in environmental policies. The environmental effects of economic changes associated with completion of the Internal Market are discussed in Part 2 of this report, while the policy implications are considered in Part 3.

PART TWO

ENVIRONMENTAL IMPACTS OF THE INTERNAL MARKET

CHAPTER 2

REMOVAL OF PHYSICAL, TECHNICAL AND TAX BARRIERS: THE ENVIRONMENTAL IMPLICATIONS

2.1 Introduction

The EC Commission's 1985 White Paper distinguishes between three types of barrier which stand in the way of the completion of the Internal Market and are to be removed by the end of 1992.

Physical barriers - the delays and costs caused by border controls;

Technical barriers - which exist through different standards, market entry barriers, nationally protected public procurement markets;

Fiscal barriers - differences between rates of VAT and excise duties in Member States.

The present chapter analyses the effects of the various types of barriers which at present exist within the Community, and the potential environmental implications of their removal. Although the distinction is conceptually clear, it is in practice difficult always to distinguish between the environmental impacts due to the removal of physical, technical and fiscal barriers (the "static effects") and those due to the induced direct and indirect, mid-term and long-term impacts (the "dynamic effects"). Hence the distinction, although a useful analytical device, may in the end be somewhat artificial.

It should also be noted that not all the measures envisaged in the White Paper have been agreed by the Council; some Commission proposals have yet to be agreed by the Council, while others are still being developed: (the state of progress up to June 1989 is summarized in Box 1.A). Following approval by the Council, Community directives must then be transposed into national law: and their ultimate effect depends upon the application of these laws in the Member States.

Some proposed measures - particularly those relating to the removal of border controls and to tax harmonization - have encountered considerable difficulty in the course of Council discussion, and there remains uncertainty as to the timing and precise form of eventual legislation. This presents a serious impediment to the analysis of the static effects and their environmental dimension - analogous to the difficulties of hitting a moving target.

The Task Force necessarily considered in its work the most up-to-date Commission proposals (e.g. for fiscal harmonization) as well as the ongoing discussion in the Council as the base line for their analyses and evaluation. It is for this reason that at the present only a preliminary mostly qualitative identification and evaluation of the environmentally relevant measures in the White Paper can be made.

The present chapter first analyses the effects of the various types of controls and barriers which at present exist within the Community, and the environmental implications of their removal. It then considers policy to meet the requirements for environmental protection. The barriers discussed below are associated with:

- frontier controls (customs, etc.);

- national differences in product regulations and standards;

- national restrictions on public procurement;

- national restrictions on market entry (e.g. in the field of transportation and energy);

- differences in indirect taxation.

2.2 The Removal of physical barriers

2.2.1 Introduction

The present system of checks on goods is required by the diversity of fiscal provisions, by differences in product standards set by each country, and by differences in plant and animal health regulations (See box 2A).

It has been estimated that total costs associated with existing frontier controls within the Community amount to 8 to 9 billion ECU per year (corresponding to 1.7 to 1.9% of the value of total intra-Community trade - See "The Economics of 1992", p. 49).

While frontier controls are time-consuming and costly they do nevertheless fulfil important functions for environmental and consumer protection in Member States. At the borders between Member States at present a series of environmentally related import and export controls take place in various areas, e.g.:

- food, plants, animals and veterinary certificates which for reasons of laws on food, plant protection, animal diseases or consumer protection were not permitted to enter individual Member States up until now;
- waste, especially hazardous waste;
- radioactive materials;
- endangered wild animal and plant species (according to the Washington Convention);
- for certain imports of environmentally harmful products for which a charge is levied at the border (e.g. waste oil).

Furthermore, the present European regulations on transport of waste - including nuclear waste - are based mainly on border controls on imports and exports. [1]

In the White Paper the Commission has proposed measures (some of which have already been approved) to streamline control procedures (see Regulations 1900 and 1901 of July 1985 on documents for customs procedures, and Directive 347, also of July 1985 on fuel for transport). The ultimate objective is the total elimination of border checks.

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[1] Cf. Directive 84/631/EEC of 6/12/84 on the supervision and control within the European Community of the transfrontier shipment of hazardous wastes.

BOX 2A

Frontier controls within the Community exist mainly for the following reasons:

- control of road transport licenses, and the compliance of vehicles with national regulations including safety rules for the transport of dangerous products;
- differences in national public health standards involving veterinary and plant health checks;
- differences in value-added tax and excise duties applied in accordance with the "destination principle" and thus necessitating border adjustments;
- application of monetary compensatory amounts to trade in certain agricultural products;
- formalities carried out for statistical purposes;
- enforcement of certain bilateral trade quota regimes with Third countries.

2.2.2 Potential impact on the environment

The removal of border controls foreseen in the Commission's White Paper will involve the loss of an instrument for environmental and consumer protection since imports and exports can no longer be regulated or, in appropriate cases, prevented by means of border controls - this is a particular concern in the context of movement of animals and plants and also of wastes. In future it will no longer be possible by means of border controls to discover infringements of EC Directives or national regulations.

With regard to the possible effects on the environment from the planned removal of border controls the following questions should be asked:

- How appropriate and effective are border controls as a complementary instrument for environmental policy?

- What environmental measures can replace border controls in the future?

The Effectiveness of Border Controls

a) The importance, and benefit, of plant and animal health regulations varies between countries. Ireland, the U.K. and Denmark have a high animal and plant health status; this reduces losses from diseases, and expenditure on treatment and control, and it allows export to countries such as the U.S.A., Canada and Japan. The numbers of outbreaks of various exotic animal diseases in Community Member States in 1987 are shown in Table 2.1 below:

Table 2.1

Number of outbreaks of certain animal disease in European Community Member States, 1987

	Foot & Mouth Disease	Classical Swine Fever	African Swine Pleuropneumonia	Contagious Bovine	Newcastle Disease
Italy	167	13	21	-	15
Spain	-	-	794	-	-
Portugal	-	-	648	749	-
France	-	5	-	-	-
Belgium/Lux.	-	84	-	-	-
Germany	2	41	-	-	-
Netherlands	-	1	-	-	-
U.K.	-	1	-	-	-
Greece	-	-	-	-	-
Denmark	-	-	-	-	-
Ireland	-	-	-	-	-

Source: F. Convery "Regional Economic and Environmental Impacts of the Single Market - Ireland", Report for the European Community Task Force on the Environmental Implications of the Single European Act (1989).

Following completion of the Internal Market regulations - even if genuinely necessary for the protection of plant and animal health - will no longer be enforceable by means of frontier controls. If the substitute enforcement procedures were to prove less effective than the use of frontier controls, there would be a risk of environmental damage through the spread of plant and animal disease.

b) The extensive legal transport of waste within the Community (cf. Table 3.9) raises a question as to the national relevance of policies which require the disposal of waste within the waste generating country or region and therefore the necessity for border controls. As regards the effectiveness of environmental and consumer protection orientated border controls serious doubts can be raised if one thinks of:

- the weaknesses of the control system in cases of illegal transport of radioactive materials; [1]
- the cases of illegal toxic waste transport within EC and in Third countries. [2]

Freedom of movement of goods is ensured under Article 30 of the Treaty, and it remains unclear to what extent movement of wastes is covered by this provision. However, as a practical matter, completion of the Internal Market implies that border controls cannot be used to restrict the movement of waste - even toxic and hazardous waste which is only for disposal and for which there is no economic possibility of use through recycling. Insofar as the new Commission strategy for management and disposal of waste and transfrontier movement of wastes is achieved then border controls will lose their present functions. [3]

c) In general it can be said that the extent of illegal importation of, and trade in, endangered wild plant and animal species clearly demonstrates that border controls in this case are not sufficient or not appropriate to protect the environment. [4] As the annexes of the Washington Convention on endangered species now include more than 8,000 animal and 40,000 species of plant, customs administrations are faced with virtually insoluble problems. [5]

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[1] Erklärung der Bundesregierung zum Thema "Die Behandlung schwach- und mittelradioaktiver Abfallstoffe des Kernkraftwerkes im Zusammenhang mit den Ereignissen um die Firma Transnuklear", in: Umwelt, Nr. 2/1988, p. 75 ff.

[2] Giftmülltourismus - Sogar Heizöl und Straßenbelege durch illegale Entsorgung vergiftet, in: Handelsblatt, Nr. 150 vom 8.8.1988, p. 9.

[3] Commission's strategy paper on Waste Tourism and Management

[4] K.L. Ulrich, Ausverkauf der Tierwelt, in: Das Parlament, Nr. 19 vom 12.5.1984, p. 12; M. Niekisch, Das Washingtoner Übereinkommen - Schutz vor Rabbau an der Natur?, in: Praxis der Naturwissenschaftlichen Biologie, Heft 6/1988 (37. Jg.), p. 2 ff. Bundesministerium für Ernährung, Landwirtschaft and Forsten (Hrsg.), Washingtoner Artenschutzübereinkommen, Jahresstatistik, div. Jg.

[5] M. Niekisch. Das Washingtoner Artenschutzübereinkommen - Schutz vor Rabbau and der Natur?, in: Praxis der Naturwissenschaften - Biologie 6/37. Vol. (1988), p. 8.

Clearly border controls with limited personnel, specialist knowledge and equipment can scarcely correct mistakes, weak points or omissions at other places on the basis of freight documents at the last moment with insufficient resources. Thus the question can be raised as to whether these sort of environmental controls must necessarily take place at the border.

Replacement of Border Controls

Notwithstanding the justified scepticism concerning the appropriateness and effectiveness of present border controls as an instrument for environmental and consumer protection the removal of border controls should not be seen as entirely negative. This all the less because the possibility exists of introducing in certain cases more effective measures for protection in the place of border controls. Where and how the necessary and desired controls should be carried out in the future is above all a question of effectiveness and economic efficiency. There is a number of solutions which can be found in environmental practice.

a) Pending complete harmonization of health standards for plants and animals the Commission has proposed several measures (some of which have already been adopted) in order to facilitate Community trade. Veterinary tests relate to various aspects of trade in animals: public health, animal health, animal well-being, etc. Since substantial differences remain in the standards required by national regulations, at present importing Member States require checks on imports from countries which adhere to different regulatory standards.

The long-term objective is to raise the health standards of all Member States to the highest levels so there is no need for any restriction on trade. This must be done by developing common policies to combat disease. In the shorter term, ways of controlling animal and plant movement which do not require controls at the frontiers have to be found. The Commission's new approach in this area envisages procedures based mainly on the mutual recognition by Member States of each others' checks, controls and inspections prior to certification at the places of origin and occasional spot-checks on certification at the points of destination within the Community. Testing should be transferred "upstream", i.e. at the production stage. The difficulty with this proposal derives from the asymmetry in incentives which is implied: at the point of origin, the main incentive will be to achieve a sale, to facilitate movement; there will be no incentive, except a very indirect one, to maintain the disease-free status of those areas of the Community which have such status.

Where national authorities in exporting countries would be responsible to importing countries and have a responsibility for the undertaking of tests in a consistent manner and in accordance with established criteria, complete harmonization of veterinary tests and criteria and an equivalent and effective implementation would be necessary.

At present Member States undertake plant health checks at the border on imported food of vegetable origin. As in the case of veterinary checks the Commission seeks to shift the checks from the frontier to the point of production.

With regard to food products a shift from the frontier to the point of production should be based on the detailed harmonization of standards and of the analysis of substances: with regard to animal trade it should be based on a coordinated system of health tests. This is a delicate matter, as shown by recent experience (for example, the controversy over the hormone content of beef imported from the USA). Community action is necessary to specify acceptable products and rules concerning the trade of specific products such as pesticides used in agriculture. For trade in animals proposed directives concern criteria and implementation methods for specific items, such as animals and specific breeding methods.

b) In relation to the removal of border controls for the supervision and control of the transfrontier transport of hazardous and nuclear waste appropriate new measures should be taken. The Commission plans for 1989 a proposal for a regulation on the transport of nuclear waste. On the occasion of the transposition of the Basle Convention on the export controls on hazardous waste the Commission plans an amendment to the Directive 84/631/EEC.

c) In the area of trade in endangered plant and animal species it is necessary to monitor appropriately the implementation of the Washington Convention at the external frontiers of the Community and/or at the destination points within the Community (e.g. traders, processing plants etc.) Border controls could be replaced by better enforcement of the existing import and trading bans at the points of destination.

2.3 The removal of technical barriers

2.3.1 Introduction

Member States frequently have their own technical norms and specifications in which they lay down what requirements certain products must fulfil in relation to health and security, or environmental and consumer protection. Such norms and specifications become barriers to trade if they differ from country to country and if Member States do not mutually recognize national permits, certificates and examinations. Experience demonstrates that product norms are often misused to protect national markets, even where they are only indicative and their fulfilment is not a legal precondition to the sale of products. [1]

There are three types of technical barrier to trade; related to differences in industrial standards, national regulations and testing and certification procedures (See BOX 2B).

In general, technical barriers to trade mean significant direct and indirect costs for European producers and consumers. They prevent or complicate large-scale production; they increase the cost of storing raw materials or finished products; they reduce competition and its beneficial effects on prices and on the range of choices available to the consumer. Technical barriers are continuously growing as a result of technological developments and increasing concern for environmental, health, safety and consumer protection issues.

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[1] Commission of the European Communities Europe without Frontiers - Completing the Internal Market (Luxembourg 1988), pp. 39-40

The evidence about the importance of technical barriers to trade is illustrated by the size of the various national standardization bodies, and the large number of standards written per year (see Table 2.2). Further evidence stems from business surveys undertaken for the Cecchini report where technical standards and regulations have been rated by industrialists as the most important single category of trade barrier (see BOX 2C):

Trade in investment goods, especially electrical and mechanical engineering products, and in pharmaceuticals, food, precision and medical equipment, appears to suffer most from technical barriers. Consumer and environmental protection tend to motivate different product regulations governing the foodstuffs industry, especially concerning the ingredients, packaging and labelling, and the use of generic descriptions.

Up until now the Community has concentrated on the removal of such trade barriers by means of a complete and definitive harmonization of national specification. With a view to 1992 the Commission has sought harmonization in numerous areas (e.g. motor-vehicles) on the basis of Community specifications. In this process regulations are not automatically dismantled they are merely brought to a similar level.

As a new additional instrument the Commission is applying the mutual recognition principle towards national regulations, such that products lawfully produced or marketed in one Member State can have access to all Member States. This is known as the "Cassis de Dijon" approach, since it applies the main message of the ruling of the European Court of Justice in 1979 which removed restrictions on the export of the French liqueur to Germany. This approach overcomes many of the problems which arose from the previous detailed approach to harmonization.

It is, however, important to note that in the absence of specific Community legislation, Member States may still restrict the free movement of goods and services on grounds of certain public policies and interest, including environmental protection (See Article 36 of the Treaty and the Communication of the Commission to Member States in the OJ of 3 October 1980).

As a mixed strategy between complete harmonization and mutual recognition the Community has also since 1985 followed a so-called "new approach" to harmonization. This dispenses with the earlier type of detailed directives, which were difficult to agree and quick to become obsolete. The new type of directive only indicates "essential requirements" with respect to health, safety, environmental and consumer protection and leaves greater freedom to manufacturers as to how to satisfy these requirements. On the other hand, a convenient means of establishing conformity is by observance of European standards worked out by the Commission or European standardization bodies on mandates deriving from the directives. Those national rules which do not concern such essential requirements will no longer be subject of Community harmonization but will be automatically subject to national mutual recognition, enforceable before the European Court. According to Article 100b of the EC Treaty this originating country principle is also valid in the trade of goods if by 31.12.1992 no harmonization has been achieved.

BOX 2B Three Types of technical Barriers

The first is caused by differences between national industrial standards (DIN in Germany, AFNOR in France, BSI in the United Kingdom, etc.), which must be met as a condition for the import, sale or use of a product. Drawn up by private organizations, such standards for product form, functioning, quality, compatibility, etc. are not legally binding and the way they hinder trade can be quite subtle. For example, an insurance company may agree to pay for damage caused by building materials only when they have been certified as conforming to national standards.

The second type of barrier results from differences in national regulations, which are similar to standards but which are legally binding. These rules are generally enacted in order to protect the public interest: health, safety, the environment, etc. For example, many Community countries regulate the composition of certain food products and make it illegal to market imported products that do not conform to national rules.

The third type of barrier is created by the testing and certification procedures which ensure the conformity of a product to national regulations or industrial standards. A barrier to trade occurs every time an importing country requires certification additional to that required in the country of origin. The resulting extra costs and delays are well known in such sectors as pharmaceuticals.

Table 2.2

Comparative overview of some European Standardization Organizations

(The figures have been taken from ISO and CEN documents. They relate mainly to 1986)

Country	Standardization Organization	Status (1)	Employees	Number of Standard Sheets (3)	Standards issued in a year (4)	CEN-Secretariat (of 82 Technical Committees) (Number 1987)
D	DIN	2	596	120000 (25700)	1400	34
DK	DS	1	65	15000 (2355)	250	6
E	AENOR	1	70	78200 (6589)	850	0
F	AFNOR	1	446	138344 (13366)	1100	17
IT	UNI	1	48	30000 (6411)	270	3
NL	NNI	2	100	55000 (5500)	110	2
UK	BSI	1	1200(2)	125000 (9360)	660	10

(1) Status: 1 Private organization but recognized by the state in its public function.
2. Private organization.
(2) Approximately half of the personnel is allocated to work in examination and certification offices.
(3) The numbers in brackets relate to the approximate numbers of standards.
(4) Order of magnitude.

Source: F. Nicolas in Zusammenarbeit mit J. Repussard, Gemeinsame Normen für die Unternehmen, Brüssel-Luxemburg 1988, p 26

BOX 2C

THE IMPORTANCE OF TECHNICAL BARRIERS, BY INDUSTRY (1)

Rank order from the business survey (2)	Industry	Numerical score	Judgment of expert services of the Commission — Degree of importance: Great	Medium	Less
1.	Motor vehicles	68		X	
2.	Electrical engineering	66	X		
3.	Mechanical engineering	63	X		
4.	Chemicals, of which:	60			
	- pharmaceuticals		X		
	- other				X
5.	Non-metallic mineral products	56		X	
6.	Other transport equipment	55			X
7.	Food and tobacco	52	X		
8.	Leather	51			X
9.	Precision and medical equipment	50	X		
10.	Metal articles	50		X	
11.	Rubber products	50		X	
12.	Plastics	47			X
13.	Wood and furniture	44			X
14.	Metals	41			X
15.	Office and data-processing machinery	41		X	
16.	Textiles	38			X
17.	Footwear and clothing	37			X
18.	Mineral oil refining	37			X
19.	Paper and printing	35			X
20.	Article fibres	31			X

(1) Results of a survey covering some 20,000 enterprises throughout the Community were used to assess the importance of technical barriers in the form of standards and regulations. These business survey results have been converted into numerical scores, according to which industries are ranked. The importance of the barrier is classified as: (a) very important; (b) important; (c) not so important. The coefficient is 100 when all firms consider the particular barrier to be very important.

(2) The judgements of Commission experts responsible for policy action to overcome trade barriers.

Source: "The Economics of 1992", p. 51

A further Commission policy instrument is the 1983 mutual information directive (83/189/EEC) which obliges Member States to notify new regulations and standards. The Commission has the power to freeze the introduction of new national regulations for up to a year, if it decides that Community action is necessary.

2.3.2 Potential impacts on the environment

The evaluation of the potential environmental effects of the removal of technical trade barriers implies a series of open questions:

(1) For what product categories will the essential requirements for the protection of human health, safety and the environment be applied? In what product areas will the principle of national recognition of national norms predominate?

(2) At what level or standard of protection will the essential requirements be laid down where harmonization is regarded as necessary? What consequences does Community wide harmonization have for existing or planned national regulations which go beyond the level of Community wide harmonization?

(3) In how far will it be made certain that the product regulations or standards harmonized at EC level will also be implemented?

Regarding the first question there will in the future be a certain number of Community-wide product standards. According to the "New Concept for Technical Harmonization" [1], these standards will only be in the form of reference standards for large product categories and covering only certain types of risks. At the present time it however cannot be judged - apart from product norms already agreed upon or under discussion - for which large product categories a harmonization will be required for the risk of environmental pollution. Such harmonization may be appropriate only for toxic pollutants and pollutants which cause damage to health. For other forms of pollution other approaches may be followed:

a) In the future in public and private calls for tender environmentally friendly products or recycled products, which up until now fulfil the requirements of practice, can no longer be excluded through the setting of standards.

b) Environmentally friendly products for which no standards have been set, will in the future have fewer competitive disadvantages compared with products which are less environmentally friendly but standardized.

The second question concerns the protection level of EC Directives with reference standards. Under Article 100a (4) the Commission has indeed to base its proposals on a high level of protection, but nevertheless it cannot be certain a priori what this will imply in individual cases: Furthermore it is in no way certain that the European Parliament and the Council of Ministers will follow the Commission Proposals with respect to the level of environmental protection to be adopted in Community legislation.

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[1] O.J. C 136/01, 1985

In the Internal Market product-related environmental policy is unlikely to become simpler but rather more complex. The difficulties of reaching agreement on high standards in Community environmental legislation are illustrated by the discussions of exhaust limits for cars. The discussion on the production and use of Pentachlorphenol or certain pesticides have shown the limits on national room for manoeuvre. It must not be overlooked that Community environmental protection cannot be more than what can be agreed on by consensus or the majority of the 12 Member States. Agreement could therefore in some cases be reached at a level which is seen as too low by some Member States. For the protection of the environment in the whole Community such compromises may sometimes be better than no Community regulations at all.

In cases where, for reasons of free trade in goods, it is necessary to harmonize individual Member States' environmental protection measures, there is a danger this process may lead to a deterioration in environmental quality in certain Member States if, as a result of harmonization, an existing, or desired, high level of protection can not be achieved in future. The question is thus raised as to the national options for product related regulations, that go further than Community wide harmonization.

Article 100a on completing the Internal Market empowers the Community to harmonize environmental protection regulations for specific products by 1992. In the process "the Commission in its proposals... will take as a base a high level of protection". Since in this case decisions can be taken by qualified majority and the Member States have only limited powers to adopt national rules it is very doubtful whether a Member State would be able to introduce new, more stringent national rules for specific products on the basis of Article 100a [4] of the EEC Treaty. In any case they would be bound by the European Court of Justice's interpretation of Articles 30 and 36 of the EEC Treaty which stipulates that the rules must be necessary and reasonable, though this, of course, by no means precludes autonomous assessment by national authorities of the environmental and health risks.

The new concept for technical harmonization and standards underlines too that on the one hand the individual Member State protection measures must be harmonized to ensure the free movement of goods. On the other hand the already existing and justified protection in the Member States may not be reduced.

The logic and legal principles of the Internal Market require that if a product is lawfully marketed in one Member State, it may also be marketed in any other member State. This follows as a consequence of products either being manufactured to standards harmonized at Community level or recognition by the Community of the equivalence of standards as a result of the case law of the Court or the application of Article 100b [1] of the Treaty. Conflicts between the requirement of mutual acceptance implied by the concept of the Internal Market and the application of the subsidiarity principle in setting and managing ambient quality standards arise, however, when the achievement of the ambient quality standards requires the application of higher product standards in a member State. The only means of reconciling this conflict is through the application of Article 100a [4], 100b [2] or case law exception to Article 30 (e.g. "Danish bottles"), whichever is relevant to the situation. Although

these may provide the mechanism for dealing with the tension between Internal Market and Member State autonomy over lack of environmental protection, no "right" answer can be predicted for every set of circumstances in which this conflict might arise.

Regarding the implementation issue (the third question under consideration), products traded between Community Member States which conform to Community-wide standards or which are produced according to the requirements of the exporting country will in future be allowed onto the market throughout the Community. Following completion of the Internal Market routine controls of products from other Member States and targeted controls without a specific reason will no longer be permissible. Such controls will only be possible in the future through general product inspections which treat equally home products and those from other Member States.

The free movement of goods in the Internal Market therefore requires an effective Community product and quality control according to Community rules. This raises the question as to the comparability, quality and reliability of the relevant national examination and certification institutions and procedures. In this connection a harmonization of the methods of examination and inspection is called for as well as equivalence in relation to examination procedures, places for examination and examiners, whose independence from industry must be ensured. Otherwise there may be a danger of protectionism in the form of discrimination by national inspection organizations against foreign suppliers. Therefore special attention should be devoted to the question of equivalent product controls. The first steps in this direction are to be found in the area of food inspection. The proposal for a Council Directive on the inspection of food contains principles and requirements for the harmonization of food inspection in the EC Member States. According to the proposal the Member States will be required inter alia to inspect with equal care products destined for export to other EC countries as those for marketing within the state concerned.

The achievement of equivalence in controls will depend furthermore on the organization and equipment of the authorities responsible for food inspection, especially the procedures for examination of the qualifications of personnel, and the provision of examination equipment in all Member States; these can be controlled by Community regulations governing inspections, numbers of controls and requirements for the education of inspection personnel.

Overall it must be ensured that inspection measures are carried out effectively in all Member States and that the Commission concerns itself with the removal of any inadequacies which may arise.

2.4 Opening-up of public procurement

2.4.1 Introduction

Public purchasing as a whole includes all purchases of goods and services by government and by public enterprises. Public procurement (the contractual part of public purchasing) was in 1986 worth between 6.8% and 9.8% of GDP in the Community [The Economics of 1992, p. 54].

The positive market effects of the opening of the public procurement are generally considered to be of three types. There is a static effect which is due to the lower costs of public purchases, and a second effect is linked to competition among suppliers which should cause a reduction of prices. A third long-term effect is the tendency to reduce the diversity of product characteristics through standardization at a European level. This would make it possible to increase the rate of utilization of plants, and therefore to achieve further cost reductions.

National public procurement markets are one of the most protected economic activities in the Community. Out of a contract volume amounting to between 240-320 billion ECU in 1986, the value of contracts awarded across frontiers amounted to only 4-5 billion ECUs. To tackle this situation the Commission White Paper proposed a series of actions: the main actions taken to date are set out in Box 2D.

Along with the proposal which is envisaged for a directive on public service contracts, future Commission action will also include a proposal on surveillance of the respect for procurement rules by utilities in the water, energy, transport and telecommunications sectors.

In addition to the legislative programme, the Commission has also engaged in a series of measures for improving information on public procurement, mainly for small- and medium-sized enterprises, and for ensuring greater compliance with EC procurement rules both through closer control of projects financed by the Community and also through procedures under Article 169 of the Treaty, which empowers the Commission to bring before the Court of Justice cases in which it considers that a Member State has failed to fulfil its obligations under the Treaty.

2.4.2 Potential Impacts on the Environment

The environmental effects of the opening-up of public procurement concern both the market for pollution treatment plants and the like (to the extent that is a matter for public procurement), and other public sector contracts e.g. for public works or manufactured goods, which may have an environmental impact.

As pointed out above, increased competition in markets which supply the public sector favours efficiency in production both in the short and in the long run. The effect on the market for pollution abatement equipment should therefore be beneficial (See Chapter 9 below).

As a result of the opening-up of the public procurement markets, heightened competitive pressure and thus reduced prices can be expected to lead to cost reductions for public procurement measures which are decided upon by call for tender. Moreover, the extension of the directives for public building and supply contracts may tend to reduce the costs of work under such contracts. In the event that the money saved is used to increase public demand for environmental protection goods, more environmental protection projects can be realized with a given level of resources.

BOX 2D

The main Community policy actions in the field of public procurement

i) Revision of the "supplies" directive of 1976 (77/62 EEC). This was achieved by Council Directive 88/295 EEC (OJ L 127 20/5/88) adopted in March 1988. The new rules, in force since 1 January 1989 (with derogations for Greece, Portugal and Spain until March 1992), involve, inter alia, more transparent award procedures, obligatory use of European Standards, and more generous time-limits for the different phases of award procedures.

ii) Revision of the "public works" directive of 1971. This was achieved by a Council decision of 14 June 1989. The new rules are as much as possible in line with those of the "supplies" directive; however, the necessary adaptations to specific characteristics of the field of construction have been made, such as provisions concerning public works concessions or the "construction products" directive (88/106/EEC).

iii) The proposal for a "remedies" directive ensuring the availability of effective remedies in all Member States as well as providing for a mechanism for the rapid correction at the Commission's initiative of infringements detected during contract award procedures. The Council agreed on the text of a common position on 14 June. Final adoption an therefore be expected by the end of 1989 or early 1990. Member States will have to implement the directive by March 1992.

iv) Proposals for procurement rules for the "excluded sectors", that is, utilities in the field of water, energy, transport, and telecommunications. Following the first reading by the European Parliament, the Commission will submit a modified proposal. Its scope and contents will be very similar to the initial proposal although the text will be drafted in a different way, in particular, to merge the Two directives proposed originally into one.

v) A Commission communication on the social and regional aspects of Public procurement including actions to ensure compatibility of preference schemes with Community law.

Source : Commission of the European Communities Public Procurement and Construction: towards an integrated market (Luxembourg, 1988)

Different environmental effects can result according to whether the public procurer in the awarding of building or supply contracts is orientated to the "lowest price" or the offer which is most favourable on broader economic grounds. A decision on the basis of the lowest price offer can mean that no account is taken of other important criteria - such as the extent to which products, materials or services are environmentally friendly. Community directives relating to public procurement give a series of factors for the assessment of offers - price, time for delivery, running costs of goods supplied, quality, aesthetic characteristics of the goods, customer service, etc. These criteria must necessarily be objective and apply to every offer and must be stated in the information accompanying the call for tender. From an environmental point of view it must be asked whether the environmental friendliness can be used as an explicit criterion in an "economically most favourable" selection procedure, because it is difficult to define how much more expensive an environmentally friendly offer can be whilst remaining the lowest cost option.

Products and materials are environmentally friendly which are produced in a comparatively environmental and resource-protective way or cause less environmental damage. In Germany a procedure exists - under the blue Angel scheme - whereby products are certified to conform with certain specific environmental criteria. In the absence of such criteria, it will be necessary in every single case to consider the extent to which contract conditions should be supplemented by environmentally relevant criteria such as energy saving, recyclability, etc. The contract conditions to protect the environment should however be added. In this context the recent Commission initiatives to develop a scheme for green labelling may serve to introduce operational EC-wide environmental criteria.

Choosing the lowest cost option may lead to the purchase of polluting products, and products obtained though polluting processes. In such cases the relationship between economic efficiency and environmental protection would depend on the way in which the system of technical regulations and standards is harmonized. As pointed out above, the prominence of such aspects within the present framework of the Internal Market depends upon the extent to which national public procurement regulations take account of environmental objectives and the Polluter Pays Principle (such that polluters are required to cover the costs of environmental damage). Thus the most environmentally permissive countries would reap a trade advantage since they would be able to export at lower costs for the purpose of public procurement. This may also provide an advantage for those countries which have high environmental standards and little unemployment, since goods produced for public procurement through polluting processes would be manufactured abroad.

2.5 Opening-up of market-entry

2.5.1 Introduction

Even with the removal of physical border controls and technical barriers, Community firms may be restricted in exercising their rights of free movement throughout the Community. Having crossed the frontier into another Member State, Community firms are still restricted in what they can do there.

The Commission has therefore drawn up a set of action programmes to accompany free trade in goods with additional measures which would facilitate market entry through:

- a common market for services
- free movement of capital
- a common energy market.

Private services are probably the most important area in the completion of the Internal Market both in relation to their weight and in relation to their function in the process of fusing national markets.

Most activities in the service sector, as for example the transport sector are regulated to a greater or lesser extent by Member States, either through restrictions on market entry and legal regulations or by means of price and tariff arrangements. This has braked the expansion of trade in services within the Community and thereby a central dynamic field in its development.

Transport markets have an especial importance within the service sector. This is the case for both travel of businessmen and transport of goods, the basis for trade and the growing division of labour between EC Member States.

Transport represents more than 7% of the Community GDP and although it is by its nature a very widely traded service, it remains paradoxically one of the most highly regulated and protected markets in the Community. Although the Treaty envisaged specific action to replace national transport policies with a common transport policy, this has not been implemented by the Council.

The Commission has, however, put forward comprehensive proposals to deregulate all modes of transport - road, rail, inland waterways, marine transport and air.

The following measures should serve the goal of a free market in the field of road haulage:

The number of Community licenses for cross frontier road haulage shall be increased yearly. After EC Council decisions of June 1988 [1], the remaining restrictions on competition should be removed and the transport market should be liberalized step by step with harmonization, particularly of fiscal provisions (lorry and mineral oil taxes and motorway tolls). In addition the tariff structure shall be liberalized. Most importantly the Commission wishes to replace the still existing obligatory tariffs for cross border road haulage by reference tariffs. The open transport market will also require the opening up of cabotage allowing firms from another EC Member State to enter into national markets.

The effects of deregulation are to be seen in the first instance in the opening up of markets and the resulting increased competitive pressure. There will also be effects on the tariff structure. The level of tariffs on inland transport will have to adjust to the lower rates charged for cross border traffic. The resulting reduction in tariffs on road haulage will have an adverse effect on the competitive position of rail transport.

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[1] Reg 1841/88 EEC, OJ L 163/88, 30/6/88

In the case of air travel, a cartel operates in most of the world that appreciably limits competition between airlines: this applies equally to Europe where almost all the larger airlines are owned by their national governments. Air fares in Europe are fixed by agreements between governments which effectively prevent services being provided at competitive prices. These agreements render fares much higher than they would be in the absence of such restrictions, but it should be noted that recent judgements of the Court of Justice have brought the impact of Community competition law more fully into play in this sector and have disapproved of inter-governmental fare fixing arrangements.

Such cartels work against the interests of the consumer and lead to inefficient use of resources. At the end of 1987 the Council adopted proposals, which take effect from 1 January 1988, to increase competition gradually and to which would allow greater flexibility in the setting of fares and the allocation of flights, and lead to a gradual increase in competition. The Member States have not accepted those proposals in their entirety but have recently adopted a package of measures as a first step towards freer competition.

Similar protectionist policies apply to rail and marine transport, and in each case the Commission has put forward proposals to open up the market and remove protective restrictions.

A considerable degree of liberalization has already been achieved in relation to the Community-wide movement of capital. The Commission's objective is the complete liberalization of all financial transactions: this means, in effect, complete freedom of movement for all financial instruments including cash, bank transfers and all other financial instruments. This objective is clearly linked to the liberalization of financial services and ensuring fair conditions of competition and adequate saver and investor protection Community-wide. Complete freedom of movement for capital also has implications for each Member State's balance of payments and increased possibilities for tax evasion.

In this context the Council adopted, in June 1988, a directive to extend liberalization to investments in short-term securities, current and deposit account operations and financial loans and credits, subject to the possibility of the reintroduction of controls on short-term capital movements in emergency monetary or exchange rate conditions.

In July 1989 the EC Commission set out its ideas on the achievement of the goal of a large European Market for the energy sector by the end of 1992. Three proposals for directives are involved. They concern firstly the strengthened exchange of energy (electricity and gas) between Member States. Secondly strengthened transparency in electricity and natural gas prices for industry and thirdly declarations of, and coordination of, investments in the energy sector.

Notwithstanding the considerable variation which exists between conditions in individual Member States the Commission has given high priority, in the context of completion of the Internal Market to the introduction of the common carrier system. This would require the owners of electricity and gas transmission systems to also allow third parties to use these transport systems on payment of a fee.

The introduction of a right of transit on national grids should allow for a noticeable growth in the exchange of electricity and bring about as well a reduction in the average cost of access to electric energy and greater security in the supply of electricity at a Community level.

2.5.2 Potential impacts on the environment

The main impact of the proposed liberalization of transport services is expected to be a reduction in costs of road haulage; at the same time there will be a growth induced increase in goods traffic within the Community and with third countries. These supply and demand effects will together lead to an increase in traffic which will in turn tend to increase harmful emissions and noise, particularly on the main routes, and also energy consumption.

The liberalization of the skies over Europe, and the resulting reduction in airfares, will tend to increase flights on the already most crowded airspace in the world. Commission studies of the thirty most heavily used routes within the Community suggest that on these routes alone there could be up to 340 additional return flights between Germany, France and Britain.

An increase in flights will create increased environmental problems in the forms of aircraft noise, air pollution from aircraft emissions, use of land for new runways, etc., not to mention the risk of reduced aircraft safety due to cost-cutting competition and the increased risk of collisions due to inadequate air traffic control. Potential environmental impacts of growth in the transport sector are discussed in more detail in Section 3.3.2 and are summarized in Table 3.4 below.

Liberalization in the waste sector could also be very significant for environmental protection. If services in the waste sector are liberalized in the same manner as other services and movement of waste is given the same freedom as trade in goods then there will be significant waste tourism, with increased transport of hazardous wastes leading to greater risks for the environment. On the other hand liberalization in the waste sector could also stimulate the upgrading and more efficient operation of the waste management infrastructure (these issues are considered further in section 3.4 below).

Freeing the movement of capital and labour, and removing restrictions on land acquisition, is likely to accelerate the already existing trend in the direction of multinational investment in farming, forestry, fisheries development and tourism (this is discussed further in Chapters 3 and 4 below).

The achievement of a common energy market and the introduction of the common carrier principle to Member States with differing environmental and security standards as well as differing costs and prices (for reasons of state tariff setting, subventions, etc.) would give rise to structural changes in the Community energy market and to reductions in prices to the consumers. This could mean for some Member States:

- on the one hand, a reduction of environmental pressures and risks related to the domestic energy sector;

- on the other hand, an increase in the environmental problems associated with imports of transfrontier pollution.

Energy-saving schemes which promote the use of alternative energy sources could also be affected by the change in the competitive situation. To ensure that its outcome is beneficial in broad economic terms (including environmental impacts) completion of an Internal Market in energy must avoid pricing mechanisms that cause distortions of competition. Such distortions may result from different pricing schemes, subsidy schemes or environmental legislation, which lead to unjustified differencies in industrial costs between Member States. In its working document on the Internal Market [1], the Commission has already highlighted in a general way the problems which arise of the internal energy market for completion due to differences between the environmental legislation in Member States. In this context two aspects are of prime importance:

a) Different environmental legislation for energy production/ transformation facilities may result in different cost burdens to industry and may cause distortions of competition.

b) Different environmental standards for energy products (petrol, gasoil, etc.) may create technical barriers to trade in an unified Community market.

The existence of different national environmental legislation is not excluded by the Single Act which lays down in Art. 130t that "protective measures adopted in common pursuant to Article 130s" (environmental protection) "shall not prevent any Member State from maintaining or introducing more stringent protective measures compatible with this Treaty". As is noted above in Section 2.3.2 there would appear to be a conflict between harmonization needs in the framework of the Internal Market and possibilities for national legislation which is more stringent than the average Community standard. With regard to energy products this is not a totally new concept as in the past standards have already been agreed upon for petroleum products in a certain range.

The Commission also stated that harmonization of safety standards and their application is an essential element of a unified energy market. However, the legal framework in this sense is largely limited to radiation protection aspects as set out in Chapter II of the Treaty entitled "Health and Safety". There has been major developments in recent years in energy sector standards designed to protect the environment, e.g. a directive on emission standards for large combustion plants. The Commission will also be proposing emission standards for small and medium-scale combustion plants.

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[1] (COM (88) 238 final)

2.6 Removal of tax barriers

2.6.1 Introduction

Customs barriers between States are also tax barriers in that the enforcement of fiscal controls, and the making of tax adjustments means that customs controls constitute a device which insulates national systems of indirect taxation. This enables individual countries to follow, freely and effectively, independent approaches (in the choice both of taxable goods and of tax-rates) in the field of indirect taxation.

In the flexible framework established by the operation of this system, a variety of national approaches to indirect taxation has developed. Indeed, wide differences can be seen to exist among countries, as concerns both VAT and excise duties. The breadth of the tax base for VAT differs considerably between Member States, reflecting variations in the extent of zero-rating and sectoral exemptions; at the same time, rates of VAT vary significantly in number and levels. In the field of excise taxation, while a certain convergence in the choice of tax bases (of taxable goods) can be noticed, there remains a wide divergence in tax-rates. The Commission has formulated proposals for harmonization of indirect taxes which are outlined in Box 2E.

The proposed harmonization of the different bases of measurement for mineral oil taxes would require removal of sectoral tax concessions in various countries. Furthermore, the latest Commission proposal foresees for diesel a narrow tax band, with a set of minimum tax rates for petrol and LPG. The use ofa lower rate of excise tax to promote the use of lead-free petrol has expressly been approved by the Commission for its positive effect on the environment. The Commission therefore proposes that such a tax differential should prevail throughout the Community.

2.6.2 Potential Impacts on the environment

The Commission's proposals for fiscal harmonization introduce constraints on the use of tax instruments for environmental policy. Selective taxation of products (either intermediate inputs or final outputs) can give users (firms and final consumers) incentives to limit (and reduce) their consumption of products which give rise to environmental damage. The current proposal for fiscal harmonization considerably reduces the scope for such selective use of taxation at the national level.

As far as excise taxation is concerned, the most relevant feature of the EEC proposal seen from the environmental point of view is the potential drastic reduction in the number of products which could be taxed. Among products which have a relevant environmental impact, only oil products could be taxed. Furthermore, this should take place at rates which do not appear to bear any relationship to the environmental impact of their use (the proposed rates are in fact the arithmetic or the weighted average of the rates applied at present in the various countries). In particular for certain countries the present proposal would cause a rather sizeable decrease of the tax rate on diesel oil, thereby increasing demand and environmental problems, particularly with regard to air pollution.

BOX 2E

The Commission Proposals for Tax Harmonization

The Commission proposals for tax harmonization August 1987 and of June 1988 envisage a fundamental change in the system of indirect taxation, which the Commission believes to be essential to ensure the abolition of fiscal barriers and border controls in such conditions does not result in unacceptable distortions in the flows of international trade.

A main feature of the Commission's proposal is that the principle of destination would cease to be of general application. It would continue to operate as far as excise taxes are concerned; but, in the case of VAT, it would be abandoned in favour of the opposite principle of origin. However, the present system of allocation of VAT revenues among countries, based on allocation to consuming countries, would be maintained. To this end, other mechanisms are to be developed, such as the creation of a clearing mechanism.

In order to avoid competitive distortions as a result of differences in tax rate and structures, as part of the Internal Market programme, a harmonization is being sought on the basis of measurement and tax rates for certain consumption taxes. The Commission's present proposal (of 25.10.1989) is that for consumption taxes on mineral oil, tobacco and alcoholic drinks: rates of tax below the minimum level should be raised to this level by the end of 1992, while rates above this level could not be increased, but could be reduced to a level at or above the minimum rates. With respect to other goods, Member States should undertake to refrain from introduction of new consumption taxes and from increases in the rates or the areas of application of existing consumption taxes, except in cases where the taxes in question do not rely on border controls.

Due to its importance as a source of income in all Member States and its environmental effect, it is appropriate to study the question of mineral oil taxation in greater detail. Tax structures on oil vary greatly between Member States. Differentiations are made between oil as a consumption good and as a raw material, and concessions are made to different groups and economic sectors. A common tax on all oil-based fuel in the EC would correct distortion in competitive positions for the transport of persons and goods on road, water and in the air which up untill now were taxed differently. For example, in Germany this would mean a reduction in the tax concessions to inland shipping and airlines which are at present being subsidized to the amount of almost 400 million DM. Also the cheapening of gas oil for agriculture would have to be changed if harmonization were to come about.

The introduction of the most recent EC Commission proposal for harmonized mineral oil tax rates would mean significant changes for most Member States with noticeable effects on the mineral oil and transport markets. According to this proposal (see Table 2.3) the changes in the rates for petrol and diesel would mean significantly cheaper petrol in Italy, Denmark and France and cheaper diesel in the UK, Ireland, Denmark, Germany and France. Cheaper petrol would certainly mean that car manufacturers would have fewer incentives to develop and introduce car engines with low fuel consumption, which would be welcome from an environmental point of view. Charges in the relative prices of diesel and petrol would give rise to environmental effects which differ between Member States; these would not necessarily be favourable, and it is important that both petrol and diesel be taxed at rates which take account of their environmental impacts. For goods traffic, the cost of road transport would decline relative to that of rail.

The question of complementary taxes must also be raised, particularly in relation to vehicles. In some countries fees are used for the use of roads (in addition to taxes on mineral oils), and these can influence the composition of the vehicle stock. In Denmark, for example, luxury tax on cars, is especially high on diesel cars, balancing out the cheaper price of the diesel fuel itself. In contrast, other countries (for example, Germany and the Netherlands) have different vehicle tax rates for cars with petrol and diesel motors (e.g. according to their compliance with exhaust standards). The potential for adverse environmnental impacts from changes in vehicle and fuel taxes together are illustrated by the case of Ireland (see Box 3D below).

In relation to light heating oil, Great Britain, Belgium, Luxembourg and Germany would be faced with dramatic price rises (up to 40%). This would lead to a reduction in use of oil which is to be welcomed from an environmental point of view. On the other hand, Denmark, Italy aand the UK would face significant tax-induced increases in consumption with negative environmental effects. As light heating oil and diesel fuel products represent the same level of processing, the expected reduction in demand for heating oil could be used to partly fill the higher demand for diesel fuel in comparison to petrol. The rise in taxes on heating oil would provide competitive advantages for other heating methods which in some areas are more environmentally friendly - gas, electricity.

Table 2.3

CURRENT AND PROPOSED RATES OF EXCISE DUTY ON MINERAL OILS (In ECU (1), per 1000 Litres)

Member Countries (2) Mineral Oils	BE	DK	FRG	FR	GR	IRL	IT	LUX	NL	UK	SP	PT	Commission 1987(3)	Proposal 1989 (4)
PREMIUM PETROL	274	460	313	476	323	372	553	205	339	316	346	273	340	337 (min)
UNLEADED PETROL	252	414	274	416	318	350	553	205	326	265	346	270	310	287 (min)
DIESEL	138	218	213	214	122	282	156	98	108	268	168	122	177	195-205
LIQUID PETROLEUM GAS (Automotive)	0	154	159	273	49	222	92	21	0	150	69	13	85	84,5 (min)
HEATING GAS OIL	0	219	28	54	84	48	156	0	44	17	52	18	50	47-53
HEAVY FUEL OIL (Per tonne)	0	246	14	16	97	10	8	2	15	12	1	8		16-18
LUBRICANTS (Per tonne)	0	0	256	0	92	55	273	2	0	0	355	0		

(1) ECU exchange rates at 1 January 1989
(2) Situation at 1 January 1989
(3) COM(87)327
(4) Commission proposal of 25.10.1989

Source: Commission of the European Communities, DG XXI.C.2.

Harmonization has not been achieved on other taxes on consumption either. In fact the Council has expressly approved national tax concessions by Member States on environmental protection grounds. The legally non-binding Commission request, that Member States avoid the introduction of new consumption taxes and changes in existing consumption taxes, has hitherto been of little practical significance. Member States have meanwhile, without the Commission's disagreement, introduced or modified environmentally-related taxes too e.g.:

Italy: a new tax on plastic bags of 100 lire per bag;

Denmark: a CFC tax of 30 Danish krone per kg net weight - a tax on plastic cookery as well as drinks packaging and containers;

Nether-
lands: Tax concessions for certain cars with reduced exhausts;

Germany: Tax concessions for certain cars with reduced exhausts
tax on natural gas.

The Council has expressly welcomed tax concessions for certain cars with reduced exhausts. From an environmental point the following conclusions can be made on the planned tax harmonization:

- the tax advantage for diesel fuel foreseen to promote the movement of goods and persons may be environmentally counterproductive;

- energy price increases may well be desirable on environmental grounds in order to limit or reduce consumption and hence environmental impacts. The necessary price increases should not be precluded by a common or minimum tax rate which is too low or a tax band which is too restrictive;

- consumption taxes cannot be dispensed with as an instrument for adjusting the price of consumption and thereby avoiding harm to environmental resources, particularly in view of the imporrtance of market-based economic mechanisms in other areas related to the completion of the Internal Market. The usefulness of price signals will also be underlined by the Commission's proposal to separate the tax rates for unleaded and leaded petrol;

- it is necessary to coordinate the overall impact of complementary fiscal measures, such as vehicles taxes, fees on road use, mineral oil taxes, etc..

It should be considered whether in the complex of taxes and charges to be harmonized fees for road use and other transport charges should not be included. These changes can distort the competitive position of individual national transport sectors, and also lead to adverse environmental impacts.

2.7 Conclusions

The principal measures being undertaken to implement the Single Market include: the removal of border checks, the new concept of harmonization of technical standards and regulations, the reduction of market entry barriers, and the opening up of public procurement, and fiscal harmonization.

These and other measures may have a considerable impact on environmental quality, since barriers still exist between Member States for the enforcement of national regulations to implement environmental policies.

Some examples:

* Border checks are used to control the movement of nuclear and hazardous waste and to meet obligations under International Conventions relating to the trade in rare and endangered species.

* Technical Standards and Regulations are used by Member States to ensure that products are environmentally acceptable.

* Fiscal provisions are used by some Member States to encourage environmentally positive behaviours, and to discourage the reverse.

To the extent that these barriers are removed or modified, and no alternative policy measures put in place, a number of additional environmental pressures is to be feared:

- There is a risk of large-scale waste tourism;

- The absence of Community product regulations could permit the Community wide circulation of products originating in countries without stringent product controls;

- The proposals for tax harmonization could preclude the use of fiscal measures for environmental management and stimulate pollution-intensive energy use;

- The opening-up of market-entry would permit the entry of new-comers especially in the field of road haulage and air transportation and lead to increases in environmental pressures;

- Removal of controls on the acquisition of land may have the effect of promoting developments with significant environmental consequences.

As the Internal Market programme has a considerable potential for negative impacts on environmental quality, there is a strong need to formulate an adequate policy response. Action is needed to ensure that full account is taken of these environmental implications when shaping the 1992 measures.

CHAPTER 3

SECTORAL IMPACTS AND THE ENVIRONMENT

3.1 Introduction

This chapter analyzes the effects of the completion of the Internal Market on the nature or pattern of economic activity, and the consequent environmental impacts. The analysis is used to identify specific sectors of economic activity in which there are likely to be economic changes with significant environmental implications. The chapter addresses the following main questions:

- how will 1992 influence the pattern of growth in the Community economy? what economic sectors are likely to grow? which to decline?

- how will this affect the Community environment? what will be the nature and location of the impacts? are there particular sectors of economic activity that may be expected to give rise to specific environmental problems?

Certain sectors are examined in more detail: manufacturing, industry, energy production and use, transport, tourism and agriculture. These examples are intended to illustrate the nature and type of problems that may arise.

The impact of the completion of the Internal Market on the environmental industry is examined in Chapter 9. This sector supplies technologies and services which monitor, prevent, limit or correct environmental damage. It is analyzed separately in Part III of the Report ("Policy Responses"), because it should be considered both as an industrial sector in its own right and also as a "transmission mechanism" providing an essential linkage between policy initiatives and the quality of the environment.

It is important to note that it is in most cases difficult to distinguish between environmental impacts that will arise from specific 1992-related measures and those that would in any case occur as the European economy continues to grow. Where possible, the chapter focuses on ways in which the environment may be affected by changes in particular sectors due to removal of specific barriers.

Changes in the sectoral distribution of economic activity, in the context of a general increase in economic growth, will give rise to changes in the amounts, composition and geographical distribution of waste arising. The completion of the Internal Market will therefore have implications for the transport, treatment and disposal of wastes. This topic is discussed in Section 3.4 below.

3.2 Changes in the Structure of Economic Activity

3.2.1 Impacts of Market Integration

The report on "The Economics of 1992" identifies obstacles to the full realization of the potential of the manufacturing sector in the Community, due to customs formalities, differences in technical regulations and disparate tax treatment. The report also finds that protectionist public procurement policies result in high prices and inefficiencies in industries such as telecommunications, energy production (for example, manufacture of electricity generation systems) and transportation, and that specific regulations impede competition in the service industries such as transport, insurance and banking.

It can be anticipated that there will be an overall increase in economic activity, as barriers affecting trade are eliminated with the result that increased competition leads to lower prices for consumers and competitive advantages for producers with lower costs. These effects of the completion of the Internal Market will develop over time and involve a restructuring of economic activity within the European Communities. This structural process implies a rationalization of inefficient firms as competition puts pressure on all forms of economic activity to improve productivity and to reduce prices, as economies of scale are achieved.

It is possible to distinguish in broad terms four stages, as the removal of barriers leads to changes in the nature and extent of economic activities within the Community. The first two stages are essentially short term in nature and are classified as barrier removal effects.

- Stage 1: With the elimination of barriers affecting trade, static benefits are realized by exporters and importers of goods between EC countries with a considerable reduction in border delays and administrative costs associated with formalities.

- Stage 2: Barriers which inhibit cross border competition and market entry are eliminated. This will tend to reduce prices.

Over time, the third and fourth stage market integration effects will begin to materialize in the form of dynamic benefits.

- Stage 3: Competition will lead to a restructuring of industries (mergers, joint ventures, etc.) over the medium term with rationalization of inefficient plants and investments to achieve economies of scale.

- Stage 4: Competition will also stimulate moves to improve efficiency by elimination of overmanning, excess inventories, and reduction in overhead costs.

In the various areas of economic activity, completion of the Internal Market may have impacts which are of greater or lesser significance, or, in some cases, neutral (See Box 3A). The effect on a particular sector will depend on the present importance of barriers to trade and market entry and on the potential for achievement of economies of scale. The abolition of intra-Community barriers will increase competition between producers in different countries, accelerating adjustments in certain sectors. It will also offer opportunities to build on the strengths of particular localities: those with advantages such as good communications and a reserve of highly-skilled workers will be in a good position to move into new markets after 1992, thus bringing about shifts in the structure of production.

Changes will arise as a result of a series of effects which can be classified into three groups:

- direct effects of the White Paper measures, whether they apply specifically to certain sectors or to all sectors;

- induced effects arising from changes in relative prices, market share, or overall demand;

- strategic effects, principally the result of changes in the behaviour of firms in the context of an expansion of trade within the Community and with the rest of the world.

One of the principal factors determining the sensitivity of industrial sectors is the extent and nature of non-tariff barriers. On the basis of a survey of 11,000 firms, the Cecchini report classifies twenty industrial sectors according to the overall impact of non-tariff barriers; the results of this survey are presented in section 2.3.1 above. It is apparent that there is wide variation between sectors.

Other factors determining the impact on different sectors of the completion of the Internal Market include: the dispersion of prices, the scope for economies of scale, the degree of concentration and the extent of internationalization.

BOX 3A

Completion of the Internal Market - The "Gainers" and the "Losers"

The industries which would appear to gain most from integration are those which benefit most from the opportunities to exploit economies of scale - transport, chemicals, machinery and instrument manufacturers and paper and printing. However, the markets for equipment goods such as these exhibit price disparities below the Community average, presumably because a fair degree of international competition already exists (Table 3.A.1).

Table 3.A.1
Price Dispersions in the European Community by Product Group (1985)

	Without Taxes	With Taxes
Consumer goods	15.2	19.4
of which: durable goods	12.3	17.4
Services	n/a	27.2
Equipment goods	12.4	12.4

Co-efficient of variation of prices for Euro-9

Source: "The Economics of 1992", Table 7.1.1

By contrast, there are large price disparities in those industries where the technical economies of scale are lower (such as food, drink, textiles and clothing), and where there is considerable potential for exploitation of economies of scale in the areas of marketing and distribution. This suggests that the consumer sectors may see an accelerating trend in pan-European business.

The following assessments have been made of the impacts on industrial sectors - significantly positive, minor or neutral - of the Internal Market in "The Environment in the Context of the Internal Market" Report by Cambridge Decision Analysts Ltd. to the Commission of the European Communities Directorate-General for the Environment, Nuclear Safety and Civil Protection, 1989.

(i) Significant Impact

The available evidence suggests that the following sectors should generally benefit from completion of the Internal Market:

- Road Transport - Greater trade flows and liberalization of existing domestic and international traffic should create major opportunities.

- Food and Drink - Harmonization of duty on alcohol would change regional consumption patterns. Considerable opportunities exist for consolidation in the fragmented drink sector. Present barriers in the food industry are minor.

- Leisure - Hotels stand to benefit from improved business and tourist traffic.

- Airlines - Existing liberalization measures are relatively modest, but efficient airlines should now begin to have scope to expand market share.

- Advertising Agencies - consolidation of major brands, together with pan-European satellite-borne media, should lead to more centralized European advertising campaigns.

- Consumer Medicines - Harmonization and relaxation of restrictions on advertising and distribution should boost sales.

(ii) Minor Impact

The following sectors will be minimally affected by completion of the Internal Market:

- Building Materials - There is likely to be some cross-border trade potential in lighter materials.

- Construction - An information bias towards local contractors may remain.

- Motors - Non-tariff barriers are not significant, and questions remain concerning the degree of European co-operation and policy towards Japan.

- Retailing - Non-tariff barriers not significant, except for mail order.

- Printing and Publishing - This industry is already expanding worldwide, and non-tariff barriers are not particularly significant.

- Oil Companies - The industry is already internationally integrated; there could be minor gains to marketing companies in previously highly regulated countries.

(iii) Neutral Impact

These three sectors will not immediately benefit from completion of the Internal Market:

- Information Technology - Further rationalization is needed to meet US/Japanese challenge; only a few firms seem ready.

- Chemicals - Harmonization of frontier controls and standards would effectively increase capacity and may lead to short-term pressure on profits.

- Pharmaceuticals - Gains from harmonized approval procedures may be offset by single Europe-wide price levels, lower than the average now prevailing.

3.2.2 Changes in manufacturing industry

In the longer term, much will depend upon the ability of Community industry to respond to the challenges of the Internal Market. Thus, for example, the "neutral" impacts on information technology and pharmaceuticals (cf. Box 3A) could be transformed by a vigorous response to competitive pressures. This is illustrated by the threefold classification set out in Box (3B, page 3.11), which is based on a set of sectoral forecasts of the economic outlook for Europe in 1993:

- The first group is made up of sectors subject to rapid technological change in which the Community has tended to lag behind its main competitors (for example, information technologies, new materials, biotechnologies). In these sectors, the Community's competitive position may improve following completion of the Internal Market: the eventual outcome of this process would depend upon the response of industry, within the Community and elsewhere, to the competitive challenge;

- The second group is made up of sectors where gains associated with completion of the Internal Market would take the form of improvements in productivity without any significant growth in activity, and in which there could be a decline in employment Community-wide. The textile, plastics processing and chemical industries would appear to fall within this category.

- The third group includes sectors where, as in the previous case, no particular acceleration in output can be expected but where production structures are dissimilar, such that the negative effect on employment will tend to be concentrated in certain countries. This sensitive group includes the clothing sector and other everyday consumer goods industries, as well as the automotive industry.

In parallel with the removal of barriers to trade, there are a number of other developments within the Community which will interact with completion of the Internal Market and are likely to have considerable implications for the Community environment.

Four developments are likely to be of particular significance in this context:

- Transport: The Commission has made proposals for a Community Action Programme on the completion of an integrated transport market, which would include a large number of major infrastructure developments. These will clearly have some direct effects on local residents (as has been indicated by the concern in the south east of England arising from the London Channel Tunnel high-speed link); furthermore, experience of the past fifty years suggests that the completion of such links will have an impact on the distribution of economic activity and urbanization.

- Energy: In July 1989 the EC Commission set out its specific ideas on the achievement of the goal of a large European market for the energy sector by the end of 1992. Three proposals for directives are involved.

  They concern firstly the strengthened exchange of energy (electricity and gas) between Member States; secondly, strengthened transparency in electricity and natural gas prices for industry; and thirdly, declaration and coordination of investments in the energy sector.

Priority in the Commission's considerations on the completion of the Internal Market has, notwithstanding the highly different conditions in individual Member States, been put on the introduction of the "common carrier" system. Common carriage means for the owners of electricity and gas transmission systems in the EC that they must also allow third parties to use these transport systems for the payment of a fee.

It can be assumed that the completion of the Internal Market in energy will inevitably affect the division of labour between different energy sectors within the Community and within individual Member States.

- Structural Funds: As part of the 1992 programme, a considerable amount of Community funds will be spent in the "regions", primarily on projects designed to stimulate local economic growth. This will include both infrastructure investment as well as some more targeted economic development projects. The "regions" include some of the most environmentally sensitive areas in the Community. Not only is there concern about habitat protection but also ensuring that growth is shaped so as to protect the local amenity of the population. It can be assumed that the envisaged increase of the Structural Funds will have impacts on sectoral activities; these impacts are considered in more detail in Chapter 4.

- Agriculture: While reform of the Common Agricultural Policy is not technically a part of the 1992 programme, this will inevitably affect land use within the Community, and account needs to be taken of its implications.

3.3 Environmental Implications of Sectoral Impacts

This section reviews some of the implications for the environment of the changes that can be anticipated up to 1992 and beyond, focussing primarily - but not exclusively - on the effects of completion of the Internal Market. It must be emphasized that this is not intended as a comprehensive review - its purpose is rather to highlight the likely effects and to identify policy actions that may be required with particular reference to certain sectors which are likely to be especially significant in this respect. In question are energy, transport, industry, tourism and agriculture: an assessment is made of the impacts of changes in these sectors, and others, on the receiving environment.

3.3.1 Environmental Impacts of Industrial Changes

In view of the - unavoidably - tentative nature of forecasts of economic impacts at sectoral level, it is not possible to assess with any certainty the likely environmental effects of these developments.

Certain sectors have been identified in Box 3A as likely to be significantly affected by completion of removal of intra-Community barriers:- some of the environmental implications are discussed below, with reference to the impacts of growth in transport and tourism, and of changes in agriculture. Other sectors may be less immediately affected by the removal of barriers, but with potential for increased growth in the longer term following the completion of the Internal Market.

It is also possible to identify certain sectors which give rise to particularly significant impacts on the environment: Table 3.1 shows impacts associated with some of these sectors. Drawing on the evidence of this table, together with that of Box (3B), the following industrial sectors may be identified as having potentially significant environmental impacts due in part, to developments associated with "1992":

- Micro-electronics
- Textiles
- Chemicals and Pharmaceuticals
- Food production.

3.3.2 Environmental Impacts of Changes in Energy Production and Use

Experience from the past suggests that the production and use of energy is the principal source of many of the pollution problems within the Community. Table 3.2 illustrates the broad scope of environmental effects associated with the different energy sectors.

With respect to air pollution, the principal sources within the Community are electricity generation and motor vehicles (other - less prominent - sources include the chemical industry, metal industries and refining). Electricity generation accounts for some 35% of carbon dioxide (CO_2) emissions within the Community and (with fuel combustion by industry) for approximately 90% of sulphur dioxide (SO_2) emissions. Over the Community as a whole (with some regional variation), electricity generation accounts for between 25 and 35% of emissions of nitrogen oxides (NO_x). The role of electricity generation in SO_2 emissions, however, varies across the Member States depending on the mix of fuels used. In France, for example, power generation accounts for only about 30% of emissions because of the significant role of nuclear power in this country. In Ireland, where peat represents a key fuel source, power generation accounts for about 20% of SO_2 emissions. Conservation measures and other emission control measures, and the proportion of electricity from nuclear sources, are all key factors influencing emission levels and the relative roles different sectors have in overall emissions.

TABLE 3.1

SELECTED ENVIRONMENTAL EFFECTS OF SELECTED INDUSTRIAL SECTORS

SELECTED INDUSTRIAL SECTORS	RAW MATERIAL USE	AIR	WATER RESOURCES	LAND RESOURCES	SOLID WASTE	NOISE	RISKS OF ACCIDENTS	OTHER IMPACTS
MICRO-ELECTRONICS	Chemicals (e.g. solvents) acids	Toxic gases		Contaminations of soils and ground water by toxic chemicals (eg. chlorinated solvents) Accidental spillage of toxic material				
PETROCHEMICAL REFINERIES	Inorganic chemicals	Major polluter: SO2, HC, NOx, CO, particulates, odours	Cooling water BOD, COD, oil, phenols, chromium, effluent from gas scrubbers		Sludges from effluent treatment, spent catalysts, tars		Risk of explosions and fires	Risk of accidents, noise, visual impact
CHEMICALS	Inorganic and organic chemicals	Major polluter: organic chemicals (benzene, toluene), odours	Organic chemicals, heavy metals, suspended solids, COD, cyanide		Major polluter: sludges from air and water pollution treatment, chemical process wastes		Risk of explosions, fires and spills	Exposure to toxic substances, potentially hazardous products
IRON AND STEEL	Iron ore, limestone, recycled scrap	Major polluter: SO2 particulates: NOx, HC, CO, hydrogen, sulphide, acid, mists	Process water BOD, suspended solids, oil, metals, acids phenols, sulphides, sulphates, ammonia, cyanides, effluents from wet-gas scrubbers		Slag, wastes from finishing operations, sludges from effluent treatment		Risk of explosions & fires	Accidents exposure to toxic substances and dust, noise
NON-FERROUS METALS (e.g. aluminium)	Bauxite	Major polluter: CO, SO2 particulates	Gas scrubber effluents containing fluorine, solids and hydrocarbons		Sludges from effluent treatment, spent coatings from electrolysis cells (containing carbons and fluorine)			
TEXTILES	Wool, synthetic fibres, chemicals for treating	Particulates, odours SO2, HC	Process water BOD, suspended solids, salts, sulphates, toxic metals		Sludges from effluent treatment		Noise from machines	
LEATHER	Hides, chemicals for treating and tanning		Process water BOD, suspended solids, sulphates, chromium		Chromium sludges			

Source: OECD

Box 3B

SECTORAL IMPACTS OF THE SINGLE MARKET

GROUP I

Definition : Industries undergoing rapid technological change where the Single Market could increase Europe's production	
Industries	**Challenges and Opportunities**
Telecoms services:	Value-added services and continental telecoms
Telecoms equipment:	Capitalizing on Europe's technological lead
Software:	Europeans' mastery of complex systems
Data proc. equipment:	National standard bearers' work on new architectures
Aerospace:	Strengthening Europe's lead
Consumer electronics:	High-definition TV, Europe's chance to catch up
Audiovisual:	The key to a European culture
Semiconductors:	Reconciling the relocation of production offshore and the development of European R&D potential

GROUP II

Definition : Industries with productivity gains outstripping production growth Production structures fairly similar throughout Europe	
Industries	**Challenges and Opportunities**
Textiles:	Revitalization of traditional industry by new technology
Plastics:	Capitalizing on the worldwide dominance of the European chemical industry
Pharmaceuticals:	The risk of falling behind in biotechnology calls for stepped-up R&D
Oil and gas:	Adaptation for clean fuels (lead-free petrol)
Machine tools:	The mastery certain EC countries have of advanced electronic systems should spread to the rest of Europe
Constr. and housing:	Reorganization of the industry with the opening of public contracts
Food, drink and tobacco:	Sweeping changes in the structure of the industry

(continued)

Box 3B (continued)

Group III

Definition : Industries with unequal performance in different European countries No marked increase in production	
Industries	**Challenges and Opportunities**
Clothing:	Opportunity for new organization structures and innovative link-ups with distribution ("Benetton System")
Automotive:	How to make six general car makers survive and thrive
Steel:	Diversification into new materials to curb job losses
Coal:	An orderly retreat in some countries
Insurance:	Sweeping structural changes of the industry and its products
Transport:	Avoiding "social dumping" in road transport
Electricity:	A single market for distribution still has to be created

Source: "EUROPE IN 1993: Economic Outlook by Sector" - January 1989
BIPE (Paris)/IFO-INSTITUT (Munich)/PROMETEIA (Bologna)

TABLE 3.2

SELECTED ENVIRONMENTAL EFFECTS OF THE ENERGY SECTORS

ENERGY SECTORS	RAW MATERIAL USE	AIR	WATER	LAND RESOURCES	SOLID WASTE	NOISE	RISKS OF ACCIDENTS	OTHER IMPACTS
	COAL	-SO2-NOx particulates -Dust emission -Long-range transport and deposition of pollutants -Climatic impacts of cooling towers	-Acidic discharges from mineworkings -Mine liquid waste disposal -Water availability -Wash water treatment -Water pollution from storage heaps	-Land subsidence -Land use for mines and heaps -Land reclamation of open cast mines	-Solid wastes -Ash disposal	-Noise of rail transport		-Visual impact of coal heaps -Visual impact of cooling towers and power lines
	PETROLEUM	-H_2S production -SO2, NOx, CO2 HC, ammonia, particulates, trace elements	-Oil spills -Water availability	-Land use for facilities and pipes			-Explosions and fires -Pipeline leaks -Spills	-Odour -Visual impacts of pipelines
	GAS	-HC emission (mainly methane) -Trace metal emission -H2S and NOx combustion emission	-Liquid residual disposal	-Land use for facilities and pipes			-High leak potential -General safety -Spills and explosions	-Visual impacts of pipelines
URANIUM FUEL CYCLE AND ELECTRICITY FROM NUCLEAR POWER PLANTS		-Radioactive dust -Gaseous effluent (radionuclides F, NO) -Noble gas, H-3 I-131,C-14 -Local climatic impact of cooling towers -Decontamination and decommissioning of nuclear power plants	-Mine drainage -Underground water contamination -Water availability -Thermal releases -Liquid radionuclide emission CO-60, Sr-90, I-131, Flu-106, Cs-136 and 137	-Land subsidence (mine) -Land reclamation of open cast mines --Land use for mines	-Solid chemical wastes, radiological wastes -High level radioactive		-General safety	-Recycled fission products -Radioactive products -Visual impact of cooling towers and power lines

Source: OECD

Fuel combustion by industry represents a major source of SO_2 and CO_2 emissions with approximately one third and one fifth respectively of Community emissions. Other significant emission sources include commercial and domestic fuel usage (approximately one quarter of Community CO_2 emissions) and solvents (40% of Community NMHC emissions).

Transport sources (predominantly motor vehicle emissions) are the main source of NO_x emissions, accounting for half the Community total. Transport is also a major source of emissions of hydrocarbons (NMHC) and CO_2, accounting for 40% and 20% respectively of total emissions within the Community.

Effects of Economic Growth on Emissions of Sulphur Dioxide, Nitrogen Oxides and Non-Methane Hydrocarbons

Projections are shown in Box 3C for emissions of SO_2, NO_x and non-methane hydrocarbons under two economic growth scenarios: annual growth rates in Community GDP of 2.5% and 4% (over the period 1987-2000). Hydrocarbons are of significance because of the important role they play in ozone formation.

These emissions projections assume implementation of the recent EC directives - the Large Combustion Plant Directive and Luxembourg Agreement with Stage 2 for small cars - and planned national policies (as of 1987) in Denmark, the FRG, Italy, the Netherlands and the U.K.

The projections show emissions by the year 2000 being 10-20% higher for the EC as a whole with an annual growth rate of 4.5% rather than 2%, illustrating that growth is a major determinant of the amounts of all three energy-related pollutants, unless measures are taken to restrict energy consumption and/or emissions.

It can be seen that growth in emissions will be greater in the southern states; the key reasons for this are:

- higher economic growth rates;
- less stringent requirements for emissions control under EC directives.

In the case of NO_x, for example, while northern states are expected not to exceed 1987 emission levels with application of the EC directives even under the 4% growth rate scenario, emissions in southern states will undergo more rapid growth and exceed 1987 levels under both economic growth scenarios, despite existing EC controls notwithstanding the future application of EC legislation.

Passenger Vehicle Movements and Emissions of Nitrogen Oxides and Non-Methane Hydrocarbons

The effects of increased vehicle kilometrage on emissions from passenger vehicles in the EC is illustrated in Table 3.3. A comparison of the effects of annual growth rates in vehicle kilometrage of 2% and 2.5% shows that the higher growth rate would result in levels of emissions of NO_x and NMHCs for the year 2000 which are more than 10% above the emission levels with the lower growth rate.

Box 3

Emissions Projections with Recent Developments in EEC Directives *(including planned policies)*, 2000

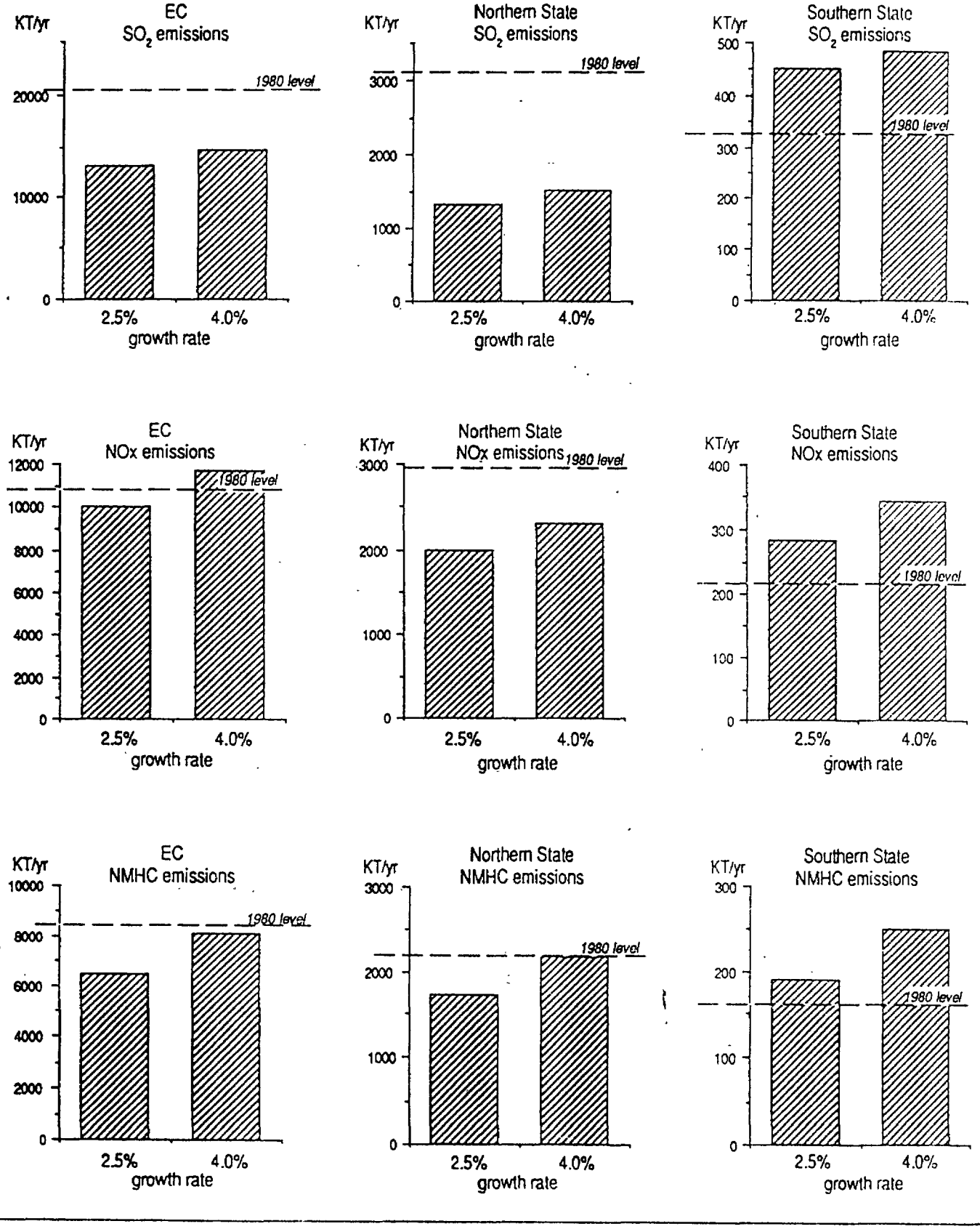

Table 3.3

Emissions of Nitrogen Oxides and Non-Methane Hydrocarbons from Passenger Vehicles in the EC, Year 2000 (kt/year)

	Average Growth Rate in Vehicle Kilometrage (% per year)		
	2	2.5	% difference
NO_x	2835	3140	10.8
NMHCs	1073	1190	10.9

Source: "The Environment in the Context of the Internal Market" Report by Cambridge Decision Analysts Ltd. to the Commission of the European Communities Directorate-General for the Environment, Nuclear Safety and Civil Protection, 1989.

Effects of Economic Growth on Emissions of Carbon Dioxide

Table 3.4 shows emission predictions for CO_2 under two economic growth scenarios - annual growth rates in GDP of 2.5% and 4% for the Community as a whole (over the period 1987-2000). The emission projections, as with those for SO_2, NO_x and NMHCs, assume implementation of the recent EC directive - the LCP Directive and Luxembourg Agreement with stage 2 provision for small cars - and planned national policies (as of 1987) in Denmark, Italy, the Netherlands and the U.K.

Table 3.4

Carbon Dioxide Emission Projections for the EC under different economic growth scenarios (millions of tonnes of CO_2)

	1983	2000 (GDP growth rate of 2.5%)	2000 (GDP growth rate of 4%)
Power generation	734	1162	1421
Refining	63	67	76
Other industry	424	491	553
Commercial & domestic	542	494	494
Transport	467	605	716
TOTAL	2231	2821	3259

Source: as for Table 3.3

It can be seen from this table that economic growth is a major determinant for emissions of CO_2; unless conservation and other measures are taken, a difference of 1.5 percentage points in the annual rate of economic growth would increase the level of emissions in the year 2000 by 15%. World total CO_2 emissions are estimated to be of the order of 22×10^9 tonnes (1988); and the EC is therefore responsible for some 10% of the total at present. While the relative contribution of the EC will diminish as the developing countries industrialize, a 15% increase in EC emissions (over and above the 26% increase which is anticipated for the 2.5% growth scenario) is still considered to be significant in global terms; this is reinforced by recent thinking that significant reductions in CO_2 emissions may be necessary to avoid serious consequences from the greenhouse effect.

3.3.3 Environmental Impacts of Changes in Transport

A number of key developments associated with completion of the Internal Market will influence the growth and pattern of road and rail transport in the Community. These developments include:

- Community Action Programme on integrated transport infrastructure;

- deregulation of the transport industry (removal of quotas, tariff controls and permits to facilitate rapid, smooth running international movement of transport) - potential implications for freight movements are set out in Box 3D;

- general economic growth and harmonization of excise duties, with implications for car ownership and passenger vehicle movements.

The possible effects of harmonization in a country with high levels of vehicle and fuel taxes are illustrated by the case of Ireland (Box 3E). In the longer term the pattern of transport in the Community may change as a result of demographic movements induced by the completion of the Internal Market and associated developments. These movements of population could lead to the formation of new urban centres and to the types of traffic problems associated with urbanization.

Significant increases in passenger vehicle and road freight movements are expected. Increase in passenger vehicle traffic has particular implications for the urban environment; most major cities are already seriously congested and few countries have yet to implement wide-ranging urban traffic restraint policies (a notable exception being the Federal Republic of Germany). Removal of border controls is also expected to lead to an increase in the number of long-distance trips.

It can be anticipated that completion of the Internal Market will lead to significant growth in transport. In addition to the increase in demand resulting from economic growth, there are likely to be supply side-effects from liberalization of air travel and road haulage. Thus the developments in the transportation sector will put additional pressure on the environment. The main

Box 3D

FREIGHT TRANSPORT BY ROAD AND 1992

At present road haulage companies are controlled by a complex system of tariffs and licence restrictions which differ from one Member State to the next. Once deregulation is complete, road haulage companies will be free to compete on an international basis.

The benefits of deregulation will be in improved efficiency and reduced costs through elimination of many unladen journeys due to cabotage and time-wasting border controls. The Cecchini Report quoted a study by Ernst and Whinney [1] in which it was estimated that the cost of lorries travelling empty is as much as 1.2 billion ECU, of which some 20% may be related to regulatory restrictions.

The immediate impact of deregulation would - other things remaining the same - reduce the distance travelled. However, it is likely that this effect will be more than counterbalanced by increases in demand, in response to a reduction in road haulage costs, and dynamic impacts of the Internal Market - such as economic growth, spatial concentration of production - by increases in passenger vehicle traffic (resulting from increases in income) and by the effects of increased traffic congestion, which reduces the efficiency of the utilization of vehicles. Thus with increased trade and lowering of prices, 1992 is expected to result in an increase in freight movements by road. 70% of Europe's freight travels by road (growing from about 50% in 1965) and completion of the Internal Market is expected to lead to further competitive advantages for road transport over rail and up to 30-50% more trans-border lorry traffic.

Rationalization of distribution systems is likely to take place first where freight activity is already high, namely around the axis of the UK - Benelux - West Germany - Italy.

[1] Ernst & Whinney, "The Cost of Non-Europe: Road Transport of Merchandise"

BOX 3E

EFFECTS OF HARMONIZATION OF EXCISE DUTIES FOR CAR OWNERSHIP IN IRELAND

Automobiles are among the items which attract a very high rate of excise duty in Ireland. Petrol is likewise relatively heavily taxed. If the Commission were to proceed with its initial proposals to harmonize excise duties, the following would be the outcome for car prices.

	Existing IR£	Post-Harmonization IR£
Recommended retail price	11,000	7,696
Excise duty	2,387	0
V.A.T.	2,200	1,283
Pre-tax price	6,413	6,413
Total tax mark up%	71.5%	20.0%

Petrol would fall from 130.5 pence per gallon to 120.0 pence. A fall amounting to 30% of the existing car price will certainly accelerate the recovery in the rapid growth in car numbers, other things being equal. However, other things will not be equal. If the Single Market achieves the extra GNP growth envisaged, this will further stimulate the increase in car numbers, so that cities in general, and Dublin in particular, could experience traffic congestion on a major scale. The expected increase in tourism numbers will further exacerbate the problem.

Source: F. Convery, (1989). Regional, Economical and Environmental Impacts of the Single Market - Ireland. Draft report for the European Community Task Force on the Environmental Implications of the Single European Act.

TABLE 3.5

SELECTED ENVIRONMENTAL EFFECTS OF PRINCIPAL TRANSPORT MODES

TRANSPORT MODES	RAW MATERIAL USE	AIR	WATER RESOURCES	LAND RESOURCES	SOLID WASTE	NOISE	RISK OF ACCIDENT	OTHER IMPACTS
ROAD TRANSPORT	MINERAL OILS	Air pollution (CO, HC, NO particulates and fuel additives such as lead)	Pollution of surface water and ground water by surface run-off; modification of water systems by road building	Land taken for infrastructures; extraction of road building materials	Abandoned spoil tips and rubble from road works, road vehicles withdrawn from service; waste oil	Noise and vibration from cars motorcycles and lorries in cities and along main roads	Deaths, injuries and property damaged from road accidents; risk of transport of hazardous substances; risks of structural failure in old or worn road facilities	Partition or destruction of neighbourhoods, farmland and wild habitats; congestion
AIR TRANSPORT	KEROSENE	Air pollution	Modification of water tables river courses and field drainage in airport construction	Land taken for infrastructures; dereliction of obsolete facilities	Aircraft withdrawn from service	Noise around airports	Aircraft accidents	
MARINE AND INLAND WATER TRANSPORT	MINERAL OILS		Modification of water systems during port construction and canal cutting and dredging	Land taken for infrastructures; dereliction of port facilities and canals	Vessels and craft withdrawn from service		Bulk transport of fuels and hazardous substances	
RAIL TRANSPORT	COAL, OIL FOR ELECTRICITY			Land taken for rights of way and terminals; dereliction of obsolete facilities	Abandoned lines, equipment and rolling stock	Noise and vibration around terminals and along railways	Derailment or collision of freight carrying hazardous substances	Partition or destruction of neighbourhoods, farmland and wildlife habitats

Source: OECD

In addition to the air pollution problems caused by motor vehicle emissions (which are discussed above in section 3.3.1), there are likely to be significant land use impacts, both directly resulting from transport infrastructure development, and also associated with changes in industrial location and in the pattern of population, in conjunction with transport developments. Increased urbanization and concentration of industry and population - along route corridors and at transport nodes - can have visual impacts on landscape (both natural landscapes and agricultural land) and strain the capacity of infrastructures.

Particularly severe damage can be caused to sensitive and protected habitats. Transport infrastructures can also cause community severance and increase the pressure on urban areas, in the form of congestion and noise - possibly leading to a "vicious circle" of demands for additional infrastructure investment to relieve these pressures.

It is possible that environmental pressures of this type will arise disproportionately in the less developed peripheral regions of the Community. As economic growth in the more central regions (the "Edinburgh-Milan axis") is liable to increase land prices such that, with improved transport links, peripheral regions may offer alternative, lower cost, locations for business and industry, which are also attractive in environmental terms. This possibility highlights the importance of ensuring that infrastructure developments - particularly those financed by Community Structural Funds - take proper account of the environmental dimension (this issue is discussed further in Chapter 4).

3.3.4 Environmental Implications of Increases in Tourism

Mass tourism can give rise to considerable environmental pressures. Substantial seasonal increases in population in tourist locations can severely strain the capacity of local facilities, such as transport, water supply and sewerage treatment. Concentrations of tourists in August are illustrated in Figure 3.1, which shows the particular pressure on coastal zones. Development of tourism infrastructures can lead to pressures on land use, with destruction and disturbance of sensitive habitats and general degradation of the rural environment as development spreads into natural rural areas.

The past 30 years have seen rapid and steady growth in tourism within the Community, stimulated by rising disposable incomes, and cheaper and improved access to tourist destinations. Further growth in tourism is anticipated, concentrated in southern Member States: Euromonitor 1988 forecasts suggest that 1995 tourist arrivals for Spain will be 38 million (compared with 25 million in 1986), Italy will be 35 million (25 million) and for Greece 16 million (7 million). Completion of the Internal Market and associated developments are likely to reinforce this trend, particularly as a result of liberalization of regulations relating to transport, removal of border controls, and increases in expenditure from the (augmented) Structural Funds, which will - inter alia - improve and extend infrastructure catering for tourists. Economic growth resulting from the completion of the Internal Market will increase disposable incomes, leading to further - demand led - growth in tourism.

In this sector - as in others - the environmental impact may be positive or negative depending on how the activities of the industry are managed. There are numerous instances of environmentally destructive depletion of ground water reserves, resulting in erosion and salinization, elimination of coastal vistas and destruction of habitat for rare species. Tourist use can disrupt nature and habitats to the extent that survival is threatened. Buildings of character and distinction can be destroyed if they do not suit tourist "needs", and congestion can lead to pressure to widen roads, leading to further destruction.

Conversely, tourism can be a very positive environmental force. It can provide a commercial rationale for conserving environments which otherwise would be destroyed. For example, in cases where local residents wish to build houses on a coast, refusal or permission can be justified on the basis that to build would damage tourism and the local economy. Likewise, the conservation of monuments, natural areas, the establishment of national parks, the provision of pedestrian areas, the conservation of buildings and streetscapes all can be, and often are, justified on the basis that the long-term interest of the tourist economy demands that they be conserved.

The growth of tourism can have various forms of polluting effects and land use impacts: the various types of environmental impact are summarized in Box 3F. Transport associated with tourism - particularly road traffic and air travel - gives rise to congestion and to noise and air pollution. Inadequate sewerage and waste disposal facilities can cause water pollution. Construction of facilities encroaches upon natural landscapes and agricultural land. These developments, together with the use of natural sites for recreation, can threaten plant and animal species. New development, if excessively concentrated or not in harmony with existing sites, can cause degradation of the landscape. Pressure of numbers can also lead to deterioration of historic sites and buildings. The problems of increased levels of pollution and ecological damage are illustrated by the case of the Mediterranean Basin (See Box 3G).

In the broader context tourism can adversely affect the quality of life, as a result of social and economic tensions: competition for resources can have disruptive effects on the structure of the local economy - for example, by reducing the labour supply in other sectors - and can lead to excessive dependence on a single type of economic activity.

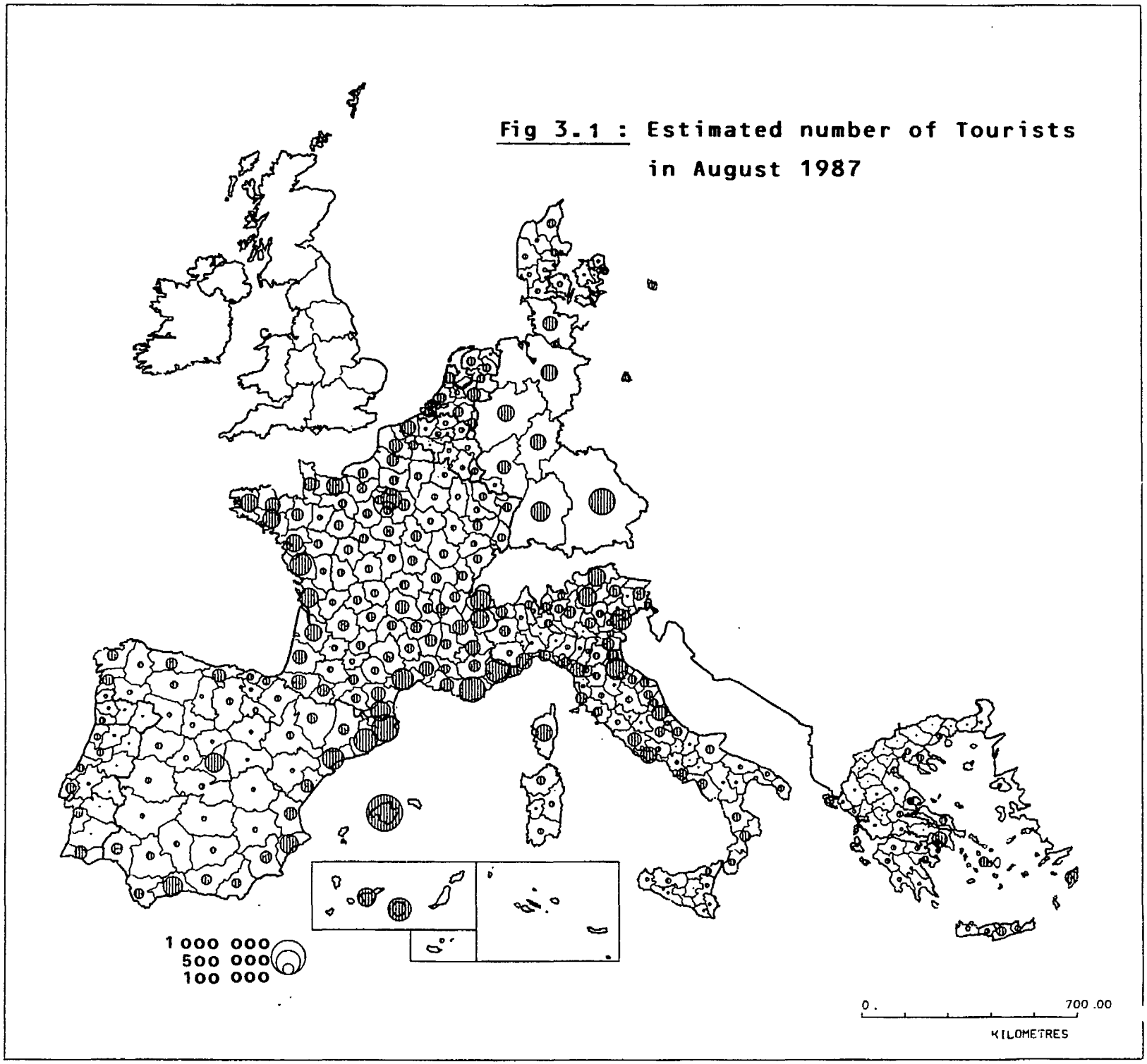
Fig 3.1 : Estimated number of Tourists in August 1987
1 000 000
500 000
100 000
0.
700.00
KILOMETRES

Box 3F

Impact of Tourism on the Environment: Short and Long-Term Effects

The environmental damage which tourism or its excesses may cause can be classified as follows:

(a) **Effects of pollution**

i. Air pollution mainly due to motor traffic and to the production and use of energy.

ii. Water pollution (sea, lakes, rivers, springs), due to:

- discharge of untreated waste water due to the absence or malfunction of sewage treatment plants;
- discharge of solid waste from pleasure boats;
- motor-boating (discharge of hydrocarbons).

iii. Pollution of sites by littering (picnics, etc) and the absence or inadequacy of waste disposal facilities (mainly household waste).

iv. Noise pollution, due mainly to motor traffic or the use of certain vehicles used for recreational purposes (snow mobiles, cross-country motor cycles, motor-boats, private planes, etc), but also to the crowds of tourists themselves and the entertainments provided for them (publicity stands, beach contests etc).

(b) **Loss of natural landscape: agricultural and pastoral lands**

i. The growth of tourism brings with it the construction of housing, facilities and infrastructure for tourists which inevitably encroach on previously open spaces, i.e. natural landscape or agricultural or pastoral lands.

ii. Some valuable natural sites (beaches, forests) are often barred to public access because they become privately owned by hotels or individuals.

(c) **Destruction of flora and fauna**

i. The various kinds of pollution mentioned above, together with loss of natural landscape and agricultural and pastoral lands, are responsible for the disappearance of some of the flora and fauna.

ii. Excessive access to and use of natural sites also result in the disappearance of various plant and animal species, owing to tourist behaviour (trampling, excessive picking of fruit or flowers, carelessness, vandalism, or the kind of thoughtless conduct sometimes leading to forest fires, for example).

Continued

Box 3F (continued)

Impact of Tourism on the Environment: Short and Long-Term Effects

(d) **Degradation of landscape and of historic sites and monuments**

i. The installation of modern tourist-related facilities and infrastructure often leads to aesthetic degradation of the landscape or sites: the style and architecture of such new installations may thus not always be in harmony or on a scale with traditional buildings, moreover tourist facility development is often disorderly and scattered, giving the landscape a "moth-eaten" look.

ii. An excessive number of visitors to historical or exceptional natural sites may also result in degradation (graffiti, pilfering etc).

(e) **Effects of congestion**

i. The concentration in time and space of tourists on holiday leads to congestion of beaches, ski slopes, resorts and overloading of tourist amenities and infrastructure, thus causing considerable harm to the environment and detracting from the quality of life.

ii. One major consequence is traffic congestion on roads at week-ends and at the beginning and end of peak holiday periods, leading to loss of leisure time, high fuel consumption, and heavier air and noise pollution.

(f) **Effects of conflict**

During the tourist season, the resident population not only has to put up with the effects of such congestion, unknown during the rest of the year, but often has to change its way of life completely (faster work, pace, an extra occupation, etc) and to live cheek by jowl with people of a different, largely urban kind in search of leisure pursuits. This "co-existence" is by no means always easy and social tensions, particularly acute in places where there are many tourists, may occur.

(g) **Effects of competition**

Since the development of tourism uses up a great deal of space and siphons off a fairly large proportion of local labour, competition is bound to occur, usually to the detriment of traditional activities, (for instance, less land under cultivation and less manpower means agriculture).

Competition of this kind generally tends to result in the exclusive practice of tourist-related activities, which may be economically undesirable for the regions concerned.

Source: OECD (1980); The Impact of Tourism in the Environment: General Report.

BOX 3G

CASE STUDY: TOURISM GROWTH AND POLLUTION IN THE MEDITERRANEAN BASIN

The Mediterranean basin accounts for 35% of the international tourist trade and is the world's leading tourist area.

By 2025, the United National Environment Programme's Blue Plan suggests there will be:

- 380 million tourists for all the countries of the Mediterranean, almost half of them along the Mediterranean coast, if economic growth is poor and 760 million tourists (11 billion nights' lodging) if it is strong.

As the Blue Plan stresses, the first effect can be gauged in terms of space. Ground occupation by all tourist lodging was approximately 4400 km^2 and 90% of it in three countries in the north west: Spain, France and Italy. This could double to 8000 km^2 by the year 2000. The solid waste generated by the tourists, currently 2.8 million tonnes per year, would be between 8 and 12 million tonnes by 2025, while waste water would increase from 0.4 billion m^3 to as much as 1.5 billion m^3.

These figures are in addition to those attendant on the pollution problems of the local population - 350 million in 1985 but between 530 and 570 million by 2025. A maximum reception capacity must clearly be defined in the light of the results of analyses of the state of the local environment.

Source: CEC (1987); Conference on Tourism Horizon 1992; Brussels, November 1987.

3.3.5 Environmental Impacts of Changes in the Agricultural Sector

Effects of the Removal of Frontier Controls

The removal of frontier controls as a mechanism for the implementation of policy measures will require certain changes in the execution of agricultural policies. Specifically, this will affect the enforcement of plant and animal health regulations (see Section 2.2.2 above) and the system of monetary compensation amounts (MCAs).

MCAs were instituted to mitigate the impact of currency realignments on farm prices. At the end of December 1987 the highest support price prevailed in Germany and the Netherlands (7% above the Community's effective average), and the lowest price levels on average prevailed in the U.K. and Greece - 12% and 34% respectively below the Community average (the percentage rates of MCAs for various types of agricultural produce are set out in "The Economics of 1992" (Table 4.7.1, p. 80).

Since they depend upon the existence of frontier controls, completion of the Internal Market would require the abolition of MCAs. This may be expected to stimulate trade, both directly as a result of elimination of frontier formalities, and indirectly, as relative agricultural prices would - other things being equal - be less subject to the distortions of the green currency system.

Development of Agro-Industries

Beyond the immediate impact of the removal of barriers, the development of the Internal Market is likely to give rise to structural changes in agriculture on similar lines to those which are projected for industry. Indeed, in certain areas there may well be considerable "industrialization" of agriculture, in the form of vertical integration by food processing companies taking over the food production stage. This process will be facilitated by the removal of restrictions on capital movements which will accompany the completion of the Internal Market.

A further impetus for structural change may arise from transfers of the production quotas which under the Common Agricultural Policy limit certain forms of agricultural output. At present quotas are allocated to specific land on the basis of the production level in a reference year.

However if, in keeping with a market-led Community, quotas cease to be linked to specific land, transfers would be possible both within countries and across national boundaries. This could increase concentration of production in areas of greatest profitability. An increased market orientation, coupled with easing of market entry through the unrestricted movement of capital throughout the Community may give rise to a "two-track" agricultural structure, increasing the dichotomy between "agro-industrial" enterprises and less productive farms on the margins of profitability.

Environmental Impacts of Agriculture

The environmental problems arising from these contrasting forms of agricultural activity will be quite distinct. In the case of marginal farming operations there may be difficulties with land management resulting from the abandonment of agricultural land: this is likely to be a particular problem in peripheral regions of the Community (see section 4.4 below).

Intensive agriculture can exacerbate problems associated with various types of pollution, arising from the use of fertilizers and pesticides, and with the disposal of agricultural wastes, particularly animal slurry. Where land is taken over for cultivation, threats can also arise to natural habitats and species diversity, and soil quality may be affected, particularly as a result of deforestation, through erosion and mineralization, with nutrient losses, particularly through accelerated nutrient leaching from increased rainfall on exposed bare ground. There may also be soil compaction, resulting in increased soil density and reductions in infiltration and porosity; and gaseous denitrification with an increase in anaerobic conditions from waterlogging.

Pollution from agricultural sources is giving rise to increasing concern within the Community. Of particular significance are nitrate pollution, eutrophication, toxic pesticides, and farm wastes, particularly where agricultural activities are highly concentrated - as is illustrated in Figures 3.2 and 3.3, which show the density of population of pigs and the geographical concentration of sugar beet production within the Community. The environmental impacts of agriculture are summarized in Table 3.6.

Agriculture accounts for 80-90% of nitrate loadings. Trends in nitrogenous fertilizer consumption in the EC are shown in Table 3.7. Applications of nitrogenous fertilizers to agricultural land have been increasing and this is reflected in the increasing nitrogen and phosphorous concentrations observed from water quality monitoring in the major rivers in the EC over the period 1970-1985 (cf. Box 3H).

Table 3.7 Trends in Consumption of Nitrogenous Fertilizers in the EC

Country	Consumption (1000 tonnes)		
	1970	1980	1985
Belgium	178	194	195
Denmark	289	374	360
France	1453	2147	2400
FRG	1131	1551	1450
Greece	201	333	415
Ireland	87	275	335
Luxembourg	-	-	-
Netherlands	405	483	500
Portugal	77	137	140
Spain	578	902	960
U.K.	894	1240	1600

Source : OECD Environmental Data Compendium 1987 (FAO data)

Table 3.6

SELECTED ENVIRONMENTAL EFFECTS OF AGRICULTURE

AGRICULTURAL PRACTICES	SOIL	GROUND WATER	SURFACE WATER	FLORA	FAUNA	OTHERS: Air, noise, landscape, agricultural products
Land development: land consolidation programmes	Inadequate management leading to soil degradation	Other water management influencing ground water table		Loss of species		Loss of ecosystem, loss of ecological diversity. Land degradation if activity not suited to site
Irrigation, drainage	Excess salts, water logging	Loss of quality (more salts), drinking water supply affected	Soil degradation, siltation, water pollution with soil particles	Drying out of natural elements, affecting river ecosystems		
Tillage	Wind erosion, water erosion					
Mechanization: large or heavy equipment	Soil compaction, soil erosion					Combustion gases, noise
Fertilizer use						
— Nitrogen		Nitrate leaching affecting water				
— Phosphate	Accumulation of heavy metals (Cd)		Run-off, leaching or direct discharge leading to eutrophication	Effect on soil microflora		
— Manure, slurry	Excess: accumulation of phosphates copper (pig slurry)	Nitrate, phosphate (by use of excess slurry)		Eutrophication leads: to excess algae and water-plants	to oxygen depletion affecting fish	Stench, ammonia
— Sewage sludge, compost	Accumulation of heavy metals, contaminants					Residues
Applying pesticides	Accumulation of pesticides and degradation products	Leaching of mobile pesticide residues and degradation products		Affects soil microflora; resistance of some weed	Poisonning; resistance	Evaporation; spray drift, residues
Input of feed additives, medicines	Possible effects					Residues
Modern buildings (e.g. silos) and intensive livestock farming	See: slurry	See: slurry	See: slurry			Ammonia, offensive odours, noise, residues Infrastructure: Aesthetic impacts

Source: OECD

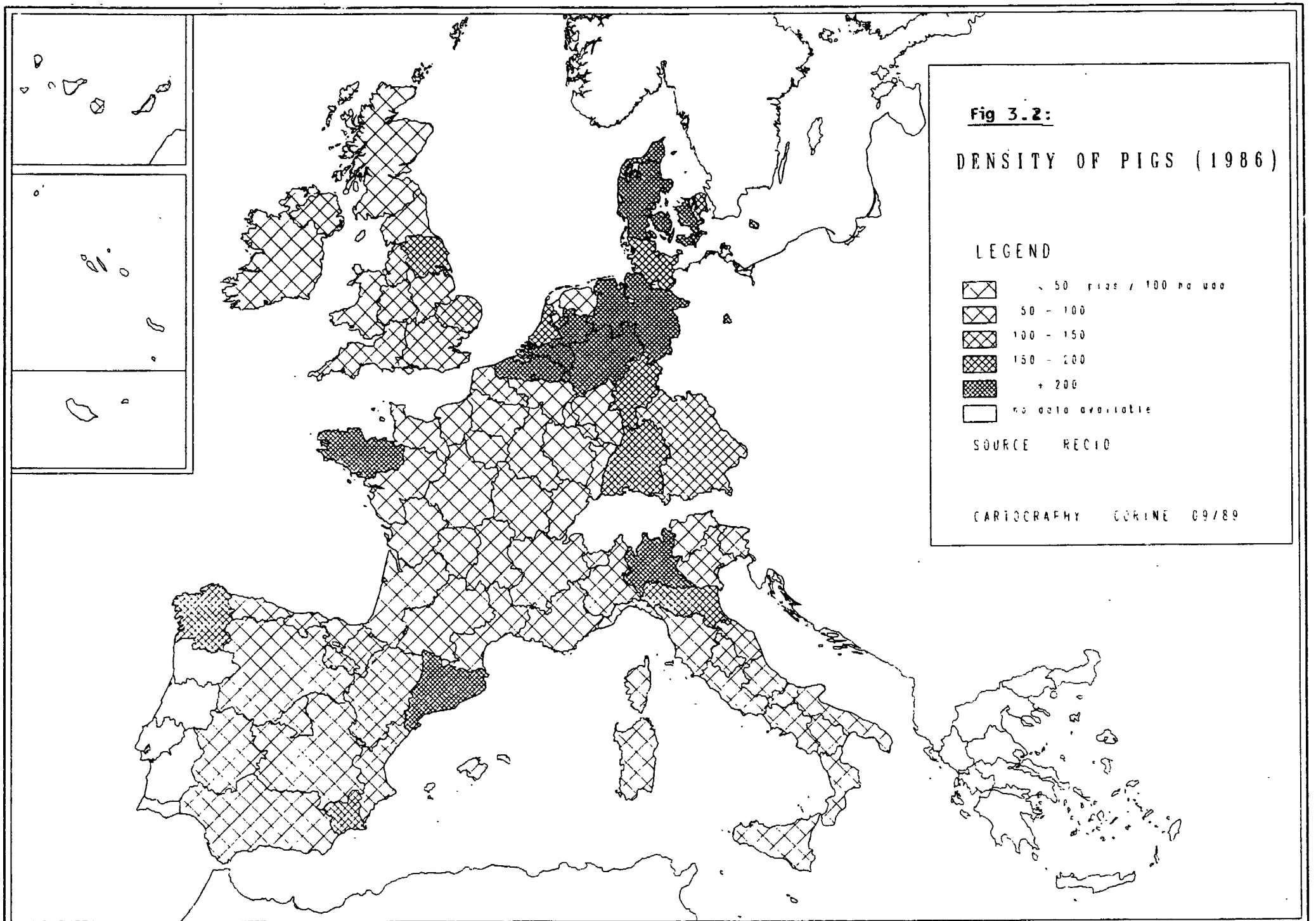
Fig 3.2:
DENSITY OF PIGS (1986)
LEGEND
< 50 pigs / 100 ha uaa
50 - 100
100 - 150
150 - 200
+ 200
no data available
SOURCE RECIO
CARTOGRAPHY CORINE 09/89

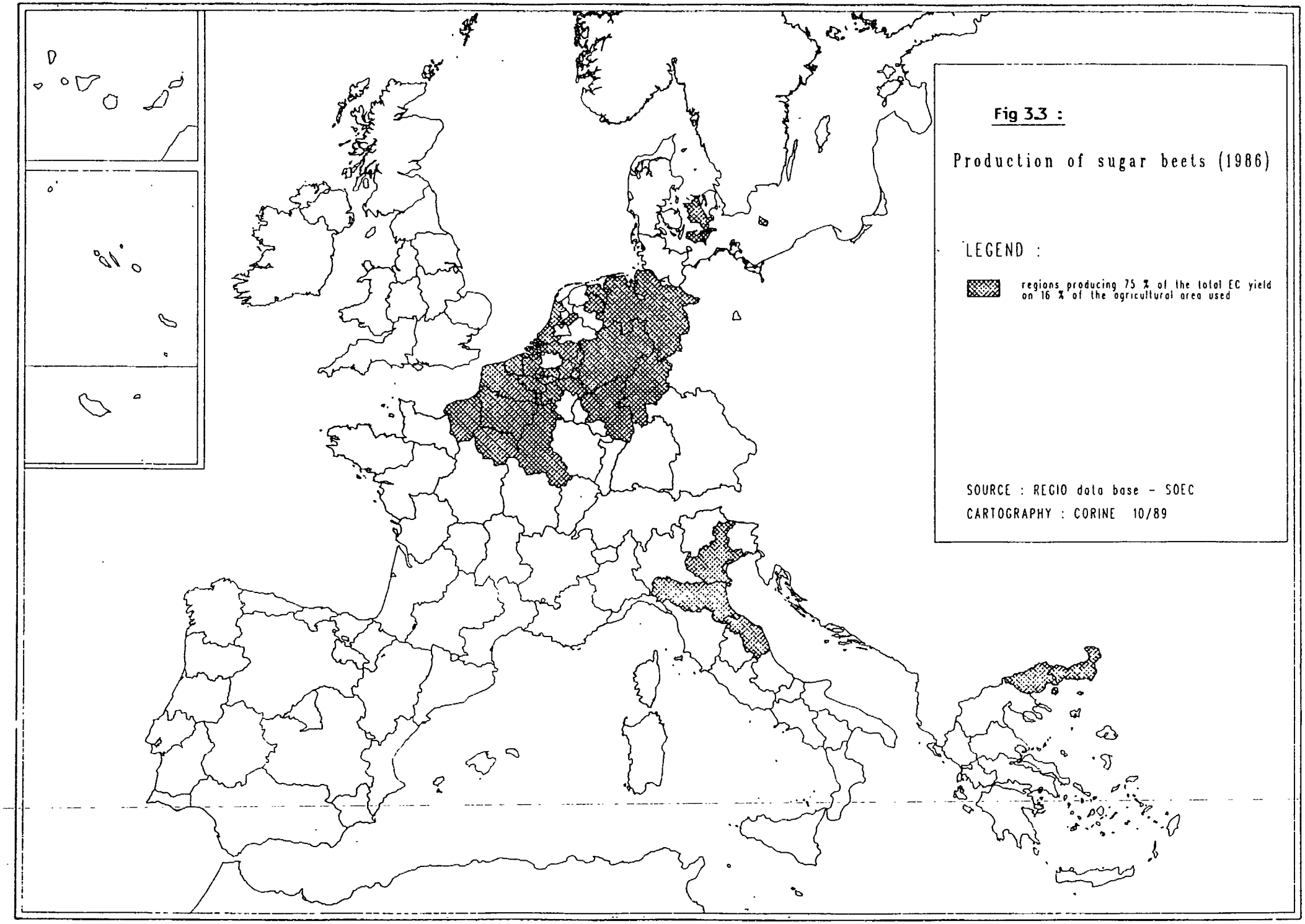
Fig 3.3 :
Production of sugar beets (1986)
LEGEND :
regions producing 75 % of the total EC yield on 16 % of the agricultural area used
SOURCE : REGIO data base - SOEC
CARTOGRAPHY : CORINE 10/89

BOX 3H

Trends in Nitrate and Phosphorus Concentrations in Selected Rivers, 1970-1985

Source: OECD Environmental Data Compendium 1987

			Nitrate/Nitrates (mgN/liter / mgN/litre)					Phosphorous/Phosphore (mgP/liter / mgP/litre)				
			1970	1975	1980	1985	Average/moyenne last 5 years avail./ 5 dern. années disp.	1970	1975	1980	1985	Average/moyenne last 5 years avail./ 5 dern. années disp.
Canada	St Lawrence/St Laurent	h)	0.193	0.230	0.160	0.210	0.215	0.018	0.010	0.024	0.006	0.015
	Mackenzie	i)	0.084	0.111	0.110	0.090	0.080	..	0.022	0.041	0.035	0.039
	Fraser		0.049	0.300	0.060	..	0.080	0.002	0.107	..	..	..
	Nelson ,	i)	0.040	0.400	0.060	0.090	0.060	..	0.019	0.008	0.021	0.014
	Saskatchewan	h)	..	..	0.050	0.040	0.067	..	..	0.035	0.054	0.054
	Slave	h)	..	..	0.050	0.090	0.080	..	..	0.079	0.076	0.104
USA/	Delaware-Trenton	k,l)	..	0.880	1.080	..	..	1.700	0.100	0.008	0.130	0.120
Etats Unis	Mississippi-St.Franc.	k,l)	0.360	1.040	1.300	1.230	1.470	..	0.190	0.240	0.140	0.150
Japan/	Ishikari	f,g,l)	..	..	0.530	..	..	..	0.090	0.090	0.070	0.090
Japon	Yodo	d,f,l)	..	..	0.760	..	..	..	0.186	0.218	0.155	0.177
Australia/le	Brisbane est.	d,j,l)	..	..	0.850	1.050	0.927	..	0.200	0.380	0.480	0.430
Belgium/	Meuse-Heer/Agi.	g)	1.800	7.800	2.180	3.120	2.473	..	1.230	0.220	0.350	0.323
Belgique	Meuse-Lanaye		3.900	9.400	2.520	2.790	2.673	..	1.410	0.550	0.720	0.750
	Escaut-Bleharies	g)	..	..	4.170	5.620	5.193	..	0.700	0.940	1.090	0.880
	Escaut-Doel	g)	3.000	7.350	4.170	3.910	3.910	..	1.060	0.550	0.870	1.133
Denmark/	Gudenaa	i)	..	1.250	1.700	2.000	1.837	..	0.300	0.160	0.180	0.125
Danemark	Skjernaa	i,l)	..	..	2.996	3.180	2.922	..	..	0.221	0.130	0.174
	Susaa	i,l)	..	5.770	6.730	5.210	6.087	..	0.660	0.264	0.340	0.298
Finland/de	Tornionjoki	h)	..	..	..	0.023	..	0.015	0.016	0.022	0.019	0.022
	Kymijoki	h)	..	..	0.580	..	..	0.045	0.028	0.030	0.027	0.027
France	Loire	b)	1.581	1.445	1.987	..	2.175	..	..	..	..	..
	Seine		..	4.177	5.352	..	5.179	..	..	..	..	..
	Garonne	b)	1.152	0.926	1.829	..	1.731	..	..	..	..	..
	Rhine-/Rhin-Selz	i)	..	1.581	2.920	2.940	2 617	..	..	0.470	..	..
Germany/	Rhine-/Rhin-Bimmen L.		1.820	3.020	3.590	4.200	3.900	0.520	0.750	0.360	0.480	0.520
Allemagne	Elbe		..	..	3.900	2.990	2.993	..	..	0.360	0.530	0.540
	Weser		..	4.300	5.420	5.080	5.180	..	0.670.	0.530	0.360	0.363
	Donau-Jochenstein		0.200	0.300	0.500	0.600	0.533	..	..	0.180	0.210	0.217
Italy/Italie	Po		0.946	1.350	1.630	3.280	2.550	..	0.231	0.280	0.220	0.260
	Adige		..	0.880	0.940	..	..	..	0.191	0.180	0.000	0.000
	Tevere		..	7.500	1.370	..	..	..	0.260	0.400	0.000	0.000
Netherlands/	Meuse-Keizersv.		3.070	3.690	3.770	4.280	4.007	0.410	0.570	0.500	0.480	0.450
Pays Bas	Meuse-Eijsden		2.450	2.510	2.780	2.920	2.853	0.430	0.730	0.580	0.570	0.533
	Scheur-Maasluis		..	3.370	3.840	4.160	4.050	..	0.560	0.650	0.550	0.550
	Ijssel-Kampen	i)	2.760	3.460	4.270	4.330	4.130	0.430	0.620	0.630	0.570	0.573
	Rhine-Lobit		2.680	3.270	3.930	4.510	4.310	0.500	0.720	0.660	0.620	0.593
Norway/	Skienselva	i)	..	0.350	0.350	0.340	0.337	..	0.011	0.012	0.010	0.010
Norvège	Glomma	i)	..	..	0.330	0.350	0.319	..	..	0.020	0.017	0.017
	Drammenselva	h)	..	..	0.410	0.350	0.350	..	..	0.012	0.009	0.010
	Numedalslagen	i)	..	..	0.290	0.312	0.368	..	..	0.009	0.016	0.018
Portugal	Tejo		0.519	..	5.600	..	..	..	..	2.000	..	..
Spain/	Guadalquivir	d)	..	..	7.200	13.500	10.975	..	0.850	0.860	0.610	1.000
Espagne	Duero		..	..	8.500	0.190	0.973	..	..	0.690	0.350	0.597
	Tajo		..	..	1.500	1.550	1.437	..	..	0.420	0.230	0.267
	Ebro		..	..	5.300	10.160	8.923	..	..	0.330	0.740	0.533
Sweden/	Dalalven		0.120	0.107	0.136	0.106	0.115.	0.015	0.016	0.023	0.016	0.017
Suède	Ranealv		0.052	0.050	0.034	0.052	0.043	0.012	0.019	0.025	0.017	0.017
	Morrumsan		0.176	0.230	0.170	0.245	0.211	0.023	0.019	0.024	0.018	0.016
	Ronneam		1.294	1.188	1.487	1.308	1.305	0.044	0.036	0.084	0.058	0.055
Switzerland/	Rhine-/Rhin-Village	d)	..	..	1.390	1.500	1.393	..	0.070	0.170	0.130	0.157
Suisse	Aare-Brugg	d)	..	..	1.425	1.750	1.532	..	0.230	0.113	0.118	0.439
	Limmat-Baden		..	..	0.905	1.110	0.921	..	..	0.131	0.148	0.121
	Rhone-Port du Scex	d)	..	..	0.519	0.540	0.463	..	0.117	0.102	0.127	0.103
UK/	Thames/Tamise	c)	..	6.500	6.890	7.520	7.340	..	1.073	1.160	1.320	1 502
Royaume Uni	Severn	c)	..	5.520	5.800	6.330	6.160	..	0.748	0.535	0.710	0.866
	Clyde	c)	..	2 600	1.850	2.160	2.260	..	0 692	0.497	0.319	0.414
	Mersey	c)	..	1.840	2.290	3.120	2.500	..	..	..	1.362	1.472
	Tyne		..	0.970	0.830	1.010	0.830	..	0.138	0.121	0.075	0.113
	Trent	c)	..	8.960	10.760	9.510	9.170	..	..	..	1.769	1.646
Yugoslavia/	Dunau		..	1.700	5.800	..	..	..	..	..	..	..
Yougoslavie	Drava		..	5.200	7.700	..	..	..	..	..	..	..

NOTES:

a) Measured at the mouth or downstream frontier of river.
b) 1970 data refer to 1971.
c) Phosphorous: orthophosphate concentrations.
d) 1975 data refer to 1976.
e) 1980 data refer to 1978.
f) 1980 data refer to 1979.
g) Nitrates: 1970 data refer to 1971.
h) 1985 data refer to 1984.
i) 1980 data refer to 1981.
j) Data refer to fiscal year.
Data for the same indicator may not be comparable because of measurements by different authorities. Data for 1972-75 are not comparable with those of later years because of different record methods.
k) Total concentrations.
l) 1985 data refer to 1983.

NOTES:

a) Mesuré à l'embouchure ou à la frontière aval de la rivière.
b) Les donnees 1970 sont de 1971.
c) Phosphore: concentrations en orthophosphate.
d) Les données 1975 sont de 1976.
e) Les données 1980 sont de 1978.
f) Les données 1980 sont de 1979.
g) Nitrates: les données 1970 sont de 1971.
h) Les données 1985 sont de 1984.
i) Les données 1980 sont de 1981.
j) Les données concernent l'année fiscale. Les données pour un même indicateur ne sont pas toujours comparables car les mesures ont été effectuées par des autorités différentes. Les données 1972-75 ne sont pas comparables avec celles des années suivantes à cause des méthodes d'enrégistrement différentes.
k) Concentrations totales.
l) Les données 1985 sont de 1983.

Two proposals have been put forward to control nitrogen loadings to surface and ground water in the EC.

- Draft directive on the protection of fresh coastal and marine waters against pollution caused by nitrates from diffuse sources (1989). Introduction of restrictions on the use of inorganic and organic fertilizers in designated "vulnerable zones" where nitrate limits of 50 mg/l are likely to be exceeded.

- North Sea Conference declaration (1987) - agreement to prepare national plans to achieve the goal of a substantial reduction of the order of 50% in inputs of phosphorous and nitrogen in areas likely to cause pollution.

The algal blooms observed in the North Sea, in particular in the relatively enclosed, low-mixing waters off Denmark and Norway, have been attributed to nutrient loadings in the North Sea, the biggest inputs being from rivers. Eutrophication problems have also been observed at the mouths of the major rivers entering the North Sea.

Increasing usage of pesticides (insecticides, herbicides, fungicides) has added considerably to water pollution and perceived threats to human health in the Community in the past decade. In Denmark, for example, the volume of pesticides used has increased by 69% since 1975, despite a change-over to more effective and concentrated agents; while the frequency of application increased by 115% between 1981 and 1984.

Problems associated with farm wastes are illustrated by the difficulties of manure disposal in the Netherlands. About 100 million tonnes of manure are produced each year; only half of this can be absorbed safely as a fertilizer on land in the Netherlands. This has caused problems of nutrient leaching, BOD loadings to rivers and heavy metal contamination of ground water (heavy metals in animal feed).

3.4 Waste policy in the Internal Market

3.4.1 Generation of waste

The quantity of waste currently generated within the Community amounts to some 2 bn tonnes per annum. Of this, 150 m tonnes arise from industrial sources, and, depending on national definitions, 20-30 m tonnes of industrial waste are classified as hazardous. Economic growth associated with completion of the Internal Market will tend - other things remaining the same - to increase the quantities of waste arising within the Community. This would in turn give rise to a need for investment in facilities which can undertake treatment and disposal of waste safely and cost-effectively.

One central theme of this report is the challenge of ensuring that the Community's development is sustainable, and that it avoids incurring the costs of increasing environmental degradation. The Treaty, as amended by the Single Act (Article 130r), calls for preventive action and rectification of environmental damage at source. Policy measures to encourage resource recovery and recycling clearly have a role in this context: such action has met with some success in the domestic and commercial sectors, although in a limited number of areas. On the other hand, a vigorous implementation of environmental policies could - somewhat paradoxically - tend to increase solid waste arisings, since additional treatment of emissions and discharges to the environment could lead to an increase in the amount of solid waste residues - for example, flue gas desulphurization of power station emissions generates large quantities of wastes in the form of gypsum.

3.4.2 Non-Hazardous waste

In terms of quantity (as distinct from the potential for causing environmental hazards), a very large proportion of waste is of domestic or commercial origin. An increase in this type of waste would tend to place additional pressure on waste treatment and disposal facilities. There is already pressure on landfill sites within the Community (particularly in the more densely populated areas). As an alternative there may be possibilities for greater use of incineration: Table 3.8 shows great variations between Member States in the use of incineration for domestic waste and in the extent of environmental protection measures.

Table 3.8 Domestic Waste Incineration in Community Member States

	B	D	DK	F	GB	I	NL	SP
Number of inhabitants (m) (1987)	10	60	5	54	57	57	14	40
Domestic waste (m te/a) (1987)	2,8	19	1,8	17	18	14	4,3	11
Domestic waste per capita (kg/a)	280	320	360	315	320	250	310	275
Number of incinerators (1986)	29	47	46	284	38	80	11	22
Waste incinerated in 1986 (m/te)	1,32	6,50	1,45	7,00	1,80	2,50	1,70	0,7
Percentage of waste incinerated in 1986	47	34	80	41	10	18	40	o,4
Number of plants fitted with scrubbers	11	31	0	0	0	3	1	
Percentage of plants fitted with scrubbers (1986)	38	66	0	0	0	4	9	

Source: Zeitschrift UMWELT 3/88

Waste disposal problems occur particularly in conurbations, where there is a high volume of waste arisings owing to the concentration of industry, commerce and service undertakings which is seldom matched by adequate disposal capacity within these regions. In such circumstances, or instances, where capacity is exhausted and new disposal facilities are not, or not yet, available, it may be necessary to transport waste over considerable distances, not only within a country but also across national frontiers.

In the domestic waste sector (including commercial and industrial waste that can be equated to domestic waste), only the Federal Republic of Germany carries out transfrontier shipments which meanwhile, owing to lack of disposal capacity, run into millions of tonnes per annum and go mainly to France and to the German Democratic Republic.

3.4.3 Hazardous waste

The (small) proportion of wastes which can be classified as hazardous poses particular problems in the context of the Community's Internal Market. Restrictive conditions governing its disposal and requirements for specialized treatment cause hazardous waste to be transported over longer distances than ordinary wastes; this transportation can involve the crossing of frontiers, both within and beyond the Community. Table 3.9 shows quantities of hazardous waste imported and exported by five Community Member States.

Table 3.9 Imports and Exports of Hazardous Waste 1986/1987

Country	Exports (te)	Exports as a percentage of production	Imports (te)
Denmark	20.000	4%	
France	25.000	0,6%	290.000
Netherlands	160.000	15,0%	
Germany	700.000	14,0%	40.000
Great Britain			170.000

Under the Treaty Member States are not permitted to restrict imports from other Community countries, and thus are required to afford mutual recognition to standards prevailing elsewhere in the Community (see Chapter 8 below). It is not altogether clear to what extent wastes are covered by this provision - materials for recycling with a positive economic value could be expected to come within the provisions for free movement of goods - but it is doubtful whether final wastes for treatment and/or disposal can legitimately be classified as a "good". On the other hand, following completion of the Internal Market intra-Community frontier controls will no longer be available as a means of controlling wastes: consequently alternative policy mechanisms must be used. It is necessary therefore to consider the implications for Council Directive 84/631 which provides for controls on transfrontier movement of hazardous waste.

Completion of the Internal Market (and particularly the removal of public procurement barriers) can be expected to stimulate the transfrontier supply of environmental services, and hence reduce waste treatment costs (the prospects for the environmental industry in the Internal Market are discussed in Chapter 9 below). However, there is a potential dilemma for environmental management, inasmuch as the increasing public awareness which leads to a demand for additional waste treatment facilities may also render the siting of such facilities extremely difficult

As the Community moves towards completion of the Internal Market, there are already severe pressures on the capacity of Member States to treat and dispose of hazardous wastes. Public opinion has become increasingly hostile to the discharge of wastes into rivers and the sea, and, in some areas, to its disposal in landfill sites. The quantities of wastes incinerated at sea by Member States are shown in Table 3.10.

Table 3.10 Volumes of waste delivered for incineration at sea by Member States (tonnes)

Origin	1980	1981	1982	1983	1984	1985	1986
B	13.000	9.172	10.650	12.554	10.654	12.767	14.785
FRG	64.866	58.561	39.560	37.177	44.718	58.173	53.808
F	18.452	11.914	9.487	7.029	10.277	10.024	15.471
UK	0	811	1.303	2.102	1.952	2.244	3.754
IRE	0	40	0	0	0	0	0
I	0	471	3.401	2.359	9.044	2.773	4.894
NL	5.458	7.483	17.970	4.058	1.835	2.874	4.832
E	0	21	191	390	194	87	147

Source: Oslo Commission

Incineration at sea (currently accounting for some 80,000 tonnes of waste per year) is now being phased out. The Declaration issued by the Second International Conference on the Protection of the North Sea provides for a reduction in incineration at sea of at least 65% by 1 January 1991 and a complete end to incineration, if possible, by 31 December 1994.

Some Community Member States export waste to non-Community countries. A notable instance is Germany, which in 1987 exported some 2m tonnes of waste (hazardous and domestic) to the German Democratic Republic. However, it may be doubted whether this practice can continue at present levels - and so export is unlikely to provide an outlet for additional wastes resulting from economic growth.

These developments have led to an increase in demand for incineration plant - but the Community's existing incineration capacity of under 2 m tonnes per year represents less than 10% of the total amount of hazardous waste arising. The inadequacy of existing capacity is illustrated by the case of Italy where there is at present authorized disposal capacity to cater only for an estimated 10-15% of the annual output of 4.5 m te of toxic residues. Another example is that of the UK, which has four incinerator plants with a total capacity amounting to under 20% of the UK's output of toxic wastes; currently 80% of this waste is disposed of to landfill.

3.4.4 Waste management in the Internal Market

In the context of waste it would appear that the impact of the Internal Market is likely to be offset by powerful countervailing forces. The economic growth effect of the Internal Market would tend - other things remaining the same - to increase waste generation while the removal of intra-Community barriers would facilitate the transport of wastes for treatment and disposal across national boundaries. On the other hand, there is strong evidence of public concern over the transport, treatment and disposal of wastes. This concern will call for policy initiatives, by the Community and by Member States, designed to promote investment in more "environmentally friendly" methods of treatment and to reduce risks of environmental damage. It is expected that policies will emphasize the Polluter Pays Principle as a means of ensuring that those who generate and handle wastes bear the full costs of measures to avoid and, if necessary, to remedy environmental damage.

An essential function of environmental policy in the Internal Market would be to ensure that adequate provision is made in all Community Member States to prevent waste disposal arrangements from having an adverse environmental impact and endangering human health. Consequently, a key task in the environment sector will be the creation of a Community-wide infrastructure for waste treatment and disposal which satisfies certain qualitative and quantitative criteria.

Free transfrontier shipment of waste in the Internal Market on environmentally acceptable terms calls for the harmonization of disposal standards Community-wide. In addition to the existing standards for domestic waste incineration plants, the following requirements should be set in the context of 1992:

- minimum standards for hazardous waste incinerators and treatment plant for chemical/physical wastes;
- standards for landfills (surface and underground) for domestic and hazardous wastes, and
- technical standards for the various types of waste treatment.

A strategy for transfrontier movement and disposal of wastes would need to take account of the following considerations:

- as far as possible, avoidance of shipments over long distances;

- mutual recognition of disposal installations in other Member States taking account of plant licences and operating restrictions;

- coordination of the disposal plans to be established in accordance with Article 6 of Regulation 75/442/EEC and Article 12 of Regulation 78/319/EEC by Member States involved and the Commission, aimed at the development of a Community-wide waste disposal plan.

  In addition, an efficient system of waste management is necessary in future to cope with waste disposal in the Internal Market. Large-scale logistical planning integrating the waste collection and transport systems with the disposal and/or treatment arrangements will be required.

3.5 Conclusions

The changes associated with "1992" are likely to have significant effects on economic structures, and hence on the sectoral distribution of economic activity. These changes in the context of a general increase in economic growth will give rise to environmental impacts particularly associated with changes in certain sectors.

Certain types of economic activity may have significant environmental impacts associated with completion of the Internal Market. In particular, the Task Force identified production and use of energy, transport, tourism and agriculture. Among industrial sectors the following are potentially significant in this context:

- Micro-electronics
- Textiles
- Chemicals and Pharmaceuticals
- Food.

Economic growth is a major determinant of environmental impacts, and the effect of the Internal Market is likely to accelerate growth and thus to render more acute issues which arise from the growth process. There is particular concern over air pollution (from energy and transport), land use impacts, and threats to habitats. Agricultural changes may give rise to problems of land management and exacerbate environmental damage from pesticides and fertilizers.

Changes in economic activity resulting from the completion of the Internal Market would tend - other things remaining the same - to increase waste generation. Provision is required to avoid adverse environmental impacts and dangers to health, and a key task will be the development of a Community-wide infrastructure for waste treatment and disposal.

CHAPTER 4

REGIONAL IMPACTS AND THE ENVIRONMENT

4.1 Introduction

4.1.1 Assessment of Regional Impacts

This chapter discusses the spatial context of the Internal Market - the distribution of socio-economic and environmental problems and environmental investment opportunities, the changes which may be anticipated resulting from completion of the Internal Market, and the environmental implications flowing therefrom. We conclude with a discussion of some policy implications at regional level.

The terms of reference of the Cecchini report (See Chapter 1) were for a study of the economic effects at Community level of the completion of the Internal Market. Consequently the report does not analyze the spatial distribution of economic growth associated with the Internal Market, or the specific impacts on the peripheral countries. In order to assess the spatial distribution of environmental impacts, and the effects on peripheral countries (precisely those regions where a priori a considerable impact might be expected), it was necessary first to make an assessment of likely economic impacts. In order to do this:

* A special report was commissioned which identifies, necessarily in aggregate form, those areas in the Community most likely to benefit from the Single Market, and those less likely to do so, and indicates in which areas one could expect the greatest environmental impact.

* Particular attention was focussed on the Peripheral (Objective 1) Regions and on those in industrial decline (Objective 2) Regions. An emphasis was thus given to certain areas of the Community which are of particular interest, because they are deprived, economically and socially, with a pressing need for economic renewal, with very limited resources available to protect environmental assets, and with very valuable but fragile environmental resources. Members of the Task Force prepared reports on Andalucia (Spain), Greece, Ireland and Portugal, and further reports were commissioned on Southern Italy, on Nord-Pas de Calais, and the Ruhrgebiet, together with sectoral reports on tourism in Greece, fishing in Portugal and agriculture in Andalucia. In order partially to address the lacunae in knowledge resulting from the fact that the Cecchini report did not specifically address the impacts of the Single Market on the periphery, we applied the HERMES model (reduced version) to Greece and Ireland.[1]

[1] The Irish results have since been published in J. Bradley, J. Fitzgerald and L. O' Sullivan (1989) Medium-Term Review 1989-1994, the Economic and Social Research Institute, Dublin, June 1989

4.1.2 Overview of Spatial Environmental Assets and Stress Points

From the perspective of the Single Market, there are three spatial dimensions of particular interest: the "hot spots", the locations of significant cross-border pollution, and those environmental assets remaining which are of European significance. We can see that for a few key air pollutants, the problems are concentrated in the industrial North and coastal "pockets" in the South. The areas of greatest biodiversity are to be found mainly in those relatively remote peripheral regions of the Community. Problems of cross-frontier pollution are most marked in the congested and industrialized areas of the North.

Furthermore, the pattern of urban development within the agglomerations themselves has varied considerably between the more and less economically developed regions. This is illustrated by figure 4.1 which compares the rate of population growth between 1960-80 of the central part of towns (excluding suburbs) with a population above 500,000, as compared with the European average rate of growth. Clearly the town centres are declining in the northern, more developed, regions, whereas the growth continues in the South. The process of urbanization is virtually complete in the most developed countries of the Community, and future growth is expected to come mainly from the less developed regions, as is shown in Tables 4.1 and 4.2.

Table 4.1

Urban Agglomerations with populations of two million or more European Community, 1985

Agglomeration	World Ranking in 1985	Population (mil) 1985	2000	Average Annual Rate of Growth 1970 -1986	1985-2000
London	9	10.36	10.51	- 0.14	0.09
Paris	16	8.68	8.72	0.26	0.03
Milan	22	7.22	8.15	1.79	0.81
Madrid	32	4.49	6.53	4.24	2.51
Naples	37	4.11	4.30	0.91	0.29
Rome	45	3.69	3.87	1.23	0.32
Barcelona	52	3.20	3.35	1.23	0.30
Athens	73	2.68	3.04	1.64	0.85
Turin	85	2.26	2.61	2.23	0.95
Hamburg	90	2.19	2.19	- 0.04	0.0
Munich	94	2.11	2.22	1.42	0.33

Source: The Prospects of World Urbanization: Revised as of 1984-1986 UN, New York, pp. 25, 26, 27

Fig. 4.1 : Urban growth in the European Communities between 1960 and 1980 for cities of more than 500,000 inhabitants

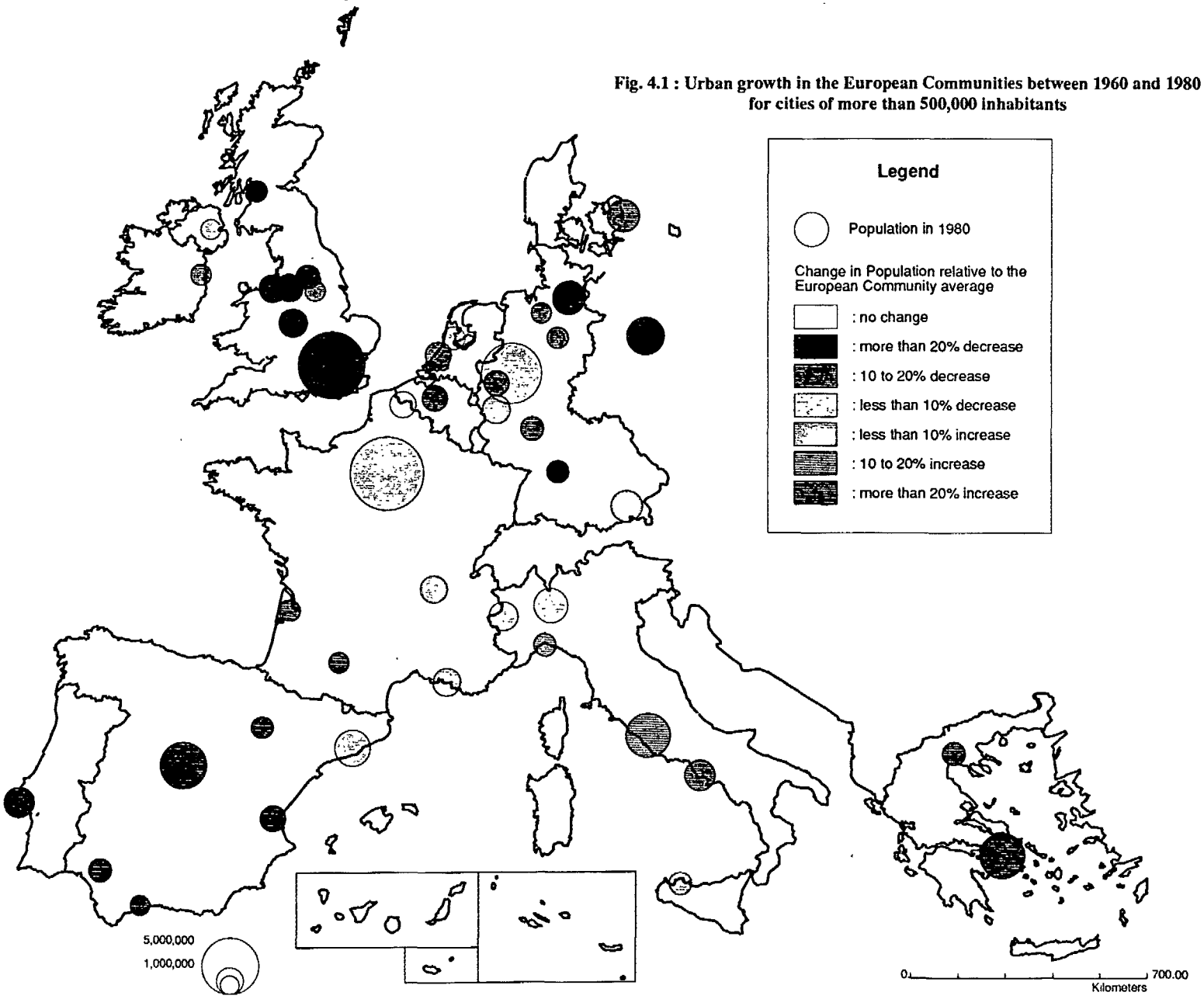

Table 4.2 Urbanization in the European Community

	Population Urban (%)			Urban	Average Annual Growth Rate of Pop.		
	1960	1972	1985	population 1985/(1000s)	1980 -85	1985 -90	1990 -95
Northern							
Denmark	73.7	79.9	85.1	4407	0.37	0.33	0.19
Ireland	45.8	51.7	57.0	2058	1.78	1.96	1.98
United Kingdom	85.7	88.5	91.5	51351	0.25	0.15	0.16
Western							
Belgium	12.5	94.3	96.3	9535	0.30	0.20	0.14
France	62.4	71.0	78.4	40114	0.29	0.40	0.40
Germany	77.4	81.3	85.5	52077	0.05	0.01	0.06
Luxembourg	62.1	67.8	81.0	29	0.82	0.41	0.36
Netherlands	85.0	86.1	88.4	12318	0.49	0.35	0.30
Southern							
Greece	42.9	52.5	60.1	5939	1.29	1.23	1.18
Italy	59.4	64.3	67.4	38593	0.35	0.38	?.46
Portugal	22.5	26.2	31.2	3181	1.77	1.98	2.18
Spain	56.6	66.0	75.8	29210	1.39	1.20	1.16

Source: The Prospects of World Urbanization - Revised as of 1984-1985 U.N. New York, 1987, pp. 52, 53, 76, 92, 93

4.2 Where will growth occur?

An analysis of economic trends in the European Community in the fourteen-year period since 1975 indicates that there has been no convergence in levels of prosperity between the richer and poorer regions. Will the Single Market growth widen the gap, will it stay the same, or will the poorer regions - assisted by the additions to the Structural Funds - begin to catch up? A definitive answer cannot be provided, but we can begin to get a sense of the prospects by categorizing the regions according to characteristics which are likely to help or to hinder convergence.[1] Regions which at present enjoy a relatively high level of prosperity, with a relatively high concentration of growth sectors, located near to the centre, with relatively low production costs, should participate fully in the growth. Conversely, regions already in decline, with few growth sectors, on the periphery and with high costs, are unlikely to capture a share of the growth which would allow them to begin to catch up with their more prosperous fellow-regions.

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[1] A classification of regions following the criteria outlined in this paragraph is set out in "The Environment and the Internal Market - Development and application of a taxonomy of the European Regions and Sub-Regions" Report by ECOTEC Research & Consulting to the Commission of the European Communities, 1989

However, this system of classification should be interpreted with caution for a variety of reasons: First, it ignores the potential "X" factor; for example, determination and leadership in a "low-prospects" region which might allow it to transcend its past and increase its share of future growth. Secondly, some observers feel that as integration proceeds, and communications, services and facilities improve, there is likely to be a secular shift of people and activity to the periphery, and especially the Southern periphery, analogous to the shift of people and investment to the "sunbelt" in the U.S.A.

The Structural Funds, with their objective of economically arming the more deprived regions in order that they can participate fully in Community growth, have been increased so as to assist and facilitate this process of equalization.

Our macro-economic analysis of Greece and Ireland indicates that over the medium term (5 years), the combination of Single Market induced growth and the additional Structural Fund expenditure may allow these countries to maintain a growth rate close to that of their more prosperous Community partners, but as is shown by Table 4.3, it is unlikely that it will be sufficient to "narrow" the gap.

Table 4.3 Macro-economic impact of 1992 and increase of the Structural Funds, medium/long-term % change, Greece and Ireland

	Greece			Ireland		
	Internal Market (1)	Structural Funds (2)	(1) + (2) (3)	(1)	(2)	TOTAL
GDP	+2.44	1.43	(5.37)	1.84	0.89	(2.73)
Priv. consumpt.	1.03	+0.77	(2.87)	1.36	1.26	(2.62)
Priv. investmt.	6.42	6.84	(19.38)	5.43	1.73	(7.16)
Export	4.05	-0.68	(2.83)	2.24	0.89	(3.13)
Import	+0.79	+2.35	(-3.02)	2.60	1.84	(4.44)
Inflation	-1.47	-0.06	(-3.79)	-1.08	1.74	(0.66)
Employment	-0.83	+0.51	(-0.03)	+0.70	0.74	(1.44)

(3) These results are obtained by adding the impact of the two policies. While this gives an estimate of the impact when both policies are implemented at the same time, it does not take into account any interaction between the two.

Sources: P. Karadeloglou, "The Environment and Internal Market: Elaboration of an integrated Community strategy for the protection of the environment, economic development and employment: Macro-economic aspects for Greece" (Study carried out for the European Commission Directorate-General for the Environment, Nuclear Safety and Civil Protection, October 1989)

J. Bradley, J. Fitzgerald and L. O'Sullivan Medium-Term Review 1989-94, The Economic and Social Research Instiutute, Dublin, June 1989

Over the longer term (5+ years) it is possible that the Structural Funds will have given a sufficiently strong boost to the developing regions to allow them to begin to catch up. There is some evidence from the U.S.A. and from the economic development of Europe that convergence eventually does occur, but that, left to market forces alone, it can be very slow.

4.3 Environmental Impacts on the Periphery

Before examining the environmental implications of the Single Market for the periphery, it is useful to provide an overview of the existing situation.

4.3.1 Backlog of Investment Needs

We focussed attention on the periphery for the following reasons:

* The geographically peripheral countries and regions of the Community have a preponderance of those relatively undisturbed natural areas and habitats which, because of their character and uniqueness, are of international significance; they comprise a tiny residue of nature's original endowment to our now intensively developed Community. They represent our continent's link with the past, and, if destroyed, they cannot be replicated.

* These countries are relatively poor and are anxious to develop rapidly so as to catch up with their more prosperous partners. Because they are poorer, the opportunity costs (what is foregone) in order to conserve areas is relatively high, and the monetary and employment benefits of such conservation are perceived to be modest. The benefits of conservation are seen as accruing largely to the Community as a whole, while the costs are borne mainly by the poorer Member States. Because of this perceived asymmetry in the conservation incentives facing the periphery, there is a tendency to "underprovide" (from the Community's point of view) such environments.

* In recognition of the special adjustment problems facing the peripheral regions, the Community has provided that the Structural Funds available tc them be doubled between now and 1992. This will provide a stimulus to development in those regions. Unless the appropriate policies are in place, environmental problems are likely to ensue. If appropriate policies are in place, the environment can be enhanced. Article 130r (Para 2) of the Treaty (as amended by the Single European Act) states that "environmental protection requirements shall be a component of the Community's other policies". Thus, the Community has a fundamental legal obligation to ensure that this critically important element of its regional policies are consistent with environmental protection.

* Compared to the richer "central" countries, the periphery has very limited resources, in terms of staff and facilities, to develop and implement policies, a difficulty which is exacerbated by the necessity to implement Community Directives many of which are of limited relevance to the problems of the periphery.

Finally, the environmental problems of the periphery differ, in degree if not in character, from those of the rest of the Community. The cities of the periphery are growing more rapidly than elsewhere in the Community, they are less well served in terms of mass transit and environmental management infrastructure, the physical quality of their building stock is very poor, and their systems of environmental management are relatively undeveloped. The rapid pace of urban development also exacerbates the problems of rural areas, with depopulation and decline in the rural economy. Many of the periphery's environmental problems have to do with land use - erosion, habitat destruction, visually destructive developments, etc. - which involve large numbers of individual actions which are technically difficult to monitor and control, and politically difficult to restrict.

It is estimated that an expenditure of 13 000 MECUs would be required in Italy to raise environmental standards to Community norms. It is to be expected perhaps that the level of expenditure required in other southern Member States would be similar. A breakdown of the required expenditure is presented below in Table 4.4.

Table 4.4 Estimated level of investment required in Italy to raise environmental standards to Community norms

Country: Italy	Amount (Million ECUs)
Water	10.940
Solid Waste	1.059
Soil Conservation	10
Protected Areas	300
Training	233
Data Collection and Processing	82
Other Measures	72
TOTAL	13.146

Source: "Southern European Countries" by Emilio Gerelli, Rita Cellerino and Giorgio Panella, 'Regional Economic and Environmental Development', Prognos 1987, pp. 134-135.

The Spanish province of Andalucia illustrates the situation in the Southern periphery. For decades there has been substantial investment in industry (chemicals, iron and steel, fertilizers, pulp and paper, food processing, etc.) and tourism facilities, but with very inadequate provision being made for the reduction or treatment of wastes. The investments required to achieve existing Community standards are shown in Table 4.5.

Table 4.5 Environmental Investment Required to Achieve Existing Community Standards, Andalucia 1989, Millions of Pesetas

Investment Category	Amount (Millions of Pesetas)
Water supply	85000
Sanitation	125000
Remove Industrial Contamination (Huelva)	9000
Reduce Impact of Urban Solid Residues	8000
TOTAL	227000

Source: as for Table 4.4

A similar situation is found in Portugal, Greece and (to a lesser extent) Southern Italy: a relatively old industrial base and past tourist development which made few concessions to the environment have endowed these regions with severe environmental problems, and so substantial investments are needed if past inadequacies are to be made good.

In Ireland, the situation vis-a-vis industry is better because Ireland's industrial expansion is more recent and has been undertaken mainly by US multinationals. Since 1972, new industrial investment has been subjected to an environmental impact assessment process.

4.3.2 Low Income and Low Levels of Environmental Awareness in the Periphery

There is within the Community a certain tension between the aspirations of the centre, which wishes to see a high priority given to the environment in general and that of the periphery in particular, and the constraints facing peripheral regions which have custody of Europe's most unspoilt environments but often lack the resources to invest adequately in their protection.

At the root of this asymmetry in behaviour is the opportunity cost - what must be foregone - at the periphery in order to conserve. Compare Portugal and Denmark. The former has a national income per person which is less than 25% of the latter. When the Portuguese government taxes its citizenry in order to protect the environment, then, other things being equal, each ECU of tax taken will involve a commensurately much larger opportunity cost in Portugal than it will in Denmark. This difference between the centre and the periphery is narrowing as incomes rise and environmental education takes hold in the latter, and as the perception grows that a high quality environment can be a positive force for economic development.

4.3.3 Existing Patterns of Environmental Degradation

The environmental context from which we view the impacts of the Single Market is well documented and familiar. In the southern countries soil erosion is endemic, a product of farm abandonment, and overgrazing in Portugal and Greece and also in parts of Spain; forest fires are another important explanatory factor. Forests have also played a part in environmental degradation: in the interior of Portugal and parts of Spain, the planting of rapidly growing eucalyptus (Eucalyptus Globulus) has increased greatly, supplying raw material for the pulp and paper industry, one of the fastest growing industries in Portugal. Eucalyptus has replaced indigenous cork and pine species, which has led to a lowering of the water table, increased erosion and destruction of wildlife habitats. The growth in wood pulp and paper production - and the stagnation of the traditional cork products industry - are shown in Table 4.6.

Table 4.6

Production of Wood, Woodpulp and Paper, Portugal, 1970, 1980, 1985

Product	Output			Growth in Output (% per annum)	
	1970	1980	1985	1970-80	1980-85
Timber (000s M^3) 6370	8530	9224		3.0	2.0
Wood Pulp (000 t)	427	645	1152	4.2	12.3
Paper (000 t)	220	463	583	7.7	6.0
Cork products (000 t)	348	327	364	-0.6	2.2

Source: The World in Figures. The Economist, London 1987, p. 251

The expansion of Eucalyptus in the Mediterranean has its analogue in the expanding areas of Sitka Spruce in Ireland (North and South) and Scotland which provides the raw material for a small but rapidly growing wood processing sector.

Environmental pressures have been greatest in coastal regions. The industrial and tourist pressures have already been noted. Clearing up industrial and residential waste loads is expensive, but it is technically and politically feasible if the resources are available. More difficult to control is the development of prime coastal sites for hotels, apartments, houses and support services. In such cases, landowners and developers stand to make substantial profits if development is permitted and conversely would make substantial losses if development is not permitted: and hence there are pressures for development which is inappropriate in terms of scale and/or location. This tendency was exacerbated by rapid growth rates in tourist numbers and revenues experienced throughout the 1970s (illustrated by the figures in Table 4.7); the slowing down in the 1980s provides an opportunity for a more deliberate approach. We will return to this issue in the discussion of the Single Market impacts.

Table 4.7

Tourism: Numbers of Tourists and Receipts, Greece, Ireland, Italy and Portugal, 1970, 1980, 1985

	1970	1980	1985	Growth (% per annum) 1970-80	1980-85
Greece					
Nos (000s)	1407	4796	6574	13.0	6.5
Receipts (Mill US$)	194	1734	1428	24.5	-3.8
Ireland					
Nos (000s)	1758	2258	2423	2.5	1.4
Receipts (MillU$)	178	472	549	10.2	3.1
Italy					
Nos (000s)	N.A	22087	25047	N.A.	2.5
Receipts (MillUS$)	1639	8213	8713	17.5	1.3
Portugal					
Nos (000s)	3343	2730	4989	-2.0	12.8
Receipts (MillUS$)	237	1147	1137	17.1	-0.2

Source: The World in Figures, The Economist, London, 1987

Throughout the periphery, the protection of natural areas, of areas of importance for habitat and species conservation, and of ancient monuments, is inadequate. Development of land for farming, for roads, for holiday home development, for minerals extraction, etc. all tend to diminish a patrimony which typically is insufficiently protected in legislation, and the legislation in turn is only sporadically enforced. When those of the centre complain about the inadequacies of the periphery as the steward of Europe's last wild areas, there are some of the periphery who regard such criticism as a veiled attempt to turn the periphery into a weekend pleasure ground for the (affluent) central Europeans.

4.4 Sectoral Impacts and the Regional Dimension

Whether convergence is achieved or not, the periphery (Objective 1 Regions) is likely to experience rapid economic growth (albeit at a rate which may be lower than the Community average), if only because of the effects of additional Structural Fund expenditure: as noted already, this is borne out by preliminary results of economic modelling to assess the Single Market impacts on the Greek and Irish economies. The extent of economic growth after 1992 depends on a variety of factors, including the nature of Structural Fund expenditures and the economy's response.

It is probable that growth will be experienced unevenly across sectors, in ways which are difficult to predict.

Energy: Energy consumption tends to be highly income-elastic, so that, as economies grow, rapid growth in car and truck numbers and petrol consumption, electricity consumption, etc. is predicted. Already there are chronic problems of congestion in the large cities of the periphery. The photochemical cloud which hangs over Athens is a potent symbol of the problem and a reminder that the environmental baseline from which we are starting is not propitious. In Dublin the expected rapid growth in traffic will engender a different environmental impact; the roads are already congested, and a programme of road widening combined with a ring road system is being implemented to help relieve the pressure. This has already resulted in controversy, as some of the main thoroughfares running through the Medieval City are to be widened. The Single Market engendered effects on traffic generation will certainly intensify the pressure in this regard.

Agriculture: Within the Community, a highly modern, productive, input-intensive, high-output agricultural sector co-exists with low-input low-output type of farming which has in some cases led to the abandonment of farms. As was shown in Section 3.3.5 above, it is likely that completion of the Internal Market will intensify this tendency. The Common Agricultural Policy, which provides high product support prices, but is increasingly fixing production quotas to which these high prices apply, encourages this pattern, because the landowners who are already substantial producers get the largest quotas.

In Table 4.8, an example of the evolving patterns can be observed. The future prospects depend in part on the extent to which the output of third countries is given access to the Community. However, it seems likely that the strong comparative advantage which Andalucia has for certain products in an EC context will ensure that it holds or perhaps increases its market share, in part because processing capacity is growing in line with supply. Clearly, the potential for increased salinization, fertilizer and pesticide/herbicide contamination will grow to the extent that Andalucia becomes the California of Europe.

Table 4.8

Vegetable Exports, Andalucia by Province, 1984 and 1987

Provinces	1984 Tonnes	1987 % Tonnes	% change in 1987/1984
Almeria	130447	233538	+79.3
Huelva	6450	32554	+405.0
Sevilla	11798	15224	+29.0
Cadiz	614	143	-76.7

Source: J. López de Sebastián, "Environmental issues in the context of the Internal Market - the situation in Spain" Report to the Commission of the European Communities, 1989

This two-track farming system engenders a variety of environmental impacts. For intensive farming, contamination of ground water and surface water by fertilizer, salinization of soils, disposal of animal waste, drainage of wetlands and other habitat destruction, are characteristic negative effects. At the extensive margin, farm abandonment can combine with ground water depletion and over-grazing to lead to soil erosion. Portugal, Spain, Greece and Southern Italy all experience, in greater or lesser degree, these problems.

Although the Single Market is likely to intensify the degree of specialization, it also provides an opportunity to shift to a more environmentally benign type of farming. Through the Structural Funds (EAGGF Guidance component) additional resources will be available to help farmers maintain environmentally-friendly extensive farming systems, to convert land to other activities, and to diversify into tourism, small business, crafts, etc.

Forestry: This sector is being encouraged by the Community because it has a large deficit in wood products, and because afforesting land takes it out of surplus product-generating farming. The Single Market is encouraging consolidation in the forest products industry, and there is evidence that Scandinavian and other non-Community forest interests are exploring investment opportunities. Portugal is a particular focus of expansion, as growth rates of Eucalyptus are very high. Some of the traditional pine forest is being converted rapidly to Eucalyptus. The latter species is very "thirsty". Plantations appear to deplete ground water and intensify soil erosion processes, as well as providing a relatively sterile habitat for wildlife. There appears to be a trade-off involved between accommodating the raw material needs of an already dynamic pulp and paper sector which will be further stimulated by the Single Market, and the adverse environmental (and economic) impacts resulting therefrom.

Private forestry is expanding rapidly in Ireland, mainly based on exotic conifers, again stimulated by the demand of a rapidly growing wood processing sector, a trend which will be accentuated by the Single Market. The environmental impacts in this case are mainly the effects on landscape and habitat.

On the other hand, forests are suffering from environmental pollution. Some results of the 1988 inventory of forest damage presented in Figure 4.2 show the distribution of trees suffering from damage due, at least in part, to environmenta² impacts. Contributory causes include the effect of climate, air pollution and the planting of species which are not well adapted to the local environment.

Fisheries: As in the case of agriculture, with regard to marine fisheries, Community policy has focussed on the use of quotas, by species, based on total allowable catch. This allows over-fished stocks to rebuild and keeps fishing at a sustainable level. The quotas policy is complemented by policies or marketing, research, etc. designed to encourage value added and species diversification. The Task Force's analysis of fishing in Portugal led it to conclude that the comprehensive approach adopted by the Community to the management of the fisheries resources may provide insights for the management of other Community environments. The Single Market is unlikely to impinge significantly on the marine sector, but will encourage company takeovers and integration at the processing stages.

Mariculture is a growing sector in Ireland, based on salmon and shell-fish. It is a sector which is likely to expand also in Portugal, Spain and Greece. It generates employment and income in remote areas and is very welcome on that account. However, a number of environmental concerns have recently come to the fore including the treatment of fish to control lice, the problem of waste disposal and the potential impact on "wild" stocks. By increasing the market potential for the products of mariculture, the Single Market will intensify the pressure to expand output, but will do so at minimum cost.

Industry: The implications for industry are symmetrical with those for other sectors: more differentiation and specialization, more competition, more pressure on costs. With increased competition in the Internal Market, there is likely to be an expansion of those manufacturing industries which are already strong, while contraction will characterize the less competitive units in each region. Whether the environmental impact is positive or negative will depend on circumstances. Enterprises operating with out-of-date plant and poor environmental controls will suffer competitive disadvantages. The existing trend towards contraction and closure in these units will be accelerated by the Single Market, and this will be environmentally beneficial, but socially difficult. Other sectors and plants will expand rapidly. Whether the impact is environmentally benign will depend on the nature of the expanding industry and the environmental controls (including implementation) in place.

Tourism: Tourism has been identified as an area of economic activity of considerable significance in the context of environmental impacts of the Internal Market (see Section 3.3.4 above).

PERCENTAGE OF TREES DAMAGED OVER THE COMMUNITY

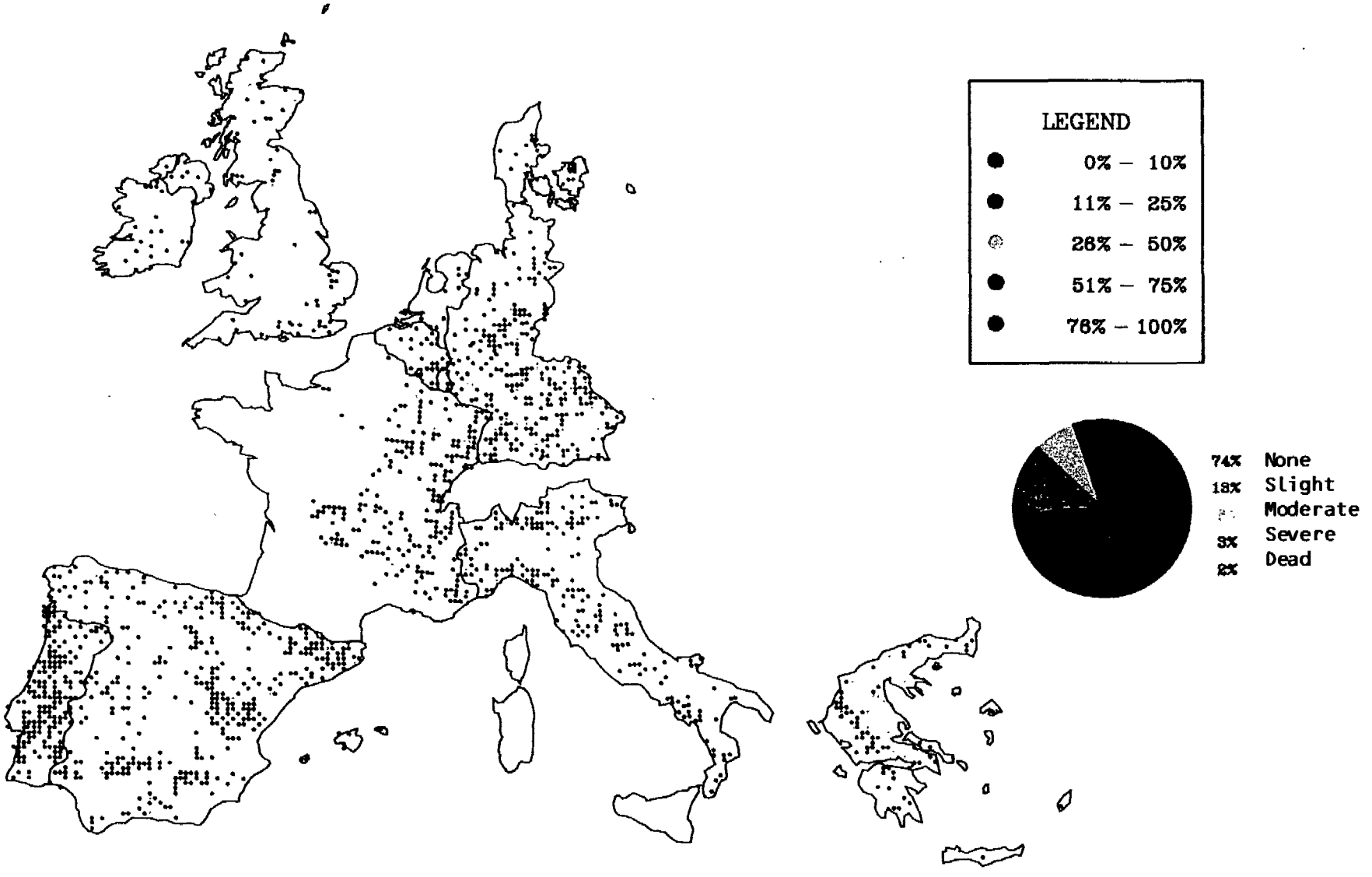


Fig 4.2 : The state of Forest Health

Source: 1988 Communitry Inventory of Forest Damage - (Directorate General for agriculture).

Our study in tourism impacts in Greece indicated that there would not be a large increase in tourism numbers, but that the type of tourism product supplied was likely to shift in the direction of large-scale, relatively self-contained tourism complexes, located in areas of striking beauty. Such developments will accept very stringent environmental controls, so that they could be relatively benign environmentally. Conversely, if the environment is not managed, then the effects overall will be negative.

Urban Impacts: The urban areas of the Community are remarkable in the variety of their architecture, their culture, history and their economies. Thy are remarkably alike in the nature of their environmental problems and their opportunities. They have problems of traffic congestion to the point where the automobile is often the dominant force shaping the city. Air pollution is a frequent companion problem to the automobile. The old built fabric of the city is often in a very poor state of repair, badly needing substantial investment. New investment is mainly at the periphery of the city. A process of suburbanization is evident, as people, schools, factories, etc. move out, and offices and (in some cases) vacant spaces "move in".

The response to these pressures has varied, with some cities in the richer countries investing heavily in the conservation of the built fabric, creating pedestrian zones, encouraging people to live in the city, etc. However, this response is typically not characteristic of the periphery, where the under-investment in the existing built fabric can be chronic.

The urban problems of peripheral regions are exacerbated by the dominance which one urban agglomeration typically exercises over the economic, social and political life of the country. Athens and Dublin each account for about one third of the population, and probably close to 50% of the GDP of Greece and Ireland respectively. Lisbon and Oporto are together responsible for more than 50% of Portugal's Gross Domestic Product.

4.5 Areas of Industrial Decline

Some of the most significant urban environmental problems arise in old industrial cities whose economic base has declined. The environmental effects of the Single Market on areas of industrial decline, or Traditional Industrial Regions (TIRs), will depend on the capacity of the regions to transform their economies and environments. The Nord-Pas de Calais region, with Lille at its core, comprises a classic case both of decline and the beginnings of a revival. This urban area was a power-house of the industrial revolution: coal-mining and steel manufacture were the region's primary sources of wealth and employment. The city developed to service the needs of the sector and its employees, and subsequently it became a major textile manufacturing centre. Gradually, the region became uncompetitive and went into decline. Since little environmental investment had been made and plants were highly polluting, plant closures did improve the physical environment, but there remained problems of toxic waste and pollution of the soil. Moreover, there was a weakening of the social environment as emigration grew, and as derelict sites and abandoned factories proliferated.

On the other hand, the region does enjoy certain advantages: one is its strategic position on the French side of the new Channel tunnel, on the London/Brussels/Paris axis. A second advantage is the existence of much of the built fabric of the 17th and 18th centuries, which is still extant and comprises an ideal basis for renewal. An unusually rich agricultural hinterland has produced food for a developing processing/packaging sector. The way forward for the region lies in efforts to encourage new, clean industry, service activities and tourism, and in investment in culture, public transport and education.

The Ruhrgebiet is an interesting example of a region which has taken a positive approach to the environment. A consistent pattern of improvement in a number of key environmental indicators is discernible; between 1976 and 1985, atmospheric concentrations of dust, sulphur dioxide, lead and cadmium have been reduced by 40%. During the past decade, the decontamination of soil has become a major regional task: costs for decontaminating the soil of the region have been estimated to be 6 billion DM. All biotopes in the region are being documented and monitored, and a special programme for the conservation of nature in the Ruhrgebiet has been established. Regional universities and research institutions have focussed much of their new capacity in environment-related subjects.

Industry in the Ruhrgebiet has discovered that environmental technologies have considerable market potential. More than 100,000 jobs in about 1,000 firms are related to development and production of environmental technologies and products. Most of the firms involved are innovative, relatively small and flexible. They are optimistic about future market potential, and a majority are planning considerably to expand their research and development activities.

Thus, like Nord-Pas de Calais, the Ruhrgebiet is a region which has benefited from regarding the environment as not only a problem, but also as an opportunity. Such a positive attitude will be even more necessary in the future, because it seems likely that the Single Market will put further pressure on the coal-mining industry, which is still an important sector in the regional economy; it is at present subsidized by means of a high (relative to the cost of alternatives) transfer price received for coal sold to the electric utilities, and this practice appears to be inconsistent with the provisions of the Single Market. In addition, the region - and such regions generally - has a very limited capacity to accommodate the increased air and road traffic likely to be engendered by the Single Market, while there is also a concern that - with open frontiers - they may become "targets" (willing or otherwise) for trans-frontier waste disposal.

The Single Market will make it more difficult for governments to subsidize the production of high-cost energy, and to protect uncompetitive industrial activities through subsidies and government contracts. It is likely to make it easier to move toxic wastes from one country to another. In the worst case, a TIR could find itself with a collapsed mining industry and industrial base, with its derelict land and abandoned mines becoming a destination for waste disposal.

Some TIRs will be able to take advantage of the opportunities provided by the Single Market. The physical environment will be transformed, making the cities and their environs attractive places in which to live and work, while skills will be adapted such that the labour force can participate in growing sectors of the economy.

The role of the Community in helping finance this transformation in the physical character and skill profile of these regions will be critically important, because investments on the scale required are very unlikely to be forthcoming from the market. Experience indicates that, for a TIR to revive economically, it must achieve a high level of environmental quality. It should be a core element of Community regional and environmental policy to help regions achieve this synergy.

4.6 Investment, the Structural Funds and the Single Market

The Community Structural Funds constitute a major source of investment funds potentially available for application to the environment. The doubling of the Structural Funds constitutes a quantum leap in the size of the potential investment funds available for environment. It is likely that many of the areas of industrial decline will use much of their Structural Fund allocation to enhance their environment, thereby enhancing their economic viability. The Peripheral Regions are also proposing that Structural Funds support environmental projects, but the extent of the commitment varies. We can distinguish the following types of opportunities for environmental investment.

(i) Correcting for the sins of the past: Some of the old industrial regions, and the heavy industry zones of the periphery have very serious problems of water pollution, ground water pollution, contamination of soil pollution, derelict sites, etc. Some rural areas have likewise serious problems of habitat destruction, salinization, etc. Investment in the correction of some of these problems will not yield a "commercial" pay-off, judged in terms of income and employment generated, and the Polluter Pays Principle is not applicable, because the original polluter is long gone.

(ii) Conserving Rare Habitats in Remote Areas: There are habitats and species which should be conserved, but which have limited or negligible potential for tourism development due to inaccessibility, or the fact that even a minimal tourism presence would be disruptive and potentially destructive.

(iii) Environmental Investment Associated with New Development: As additional investments are made in farming, tourism, industry, residential, services, etc. there will be potential for impacts which have environmentally adverse effects. Investment is required to ensure that such adverse effects are minimized. The extent of investment required will depend in part on the standards set and on assimilative capacity.

(iv) Investments in Environment which Generate Income and Employment Directly: Examples include investment in the restoration of urban streetscapes, pedestrianization, the conservation of distinguished buildings for tourists, the establishment of National Parks and interpretative centres designed to attract visitors, the cleaning up of a polluted bathing area, the landscaping of a formerly derelict site so that investment in industry and services is encouraged, etc.

It is clear from Article 130r of the Treaty, as amended by the European Single Act, that there is a legal obligation on the regions to address (iii) above in an appropriate manner and to ensure that Community funding does not have adverse environmental impacts. To promote compliance with the requirements of the Treaty, the Commission in December 1988 issued internal instructions concerning the assessment of the impact on the environment of plans, programmes and projects presented in the framework of the Structural Funds. In essence, they require that the environmental impact assessment (EIA) approach embodied in directive 85/337/EEC, on the assessment of the effects of certain public and private projects on the environment (O.J. L 175/40, 5.7.1985), be applied to the Structural Fund proposals.

The implementation of these instructions in the Plans submitted has been poor, for a number of reasons:

* The time available - approximately three months - from promulgation of the regulations to the delivery of the Plan (31 March 1989) was very short.

  The countries have very limited experience in the implementation of EIAs, and what they do have is focussed at the level of projects. There was neither a conceptual framework nor analytical experience at addressing environmental assessment at the national level.

* In the pre-submission period, the Commission emphasized that the plans submitted should be brief, strategic and unspecific as regards projects. This posed a difficulty inasmuch as environmental impact depends to a considerable extent on the mix, magnitude, location and management of projects.

* Strategically, some regions were anxious to devote a minimum of Structural Fund expenditure to the addressing of environmental problems which did not contribute to the achievement of growth and therefore convergence. The rationale for this concern is well captured in the results of the modelling exercise vis-a-vis Single Market Impacts on the Greek economy. In essence, the results show that, as regards air pollution (SO_x and NO_x) elimination of the "additional" emission resulting in effect from the Single Market could, under certain assumptions, reduce the rate of economic growth (as conventionally measured). This is not surprising, because there is no short-term identifiable financial advantage resulting from the elimination of these "additional" pollutants.

  This exercise also illustrates the problem which such investment poses for a small open economy - whether a national economy on the periphery or a regional economy in industrial decline. Except for the use of the Ruhrgebiet, such economies typically do not have a strong domestic eco-industry and so it is necessary to import hardware, software and, in some cases, skills from the larger, more integrated economies; meeting environmental responsibilities has the effect that economic activity is transferred from the poorer to the richer regions.

The policy implications of all of the above are as follows:

* The manner in which environmental considerations are integrated into the Structural Fund process is highly unsatisfactory. There is no conceptual framework on which the Commission and the regions have agreed, and hence there is no consistent application and implementation at the Plan, Programme and Project stages. This gap in concept and practice must be corrected as a matter of priority.

* It is appropriate, and indeed necessary, that Structural Funds be employed to deal specifically with the potential environmental problems arising from new development, and specifically with projects financed by the Funds.

* It is desirable, but not necessary, that investment in environment which generates income and employment directly [(ii) above] should come from Structural Funds.

* With regard to environmental investment needed to deal with the sins of the past [(i) above], this should come from Structural Funds if such investment will contribute to the development process. Likewise, since the conservation of rare habitats in remote areas [(ii) above] will contribute little per se to the development process, it will generally not be fundable under the Structural Funds. We conclude therefore that there may be a role for a separate Community Fund addressed to "catch-up" requirements, and those environmental investments which are badly needed but which do not have a specific economic role, directed at environments where there is a clear Community interest (a restriction called for as a result of Para 4 of Article 130r of the Treaty as amended by the Single European Act). This would help poorer regions undertake some environmental investment without damaging their prospects of achieving convergence.

  However, we recommend that such a Fund be established only if the central role and responsibility of the Structural Funds to deal in an environmentally sound manner with the environmental implications of their projects is appropriately recognized, together with their role as funders of "Environment for development" projects.

* Providing funding to help companies and individuals to make the investments needed to correct for vintage damages to the environment is a powerful instrument in achieving a high quality environment. It has been used very effectively by the Irish government to improve performance in industry and farming and is central to Spain's programme in Andalucia and elsewhere to deal with the problems of the past. While it is important that the Polluter Pays Principle be clearly defined and strictly applied, its application should not necessarily preclude the use of this powerful and critically important policy instrument.

There are particular locations which are especially vulnerable to potential environmental damage resulting from the Single Market. These are:

* Those areas already under environmental stress, which have zero, or very limited, capacity to assimilate further waste.
* Those areas with high quality environments which have unique, non-replicable characteristics, and are easily damaged.
* Areas where cross-border environmental impacts are a significant problem, and where the management of such impacts may be exacerbated by Single Market provisions.
* Coastal areas which attract population and industrial development, and which are extensively used for recreation
* Rapidly growing cities, especially those of the South, where rapid growth coincides with a relatively poor capacity to deal with it, because of poor transport and environmental infrastructure, a run-down building stock, and inadequate systems of environmental management.

The periphery in general is particularly vulnerable because of low income levels (and the resulting difficulty in finding sufficient resources adequately to implement measures), poor infrastructure and inadequate environmental management, while the areas of industrial decline are vulnerable because they run the risk of being marginalized economically and socially because of high costs, congestion and poor environments.

Although this potential for environmental problems exists, whether the Single Market has positive, negative, or neutral environmental effects depends largely on the policies which are in place to deal with the impacts, and on their implementation. We are not confident that the existing policies (and their implementation) will be sufficient to ensure that the environmental effects will be benign, for the following reasons:

(i) Provision for Structural Fund expenditure in the periphery has been doubled. The process enacted by the Commission to ensure that, as these funds are expended, the environment will be protected, and the implementation thereof by the applicant countries, are both inadequate as a means of ensuring that the environment is protected, and that the Commission's statutory obligations in that regard are fulfilled.

(ii) The Community's most vulnerable environments are in general located in those countries and regions with the least financial and administrative resources to protect them, with the greatest pressure to "develop" and with very little incentive in the short term to conserve, because the benefits of conservation accrue to the European Community as a whole, while the benefits of development are captured locally. Apart from a few small, relatively specialized funds, there is no source of funds to which regions can turn to help them fulfil their obligations to the Community as a whole.

(iii) Many of the manifestations of the Single Market will appear in the form of land-use changes, especially near coasts. Decisions on development are typically made at the most local level of government; the development genie released by the Single Market will be managed at the local level of government. There is no systematic evidence to show that local governments are more or less "environmental" than regional or national governments. However, there is a Community interest in ensuring that there is appropriate knowledge and capability at the local level to allow informed decisions to be made, especially when such decisions bear on environmental assets - built and natural - which are of European significance.

4.7 Conclusions

The analysis of this chapter shows that particular problems arise for peripheral regions and traditional industrial regions (TIRs).

The periphery in general is particularly vulnerable because of low income levels (and the resulting difficulty in finding sufficient resources adequately to implement measures), poor infrastructure and inadequate environmental management, while the areas of industrial decline are vulnerable because they run the risk of being marginalized economically and socially because of high costs, congestion and poor environments.

Many of the environmental problems of peripheral regions relate to land use, and specifically the protection of natural areas, of areas of importance for habitat and species conservation, and of ancient monuments, is inadequate.

In many instances the degree of protection is inadequate, due primarily to a lack of resources.

The environmental effects of the Single Market on areas of industrial decline will depend on the capacity of the regions to transform their economies and environments. Community regional and environmental policy to help regions achieve this should acknowledge that economic revival depends on the achievement of a high level of environmental quality.

Community policies should seek to ensure that the environmental dimension is taken fully into account in expenditure from the (augmented) Structural Funds, that particularly vulnerable environments are protected, and that sufficient knowledge exists to reach informed decisions at local level.

CHAPTER 5

ENVIRONMENTAL IMPACTS OF INTERNAL MARKET GROWTH: A MACRO MODELLING APPROACH

5.1 Sustainable development and the environmental dimension

One of the main issues which arises from assessment of the environmental dimension of the Internal Market is the extent and nature of the economic growth which is generated as a result of change associated with the 1992 programme. In particular it is necessary to consider the extent to which, given existing policies, this growth is sustainable in the longer term, and the type of policies which may be required to ensure its long term sustainability.

The issue of sustainability has become a matter of growing concern: the essence of sustainable development is that the needs of the present generation are to be met in a way which does not compromise the ability of future generations to meet their own needs, having regard to four key elements - the state of technology, social organization, the absorptive capacity of the environment and technological and social changes (including policy measures).

The Cecchini Report shows that completion of the Internal Market can be expected to increase the rate of economic growth within the Community. Economic assessments undertaken for the Cecchini Report suggest that Community aggregate GDP may rise in the medium-long term by between 4½% and 7%. The Cecchini Report did not take account of the environmental dimension; nor did it explicitly consider the issue of sustainability or examine the implications of the growth projections in terms of factors which, depending on the nature of projected growth and the policy response, could limit its sustainability in the longer term. The environmental dimension constitutes an important facet of sustainability, and it is one of the purposes of this chapter to illustrate how this additional dimension can be incorporated into an analysis of the economic growth process.

The original contribution of the present report is to link economic and environmental models. The economic modelling made use of the Commission's HERMES model (which was also used in the Cecchini Report): in combination with existing environmental models a series of projections was generated, incorporating assumptions relating (inter alia) to technology, behavioural changes and policy developments. These projections were then used to analyze the environmental implications of economic growth scenarios.

Analysis of the growth process generates projections for the future which may or may not be plausible in the light of the pressures which would arise, depending on the extent and nature of the growth in question. A scenario cannot be regarded as plausible if the growth process which it depicts is not sustainable - for example, where the benefits of growth would be offset in the longer term by substantial environmental costs. On the other hand, projections on these lines can serve as a useful guide to policy formulation, since they can indicate the nature of the policy response which would be required to ensure the sustainability of the growth process.

Given the numerous constraints of time, resources, data, availability of models, etc. it is possible only to indicate, for a very limited range of environmental impacts, how a more general exercise might be undertaken. The present work does not purport to give a comprehensive account of the extremely complex set of linkages between economic activity and environmental impacts. The empirical analysis has therefore focussed on two major types of pollution - emissions of sulphur dioxide (SO_2) and nitrogen oxide (NO_x).

On the other hand, the methodology is of general application and could be used to analyze other forms of pollution.

This chapter will offer preliminary answers to the following questions:

1. What are the key factors in evaluating the sustainability of the growth dynamics generated by the creation of the Internal Market?

2. As a case study, what is likely to be the impact of the Internal Market on SO_2-NO_x emissions and acid depositions, on the assumption that no new measures are taken?

3. What kind of policy scenarios could accompany the completion of the Internal Market to prevent or to abate these emissions?

It should be observed that the current analysis is at a macro level and does not evaluate sectoral or regional impacts; micro level analyses of these impacts are set out in Chapters 3 and 4 above.

5.2 The environmental impact of the completion of the Internal Market

5.2.1 The mechanisms involved

As has been indicated in section 1.2 above, the results of the study on the cost of non-Europe show that completion of the Internal Market may result in the shift towards a higher growth path (with higher growth in certain sectors such as manufacturing and goods transport - see 5.3.1). To evaluate the impact of economic growth on pollution one must distinguish three kinds of separate but linked effects:

a) a quantity effect: more growth in real terms means more production and consumption which implies, assuming everything else remains the same, more pollution, pressures on land use and environmental resources.

b) a structural change effect or sectoral effect: positive or negative, depending on whether the share of pollution-intensive sectors in overall economic production will increase or decrease.

c) a technical change effect: positive or negative, depending on the regulatory framework and incentives affecting technological development. Because of economies of scale, increased profits and increased opportunities for innovation, opportunities for pollution abatement are likely to increase.

Without positive sectoral and/or technical effects, pollution will be linked to the quantity effect of economic growth. In the case that these effects are negative, e.g. due to a stronger growth of pollution intensive sectors, pollution may even increase more than the average growth rate. If the positive technical (and sectoral, if they occur) effects are large enough to compensate for negative quantity (and, if they occur, sectoral) effects, a delinking between growth and pollution occurs.

It is likely that the completion of the Internal Market will have effects at all three levels. The overall effect of economic changes due to the impact of the Single European Market will be the sum of these three effects which may be compensating or reinforcing each other.

5.2.2 Projections for emissions of SO_2 and NO_x, as an example

In the EC study "Energy 2010" a projection is given of the likely development of emissions of SO_2 and NO_x, given the most likely assumptions regarding economic growth in the EC and elsewhere, prices of energy, technical evolutions, and under the assumption of full implementation of present environmental legislation.

Figures 5.1 a and b show that some delinking of economic growth and pollution is expected to occur. Notwithstanding an expected average economic growth of 2.6%, emissions of SO_2 will decrease while emissions of NO_x will stabilize due to energy efficiency improvements (notably, further penetration of existing technologies), and especially to the impact of EC and national environmental legislation (for example, the EC Directive on Large Combustion Installations). However, this trend is less pronounced in southern Member States where NO_x emissions will continue to rise. In addition to the SO_2 and NO_x figures, it is important to note that CO_2 emissions will continue to rise.

5.2.3 The ecological threshold as the reference for evaluation

In the assessment of environmental impacts, reference should be made to the limited absorption capacity of the environment, which is reflected in ecological thresholds and in critical loads. Although environmental scientists do not always agree on the precise specification of the standards, it is nevertheless clear that in many cases levels of pollutants exceed critical loads. It was, for example, calculated in the Dutch report "Concern for Tomorrow" that emissions and SO_2 and NO_x depositions should decrease by 70 to 90% in order to respect critical values.

When we look at the predictions of acid depositions for 1995 we notice that the Dutch standard of 1400 acid equivalents per hectare is exceeded in 5 Member States, while not one Member State will respect the Scandinavian threshold of 400 acid equivalents per hectare.

5.2.4 Towards an evaluation of the impact of the Internal Market

For the present there is considerable uncertainty concerning the net changes in the different effects (quantity, structural, technical) due to completion of the Internal Market. The main question is to analyze the extent to which present environmental and other policies (energy, transport) sufficiently provoke positive technological and sectoral changes to compensate for the negative quantity effects. Secondly, but not of lesser importance, is the question as to whether the ecological standards will be respected in this new situation.

To evaluate the net outcome, an in-depth study is necessary. However, an overall analysis is not feasible due to limits of time and resources, and especially due to a lack of scientific tools and data. This situation contains already a strong recommendation: if the sustainability of economic growth is considered as a policy objective, substantial action is needed to develop the scientific instruments necessary for a detailed and comprehensive assessment of environmental conditions in order to identify critical problems and to develop policies to overcome them.

At present, such models exist only for SO_2 and NO_x emissions related to the use of energy. As a consequence, an in-depth study is only possible for these problems.

5.3 The impact of 1992 on Sulphur Dioxide and Nitrogen Oxides: as a case study

5.3.1 Methodology, scope and assumptions

As described in the introduction, the objective of this section is to make a detailed calculation of the impact of 1992 on SO_2 and NO_x emissions and to evaluate the macro-economic consequences of the abatement - or prevention of the increase - of these emissions, as well as of further abatement instruments. The exercise makes use of five separate models which analyze the separate stages in the linkage between economic growth, environmental impacts and the policy response. The five steps of this analysis, and the corresponding models, are set out in Table 5.1.

Figure 5.1a SO_2 emissions for EUR12 by sector

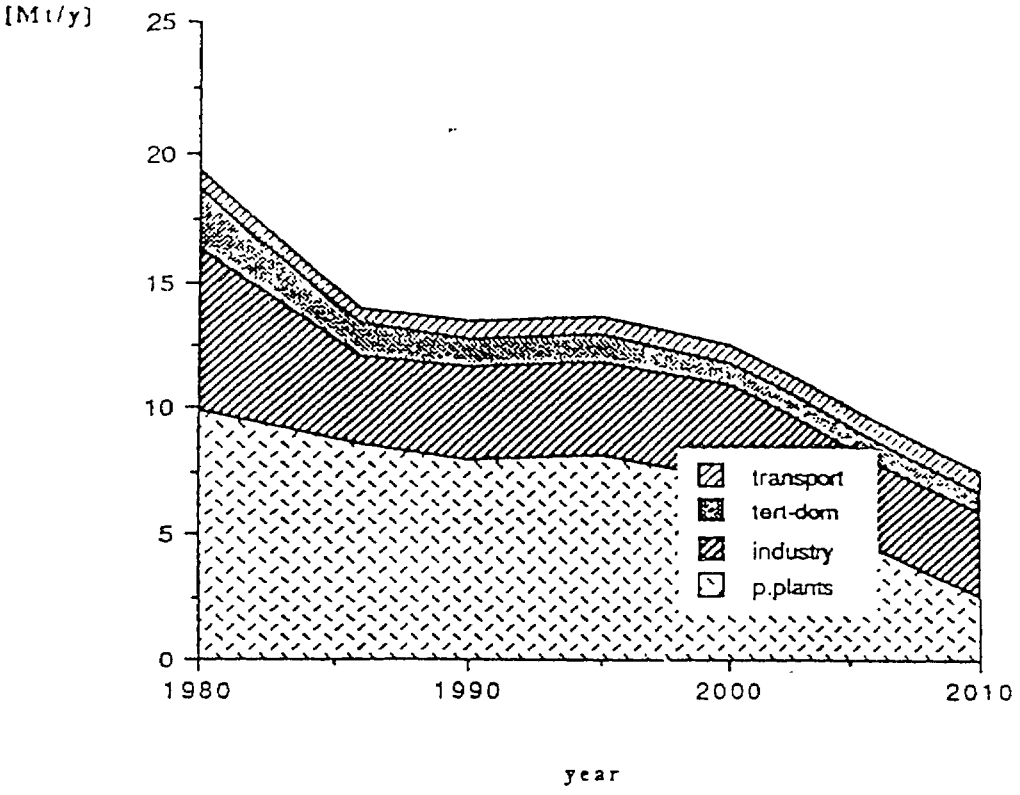
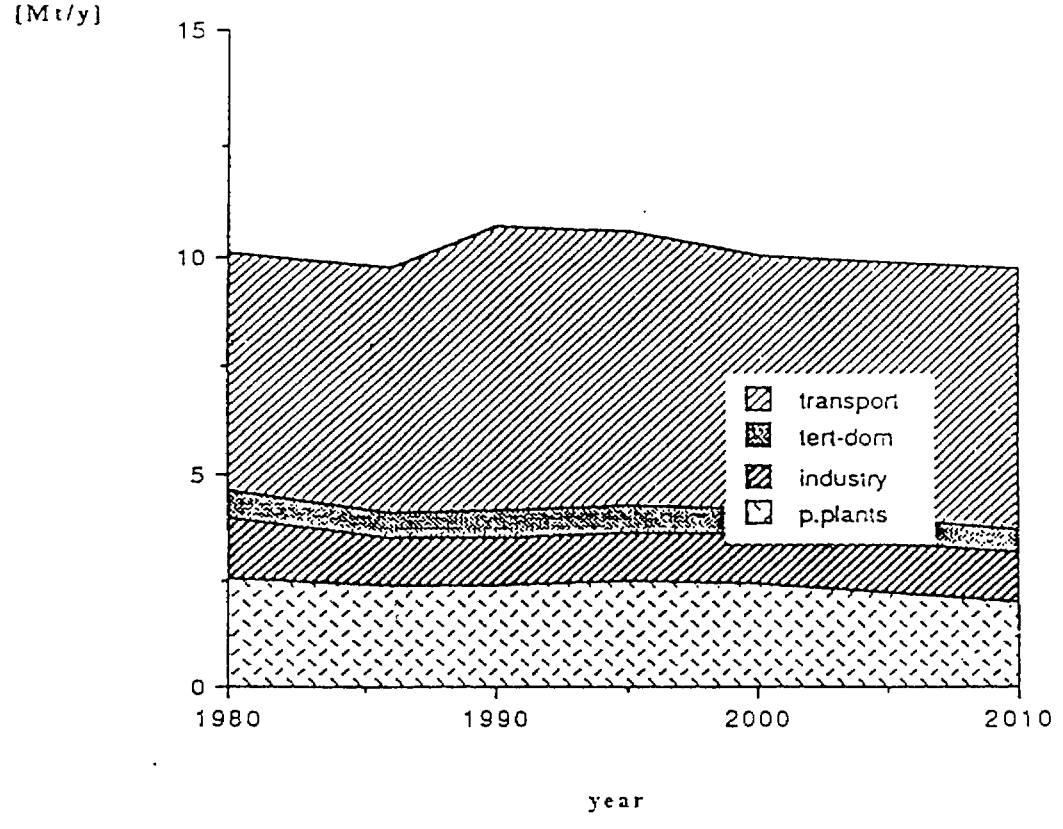


Figure 5.1b NO_x emissions for EUR12 by sector



Source: Commission Draft Communication on Energy and the Environment

Table 5.1 1992 and SO_2 and NO_x emissions: global outline of the study

	PURPOSE	MODEL
1	Impact of 1992 on economic growth	HERMES
2	Impact of economic growth on energy demand	MEDEE
3	Impact of energy demand on emissions	EFOM-ENV
4	Impact of emissions on depositions	EMAC
5	Environmental scenarios: investments needed to abate or prevent emissions	EFOM-ENV

The full exercise as described above has been carried out for France, the Federal Republic of Germany, Belgium and Greece. Limited calculations were undertaken for Italy, the Netherlands and the UK. For the other Member States extrapolations were made in order to arrive at figures for Europe as a whole.

The main assumptions underlying these exercises are:

a) concerning the long term and sectoral impact of the Internal Market:

As decisions related to the supply of energy may affect the environment especially in the long run, it was necessary to estimate the impact of 1992 on the economy in the long term (up to 2010). This is done by extrapolation of the medium-term impact as described in the Cecchini report.

From the detailed figures one can note that the positive impact on economic activity is higher in the long run (5,7% average for FR, B, FRG), notwithstanding the fact that the additional yearly impact on growth is slowly fading out. (This is because the long-term impact represents the cumulative effect of movement towards a higher growth rate - so that while the annual effect tapers, the cumulative effect continues to grow, albeit more slowly).

b) concerning the energy sector:

The assumptions underlying the EC study 2010 regarding technological changes, prices, energy conservation, fuel mix, etc. apply.

c) concerning the SO_2 and NO_x emissions:

The increase in energy demand is met by an increase in supply in the most cost-efficient way (minimizing total costs).

Full implementation of present European Community and national environmental legislation on energy (changes in relative prices) is assumed. The only exceptions concern international agreements not (yet) transformed into legislation and a new Community directive on emission standards for small/medium-sized cars. However, since these cars represent a small percentage of total emissions, their limitation is not likely to change the major outcome of the exercise.

5.3.2 Significant increase in emissions of SO_2 and especially NO_x

The potential growth stimulus of the Internal Market is likely to imply a significant increase in emissions of SO_2 and NO_x. It is estimated that unless further measures are taken, emissions of SO_2 and NO_x will by 2010 attain levels which are respectively 8-9% and 12-14% above the levels which would be reached in the absence of the Internal Market (Table 5.2).

Table 5.2

The impact of the Internal Market on SO_2 and NO_x emissions and on GNP in France, the Federal Republic of Germany, Belgium and Greece (% differences between the with and without Internal Market cases)

	1995			2000			2010		
Country	SO2	NOX	GNP	SO2	NOX	GNP	SO2	NOX	GNP
France	3	5	2.3	4	9	4.1	4	13	6.2
FRG	9	5	2.4	4	8	4.4	7	8	6.9
Belgium	6	6	1.9	7	7	3.5	8	12	6.1
Greece	4	6		6	8		17	15	
EUR 12	5.5	5.5		5	10		8	12	
to	6.3	5.7		5.7	11.5		9.2	13.8	

Source: CO<H>ERENCE, 1989

Notwithstanding the projections for the situation without the Internal Market which describe a delinking of growth and SO_2 and NO_x pollution, this additional growth impulse is likely to lead to an increase in emissions which is even bigger than the increase in GDP. These results are not in contradiction to the above-mentioned trend and can be explained by the increased energy demand and the limitation of current environmental policies and technologies.

These apparently paradoxical results are explained by the limitations of current environmental policies and technologies in the face of higher energy demand in the "with Internal Market" case. Especially in the goods transport sector, there will be considerable growth generated by the Internal Market. For those countries in which the nuclear sector is of greatest importance as a source of energy, the transport sector is the major source of increased emissions, particularly of NO_x. For other countries, the transport sector is of relatively less significance in this respect, since approximately half of the increase in the overall emissions is due to increases in demand for electricity.

The differences between countries stem largely from differences in the pattern of energy supply, environmental legislation, and impact of the Internal Market. In this respect, this increase will be higher in the Southern Member States, as has been noted in the previous chapter.

5.3.3 Evaluation of the results in view of the assumptions

As indicated above, the present exercise could not include all the impacts of the Internal Market. To the extent that the completion of the Internal Market gives opportunities for increased energy efficiency (economies of scale, incentives for innovation), the estimates are too pessimistic. By the same token, it was not possible to take account of technical changes in the transport sector, such as the extension of cabotage across intra-Community frontiers to permit carriers to transport freight within countries other than their own. However, these elements are not likely to change the orders of magnitude of the results. On the other hand, there may be grounds for judging the results excessively optimistic. Indeed, it has been assumed in the calculations that the Internal Market will not change fuel prices. Depending on the outcome of the proposals on tax harmonization, and on the extent of price reductions resulting from the competitive process, a drastic reduction in certain cases in the price of fuels or vehicles could create a substantial additional stimulus to energy demand.

5.3.4 Acid rain will remain

Although the impact of the Internal Market on emissions of SO_2 and NO_x is substantial, it will not change the decreasing trend for emissions of SO_2 and the stabilization of emissions of NO_x (starting from the 1980 level). The impact of emissions on the environment must be assessed against ecological standards based on an assessment of the absorptive capacity of the environment.

The depositions of SO_2 and NO_x emissions have been derived from the emissions per country, by use of the EMAC (European Model of Acidification) model (Table 5.3). For the purposes of this analysis it has been assumed that there is no change in the spatial distribution of emissions, so that the net increase in emissions due to the Internal Market is distributed in the same way as the total of the emissions without the Internal Market.

Table 5.3

Acid depositions in 2000 (incl. expected Internal Market growth) (1)

		without I.M.	with I.M.
1	Belgium	2039	2159
2	Denmark	962	997
3	France	970	1018
4	FRG	2098	2179
5	Greece	1140	1179
6	Ireland	548	573
7	Italy	1811	1897
8	Luxembourg	1071	1121
9	Netherlands	1909	2010
10	Portugal	798	835
11	Spain	812	853
12	UK	1934	2031
Ecological standard:	Netherlands	1400	
	Scandinavia	400	

(1) = average acid equivalent per hectare per year.

Source: EMAC, Wageningen Agricultural University, 1989

As NO_x and SO_2 emissions are, together with NH3, responsible for acidification (acid rain), we can quantify to what extent the increase in these emissions will lead to further acidification. We estimate that for 9 of the 12 EC countries, acid depositions will rise by more than 4%. Also for some non-EC countries these depositions will increase significantly, especially in Switzerland, Austria, Sweden and Yugoslavia.

The absorptive capacity of the environment varies between regions, depending, primarily, on soil conditions. With and without the Internal Market, the ecological standard of 1400 acid deposition equivalents is likely to be exceeded in the most industrialized Member States, while all Member States exceed the Scandinavian norms (400 acid equivalents). As these figures are national averages, the situation in the most industrialized regions will be even worse. It can therefore be concluded that, although the increase in emissions due to the Internal Market is not changing the emission trends, it is worsening the existing acidification problem. Acid rain will remain a problem and is becoming worse.

Another major issue highlighted by the analysis is the importance of transfrontier pollution. Figures 5.2 a and b show emissions and depositions per country. For most countries emissions considerably exceed depositions. This means that a substantial fraction is "exported" (to Scandinavia, Eastern Europe). For the FRG, however, the reverse holds. This means that the effects of pollution abatement in the FRG are partly nullified by "imports" of pollution. This finding gives support to the importance of international cooperation in the field of pollution abatement, both within the Community and more widely.

5.4 Environmental policy scenarios to reduce emissions

5.4.1 Methodology and assumptions

In this section we will examine what policy actions can be taken to reduce emissions, how the different polluting sectors are affected by these policies and what are the accompanying costs and investments needed. In a first scenario, emissions are reduced to the level without the Internal Market, while in a second scenario, an assessment is made of the extent to which emissions of SO_2 and NO_x may be reduced, given the present state of technology.

The technical opportunities and financial implications of a reduction of SO_2 and NO_x emissions were evaluated using the EFOM environment models of the Commission. By this means an assessment was made of the most cost-effective procedure for the reduction of emissions, whereby a given reduction is achieved with the technology or choice of fuel that leads to the lowest overall cost.

The present exercise examines the limits of a policy oriented at technical solutions and, as such, does not include any additional structural policy measures, such as a change in the transport system or incentives for energy-saving measures. On the other hand, existing constraints regarding legal, contractual and technical limits to substitution between fuels are taken into consideration (e.g. limiting the use of nuclear energy for Belgium and France to 70% and 80% respectively of total electricity generation). As a consequence, the possible scenarios applied in the simulation exercise consist of a more rapid implementation of certain policy measures or of imposing new measures. The cost figures obtained refer to the overall costs including those for investment, operation and purification. Due to constraints of time and resources, and limited availability of models, the analysis was undertaken only for Belgium, France and the FRG. While it cannot be claimed that the results are necessarily representative of the Community as a whole, it is noticeable that the results for these three countries are very similar [1].

[1] Further details of the analysis are contained in CO<H>ERENCE "Environnement et Marché Intérieur" Rapport intermédiaire, Septembre 1989.

5.4.2 The increase in emissions requires reduction measures in other sectors

For all three countries studied (Belgium, France and the FRG) it is possible to reduce both SO_2 and NO_x emissions to the level which would be reached without the growth increase induced by the Internal Market, provided that certain additional policy measures are taken (see Table 5.4).

Table 5.4 Ranking of emission reduction measures for the FRG, Belgium and France in order of cost-effectiveness

SO_2

1. Additional FGD (flue gas desulphurisation) on existing power plants (France and Belgium, already existing in the FRG).
2. Fuel switching and new clean coal technologies in the power generation sector (FRG and Belgium).
3. FGD in industrial sectors (FRG and France).
4. Restructuring of the electricity sector with new nuclear plants (all).

NO_x

1. Additional primary measures (already undertaken in the FRG) for existing plants and primary measures for industrial boilers (France and Belgium).
2. Secondary measures for existing power plants and industrial boilers (all).
3. Fuel switching and technology substitution in the centralized power generation sector (nuclear plants) (all).
4. Additional measures in the transport sector i.e. retrofitting of existing cars with catalytic converters (FRG).
5. Combustion modification and installation of low-NO_x burners in the tertiary-domestic sector (France and the FRG) (not included in the model for Belgium).

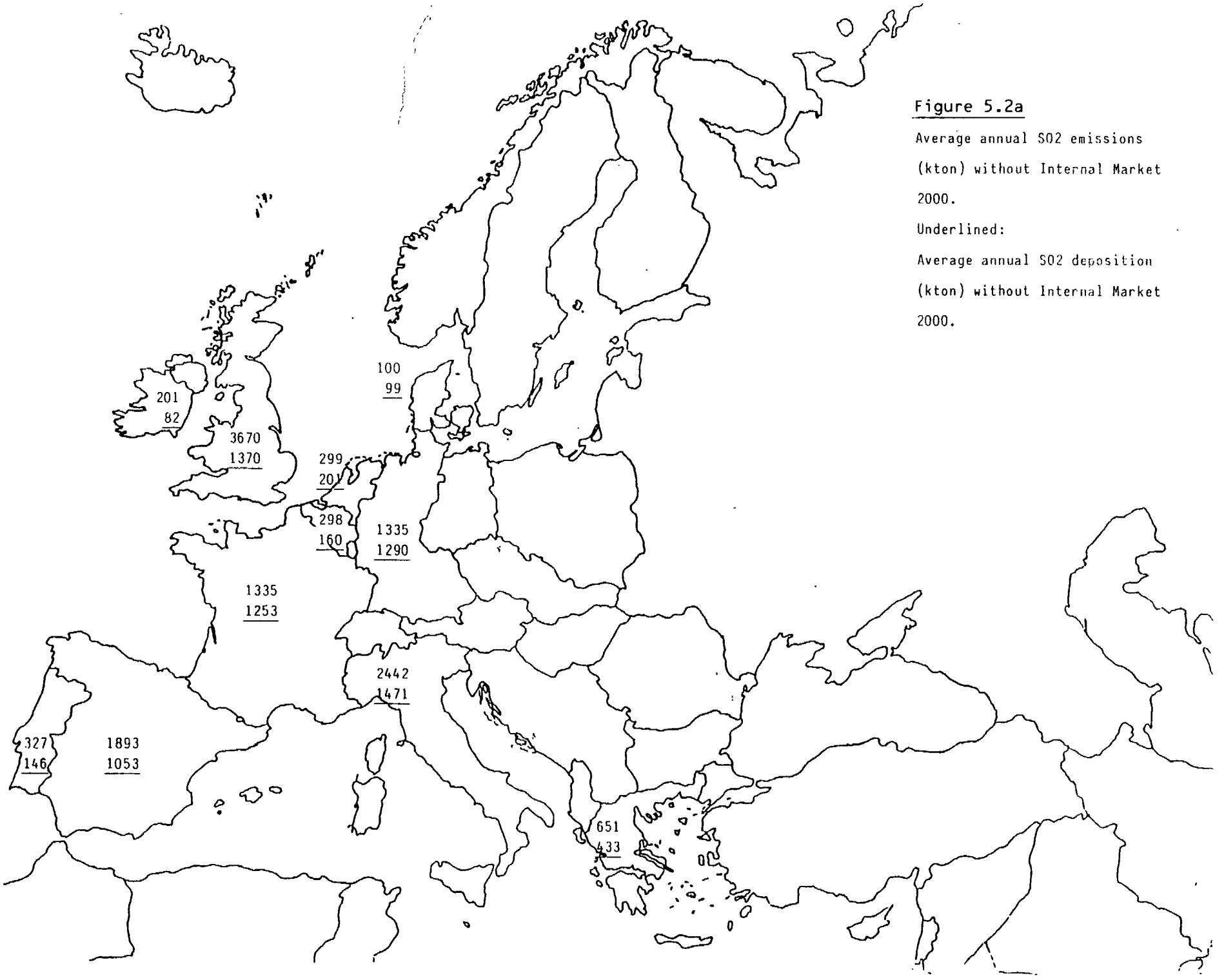


Figure 5.2a

Average annual SO2 emissions (kton) without Internal Market 2000.

Underlined:

Average annual SO2 deposition (kton) without Internal Market 2000.

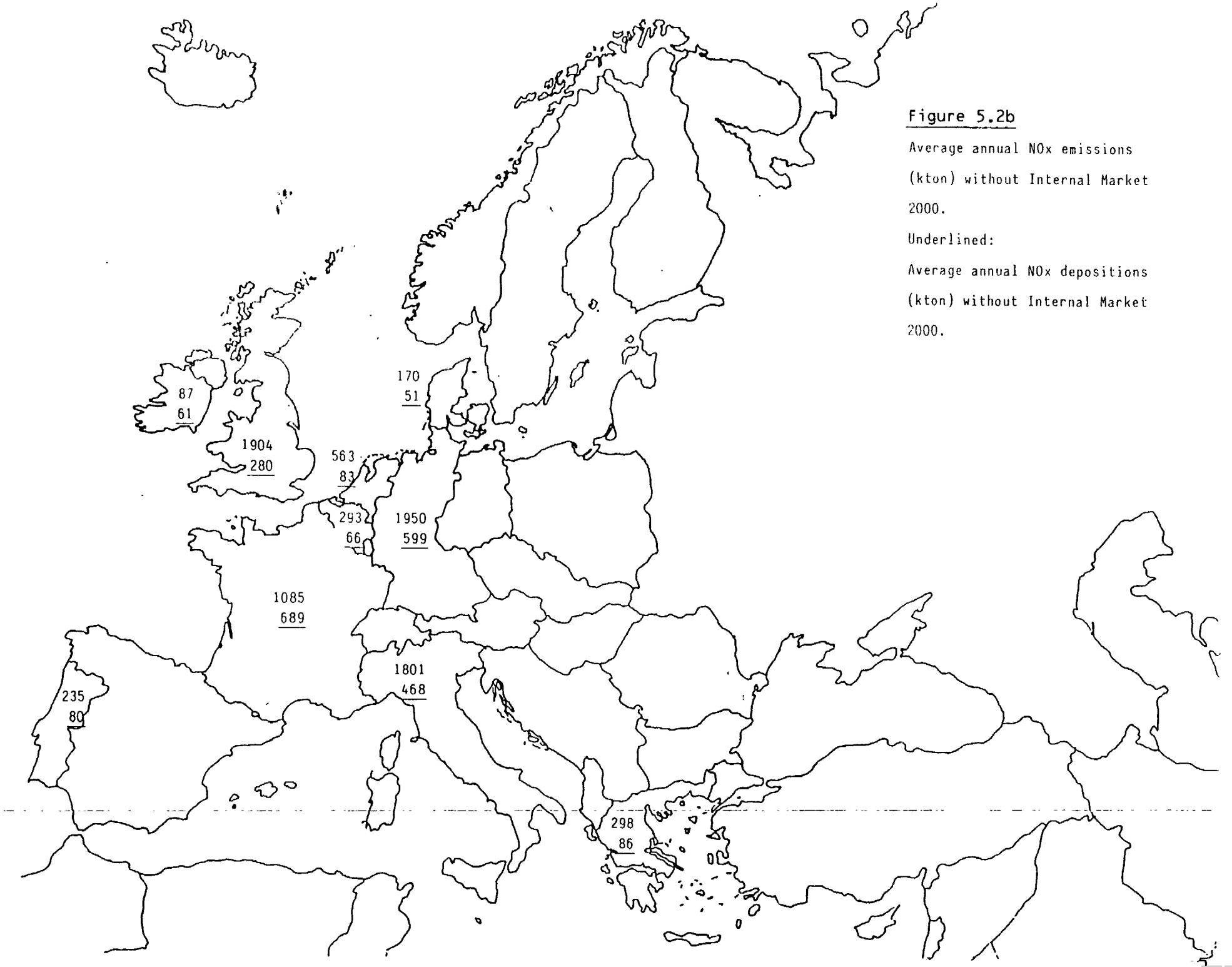


Figure 5.2b

Average annual NOx emissions (kton) without Internal Market 2000.

Underlined:

Average annual NOx depositions (kton) without Internal Market 2000.

However, the sectors responsible for the increase in emissions are not those best able to contribute to the reduction of emissions (See Table 5.5). This is especially the case for the transport sector, which accounts for more than 3/4 of the increase in NO_x, since the technical possibilities for any further reductions in NO_x emissions are very limited (in the absence of a massive switch to public transport and from road to railway transport). Indeed, the only possibility for a more rapid decrease in NO_x emissions would be to require the fitting of catalytic converters to existing cars. There are at present no possibilities for any further reduction in NO_x emissions; particularly the absence of technology to reduce emissions from diesel-powered cars and vans represents a constraint of particular significance.

Similarly, reduction in emissions of SO_2 will be sought in sectors other than those responsible for increased emissions. One reason for this is the unavailability of alternative technologies in the transport sector: another reason is the pattern of relative costs in those sectors in which alternative technologies are available. Thus while the transport sector and the tertiary and domestic sectors contribute to more than half of the increase in emissions for France, it will be the electricity sector and industry which will have to take reduction measures, assuming that the policy also aims at minimizing total reduction costs. The domestic sector can also reduce its SO_2-NO_x emissions, but at a greater cost. The importance of a cost-effective approach will be illustrated later on.

The same limits constrain the scenario aiming at a maximum reduction of emissions. The technical possibilities for further reduction in emissions in the absence of structural changes in the transport system or additional energy-saving, are limited to a level of approximately 20% for the different countries. This is due to the fact that the transport sector is responsible for more than 50% of NO_x emissions, while currently there are no technical possibilities to reduce emissions.

5.4.3 The importance of the cost-effectiveness approach

In general, due to the technological limitations in the transport sector and the fact that the electricity sector is already subject to stringent regulations (under the Directive on Large Combustion Installations), the largest share of emission reduction will have to take place in industry, unless policies aiming at structural changes or energy-saving are included. This is illustrated in Table 5.5.

However, due to differences in costs of emission reduction, it is the electricity sector which would be confronted with the greatest expenditure (Table 5.6).

Table 5.5 Some examples of the contribution of different sectors to the increase (I) and decrease (D) of SO_2-NO_x emissions (in %)

Pollutant	Country	Year	Scenario	Power plants		Industry		Tertiary & Domestic		Transport	
				I	D	I	D	I	D	I	D
SO_2	B	1995	S1	47	9	45	91	3	-	5	0
			S2		45		55		-		0
	B	2010	S1	15	10	72	90	0	-	13	0
			S2		75		25				0
	F	2010	S1	10	3	21	97	38	0	31	-
			S2		8		64		28		-
NO_x	B	1995	S1	18	27	20	12	0	-	70	61
			S2		29		21		-		50
		2010	S1	4	34	15	66	1	-	80	0
			S2		37		63		-		0
	F	2000	S1	0	17	8	73	4	0	88	0
			S2		26		64		10		0

S1 = scenario that reduces emissions at level without Internal Market

S2 = scenario that reduces emissions at maximum

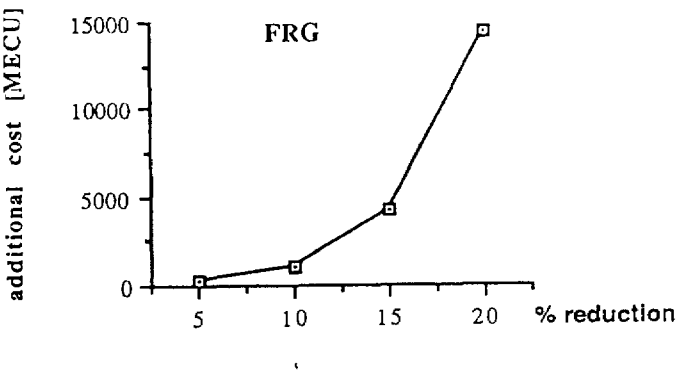
- = measures not taken into account by the model

Table 5.6 Contribution of different sectors to reduction costs (scenario of maximum reduction)

	Electricity	Industry	Transport, domestic and tertiary
Belgium	67%	27%	6%
France	54%	31%	15%

The costs of these additional "technical" policy measures may be an additional limit to the described constraints. As is clearly shown from figure 5.3 for the FRG, the environmental costs are increasing very quickly as emissions are reduced. The additional reduction of emissions in the maximum scenario in reference to the first scenario can be obtained only at a very high cost. Although the situation is similar for France and Belgium, it should be noted that these costs are relatively higher in the FRG. Indeed the FRG already has regulations in other sectors, it can only reduce its emissions further by implementing the more costly measures in the tertiary or domestic sectors. We estimated that annual environmental cost would in the maximum scenario amount to 0,2% for Belgium, 0,19% of GNP France and 0,27% of GNP for Germany.

Figure 5.3 The trade-off between environmental cost and reduction in emissions of SO_2 and NO_x



The same graph holds for the annual investment required in order to implement these changes. The required sum for scenario 1 is less than 0.03% of GDP, while the implementation of a maximum reduction policy (scenario 2), without structural changes, would need substantial investments, accounting, in the case of Belgium, for up to 0.26% of GDP. Since for these scenarios it is necessary to change towards new energy plants with other fuels (mainly gas or nuclear), the main part of this increase in investments consists of new productive investment.

5.4.4 The need for energy-saving and measures in the transport sector

The scenario analysis shows that technical measures to reduce emissions of SO_2 and NO_x are limited to ± 20%, due to constraints in the transport sector. It is therefore clear that in order to reduce acid depositions sufficiently, energy-saving and structural changes in the transport sector are necessary.

In the absence of a proper mechanism that distributes the right to different sectors and polluters to make use of the limited absorption capacity of the environment, and given the differences in emission reduction possibilities and costs in different sectors, it is clear that if emissions are permitted to rise in one sector this implies emission reduction measures and costs in other sectors. Environmental impacts may be affected by switches between energy sources (See Box 5A), although an expansion of nuclear power to mitigate air pollution would be extremely problematical.

5.5 Breaking the link between growth and pollution

The case study of emissions of SO_2 and NO_x shows that environmental legislation and projected technological changes are not sufficient to offset the quantity and sectoral effects of growth associated with the Internal Market. To determine whether this exemplifies an overall trend, it is necessary to assess the generality of its conclusions, and hence the extent to which the case study illuminates the central issue. Is the Internal Market likely to strengthen or to break the link between economic growth and pollution?

A first lesson is that indeed some delinking did occur between economic growth and pollution and the use of natural resources, but that once again, the level of pollution (in absolute terms) is the key point of reference from an environmental point of view. When we compare the growth of GNP and some forms of pollution over a longer time period it becomes clear that, fortunately, production overall becomes less pollution-intensive.

However, the absolute values of pollution are stabilizing rather than showing a big decrease, although SO_2 seems to be an exception. This suggests that the quantity effect of economic growth can offset technological progress. Indeed, without these growth effects pollutants would have declined more and/or faster.

Within these results it is noticeable that the differences in growth elasticity for emissions of SO_2 and NO_x are simply a prolongation of a trend already observed in the past. Of the two, NO_x emissions seem to be a problem which is less tractable. The same holds true regarding the use of energy and the share of some heavily polluting sectors in the economy (cement, steel, transport). In industrialized Western European countries delinking has occurred with improvement for an absolute level of pollution; in other countries a high growth rate offsets progress in reducing emissions, preventing improvement in environmental quality (although there may be improvement in relative terms, if pollution grows more slowly than GNP).

Box 5A

Does the Internal Market lead towards a switch in energy supply?

At present, the net value of international trade in electricity amounts only to 1,2% of total energy demand, essentially because energy production has a long tradition of substantial governmental interference. A major question in the Internal Market debate is to what extent the removal of trade barriers is likely to affect the energy sector. "The Economics of 1992" states on this issue that "detailed study on this question has not been undertaken but would be warranted" (European Economy N° 35, p. 84). From an environmental viewpoint two major concerns arise:

1. Will an internal energy market lead to considerable price decline which could stimulate energy demand? We have shown that an increase in energy demand is already likely to worsen the environmental problems and that energy saving will become necessary. In this case integration of environmental damage costs could be a way out.

2. How will an Internal Market for energy products affect energy supply? It is premature to believe that an Internal Market for energy will lead to optimal solutions by minimizing the costs of energy, as long as not all environmental costs are reflected in the price system.

In this respect there is a concern that increased use of nuclear energy, at present accounting for only 15% of total energy supply, would be suggested as the answer to the problems of air pollution. However, damage caused by these pollutants would be exchanged for nuclear risk and the problems related to nuclear waste and decommissioning. Furthermore, as nuclear energy is vulnerable to public, and thus political, sentiment a future switch away from nuclear energy could once again immediately pose the problem of air pollution. As there seems to be a trade-off between environmental problems related to nuclear energy and those related to traditional fuels, energy-saving is the most environmentally friendly solution.

A second lesson from the past tells us that the delinking which has occurred is the result of incentives, be it a price incentive (e.g. the oil crises of the 70s) or regulations (the increasing number and stricter nature of environmental policies). The Internal Market will only contribute to a further delinking of growth and pollution if additional incentives are created. Indeed, the environmental technology market is up to now largely dominated by end-of-pipe processes (see Chapter 9 below). This shows that present policies are insufficient to stimulate the development of integrated clean technologies. Without such a framework, the Internal Market will increase market efficiency but is likely to make an inefficient use of unpriced natural resources, as is illustrated by the SO_2 and NO_x case study. An adequate policy response should give appropriate incentives for energy saving and, in the absence of technical solutions, to structural changes in the transport sector.

It should be borne in mind that the present exercise focuses on problems which are already well-known and for which environmental policies have already been developed. These problems may be characterized as those of the 1970s, while the problems of the 1990s remain to be confronted. Carbon dioxide pollution provides an illustration: the analysis in the without Internal Market case shows SO_2 emissions decreasing and NO_x emissions stabilizing, while in contrast CO_2 emissions, largely responsible for the greenhouse effect, are increasing. As these emissions are also sensitive to economic growth, they are likely to increase even more.

5.6 Conclusions

The completion of the Internal Market will lead to an increase in economic growth as the Community moves towards a higher growth path. A detailed exercise on energy-related emissions of SO_2 and NO_x as a case study shows that without new measures the necessary conditions for a sustainable, long-term improvement of our welfare are not fulfilled. In the absence of adequate incentives, existing environmental and energy policies cannot prevent increased energy demand and increased transport demand in the Internal Market from giving rise to increased emissions.

As a result, ecological thresholds will continue to be exceeded. As existing (environmental) technologies are not sufficient to curb these emissions, a policy response should aim at energy-saving and structural changes in the transport sector.

In the absence of an adequate framework to stimulate the necessary further decoupling of economic growth and pollution and the use of ecological thresholds as the basic reference for policies, there is no guarantee that Internal Market growth is likely to be sustainable and to lead to an increase in welfare.

The case studies have succeeded both in demonstrating the value of the analytical approach and in showing the deficiencies of existing procedures and information. Further development of this approach could make possible a large "environmental impact assessment" of economic changes and economic policies.

CHAPTER 6

ENVIRONMENTAL IMPACTS OF "1992": AN OVERVIEW

6 Environmental impacts of the Internal Market

6.1 Environmental Impacts and Sustainable Development

The earlier chapters of this report examined the environmental implications of the completion of the Internal Market and associated developments, up to 1992 and beyond. It was shown in Chapter 2 that implementation of environmental policies can be affected by actions to facilitate the elimination of barriers within the Community: examples of such measures include the harmonization (and mutual recognition) of technical standards and the harmonization (or approximation) of indirect taxes. Completion of the Internal Market will stimulate economic growth and lead to changes in the sectoral and spatial distribution of economic activity. There may be especially significant consequences for transport links and patterns of urbanization, with particular implications for the peripheral regions, natural landscapes and environmentally sensitive areas.

In addition, some Community actions designed to ensure the completion of the Internal Market will themselves have implications for the environment. These include, for example, measures to harmonize product standards as well as measures designed to bring about fiscal harmonization.

The environmental dimension highlights the issue of sustainability of the development process, particularly in the context of those sectors or regions for which the environmental impacts are most acute. If the effects of economic growth are such that the longer term costs counterbalance the immediate benefits following completion of the Internal Market, a question arises as to the sustainability of the growth path. The Community therefore faces a challenge to devise policies which respond to this new situation. The purpose of this chapter is to review environmental issues in the light of the sectoral and regional developments expected to result from the Internal Market.

6.2 Sources of environmental impacts

Chapters 3, 4 and 5 have illustrated the multi-faceted complexity of the relationship between economic activities and the environment. Pollution arising from industrial sources is extremely varied - including both "traditional" polluting effects, such as eutrophications of waters and emissions of sulphur dioxide (SO_2) and particulates, and also the generation of hazardous wastes, and the release into the environment (through various pathways) of toxic substances.

The environmental impacts of industrial activities affect all the environmental media - including air, water and soil. Selected environmental effects based on the most important components in the emissions from a number of industrial sectors are shown in Table 6.1, while more extensive listings can be found in Tables 3.1, 3.4, and 3.5 above.

Table 6.1 Examples of environmental impacts from different industrial sectors

Branch	Emissions to the air	Emissions to the water	Waste
Chemical industry	Organic chemicals, benzene and toluene malodorous	Organic chemicals, heavy metals, suspended substances, cyanide	Sludge from air and waste cleaning installations, used catalysts, tar
Iron and steel industry	SO_2, NO_x, dust, hydrocarbons, carbon monoxides, hydrosulphites	Oxygen using suspended substances, oil, metals, oxygen, phenols, cyanide sulphates, ammonia, waste from scrubbers	Slags, waste from the production process sludge from cleaning installations
Textiles and leather industry	Dust, odours SO_2, carbons	Oxygen using suspended substances, salts, sulphates, toxic metals, especially chrome	Sludge from cleaning installations
Petrochemical industry	SO_2, carbons, NO_x, carbon monoxides, dust, odours	Oxygen using substances, phenols, chromium, waste from scrubbers	Waste from cleaning installations, used catalysts, tar
Food industries	Dust, hydrocarbons	Oxygen using substances, phosphorous, nitrogen, oil and grease, suspended substances	
Non-ironmetal industry, e.g. aluminium ind.	Fluorides, carbon monoxides, SO_2, dust	Emissions from scrubbers (fluorine, particles and carbons)	Waste from cleaning installations, used cells for electrolysis (coal, fluorine)

Source: J. Magner, "The Environmental issues in the Context of the Internal Market 1992 - The Situation in Denmark", 1989.

Table 6.2 Environmental effects of the energy sector

Energy sources	Forms of atmospheric pollution	Forms of aquatic pollution	Solid wastes	Other impacts
Coal	SO_2, NO_x, particles	Acid mine drainage, water pollution from storage heaps	Coal heaps	Visual intrusion
Petroleum products	SO_2, NO_x, CO_2 particles	Oil spills		
Electricity generation from fossil fuels	SO_2, NO_x, CO_2 particles; long-range transport and deposition of pollutants	Water availability, thermal releases	Solid wastes; ash disposal, slag disposal	
Electricity generation from nuclear power			Radioactive wastes	Accident risk.

Source: J. Magner, "The Environmental issues in the context of the Internal Market 1992 - The situation in Denmark", 1989.

As has been shown in chapter 3, activities associated with the production and use of energy are of particular significance, in terms both of the effect of Internal Market measures and of environmental impacts, in the form - inter alia - of atmospheric emissions of SO_2, NO_x, CO_2 and particulates, oil spills, acid precipitation, and discharges of polluting substances to the aquatic environment. In addition to the mineworkings and the sites of installations, energy production also makes use of land for the deposition of wastes - such as ashes and slag - with the risk of subsequent leaching into ground water. These environmental impacts are summarized in Table 6.2.

The environmental impact of energy usage is particularly clear in the case of transport. The environmental problems are rendered more acute by the concentration of polluting emissions in areas where the population density is highest; that is in the cities. The use of energy for transport purposes has increased immensely in recent years, and today motor vehicle traffic is responsible for about 1/3 of the total emissions of nitrogen oxides, and is the principle source of emissions of carbon monoxide, hydrocarbons and lead.

The Community is liable to face increasing problems associated with the transportation and treatment of hazardous wastes. The amount of waste that crosses the borders is increasing, and it has been estimated that 1-2% of the total amount of chemical waste in Western Europe was "exported" to countries outside Europe.

There are also environmental impacts associated with non-industrial activities. These can be very serious at the regional and local level - for example, intensive agriculture, and the use of land in urban development, and for recreational activities. Developments associated with tourism can have particularly severe effects on the local environment, especially in sensitive areas such as coastlines with dunes or cliffs.

6.3 "1992": the nature of possible environmental impacts

The environmental effects associated with the completion of the Internal Market can be expected to vary between sectors and locations, and it is necessary to identify sensitive areas, the key pollutants in the context of the various media - air, water and soil - and also to identify land use impacts, including effects on sensitive flora and fauna, and on wildlife habitats. In assessing these environmental impacts it is important to recognize that even if significant progress has been made in the assessment of the amounts of pollutants emitted, there is still great uncertainty with respect to their dispersion in the environment and their final impacts.

Table 6.3 Summary overview of the environmental issues in relation to the development of human activities

Environmental issues	Principal of origin impact	Geographical distribution of impacts
Global level		
-Climate change	Energy supply and use	Lowlands
-Ozone layer depletion	Use of CFCs	
-Depletion of natural resources and wildlife	Changes in land use	
Community and Continental Level		
-Acidification of soils and water	Energy supply and use	Regions with sensitive soils and eco systems
-Diffusion of dangerous substances	Agriculture	Community-wide and certain regions
-Exposure to dangerous wastes	Chemical & biochemical industries	Places of production, transportation and treatment
-Loss of wildlife and landscapes	Agriculture, transportation Urbanization	Regions experiencing rapid development and/or restructuration processes
Supra-regional level		
-Accumulation of dangerous substances in media (ground water; soils)	Consumers Agriculture Industries	Regions with intensive agriculture and regions receiving pollution from such regions
-Flows of waste	(idem above)	Regions of rapid urban growth
-Eutrophication	Agriculture; Consumers	Regions with intensive agriculture and downstream regions
-Loss of wildlife and landscapes	same as Community level	Downstream urban concentrations
Local and Regional level		
-Air pollution	Transportation, heating	Regions experiencing rapid development and/or structural change
-Water pollution	Tourism, consumers	
-Noise		
-Change of urban landscapes	Building industry, transportation, tourism	Regions of rapid urban growth

Moreover, there can be considerable variation between pollution sources, with respect to both emissions and environmental impacts. A further complication arises from "second round" effects, as pollution is transferred between media. For example : fallout of substances from the air will lead to pollution of the soil, the groundwater and surface water and the run-off from the soil may cause pollution of the rivers and the sea. Moreover, polluting impacts can occur at great distances from emission sources - as for example with certain forms of air and marine pollution. The Community's ability to take appropriate action is constrained by the uncertainties concerning the relationship between human activities and environmental impacts. Hence improvements in information on the various facets of this relationship are a precondition for policies to promote sustainable development.

While it is not possible to relate environmental impacts directly to economic changes specifically resulting from the completion of the Internal Market and consequent developments, an indication may nevertheless be given of the types of environmental pressure which would be associated with these economic changes. This would then give a starting point for policies to neutralize these pressures, to influence the linkage between economic growth (as conventionally measured) and environmental deterioration, and to ensure that the future development of the Community is sustainable.

The environmental issues which are associated with the development of human activities are summarized in Table 6.3, which categorizes environmental issues by the level at which they occur - global, Community, supra-regional or regional. The table also lists the sources of these impacts and their geographical distribution. This classification is at a broad level of generalization, but it does assist us in identifying the key issues and in general illustrates the need for a decentralized approach to environmental policy based on the principle of subsidiarity (see Chapter 8 below).

When interpreting the table, it should be noted that while the various types of environmental impact resulting from changes in economic activity may primarily affect the local and regional environment in areas in which economic growth is concentrated, the impacts will in many cases extend across frontiers to affect other Member States.

At a global level, economic growth in the Community and changes in the Community's relationship with the rest of the world (cf. Chapter 11 below) may tend to increase the dangers of climatic change, resulting from increased atmospheric emissions, and also pressures on natural resources.

As has been shown in earlier chapters environmental pressures at Community level may be seriously exacerbated by increases in atmospheric emissions. Atmospheric pollution can adversely affect human health, by damaging the respiratory system, and also increase the acidity of lakes, water courses and the soil (with particularly severe effects on the poor soils of northern and central Europe), causing damage to forests, to aquatic life, to buildings and to crops. Moreover, emissions of carbon dioxide and the resulting contribution to the greenhouse effect will have serious effects on climatic conditions and hence on European waters and coastal regions.

Finally, growth in economic activities can also give rise to land use changes with impacts at local and regional level. Environmental pressures of this type include:

- pressures on infrastructure;

- visual intrusion;

- threats to natural landscapes, such as heaths, moorland, and wetlands;

- reduction in the variety of landscapes;

- reduction in the numbers and types of biotopes, due to increasingly intensive cultivation;

- a decline in populations of wild animals and plants, due to pollution and loss of habitats;

- threats of extermination of plant and animal species.

PART THREE

POLICY RESPONSES

CHAPTER 7

EXISTING ENVIRONMENTAL POLICIES IN THE EUROPEAN COMMUNITY

7.1 Environmental Policy and the Internal Market

The Community has long recognized the importance of environmental concerns and has increasingly emphasized the environmental dimension as an integral component of economic policies. This commitment is demonstrated by Article 130r of the Treaty establishing the European Economic Community (as amended by the Single European Act) which provides that "environmental protection requirements shall be a component of the Community's other policies".

Completion of the Internal Market is of great significance for the future of the Community; and in this context the environmental dimension is explicitly recognized by the Treaty (Article 100A), which requires that Commission proposals concerning (inter alia) environmental protection "will take as a base a high level of protection". Earlier chapters of this report have shown the practical importance of environmental considerations in setting the course for the future development of the Community. This has in turn highlighted the need to ensure the sustainability of the development process, up to 1992 and beyond. It is the purpose of this chapter to provide an assessment of Community environment policies in the light of this requirement. Section 7.2 considers the philosophical basis of environmental policies in the new context of the Internal Market, and suggest that developments associated with "1992" will intensify the need for integrated environmental management. The key principles and mechanisms of Community policies are briefly outlined in section 7.3, as a prelude to consideration in subsequent chapters of the appropriate policy responses to developments up to 1992 and beyond.

7.2 A basis for environmental policy in the Internal Market

7.2.1 Environmental Management: the segmented approach

The development of the modern economy has led to increasing segmentation in environmental management. With technological advances have come intensification of agriculture and a growth of specialization in industrial activities; this in turn gave rise to environmental problems which were narrowly defined, in scientifically complex terms. Solutions devised within this framework ran the risk of ignoring the wider context, and were not necessarily appropriate for overall environmental management taking account of inter-relationships at local level.

Thus a segmented approach may have undesirable features, due to:

- a lack of coherence between human activities and the complex interactions between natural and human influences;
- irreversible damage which can have serious effects on these interactions;
- failure to take proper account of impacts which cannot be valued in monetary terms;
- conflicts due to degradation, and the sacrifice of potential uses, of the environment, both in the short and long term.

7.2.2 Integrated Environmental Management

Looking forward to 1992 and beyond, the true challenge for the Community in the environmental field is to supersede the segmented approach to environmental management and to develop a more integrated approach.

As the Cecchini report has emphasized, the removal of intra Community barriers and the completion of the Internal Market will have a considerable effect, but there will be even greater indirect effects from the increase in competition and in regional specialization, reflecting comparative advantage. With the establishment of a single Community-wide market, the negative effects of a segmented approach will increase, unless they are counterbalanced by specific policies designed to promote integrated environmental management.

Specifically this approach would:

- Take into account interactions at all levels between environmental factors and the economic, social and cultural factors which influence the ways in which mankind makes use of the environment and natural resources. In this way the accent would be placed on renewable resources and sustainable development.

- Ensure conservation and renewal of resources in the long term. This would require particular attention to effects which, although developing slowly over a long period, can lead to catastrophic consequences, especially in cases where damage is likely to be irreversible - examples include damage to the ozone layer, the greenhouse effect, pollution of groundwater, soil erosion, and species extinction.

- Reserve for future generations the potential for alternative uses of media and resources; future uses may well have no market value at present, and so a comprehensive resource management system is essential to avoid the distortions inherent in a segmented sectoral approach, and thus to ensure the sustainability of the development process.

The establishment of procedures for management of natural resources is thus an essential precondition to ensure the protection of the environment and sustainable development.

This must be recognized as a fundamental feature of Community policy, along with the barrier-free Internal Market and the principle of subsidiarity. This principle is fully in accord with integrated environmental management, since coherent environmental policies are aided by a decentralized approach which ensures that solutions to environmental problems are appropriate in the local context. A segmented, sectoral approach in contrast favours a centralized system, since it places a heavy emphasis on narrow technical specialism and does not adequately take account of the wider perspective, nor of the further problems which are liable to arise from inadequate coordination.

7.2.3 The role of the Community

What is the role of Community institutions in this context? It is necessary to distinguish two categories of problem: those which are confined within a single country (or locality or region) and those with wider ramifications - which may involve transfrontier impacts, or effects on the Community as a whole, or at a global level.

For the first type of problem direct Community intervention is not justified; on the other hand, the Community may have a considerable indirect influence in creating conditions favourable to integrated environmental management. Possible Community initiatives include:

- the creation of a political climate favourable to improved environmental management;

- support for educational and information programmes designed to develop awareness of the importance of the environmental dimension, both in the overall functioning of the economy and in the day-to-day activities of those whose actions may have environmental implications - for example farmers, industrial workers, municipal employees, consumers, etc.

- support for research and development, to understand more clearly the multiple interactions between man and the environment, in order that these may be taken into account in the decision-making process;

- support for pilot projects to demonstrate the operation of integrated management in a wide variety of environmental conditions in the Community's Member States;

- with respect to environmental problems which go beyond national level, Community action is legitimate to promote proper environmental management both within the Community and, in certain cases, involving non-Member States.

- measures to encourage the use of economic instruments, in conjunction with the PPP - for example taxes on waste generation and on the use of non-renewable resources;

- Community legislation to conserve the environment (especially in areas which are particularly sensitive or of Community importance); to control the exploitation of "common" resources; to regulate transfrontier impacts; and to set standards when there are significant environmental impacts associated with the consumption of goods or services;

- creation of Community institutions with the necessary legal competence and financial resources to manage the environment in cases where this cannot be done satisfactorily at national level.

7.3 Community environment policies and the Internal Market

7.3.1 Principles of environmental management

A series of Community Environmental Action Programmes, commencing in 1973, has led to a substantial body of environmental legislation at Community level. The current Environmental Action Programme (the fourth) covers the period until the end of 1992. While this programme (in Chapter 3) outlines the various approaches which might be adopted to environmental management, it would appear that further consideration must be given to the integration of specific actions within an overall approach based on the principles outlined in 7.2 above.

As Community policies have developed over the past twenty years, a number of propositions have gained broad acceptance as basic principles of environmental management, both in the Community and also in the wider international context. There is general support for the Polluter Pays Principle, albeit with differences of interpretation and practice as to the extent of the polluter's responsibility: while there is general agreement that this should cover the costs of compliance with pollution control standards, there are differences of view with respect to the feasibility of requiring polluters to cover the cost of pollution damage. There is an increasing emphasis upon a forward-looking approach to environmental management, to encourage continuous improvement with appropriate incentives for development of products and processes which are less damaging to the environment; another facet of this approach is anticipatory action, whereby full account is taken of the environmental dimension (including risk assessments) at all stages of the development process.

A great variety of measures is used in practice to safeguard and improve the quality of the environment. In general pollution is controlled by emission standards which may be implemented by limit values for emissions, or by specifying the technical characteristics of products or processes.

In some instances standards may be geared to the achievement of specified ambient environmental quality standards.

There is a wide range of regulations that may be applied to ensure the environmental safety of products or to ensure that products do not cause a nuisance. These goals may also be implemented through the use of charges: examples include beverage container deposits, and aircraft landing charges. These measures may be supplemented by charges designed either to encourage a certain type of environmentally beneficial behaviour or to finance pollution control investments. There is a wide range of other possible market mechanisms (otherwise known as fiscal measures) that can be employed to provide an economic incentive to achieve certain environmental goals: these include "tradeable permits" that allow permits to be bought and sold.

Another category of policy instrument is related to area management. Possible measures include physical planning and other land use controls, zoning for particular uses (e.g. residential, industry, country parks), protection of specified species or habitats or areas of natural beauty. They are implemented through various forms of regulation varying from strict control (in the case of species or habitat protection) to regulations that rely on essentially political processes designed to achieve a form of development the local community requires. Some fiscal measures have been used to encourage certain types of behaviour: for example to assist farmers to maintain certain types of habitat or to encourage communities to accept certain types of development.

7.3.2 Existing legislation - Pollution Control Regulations

Although Community environmental legislation is now well developed, there was, prior to the amendment of the Treaty by the Single European Act, no explicit legal provision for Community environment policies, since nowhere in the original Treaty is there to be found any reference to the environment. At a meeting of the Council of Minister in 1973 the Commission was invited to develop an action programme on the environment. Taking action in the form of Community legislation presented the problem of the absence of any specific competence for environmental legislation in the Treaty. The main impetus for Community environmental policies arose from a political commitment, and to a recognition of environmental issues associated with the free movement of goods within the Community. Article 30 of the Treaty, as interpreted by the Court of Justice, prohibits all measures that actually or potentially, directly or indirectly restrict the free movement of goods. Certain exceptions to this rule are admitted, measures justifiable on grounds of the protection of the environment being one, but it should be noted that whilst the free movement of goods is an all-pervading presumption, measures for the protection of the environment, in so far as they conflict with the free movement of goods, must always be justified. The implications of environmental measures for the free movement of goods meant that Community action could be justified under Articles 100 and 235 of the Treaty. Article 100 constituted the principal vires for the harmonization of laws which "directly affect the establishment or functioning of the common market". Article 235 is more widely based, allowing the Community to take appropriate measures necessary to attain "one of the objectives of the Community" where the Treaty does not provide specific powers to do so. Most directives were adopted under Articles 100 and 235, with Article 235 occasionally being used as a single legal base where no aspect of the directive could be said to affect directly the establishment or functioning of the common market, as for example in the case of Directive 79/409 on the conservation of wild birds.

In practice then Community environmental measures were to a considerable extent concerned with harmonization, in order to avoid distortions of trade, in addition to the achievement of environmental objectives. There has on the other hand been a growing emphasis on environmental principles - successive environmental action programmes have for example stressed the need for preventive measures. Many Community directives have sought both consistency of practice between Member States together with progressive improvement in environmental quality; examples of such directives include those relating to aquatic discharges from the titanium dioxide industry (78/176 EEC and 82/883 EEC) and to emissions from industrial plant (84/360 EEC) which respectively seek to prevent and reduce water and air pollution. Many directives set minimum environmental quality standards, such as those governing water for abstraction (Directives 75/440 EEC and 79/869 EEC) and human consumption (Directive 80/778 EEC) and the series of directives on air quality, relating to levels of SO_2 and suspended particulates (Directive 80/779 EEC) NO_x (Directive 85/203 EEC) and lead (Directive 82/884 EEC). In some cases Community Directives specify emission or discharge standards: for example the directive on discharge of dangerous substances to the aquatic environment (Directive 76/464 EEC) specifies limit values for discharges of "black list" substances, while the directive on emissions from industrial plant provides for technology based emission limits for new plant.

Where quality standards (or discharge/emission limits) are specified in directives, it is generally possible for Member States to opt for higher standards (except in instances where the environmental benefit may be outweighed by trade distortion).

Directives generally allow Member States discretion over the choice of policy instrument for use in implementation. The Community has set out guidance on policy instruments in the 1975 Recommendation on cost allocation and action by public authorities on environmental matters (75/436/Euratom, ECSC, EEC). This defined the Polluter Pays Principle and recommended rules for applying it in practice. The cost allocation recommendation focuses on the instruments for implementing the Polluter Pays Principle:

Standards and charges, or a combination of the two, are the major instruments. "Standards" include:

i) Product standards (in the form of emission limit values, approval conditions and rules on the marketing or use of products);

ii) Standards for fixed installations, sometimes called process standards (e.g. emission limit values, design standards or operating standards).

Charges include fees, contributions or levies performing an incentive or redistributive function.

The Community has also applied the Polluter Pays Principle to state aids for environmental protection measures. All state aid paid to industry by the Member States' national authorities is governed by Articles 92 et seq. of the EEC Treaty. Since 1974 the Commission has issued a series of memoranda (in 1974, 1980 and 1987) outlining the conditions under which state aid to industry for pollution control measures is compatible with Article 92 of the EEC Treaty.

It does not appear that the Community or Member States have in practice been especially innovative in their choice of policy instruments. Instruments for which provision is made in Community legislation are shown in Figure 7.1, classified by area of environmental policy. One conclusion to emerge is that hitherto the Community's environment policy has relied primarily on administrative instruments. Thus far regulatory measures have predominated ranging from licensing standards and emission limit values to bans or restrictions. While a few Community Directives expressly permit economic incentives (e.g. the Directives on waste oils and on large combustion plants) or leave the Member States the requisite freedom in discharging their responsibilities for implementing the Directives on environmental protection, in general the use of economic incentives to encourage a flexible cost-effective response from all concerned by environment policy has hardly progressed beyond declarations of intent in programmes and calls to explore this possibility.

Figure 7.1 Environment policy measures taken by the Community by instrument and field

	Air	Noise	Water	Waste	Chemicals	Nature Protection
Trading Licence				X		
Installation Standards	X		X	X		
Product Standards					X	
Environmental Impact Assessment	X	X	X	X	X	X
Product Emission Standards	X	X	X	X	X	
Production Limits	X					
Trading Limits	X			X	X	X
Emission Standards for Installations	X	X	X	X		
Standards for Specific Areas	X		X			X
Compensation Arrangements (Bubble, Off-set)	(X)					
Voluntary Agreements				(X)	X	
Product Levies				(X)		

( ) Option to the Member States

7.3.3 Completion of the Internal Market: Implications for Environmental Policy

As the Community moves towards completion of the Internal Market it is necessary to consider how its environmental policies should meet the challenges and opportunities which will develop. Specifically it may be necessary to review the Fourth Environmental Action Programme, and to reassess existing Community environmental legislation, in terms of its adequacy for the protection and improvement of environmental quality in the context of economic changes associated with completion of the Internal Market. A further issue arises from the substantial increase in financial provision for Community Structural Funds: this could have adverse environmental impacts, unless there are adequate mechanisms to ensure that expenditure take full account of the need to protect and improve the environment. Furthermore, it is necessary to ensure that Community programmes, particularly those relating to information, education and research and development are properly focussed on the new priorities in environmental policy.

In the context of opportunities which arise from completion of the Internal Market and the need to ensure that economic development is sustainable with respect to the environmental dimension, the following key issues can be identified:

1. Should there be minimum environmental quality standards laid down at Community level?

2. Should greater consideration be given to the application of the Polluter Pays Principle and fiscal incentives in order to ensure, through apportionment of liability and financial penalties, that post-1992 growth is properly shaped?

3. Are the safeguards currently proposed for application of the Structural Funds adequate to protect the environment in the regions?

4. What is the role of the Community in encouraging habitat protection? If new urbanization and other infrastructure results from post-1992 economic development, does the Community have a role in shaping that development to protect habitats of Community importance?

5. What is the role of the Commission in enforcing agreed Community legislation? Does its role extend beyond ensuring that Directives enter in a proper way into Member States legislation?

6. Should special programmes be considered in relation to:

   a. energy use
   b. transport and transport links
   c. agriculture and changing use of agricultural land
   d. environmental infrastructure including hazardous waste facilities?

Some of these issues are discussed below:

Quality standards

i) As noted above, economic growth may be expected to lead to an increase of emissions from industry, transport (including private cars), electricity generation and other domestic energy use. To ensure the protection of the environment, it follows that measures must be designed to encourage a continuing improvement in the quantity and quality of emissions or wastes discharged.

ii) Environmental quality standards are an effective mechanism for this purpose; however, there are two key issues:

- first, there is a difficulty in enforcing quality standards, the enforcement procedure requires limit values to be established for the individual discharger at such a level that the general quality standard is not breached; there are difficulties of enforcement: if quality standards are breached, it is not always easy to identify the responsible discharger: particularly as in the case of urban sulphur dioxide where the responsibility may lie with several thousand emitters;

- and there is the issue of differential quality standards: to what extent should quality standards be harmonized and to what extent should they reflect regional needs.

iii) Some Community quality standards have been established according to the use of the environment e.g. the Directives on bathing water quality, drinking water supply, fishing and shell fishing, etc. Others have been established taking account of the health needs of the population (e.g. Sulphur dioxide directive). Neither of these criteria (use of environment or health) can reasonably be allowed to vary according to region, however there may be a case for a two-tier standard: one relating to the minimum standard necessary for protection (Community-wide) with more stringent standards for particular types of region that may be set at the discretion of Member States. If no such harmonization of quality standards is undertaken, there is some danger that an incentive will be provided for certain industries to set up in certain less protected regions: however, evidence that is available suggests that for most industries the level of environmental protection is not an important location criterion.

iv) Many substances are not at present covered by Community quality standards.

Technological improvement

v) There is also a need to ensure that future economic growth is cleaner: in other words that there is an incentive for producers to devise ways of reducing emissions and controlling waste at source. One of the few Community instruments that provides a basis for this approach is the Best Available Technology Directive; however, there must be some doubts about potential for implementing and enforcing this Directive. It relies on the actions of Member States to identify Best Available Technologies (not involving excessive cost), with the Commission's role being solely to provide a forum for the exchange of information.

vi) Apart from encouraging the implementation of Best Available Technology, there is a clear potential for fiscal incentives for achieving improvements. At present, with the exception of the cost allocation recommendation, there are no Community instruments that encourage the use of market mechanisms to bring about environmental improvements.

Environmental Management

vii) In the light of the subsidiarity principle it is necessary to decide the extent to which the Community can - and should - assume responsibility for protection of the natural environment.

viii) As noted in Chapter 4 above, there is likely to be considerable pressure on particular regions of the Community arising from the changes in the distribution of economic activity post-1992 and the channelling of Community financing through the Structural Funds. There are at present few measures at Community level which can ensure the necessary protection of the environment; the environmental impact assessment directive is primarily concerned with major new developments and the mechanisms for its enforcement at regional or local level must give rise to concern about its potential effectiveness for this purpose. The proposed habitat directive, if rapidly implemented, could provide some measure of protection to environmentally sensitive areas; but its adoption and implementation is far from assured.

Land Use Management and Habitat Protection

ix) Should greater emphasis be given to the role of Structural Fund expenditure to support measures to protect or enhance the environment? The key policy objective should be sustainable economic development, having regard to the environmental dimension.

x) While it is intended that environmental implications of the proposed programmes should be fully examined; it must be recognized that there are likely to be difficulties in implementation. It will be difficult from the limited information provided with each programme to determine the environmental implications; the "applications" focus on programmes and not projects; the environmental implications, on the other hand, will flow from the nature of the specific projects. In addition, the resources available at the Commission level to examine the applications from an environmental standpoint are very limited; and it is not clear what the legal standing of the Commission will be if it wishes to alter the shape of the programme during negotiations solely because of environmental concerns.

7.4 Conclusions

The Community must consider the future course of environment policy in the context of developments associated with 1992.

The environmental issues arising from these developments are not altogether new: the main effect of "1992" is to highlight questions which have been of concern for the Community for the past two decades. The importance of Community environmental policy is emphasized by the Single European Act, which, in addition to the provisions for completion of the Internal Market by 1992 also sets out a firm legal basis for environmental policy at Community level and requires that the environmental dimension be taken into account in proposals for Internal Market measures.

Against this background the Community should pursue an integrated approach to policy, to ensure that decisions incorporate an environmental dimension. This should take full account of the policy principles set out in Article 130r of the Treaty as amended by the Single European Act, particularly the Polluter Pays Principle, and the subsidiarity principle, and the need for a preventive and regionalized approach. The operation of a policy framework on these lines is discussed in the following chapter.

CHAPTER 8

A PREVENTIVE AND DECENTRALIZED APPROACH TO ENVIRONMENTAL POLICY

8.1 Introduction

Recognition of the environmental dimension in the completion of the internal market raises issues concerning the future role of the Community in environmental policy, and the nature of policy instruments which are to be used. The abolition of physical, technical and tax barriers between Member States has far-reaching implications for the political mechanisms used by Member States to regulate economic activities. In the environmental policy context, there may be a danger that this process will give rise to pressures - both legal and economic - which tend to diminish the effectiveness of national (as distinct from Community) policy measures.

The purpose of this chapter is to examine the issues which arise from this development, in the light of the subsidiarity principle which requires that policy actions should be taken at the lowest appropriate level. The chapter outlines the various types of policy action which are relevant and considers the Community role in the design and implementation of policies, and the constraints which influence the practical application of policy principles. In particular, a distinction is drawn between the Community's interest in a minimum level of environmental quality and the responsibility of member States for deciding quality standards (above the Community minimum level) and for decisions as to how the quality standards are to be achieved. It is also recognized that the Community may legitimately intervene in situations where policies cannot easily be geared to the attainment of environmental quality standards - notably in the case of pollution from mobile sources. Finally, a consistent theme of this chapter is the importance of economic efficiency in the broadest sense - the achievement of high environmental standards and progressive development, at the lowest practical cost.

8.2 The Setting of Environmental Quality Standards

8.2.1 The Subsidiarity Principle

The completion of the Internal Market may necessitate further coordination of environmental policies at Community level; this should be done in a way which is consistent with the principle of subsidiarity under which there is a presumption that policy measures should be taken at the lowest appropriate level - whether it be Community, national or local. This is explicitly recognized in the Treaty (as amended by the Single European Act) as a principle of environmental policy: Article 130r (4) states that the Community shall take action relating to the environment only to the extent to which the objectives of Community environmental policy can be attained better at Community level than at the level of the individual Member States. In this context the subsidiarity principle would allow for different national preferences and better information available at the lower level of organization.

In applying the subsidiarity principle to environmental policy, it is important to distinguish between objectives and the means by which the objectives are to be attained. Thus environmental policies have two distinct - albeit closely related - aspects:

i) the setting of environmental quality standards. A quality standard determines the characteristics which are considered to be acceptable for the different receptor media. It is therefore a target variable which may be achieved by means of policy instruments.

ii) use of policy instruments - such as emission taxes, transferable emissions, emission standards or product standards, or a combination of these instruments - to achieve a certain environmental quality. Product standards prescribe operating characteristics (such as exhaust constraints for cars) or disposal characteristics (such as requirements for the biodegradability of detergents). Within an EC-wide environmental quality standard there can be national variation between emission standards, in accordance with the assimilative capacity of the national environments.

In the light of the subsidiarity principle it has to be decided whether, and to what extent, environmental policy should operate at Community level. A fully decentralized approach is conceivable, whereby environmental quality would be entirely a matter for Member States. In this extreme scenario, each country would decide for itself what ambient environmental standards and strategies to follow. This would result in significant differences in environmental quality. Some countries could set very high quality standards while others could ignore the environment. The latter case would run counter to the spirit of the Treaty (Article 3c), which provides for the free movement of the citizens of the Community, implying an entitlement to minimum environmental standards throughout the Community, irrespective of the location of residence or work place.

On the other hand, a country may choose to set very high ambient quality standards and therefore require product standards which are stricter than those of other countries; however, this would run counter to the rules of the Internal Market which provide for the free movement of goods (cf. Article 100a of the Treaty, as amended by the Single European Act). Thus a complete decentralization of environmental policy following the subsidiarity principle may create a conflict between environmental and market integration objectives. Moreover, it could have severe disadvantages for the Community as a whole, with - in some cases - downward "competitive" pressure on environmental quality. It would also take no account of transfrontier effects, both in the form of pollution spillovers and in the form of movement (facilitated by completion of the Internal Market) of people and goods across intra-Community frontiers.

8.2.2 Community-wide minimum quality standards

There is now general acceptance that the Community has a role in setting environmental quality standards - and this is demonstrated by the existence of a substantial body of Community legislation which establishes such quality standards. The amendment of the Treaty by the Single European Act gave formal expression to the Community dimension in environmental policy, since it explicitly provides for Community action relating to the environment on this basis.

The Community can be expected to ensure that every citizen enjoys an environmental quality which is at (or above) a minimum acceptable standard.

This may be achieved by a continuous improvement of quality standards in areas where they are low, bringing them gradually to a uniform minimum level. However, the word "minimum" should not mean low, since Article 130r(1) of the Treaty (as amended by the Single Act) requires that one of the objectives of Commmunity action relating to the environment shall be "to improve the quality of the environment".

The Community's role in setting minimum quality standards does not in any way require that environmental policy instruments - the means whereby quality standards are achieved (or exceeded) - must be identical across the Community. On the other hand, it is likely that there will be some convergence in the use of policy instruments in Member States.

8.2.3 National or regional variation in quality standards

It should be emphasized that the purpose of Community level quality targets is to ensure that minimum standards are observed. Individual Member States still must have the option to strive for an environmental quality higher than the minimum Community level and set quality standards consistent with assimilative capacity of the environment and with specific social preferences and values (e.g. attitudes concerning the value of human life, appropriate rates for discounting the future, etc.), the state of technology, the connected costs of environmental protection, etc. Countries adopting comparatively stringent standards will reap benefits from higher environmental quality, which would tend to compensate for higher costs of environmental protection. Moreover, environmental quality can be an important factor in influencing the location of economic activities, including service sectors such as tourism. Last - but not least - there may be a public demand for a higher quality environment.

In the short run environmental pressures reflect the patterns of economic activity in a region, as well as policies and practices with respect to environmental management; against this background, environmental policy instruments may differ between regions. In the longer run, firms may relocate, and environmental management techniques and pollution control technologies may improve; this would tend to reduce differences between regions in their environmental policies and practice with respect to environmental management.

It is possible that political pressures will make for convergence in the ambient quality standards of Member States. In the light of a better environmental elsewhere, citizens living in less protected areas with low levels of environmental protection may demand improvements to match the higher standards prevailing elsewhere, and these demands would influence voting patterns. Moreover, a lower environmental quality may be perceived as a negative influence on industrial location, and hence as a deterrant to investment in regions where the environment is of poor quality (cf. section 4.1 above).

8.2.4 Regional variation in land use policies

As has been shown in Chapters 4 and 6, environmental conditions and landscapes within the Community are extremely varied. There are also differences between (and within) Member States with respect to priorities and the allocation of resources to improvement of environmental quality.

Thus environmental policies have a strong spatial dimension; land use for housing, transportation, industrial production, and agriculture reduce the space available for nature, thus affecting species, biotopes, other systems of nature and the landscape. Problems in this context include the slow erosion of natural systems by urbanization, the impact of the tourist industry on ecological systems and on the landscape, and the demands of transportation infrastructure.

Land use is primarily a national or regional issue, where decisions are taken in a national land use planning framework, and it is clearly appropriate that detailed decisions on specific uses for land should be taken at local, or regional level. On the other hand, broader issues can arise in which there is a Community dimension. For example, it may be in the Community interest for a specific region to develop its transportation infrastructure - in which case conflicts could arise between Community, national and regional interests. Thus may also be the case when a country intends to use an area, ecologically sensitive in the evaluation of the majority in other countries, for purposes such as tourism. Differences may also arise in priorities - for example, an area may contain species which are rare in terms of the Community as a whole, by not in the context of an individual region.

In such a case, the area may have ecological importance from a Community perspective but not in terms of national priorities. In these situations, some institutional mechanism for conflict resolution has to be developed.

One example of the importance attached to planning of the open land is the international Ramsar Convention of 1977 which encompasses wetlands of international importance as habitats of sea birds. In the convention there is an obligation to protect the appointed areas which include both water and land areas. A similar international obligation is valid for the areas which the countries have designated in accordance with the Community Directive of 1979 on the protection of wild birds. Land use changes in areas designated under the Ramsar Convention and the EC Birds Directive will not be allowed unless it can be documented that the activities do not have harmful effects.

Economic growth and structural changes following completion of the Internal Market are liable to increase pressure on land use. It is therefore of great importance from a Community point of view that overall physical planning and nature conservation policies are adopted to safeguard the environment in the longer term.

The Community therefore has an interest in maintaining the diversity of landscapes, particularly in the face of pressures which have caused this diversity to be reduced. Several species of plants and animals have already disappeared and even more are threatened. There has been a great decrease in the area of wetlands and moorland and in the number of hedges, ditches and other biotopes.

There are, particularly in areas adjacent to major cities, conflicts between recreational demands and other interests in the open land, and also between the different forms of recreation themselves. Finally, these are also pressures on scenic countryside, including coastal and mountain areas.

8.3 Possible alternatives in the absence of environmental quality standards

However desirable Community-wide minimum quality standards or graded environmental quality standards may be for a rational environment policy, it is very often not possible in practice to specify precise levels of environmental quality parameters which would represent the maximum values consistent with the avoidance of harm or hazards to human beings, animals and nature. As a result, Community and national environmental protection legislation has so far set ambient quality standards for only a tiny proportion of pollutants. This raises the question of suitable alternatives until such time as scientists and/or politicians are in a position to lay down minimum quality standards or regional target values.

Article 130r(2) of the Treaty as amended by the Single European Act, stresses the preventive action principle by stating that "environmental damage should as a priority be rectified at source" : it therefore follows that in the absence of environmental quality standards there remains an important role for the regulation of emission sources.

In practice, a substantial body of the Community's environmental policy can be considered instruments of a preventive environment policy.

A variety of instruments is available for this purpose e.g.:

i) environmental impact assessments for specific installations;
ii) licensing conditions for specific installations;
iii) test and notification procedures for marketing new products, chemicals, etc.; or
iv) emission limit values based, for example, on best technological state-of-the-art.

In situations where, for scientific and/or political reasons, no Community-wide basic standards or regional environmental protection objectives have yet been laid down, the introduction of Community-wide preventive regulations at emission sources by no means precludes more stringent regional requirements. At the same time it leaves open for Member States the option of offering economic incentives to implement the policy where necessary.

8.4 Transfrontier Impacts

Environmental quality objectives may be established at regional level - and may differ between regions - but their attainment may be impeded by transfrontier effects, for example :

i) pollutants carried over long distances from other neighbouring regions add to the pollution load in the region; and/or

ii) mobile emission sources, such as motor vehicles and aircraft, or imported products which cause pollution as they are used or disposed of, cause or contribute towards a breach of the environmental quality standards.

8.4.1 Diffusion Standards for Transfrontier Pollution

Many environmental problems caused by stationary emission sources have a transfrontier dimension. It is important that Community environmental policy should develop policy mechanisms to take account of such international spillovers.

It is important to consider transfrontier impacts for the following reasons:

- They lead to a major exception to the principle of decentralization of policy measures;

- They are likely to increase with relocation of industry, if firms leaving one country in reaction to stricter environmental policy may locate at its border and send pollutants back to their original country of residence via environmental media.

One possible approach is to establish transfrontier diffusion standards. The diffusion standard will limit the permissible volumes of pollutants exported from a country. Pollutants therefore must be measured at the border of the pollution-exporting country. Once an agreement on inter-regional diffusion standards is reached, it can be left to the national governments to decide the type of policy instruments they want to use in order to stay within the international diffusion norm. International diffusion standards therefore are instrumental in decentralizing environmental policy in Europe. This is an important advantage.

Diffusion norms have been used in national water quality management, for instance when the water quality of a tributary (in Germany, the Emscher) is specified where it enters the main river (the Rhine). There are of course problems of technical feasibility, particularly where pollution is widely diffused.

In general agreement on international diffusion standards would seem to be subject to very severe practical difficulties, as the discussion on solving the transfrontier spillover in the Rhine shows. Full observance of the Polluter Pays Principle would imply not only that the individual polluter pays, but also that the nation that pollutes the other nations pays. However implementation of the principle in this way may in some instances prove to be impractical in the case of transfrontier pollution ; in some instances (particularly where non Community countries are involved - see Chapter 11 below) the only practical solution may be for the victim of pollution to make a payment to the polluter to induce him to abate pollutants. It should be emphasized that this would represent a pragmatic solution : a victim-pays-principle would be inconsistent with the Community's commitment to the Polluter Pays Principle.

If the governments of Member States and (where applicable) other countries cannot agree on international diffusion standards, the alternative approach is generally to reduce pollution in order to tackle the diffusion problem. This is a rather coarse approach implying a more centralized orientation of environmental policy. The costs of environmental quality would be higher than with a more "targetted" approach.

8.4.2 Mobile Emission Sources

Emission standards for mobile emission sources (such as motor vehicles and aircraft) require harmonization if the non-stationary sources can move across borders. This is specially relevant because completion of the Internal Market will involve deregulation of the transportation industry and hence will tend to increase volumes of traffic.

In the absence of a cost-effective system for monitoring individual emissions, it is necessary to control emissions by means of product standards. In order to prevent the segmentation of markets it is necessary that these standards are harmonized within the Community. Nationally differentiated product standards for cars, small aircraft, etc. would imply barriers to trade. On the other hand, national taxes for pollution-intensive products (or national subsidies for environmentally-friendly products) cannot necessarily be excluded, provided that these do not affect the movement of vehicles across borders.

8.5 International Environmental Systems

In the case of an international environmental system in which many countries have an interest - such as the North Sea or the Mediterranean - it is generally extremely difficult to link specific effects on environmental quality to individual polluters. As a practical approach in such situations a quality target could be set for the environmental system, which discharge quantities allocated between countries.

8.6 Decentralizing environmental policies with respect to stationary sources

Insofar as the environment can be treated as a purely national good - for instance a river system wholly within a single country - the subsidiarity and country of origin principles would be applicable, subject to the requirements of Community directives which set minimum quality standards, for example in relation to particular water uses. The trade-off between environmental quality standards, and the extent to which emissions of polluting substances are permitted, are then purely national issues. In these circumstances, both environmental quality standards and environmental policy instruments may legitimately vary between Member States.

Use of environmental policy instruments such as emission taxes or pollution licenses to improve environmental quality will tend to increase the costs of pollution-intensive activities. A country seeking to use environmental policy instruments in this way must therefore decide whether the environmental benefit outweighs the increase in the monetary costs of economic activities and the (short term) adverse effects on its competitiveness with other countries.

This process - known as location arbitrage - would be facilitated by completion of the Internal Market. A raising of environmental quality standards in certain parts of the Community may lead - over time - to movement of firms with "pollution intensive" production to countries with lower environmental restraints in the form of environmental quality standards which are lower than those of most other Member States, and/or a higher assimilative capacity.

Deficiencies in the implementation of environmental policies and the use of policy instruments, due to institutional inadequacies or limitations in resources can increase the divergence between the leading countries and those in which environmental policies and their implementation are less well developed.

Increased environmental pressures in the countries would be countered by Community minimum standards - where these are in force - and also by the incentive to raise environmental standards which would be felt as a result of increased pollution.

Thus a country with environmental standards which are lower than those of other Member States will attract polluting industry but as pollution increases, so will the incentive to raise environmental standards. Hence, a harmonization of environmental policies would come about by a competitive process: in areas attracting pollution-intensive activities emission standards will become more stringent, emission licences more difficult to obtain, and emission taxes (where these are used) higher. The subsidiarity principle followed in this way is consistent with the Polluter Pays Principle, since it is for Member States to evaluate environmental damages and, subject to any Community requirements for minimum environmental quality standards, to determine the trade-off between environmental damages and costs of abatement.

8.7 Product Standards

Completion of the Internal Market will lead to free movement of goods - in many cases without prior harmonization of national regulations. In the absence of formal Community level harmonization, differences between national institutions, standards and practices would be resolved by a competitive process.

The Court of Justice in the "Cassis de Dijon" case upheld the country of origin principle, whereby a product that can lawfully be marketed in one country can then be marketed in any other Member State, unless it can be shown that exclusion of the product in question can be justified by an imperative requirement of the importing Member State's policy on a question not harmonized at Community level.

However, conflicts may arise between the barrier-free Internal Market and the principle of subsidiarity if the achievement of ambient quality standards requires the application of higher product standards in a Member State. Such conflicts may be resolved in some cases through the application of the ruling in the "Danish bottles" case - another decision of the Court - that appears to limit the scope of a competitive process of mutual acceptance of goods from other Member States; this decision permitted Denmark to require, for environmental reasons, that imported beverages be sold in standard returnable containers. However, there does not at present appear to be a general solution applicable to every set of circumstances in which the conflict between market integration and environmental objectives might arise, save for the legislative solution of harmonizing product standards under Article 100a.

In circumstances in which consumption of a product has no adverse effect on anyone other than the consumer, the need for product standards depends on the extent to which the consumer is informed with respect to the characteristics of the product and the consequences of its consumption. Consumer information can be improved by a system of mandatory labelling, and in principle the importance of product standards could be reduced if a Community-wide system of strict liability can be established. Under a system of producer's liability, the consumer affected by pollutants in a product can go to court, and so producers would have an incentive to prevent damage.

There may also be a need for Community-wide product standards : it is not always possible to rely on information alone to protect consumers from toxic pollutants and pollutants causing health damage.

In general, product standards represent a form of market segmentation, giving rise to a need for harmonization at Community level. Again the issue of a national deviation in favour of a higher product quality arises of minimum quality standards in the Community, with the possibility for Member States to adopt higher quality standards.

For practical environmental policy, it is not easy to specify where the "Cassis de Dijon philosophy" can be applied and where ex-ante harmonization on a European scale is preferable. The application of the country of origin principle will eventually lead to harmonization via market decisions if consumers want it. The national political process will eventually lead to harmonization via market decisions if consumers want it. The national political process has to react to the arbitrage of consumers and firms made possible by differences in national regulations. Moreover, if consumer sovereignty can be relied on, the need for ex-ante harmonization will be reduced. In the case of product standards, there will be a trade-off between abolishing market segmentation by applying the Cassis de Dijon philosophy and the national interest, particularly in the case of toxic substances, in protecting the consumer.

8.8 Other issues

- Environmental Accidents

  Environmental accidents (such as Seveso, Bhopal, Sandoz) give rise to issues of liability, linked to the Polluter Pays Principle. Environmental accidents which have no international dimension are primarily a matter for national environmental policy. However, many of the most severe environmental accidents have international repercussions. In these circumstances, some form of harmonization of liability rules, including compensation procedures, is needed.

- Waste Disposal

  Policy with respect to waste disposal activities (as distinct from measures relating to the transport of waste) can be decentralized within the Community. Member States may legitimately take advantage of lower population density or of geological conditions suitable for waste disposal.

  Measures to remedy environmental damage inherited from the past, as a result of previous environmental neglect, are principally the responsibility of Member States.

8.9 Policy Instruments in an Integrated Market

The varied nature of environmental problems suggests that environmental protection cannot rely on one single policy instrument, but has to make use of a range of policy measures geared to specific circumstances. It has to be recognized that the environment is a scarce resource and that environmental policy instruments must give incentives to use resources in an efficient manner. When appropriate incentives are specified, economic growth will not necessarily be accompanied by proportionate environmental degradation. For example, growth in GNP appeared in the 1960s unavoidably to lead to commensurate growth in primary energy demand; however, this linkage - which as at that time constituted the basis for capacity planning in the electricity sector - was subsequently broken with increased efficiency in the use of energy, stimulated by higher energy prices (see Section 5.5 above).

Environmental policy in the internal market must be based upon the principles set out in Article 130r of the Treaty, as amended by the Single European Act. These principles include :

- the prevention principle : Article 130r(2) requires that Community environmental action "shall be based on the principles that preventive action should be taken (and) that environmental damage should ... be rectified at source"

- subsidiarity : Article 130r(4) limits the scope of Community action to the extent that environmental policy objectives can be better attained at Community rather than national level

- the Polluter Pays Principle : Article 130r(2) states that Community environmental action shall be based on the principle that "the polluter should pay"

Policy instruments should be designed in such a way that environmental objectives are achieved in an economically efficient manner. Application of the Polluter Pays Principle has a crucial role in this context, since it is the key to full integration of environmental considerations into decision making processes in the various fields of economic activity, and by this means will facilitate compliance with the provision of Article 130r(2) that "environmental protection requirements shall be a component of the Community's other policies".

Besides adequately specifying incentives, environmental policy in an integrated market has to prevent market segmentation arising not only from border controls but also - and more significantly - from market entry barriers due to regulation (cf. Chapter 2 above). To a considerable extent, environmental policy instruments influence market entry conditions through the licensing of facilities, the licensing of products and land use planning. Market based instruments such as emission taxes, effluent fees, transferable discharge permits and strict liability which reduce the role of regulatory procedures and thus make market entry easier. Such instruments which simulate the working of the market, represent an approach which is fully consistent with the Single Market philosophy, which is based on market efficiency. Economic incentives can provide a continuous incentive for environmental improvement in an economically efficient manner and so help to shape economic development towards environmentally clean technologies. Insofar as these advantages are realized through the tax system, they have a bearing on the Community moves towards fiscal harmonization (see Section 2.6 above).

Economic incentives should, ideally, be linked to the sources of environmental impacts. In the case of polluting emissions, taxes and charges would if possible be based on the pollution load emitted. However, in some circumstances this is not practicable, because the technology for monitoring of individual emission sources is not sufficiently developed, or is prohibitively expensive. In such situations product or input characteristics may be used as a proxy measure, provided this does not cause unacceptable disturbance to input or product markets in Member States.

In practice the feasibility of market-based instruments is greater for some environmental problems than for others, and varies between Member States within the Community. In accordance with the subsidiarity principle, competent authorities within Member States must decide how, given their particular circumstances, Community environmental quality objectives can best be attained.

8.10 Conclusions

The analysis of this chapter has highlighted the central principles of Community environment policy - economic efficiency, subsidiarity the Polluter Pays Principle, and the preventive approach. These will assume even greater significance as the Community moves towards completion of the Internal Market. On the one hand there will in some respects be a need for further harmonization and coordination of policies ; on the other hand it is important, particularly in the light of the Community's very considerable regional diversity (see Chapter 4 above), that the subsidiarity principle be observed, so that action is taken at Community level only in those instances where it offers a clear advantage over action at national, or local level.

In the present context the Internal Market and specifically the provisions for freedom of movement, enhances the Community's legitimate interest in the setting of minimum environmental quality standards - but leaving Member States the option to choose higher standards. The nature of the policy instruments to be used in meeting quality standards is, in principle, a matter to be decided by Member States.

The Community also has a role in resource management, particularly to maintain the diversity of landscapes, and to protect natural sites in which the Community interest is stronger than the national interest of Member State(s) concerned. The detailed implementation of land use policies in nevertheless essentially a matter for Member States.

However the practical implementation of an approach to environmental policy following the subsidiarity principle is subject to a number of severe constraints. These are forms of pollution - particularly those involving transfrontier impacts - for which it is not feasible to establish environmental quality standards.

In some cases pollution controls must be applied to inputs or products, as a proxy for emissions : a notable instance is pollution from mobile sources. It has to be recognized that there is a potential for conflict between the free movement of products, whether covered by Community standards or circulating within the Community under the "mutual recognition" principle, and environmental quality standards, particularly where Member States seek to achieve environmental quality above the Community minimum level.

Environmental policies in the Internal Market should have regard to the prevention principle, subsidiarity and the Polluter Pays Principle. Furthermore policy instruments should be designed to achieve environmental objectives in an economically efficient manner.

CHAPTER 9

ENVIRONMENTAL INDUSTRIES IN THE INTERNAL MARKET

9.1 The role of the environmental industry

Part Two of the report showed how completion of the Internal Market may generate both environmental pressures and additional resources which may be used to maintain and improve the quality of the environment. Preceding chapters in Part Three analyzed policies and instruments whereby resources might be most effectively deployed to protect the environment and secure sustainable growth. This chapter examines the role of the "environmental industry" in the context of the Internal Market, both as an industrial sector in its own right and also a "transmission mechanism" providing an essential linkage between policy initiatives and the quality of the environment. Although the precise definition of the industry remains a matter of some debate, it is taken for the purposes of this report to comprise the suppliers of technologies and services which monitor, prevent, limit or correct environmental damage and contribute to "clean" economic growth (the areas covered by the industry are summarized in figure 9.1). The impact of the Internal Market on the demand for and supply of environmental technologies and services is therefore twofold.

In common with other forms of economic activity, the environmental industry will be affected by the mechanisms for completion of the Internal Market, and in particular by the removal of trade barriers and the opening of public procurement. This industry will benefit from increases in demand resulting from economic growth and from changes in the framework of economic activity characterized by more flexible access to labour, financing and other production factors throughout the Community. The environmental industry cannot be considered in the same light as other economic sectors for two main reasons:

- Other sectors are addressed in this report because of their potential impacts on the environment in the context of the Internal Market. The "supply side" effects in these sectors are a source of demand for the environmental industry as a provider of technologies and services to prevent, limit or correct environmental damage.

- The Community has specific responsibilities for shaping environmental policies and instruments and, together with other public policy levels, its initiatives strongly influence the development of environmental industry markets. Hence policy makers have an interest in this sector not only because of their responsibility for environmental protection but also for economic and industrial policy reasons.

In general it is expected that the completion of the Internal Market will affect the supply of goods and services in the Community by promoting the concentration of European capacities around firms able to compete on a worldwide scale, by encouragement of technological developments and by achievement of economies of scale through Europe-wide integration of supply sectors. The environmental industry will be subject to these influences, although the outcome would depend on the extent of limitations or problems which may arise because of the specific structure of environmental industries and markets.

9.2 Characteristics of the environmental industry in the European Community

9.2.1 Overall features: diverse and still in the making

The environmental industry sector serves markets which are extremely diverse, both in terms of technological fields (such as water, air, wastes, noise, instrumentation, integrated processes for various sectors) and also in terms of service categories (such as planning and engineering, manufacturing, construction, operations and management). It has only recently begun to be considered as a defined industrial sector and has yet to achieve a high degree of consolidation; consequently it cannot be considered as a mature industry. The environmental industry is rather a grouping of various firms and public bodies with very different technological backgrounds and varying degrees of involvement in this market.

Evidence from a number of Community countries (summarized in Figure 9.2) indicates that several hundred firms, most of which are small or medium-sized, work on this market as suppliers of technology or engineering services. If the industry is defined more broadly, to include construction companies and private or public units operating various environmental services at local or regional levels, the number of participants in the industry amounts to several thousands.

While potential market prospects for the industry may be considerable, the linkage to political decision-making renders demand highly uncertain in the short to medium term. This results in a situation where numerous firms maintain an interest in this market but are reluctant to follow up this interest with substantial investment. The environmental industry relies heavily on small firms, partial players (whose main business line is outside the environmental market) and "in and out" participants (supplying a given market as long as it lasts and then moving back to traditional activities). This latter category is further reinforced by the short time span of most new investment markets following the passing of a regulation before the market settles down at its replacement level.

Uncertainty about future market prospects also limits long-term investment in research and development. In each country only a small number of firms can be considered as sufficiently well established in these markets to develop credible long-term strategies. Some are equipment manufacturers which, through acquisitions or technological developments, diversified into different sub-markets (air, noise, waste, water, etc.) and can shift between markets following the outcome of the environmental regulation-making processes. Others are service companies which have achieved over the years a strong home base in the few countries where operation and management of water and waste services are widely franchised to private operators. Still others are engineering firms centered on this field of activity. This constitutes the core of the European environmental industry as it stands today. Surrounding it one finds such heavyweights as chemical groups, construction giants or diversified industrial conglomerates who have more recently entered the market to a limited extent but may through acquisition become major participants overnight.

Figure 9.1 : Environmental industries: technological fields and activities

Technological fields :

. Environmental measuring and analytical technologies.

. Technologies allowing substitution of less hazardous raw materials in production processes and products.

. Integrated or clean technologies : optimizing existing processes, internal recovery, new cleaner processes, designing increase of product recyclability or treatability.

. Recycling, reuse or recovery systems.

. End-of-pipe or add-on effluent treatment technologies, remediation technologies.

Activities :

. Planning, engineering, design.

. Equipment manufacturing.

. Construction of facilities.

. Operations & maintenance, renewal.

Figure 9.2 Structural characteristics of environmental industries - Comparison of five EEC countries

	FRG	UK	DENMARK	ITALY	FRANCE
Number of firms (estimates) (Does not include public sector organizations operating water or waste systems)	4,000 (1) (Not including chemical and construction firms)	1,500 (2) Including (approx.) : . water : 450 . air : 300 . wastes: 200 . instrumentation & services : 550	400 (3)	2,300 (4) Including (approx) : . water: 1150 . recycling/ reuse : 500 . air : 250 . others: 400	n.a.
Structural characteristics					
. Public-private balance (collective facilities management)	Mostly public 50-50 for municipal waste collection	Privatisation underway	100 % public	Mostly public	Mostly private
. Engineering (main features)	Integrated in industrial groups	Independant or integrated with operations & management	Independant or integrated in industrial groups	Integrated in industrial groups	Integrated in urban service groups
. Diversification level of major equipment manufacturers (water, air, wastes)	high	low	average	low	average
. Vertical integration level	In progress	In progress	Does not include operations & management	low	high
. New entrants	Electric utilities, Chemical and construction groups	Construction groups, cleaning services	Chemical groups	Construction groups, State companies	Construction groups

Sources : Recherche Développement International and (1) IFO Institut (2) ECOTEC -ENDS Report (3) Metalarbejforbund (4) CENSIS.

The picture is further complicated because of the number of public or semi-public entities which operate on a local scale in some sub-markets such as water, waste water or waste services. Their public activities do not prevent some of them from selling engineering or management services outside their jurisdiction, thereby blurring the line which separates them from private operators.

9.2.2 National differences: uneven potentials and contrasting organizations

Today's European environmental market can be roughly characterized by a global yearly turnover of several dozen billion ECUs and a highly uneven distribution between EEC countries. Figure 9.3 compares the markets in EC countries.

Not surprisingly there is considerable diversity between national environmental industries in terms of the focus of their activities. Additional differences appear when one looks at the overall structure of the environmental industry in each country: one finds various levels of concentration, differences of balance of power between the public and private sectors; very diverse levels of integration with regard to operations, engineering, equipment manufacturing and research; a varying tendency for companies to work simultaneously in several subsectors. The number of players serving a given sub-market can also be quite different. As a result Member States face completion of the Internal Market with environmental industries which exhibit very distinct structural differences. (cf. Figure 9.2).

The domain of engineering reveals other national differences because the contributions from independent consulting engineering firms, industrial group subsidiaries and public services balance each other out very differently country by country. The creation of the Water Authorities in England and Wales, for example, has marginalized British independent engineering firms in the domestic water and waste water market to the advantage of the Authorities' in-house services, which provide 80% of the services. In West Germany, consulting engineers also experience stiff competition from the affiliates of industrial groups and by the engineering offices of the Municipal Enterprises.

9.3 The Internal Market and demand for environmental technologies and services

9.3.1 Needs and demand in the environmental market

Additional needs for environmental protection solutions do not automatically imply additional demand. In general the environmental industry will experience an increase in demand, only if these needs are reflected in policy initiatives which call forth additional expenditure. Past experience shared by all countries shows that demand for environmental technology and services is primarily driven by regulations. "Environmentally friendly" products are an exception to this rule, because consumers directly express a demand so that in some countries markets have been developed in the absence of regulations.

In a restricted economic sense, environmental technologies and services generally are a cost factor for each individual firm or public authority, so that demand appears only when they are required, or have an incentive, to take action. The environmental industry reacts to environmental policies and instruments and their level of implementation (1) and considers environmental problems as indicators of potential future regulations or incentives. The market for the environmental industry thus far has arisen from policies and instruments, and not directly from environmental protection needs.

Provided this remains true in the coming years, the key question regarding the future of environmental technology and services is the future of the process of enacting environmental protection instruments; only if the establishment of regulations, policies and incentives adequately responds to the backlog of environmental problems, the appearance of new ones, their changing nature, magnitude and geographical distribution, can the environmental industry come into play to anticipate or correct these problems. From this point of view, "clean" Internal Market growth is a matter of appropriate regulation, public policies, incentives and adequate enforcement.

It is unlikely that the dynamic effects of the completion of the Internal Market will be accompanied by a change in "industrial culture", whereby the environmental dimension is automatically internalized within the decision-making processes of enterprises.

Countries - such as Sweden and the FRG - which are in the forefront of development of environmental technologies occupy this position as a result of extremely stringent environmental legislation to reach this stage. It is noticeable that the leading countries also plan to maintain legislative pressure in order to develop recycling and clean technologies, showing that they do not believe "laisser-faire" policies will suffice.

While more responsible behaviour towards the environment may well develop among public and private decision-makers whether or not required by law, it is to be expected that standards, regulations and incentives will remain the main environmental industry market makers in the foreseeable future. Hence in order to assess the Internal Market for the demand for environmental technologies and services, it is necessary to examine the impact of existing and projected policies and instruments in the EC.

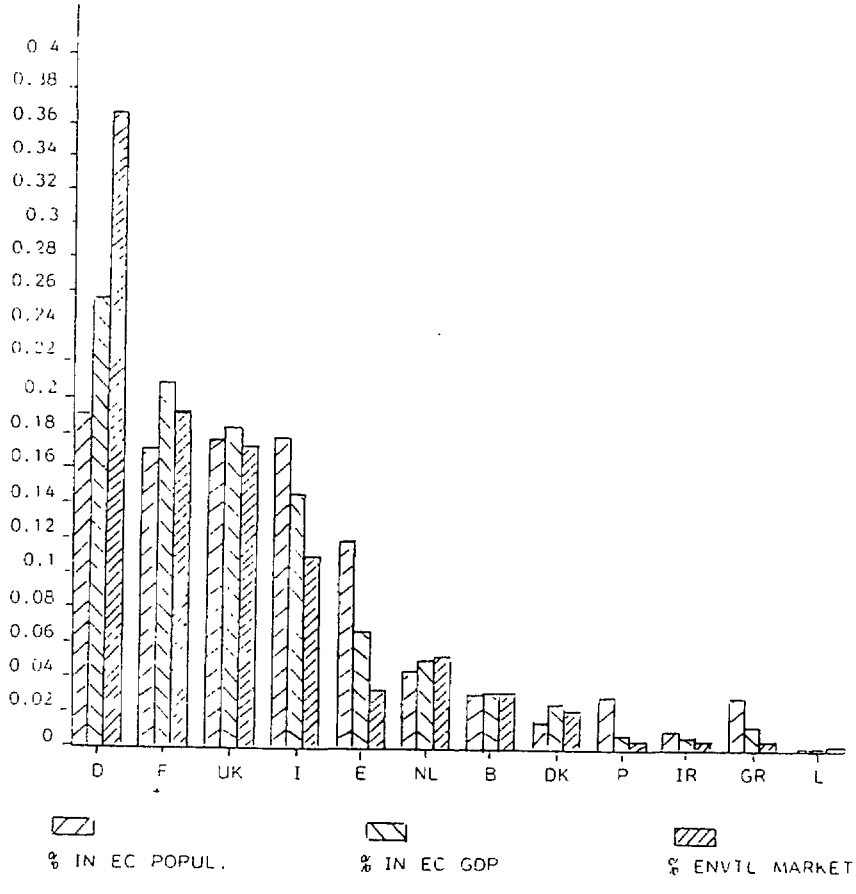
(1) Among the many examples which could be given, in June 1986 the French Ministry of the Environment issued a directive setting HCl emission limits on municipal solid waste incineration plants. Prior to this none of the 200 or so French incinerators was equipped with dechlorination units. Two years later a market of some ten units per year had been developed. (D. Drouet. Incidences de la réglementation sur les émissions de chlore par les usines d'incinération des ordures ménagères. Recherche Développement International. Juin 1988.)

Figure 9.3 Comparison of environmental markets in EC countries

Eventhough reliable and comparable data are difficult to gather on a Europewide scale several sets of estimates were recently published giving orders of magnitude of the environmental markets of EC countries (See table below). Big differences among countries appear according to these figures, the German market being fifty to a hundred times bigger that the Greek, Irish or Portugese ones. Even when compared with larger EC countries, the FRG dominates the Community, its market being at least as large as France and the UK together. A comparison of western European markets covering capital investments and operating costs for environmental facilities confirms this, with Germany accounting for 40 % of the total France 15 %, the UK 11 %, Italy 9 % and the Netherlands 5 % (1).

	FRG	F	UK	IT	NL	SP	B	DK	GR	IRL	P	Lx	EC Total
Environmental market (in 10^9 ECUs) (2).	14.5	7.7	6.8	4.6	2.0	1.2	1.2	0.8	0.2	0.2	0.1	0.0	39.8

Such variations obviously reflect differences in economic activity between countries but also contrasting environmental policies. The following chart compares each countries' share of the EC population, GDP and environmental market based on figures from table above.



Sources (1) Helmut Kayser Unternehmensberatung. (Does not include energy conservation and measuring and analysis sectors). In Haznews n° 11 - February 1989.

(2) Données Economiques de l'Environnement - Edition 1988 - Secrétariat d'Etat auprès du Premier Ministre chargé de l'Environnement. (Etude BIPE). Estimates of national spending in the air, water, wastes and noise sectors. Does not include recycling and water resource management.

Figure 9.4.: Good news for the EC environmental industry

Several recent news articles have highlighted brilliant future prospects for the European environmental industry : "Un nouveau marché : la protection de l'environnement - le grand boom du business vert" (Libération - 8 Mai 1989) , "Umwelt - Jetzt rein in den neuen Milliarden-Markt" (Impulse - April 1989), etc. Certain market studies show promising perspectives for some sub-markets. Recent examples include a study by Frost & Sullivan (London) on water and wastewater treatment equipment and a study by the Bureau d'Information de Prévision Economique (Paris) on European environmental markets. F & S predicts a 50 % growth between 1987 and 1997 (1). BIPE announces for the year 2000 the doubling or tripling of some markets for pollution control processes and even higher growth rates for substitute to CFC's or batteries by the year 2000 (2). A global study of western European environmental markets by Helmut Kayser Unternehmensberatung indicates a 66 % increase by the year 2000 when compared with 1987. According to HKU waste disposal and recovery would be the fastest growing market segment (3). Announcements have also been made regarding huge future environmental investment plans : first estimates about President Bush's plan to curb air pollution in the US range around $19 billion to be spent before year 2000. The World Bank and the European Investment Bank discuss a five year Mediterranean priority programme of some $10 to 15 billion and consider long term investments around $50 billion for water treatment in this region. On the top of this, impressive figures have also been quoted regarding eastern European potential markets.

Sources : (1) La Lettre de l'Environnement - Novembre 1988.

(2) Les marchés européens de l'environnement - La France face à ses principaux concurrents - 1989.

(3) Haznews n° 11 - February 1989.

In the light of these preliminary remarks on needs and demand for environmental technology and services, changes in demand due to the Internal Market and its accompanying measures will come from two mechanisms:

- Existing environmental protection requirements and implementation levels, and changes in economic activity (volume, location, sectoral balance) will generate a new pattern of demand for environmental technologies and services. Typical examples are in potential growth sectors, such as transportation and energy, where car exhaust regulations and emission standards from stationary sources will apply to a modified stock of pollution sources. As will be discussed further, a key question is how the market will be divided between cleaner processes and end-of-pipe solutions added to polluting processes. Also, market prospects may be delayed in regions which react more slowly in implementing environmental requirements.

- The evolution of environmental policies and instruments resulting from the Internal Market and the "Delors package" will generate new markets and/or modify existing ones. The most likely direction to be taken, given environmental policy-making processes at work in the EC, is not total harmonization of standards at the highest Community level, but a mix of minimum standards, partial or optional harmonization with possibilities for individual countries to go beyond EC directives. In addition to standards, other instruments, such as economic incentives, are likely to play an increasingly significant role.

In terms of market perspectives for environmental technology and services, the implications can be discussed at three different levels: the impact on global market volume, on market segmentation and on the breakdown between technologies and service types.

9.3.2 Implications for global market volume

The available evidence suggests that prospects for growth of the environmental industry appear reasonably good. A number of recent developments have signified notable advances for the industry (cf. Figure 9.4 - Good news for the EC environmental industry); on the other hand, it would be misleading to consider these instances as altogether representative of the future prospects of the industry. The further development of the industry will depend on a number of factors; these include:

- Significant differences in market size between Member States: as a consequence, even very high growth rates in peripheral regions will not have a strong effect on the overall turnover of the industry Community-wide.

- Market maturity: Some sub-markets in leading countries in terms of environmental standards and implementation levels (such as the FRG, the Netherlands or Denmark) have reached maturity. These markets contributed to environmental industry growth in the 1980s but are likely to level off in the 1990s.

- The continuing importance of national legislation: for those countries which are the leaders in terms of environmental standards, EC directives will not be the main market maker, inasmuch as they set limits below current or future national regulations in the leading Member States. Hence national legislation will continue to be the main driving force behind the environmental industry market. On the other hand, second-tier countries' markets will primarily respond to Community regulations. Data currently available point to uncertainty about the net outcome in terms of future investments in environmental technology in the EC: it is likely that some markets will grow, others will mature and decline and, new ones will appear.

- The growing importance of markets for replacements and operations and maintenance: it is likely that these markets will grow, given the increase in size of the environmental protection capital stock to be operated and maintained in the Community. There are also good prospects for growth in non-Community markets; although precise figures are not available, the potential demand is likely to be of considerable significance. All in all, these trends seem to indicate that demand will grow with some strong investment in sub-markets and an increased contribution from operating and maintenance expenditure to global demand.

9.3.3 Implications of market integration

Internationalization within the Community has taken several forms. Direct exports are concentrated on specific products where economies can be made through large-scale manufacturing (e.g. instrumentation, valves, etc.). For larger components or equipment, leading groups in all environmental industry sub-sectors have subsidiaries or licensees in most EC countries. In fact, a significant share of the environmental industry in some countries has largely been built up though the acquisition of foreign technology. Service and engineering companies mostly operate in other EC countries though local branches or joint ventures with local companies. Statistics for intra-European trade give an estimate of the current level of internationalization without fully reflecting the rapidly growing number of joint ventures, cooperative agreements and Community-scale networking in the environmental industry sector; the available evidence is summarized in Figure 9.5.

Among elements contributing to market opening, harmonization of product norms with an environmental dimension and harmonization of emission standards through Community directives will be a significant factor, although there will remain difficulties in reaching agreement on harmonized standards, due to the complexity of the bargaining processes involved.

Figure 9.5 Current integration level of the European environmental market

According to the IFO Institut, exports accounted for 40,5% of the German environmental turnover in 1984, up from 25,7% in 1980. 92% of the German exporting firms operated on the EC market (1). A Danish study gives another estimate of the current level of internationalization of the environmental market, showing an average of 60% of mechanical and electrical equipment (up to 80% for air treatment and pumps) being imported for environmental protection facilities built in Denmark (2). A study of the Belgian environmental industry indicates that a third of the capital stock of firms in the Wallonia and Brussels Regions is held by foreign companies (3).

Numerous examples indicate a high level of internationalization for technology licensing. An analysis of the French market for municipal solid waste incinerators over the past two years shows that 2/3 of the market was held by French firms using licenses of Danish (Volund), German (Deutsche Babcock, Martin) or Swiss (Von Roll) systems (4). In 1983, according to an unpublished study, fifteen of the leading environmental technology firms in Italy depended on licences from the FRG, the UK, France, the Netherlands and the USA (5). A study of the British environmental industry shows that the UK relies almost entirely on foreign technology for desulphurization equipment (6).

At the operations & management level internationalization is also progressing. British and French service groups develop their activities in Europe in the water and waste services. Recent examples in Belgium, Italy and Spain involve companies and organizations such as Biffa, Thames Water, Lyonnaise des Eaux and Générale des Eaux.

Sources: (1) R.U. Sprenger, B. Lössin, M. Schreyer - Die Wirkungen der Umweltpolitik auf den Markt für Umweltschutzeinrichtungen - IFO Institut - Forschungsgruppe - Umweltökonomie - 1988.

(2) Forprojekt for Vandrensningsradet - Viemose & Spile A/S - 1988.

(3) Enquête - Secteur des fournisseurs de technologies de l'environnement industriel en Wallonie et à Bruxelles - Interenvironnement Wallonia - 1989.

(4) D. Drouet - Incidences de la réglementation sur les émissions de chlore par les usines d'incinération des ordures ménagères - Recherche Développement International - Juin 1988.

(5) R. Cellerino - Gli operatori del mercato ambiental - 1989.

(6) Opportunities for the UK pollution abatement industry - Ecotec - ENDS Report 168 - January 1989.

On the other hand, stronger reliance on other forms of "harmonization" will foster market segmentation for environmental technologies. In order to speed up some form of market integration, mutual recognition of national standards will replace actual harmonization in different sectors: if applied to emission standards this may result in market segmentation for abatement or clean processes. Other approaches, such as optional harmonization (EC standards being applied only to international trade), alternative harmonization (leaving a choice between emission or ambient quality standards) and minimum harmonization (giving individual Member States the opportunity to adopt stricter norms) only partially harmonize environmental technology markets and can even introduce new segmentations. A wider use of ambient quality standards, whether or not standardized throughout the Community, would also lead to environmental technology market differentiation because of varying environmental assimilative capacities according to location.

9.3.4 The removal of public procurement barriers

The opening of public procurement should also contribute to a less segmented environmental industry market, especially in the municipal water, waste water and solid waste sectors. Nevertheless some important limitations will prevent it from having far-reaching effects. Besides the exemption of small calls for tender (less than 1 m ECUs for construction works and 200,000 ECUs for supplies and services), the single most important factor limiting the openness of markets is at present of organizational differences in the operation of public water and waste water services. In most Community countries these services are totally or largely operated by municipalities or public authorities which may have some in-house engineering capacity. Table 9.1 shows the proportion of households' piped water supplied by publicly controlled monopolies. As a result, a large share of the operation market in the environmental sector is insulated from competition, both national and international. The recent proposal for a directive on the so-called "excluded sectors", which include water, does not take this problem into account.

Remaining public monopolies for environmental management and engineering services in large sections of the Community will prevent the full development of service suppliers. In the field of water and waste systems operations, with the United Kingdom presently opening its market to private firms to an unprecedented degree, an axis is being formed between the United Kingdom, France and Spain, where private management will flourish. At the same time, from Denmark to Holland to West Germany, the revitalization of the local public sector seems to hold the greatest promise. In the latter countries the market for private operators is extremely limited. Therefore, full economies of scale will be achieved only when such markets are open to competition and not, as is the case now, either kept within the local administration or franchised to a municipal enterprise without competition.

Table 9.1 Share of piped water distributed to households by publically controlled monopolies. Status : July 1989 *

FEDERAL REPUBLIC OF GERMANY	98 %	
FRANCE	25 %	
UNITED KINGDOM	78 %	**
ITALY	95 %	
SPAIN	70 %	
NETHERLANDS	100 %	
BELGIUM	96 %	
DENMARK	100 %	
IRELAND	100 %	
LUXEMBOURG	100 %	
PORTUGAL	100 %	
GREECE	100 %	

Source : Recherche Développement International.

* **Includes some mixed companies with minority private ownership and private status organizations with public ownership .**

** **When implemented, the planned privatization of Water Authorities in England and Wales, will reduce this figure to 20 %.**

9.4 The future of the environmental industry in the Internal Market

9.4.1 Consolidation and internationalization: underdeveloped potential in spite of some progress

It is anticipated that completion of the Internal Market will be accompanied by increasing consolidation and internationalization of the environmental industry in the Community, due principally to further introduction of EC-wide standards, a relative opening of public procurement and easier access to financing and other production factors. This should not be viewed as a break from current trends but as a possible acceleration in some sub-sectors and an extension to new ones. (Figure 9.6 gives some examples of existing international agreements both intra-Community and with firms in third countries).

As a general trend the backbone of the European environmental industry will be reinforced through additional concentration and internationalization. Financial deregulation, especially in the public sector markets, can give a further impetus to concentration moves, since financial strength will become an increasingly important asset for gaining market share. Nevertheless, this phenomenon will be limited, to the extent that harmonization of environmental protection measures within the Community remains incomplete and the opening of public procurement to environmental services is only partially achieved. Both will result in ongoing or new market segmentation at national or sub-Community levels. As an additional consequence cost minimization through economies of scale will not be fully achieved and, from an environmental technology supplier perspective, the potential for a truly single market will be partly supplanted by a collection of separate ones. (2)

9.4.2 Inter regional imbalance within the Community

As noted above there are considerable differences between Member States with respect to the state of development, and the potential of the environmental industry. This is illustrated by Figure 9.7 which shows the geographical distribution of trade fairs specializing in environmental protection equipment. In this situation there are severe limits to the ability of the environmental industry in peripheral regions to take advantage of anticipated increases in demand for environmental protection in these regions.

(2) For example, the adoption of the Large Combustion Plant Directive, which was strongly supported by the German manufacturers of flue gas treatment technology, whose home base and commercial experience dwarf that of any other EC country, shows that more advanced countries have already understood that the mechanism for harmonization of regulations contained in Community directives could be used to develop conditions favourable to the creation of openings in neighbouring countries for their up-to-date technologies. But if the adoption and implementation of similar high level total harmonization proves to be very cumbersome, the contribution of these mechanisms to European market building will be smaller than what may be expected by leading environmental technology manufacturers.

This disadvantage is strongly reinforced by the special features of markets for environmental technologies, which are characterized by rapid but short-lived growth, leaving only a limited time span for new suppliers to prepare themselves. Consequently, firms with the advantages of greater and more extensive experience, technological leadership and superior financial means will have a decisive edge. Firms which enjoy these advantages are concentrated in only a few Member States where the industry is more developed. Thus there is a distinct possibility that market development in the peripheral regions would to a considerable extent benefit firms in other regions where markets are better established.

Integration of foreign technologies and know-how can take several forms, ranging from physical imports, to licensing agreements, to partnerships and joint ventures. They imply different costs and different levels of dependence for the receiving organization. Three main issues can be considered:

i) a balance of trade issue (which is also a political issue) while importing countries bear the costs of environmental protection, equipment and services for compliance with European Community directives, they gain little in terms of economic development of the environmental industry sector.

ii) an environmental priority issue: Community policy priorities have hitherto been geared to a considerable degree to problems of particular concern to "first generation" Member States. Thus existing Community legislation does not necessarily reflect the priorities of newer Member States such as, for example, problems associated with erosion or pollution from non-point sources.

iii) a long-term industrial policy issue: in addition to the short-term balance of trade deficit it is necessary to consider also the long-term costs of technological dependence. In the short run it is less expensive to purchase existing processes than to develop indigenous technology. On the other hand, if these purchases are not accompanied by an effort to develop autonomous technological expertise, long-term consequences are a widening gap in R & D capacity and the exclusion from future environmental industry export markets. A lack of expertise can also constitute a handicap in the negotiation of future policy measures at international level.

The current specific weaknesses of environmental industries in some Member States (insufficient overall technological capacity, strong reliance on SMEs, weak financial power, lack of independent engineering, inefficient operation and maintenance of environmental protection facilities) run the risk of being exacerbated in the coming years. This must be a matter of concern in future EC policy decision-making and programme definition at the scientific, training and technology transfer levels.

Figure 9.6 Examples of international agreements of EC firms

FIRMS	TYPES OF AGREEMENT	ENVIRONMENTAL FIELD
INTRA-EUROPEAN DEALS.		
. Thames Water (UK) - Ansaldo (It)	Joint Venture	Environmental management
. Walther (FRG) - Alsthom (F)	Purchase by French firm	Air pollution control from stationary sources.
. Kruger (Dk) - Hölter (FRG)	Joint Venture	Water and air treatment
. DDS (Dk) - Lyonnaise (F)	R & D Joint Venture	Water treatment
. BIFFA (UK) - Antwerp Waste Management (B)	Joint Venture	Municipal waste management
. Paques (NL) - Passavant Imp. (It)	Licensing of Italian firm	Water treatment
. Italgas (It) - Générale des Eaux (F)	Joint Venture	Water distribution
. Westech (UK) - Générale des Eaux (F)	Minority control by French firm	Waste management
. Cadagua (Sp.) - Paterson Candy (UK)	Licensing of Spanish firm	Water treatment
. TNEE (F) - Deutsche Babcock (FRG)	Licensing of French firm	Air pollution control, waste incineration.
DEALS WITH NON-EC COUNTRIES.		
. Martin (FRG) - Signal (USA)	Licensing of American firm	Waste incineration
. Waste Management (USA) - Cerconsa (Sp.)	Purchase of Spanish firm	Waste management
. Waste Management (USA) - Ecoservizi (It)	Purchase of Italian firm	Waste management
. ESMIL (NL) - Mitsubishi (Jap.)	Licensing of Dutch firm	Air pollution control from Stationary sources.
. LAB (F) - Foster Wheeler Air Pollution Control Division (USA)	Purchase by French firm	Air pollution control from Stationary sources.
. Atwood (UK) - Industrial Wastes Services (USA)	Purchase by UK firm	Waste management
. Laidlow (Cnd) - Atwood (UK)	Minority control by Canadian firm	Waste management
. Degremont (F) - Dainippon I.C. (Jap.)	Joint Venture	Water treatment
. Kent Process Control (UK) - ASEA (Ch-Sw)	Purchase of UK firm	Instrumentation, control and automation
. Uhde (FRG) - Mitsubishi (Jap.)	Licensing of Japanese firm	Incineration

Source : Recherche Développement International.

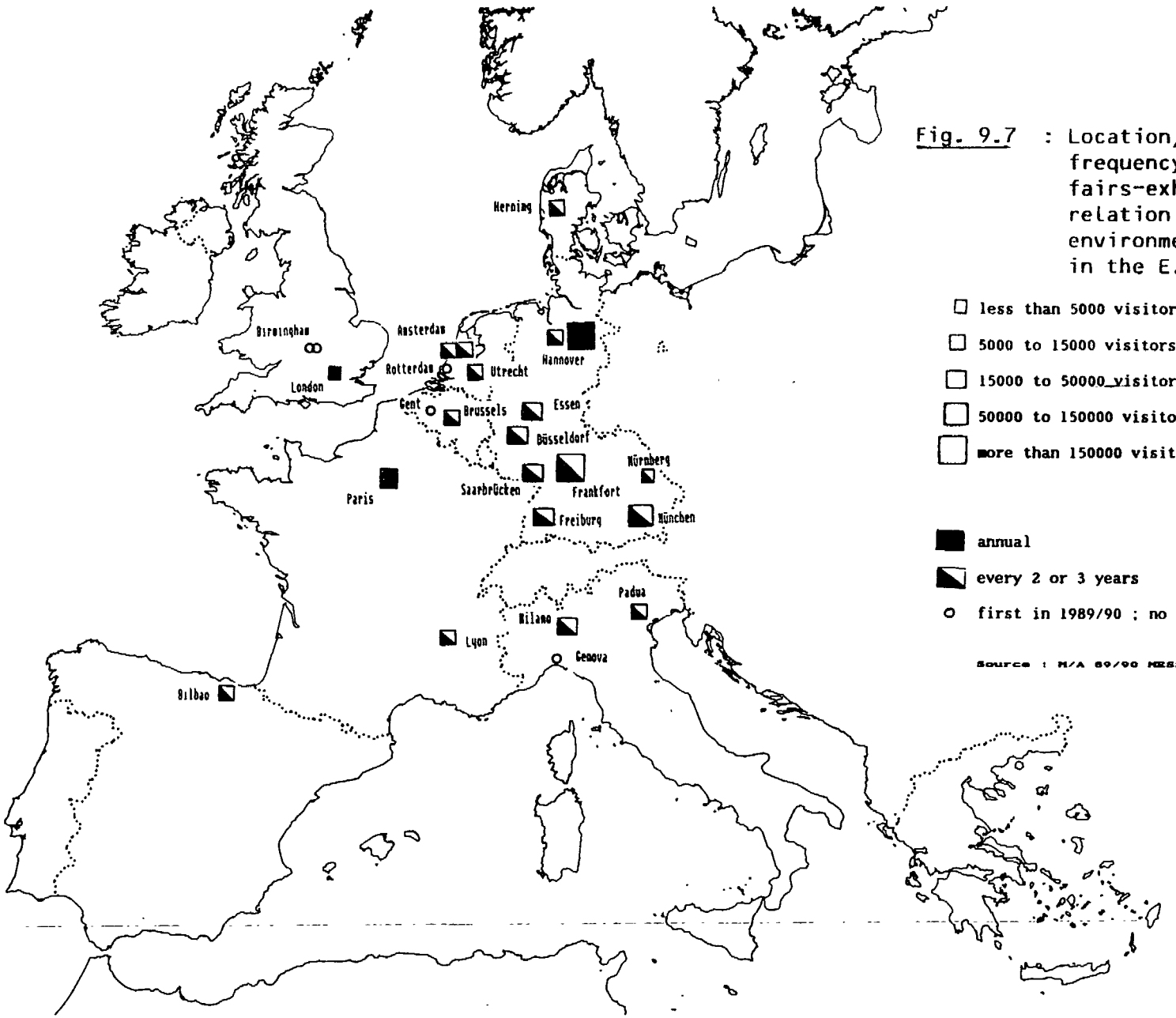


Fig. 9.7 : Location, attendance and frequency of fairs-exhibitions in relation with environmental protection in the E.C.

- less than 5000 visitors
- 5000 to 15000 visitors
- 15000 to 50000 visitors
- 50000 to 150000 visitors
- more than 150000 visitors

- annual
- every 2 or 3 years
- first in 1989/90 ; no data

Source : M/A 89/90 MESSEPLANER - FRG-

BASEMAP : CORINE

9.4.3 Implications with regard to technologies: the need to promote clean technologies

Statistics available from different countries show that little use has been made of integrated or clean technologies and that hitherto the environmental technology market has generally been dominated by end-of-pipe processes (this is illustrated by figures presented in Table 9.2). It is evident that current environmental policies and instruments have been unable to create a significant demand for integrated technologies (such as cleaner processes, processes using less hazardous materials, recycling and recovery systems).

From an environmental point of view, integrated technologies have the major advantage of creating less pollution, whereas add-on processes merely reduce polluting emissions or transform them into a more manageable form. Add-on processes also strictly depend on proper operation to be efficient. On the other hand, integrated technologies present specific difficulties: they can only be introduced when investing in new equipment or when replacing existing processes. In addition, developers of clean processes are frequently not in the business of selling environmental technologies. Problems may also arise from secrecy issues, because integrated technologies are actual production technologies.

With regard to the Internal Market, the failure thus far significantly to promote demand for integrated or clean technologies is a severe warning: if appropriate measures are not taken the most likely course of economic development within the Internal Market will predominantly be "dirty growth" with some "end-of-pipe" pollution control systems only where required. In other words, the opportunity to introduce cleaner processes and more generally to move towards "sustainable type" growth, created by the accelerated renewal of capital stock in the Community, will be lost if measures are not taken.

9.4.4 Innovation and worldwide competition: the need for a strong commitment to environmental protection

Activities of EC firms outside the Community are already well established in several fields. Technology exports are especially strong when other industrialized countries must catch up on environmental regulations already established on the EC level or in leading EC countries. As an example, in the mid 1980s, exchanges of technology between Europe and the U.S.A. were influenced by changes in American environmental regulations which reduced the disparities in several fields in which European countries had taken the lead. In addition to exports of technology, the European Community is also a major exporter in the field of environmental engineering. In the water sector, leading Community engineering firms appear to rely more on export markets - predominantly in non-Community countries - than their American or Japanese counterparts. Exports by some of the leading companies in the Community, the USA and Japan, are shown in Table 9.3. At this level again the imbalance between Member countries is evident: Spain, Portugal and Greece rank only one firm each among the 200 leading engineering exporters worldwide.

Positions of non-EC firms in the Community can also be quite strong: in a 1984 report a FAST study indicated an 80% reliance on imports for instruments and control equipment applied to environmental services. Environmental services have also recently attracted several American firms. In the industrial and domestic waste sector, Waste Management Inc., which is five times bigger than the leading European enterprises, has acquired companies in five EC Member States.

The example of flue gas denitrification shows that when the Community abandons the lead with regard to environmental standards, then catches up with more advanced countries, technological development mostly relies on imported processes. Standards adopted in the West German technical circular of July 24 1985 and later extended to other countries by an EC directive, required the use of catalytic reduction processes which had hitherto been necessary only to meet Japanese standards. In anticipation of, or in response to, these measures, there was considerable growth in the number of agreements between German and Japanese enterprises to buy Japanese processes (3).

Innovation in the environmental industry is hampered by the prevalence of market uncertainties and short demand lifecycles. Suppliers of environmental technology tend to adopt cautious strategies with regard to R & D spending. For this reason, the establishment of a dependable Community system for setting environmental policy priorities, measures and implementation is a prerequisite for the development of innovative strategies. A second requirement is for standards to be set at the most stringent level possible worldwide. Only if these conditions are fulfilled will the Community industry be at the technological forefront. If Community suppliers are faced with a sub-standard EC market, they run the risk of losing ground technologically against non-EC firms and, later on, if and when EC regulations catch up with world standards, innovation in the Community will, to a considerable extent, be hampered by the importing of technology.

(3) THYSSEN, SIEMENS, BAYER and EVT acquired rights to the MITSUBISHI processes; H.I. LENTJES and UHDE have agreements with BABCOCK HITACHI; DEUTSCHES BABCOCK and L.C. STEINMULLER are respectively licensees of KAWASAKI H.I. and ISHIKAWAJIMA HARIMA H.I. Similarly KRAFTANLAGEN HEIDELBERG (K.A.H.), a subsidiary of the Swedish group FLAKT, has benefited from the process developed by the Japanese subsidiary of the same group (GADELIUS KK). Anticipating stricter denitrification requirements like those in the FRG, firms in other countries have begun to purchase the same Japanese technologies (for example, COMBUSTION ENGINEERING in the U.S.A. and ESMIL in the Netherlands are licensees of MITSUBISHI H.I.). D. Drouet. L'innovation dans les industries de l'environnement - Op. Cit.

Table 9.2 **Clean or integrated technology investments as a share of pollution control investments**

BELGIUM	20 % (1)
FEDERAL REPUBLIC OF GERMANY	18 % (2)
FRANCE	13 % (3)

Sources : (1) Interenvironnement Wallonie (does not include the Flanders Region) - 1989.

(2) IFO Institut - 1984 (includes only private sector investments).

(3) Ministère de l'Environnement - 1987.

Table 9.3 **Exports of Water Engineering Firms 1986**

FIRMS	EXPORTS AS A % OF TURNOVER	EXPORTS 10^6 US $
USA		
Metcalf & Eddy	26 %	> 50
Camp Dresser & McKee		
Dames & Moore	5 to 12 %	10 to 20
CH_2M Hill		
Engineering Science	5 to 10 %	< 10
James Montgomery		
FRG		
GKW Consult	73 %	10 - 20
Fitchner Consult	65 %	30 - 50
German Water Engineers	92 %	5 - 10
NETHERLANDS		
NEDECO	100 %	> 50
EUROCONSULT	100 %	30 - 50
DHV	55 %	30 - 50
FRANCE		
Coyne & Bellier	70 %	10 - 20
BCEOM	93 %	30 - 50
SOGREAH - SOGELERG	54 %	30 - 50
U.K.		
Ove Arup	41 %	30 - 50
WS Atkins & Partners	42 %	30 - 50
Binnie & Partners	84 %	20 - 30
Italy		
C. Lotti & Ass.	70 %	10 - 20
JAPAN		
Nippon Koei	41 %	> 50
Pacific Consultants	40 %	> 50
Nihon Suido	10 %	5 - 10

Source : Engineering News Record.

Given the current and projected patterns of environmental policy-making in the Community, there is some concern that both these requirements may not be satisfactorily met. Some Community Member States have a reasonably straightforward and transparent approach to standard setting, making it possible for environmental technology firms to forecast future markets and to plan medium-term R & D strategies. In other countries and at the Community level, however, the decision-making and implementation processes are often very difficult to predict. Because the latter situation is likely to prevail in the future, innovative strategies in the EC environmental industry will remain difficult to develop.

A compromise is often reached when setting Community standards which, therefore, run the risk of lagging behind leading standards worldwide. As a result, it will be difficult to position the EC environmental industry as a strong R & D and innovation competitor against its Japanese and American counterparts. A halfhearted commitment to environmental protection and environmental industry development may have the result that partial players or newcomers with strong technological capabilities, such as chemical or instrumentation and control companies, might remain on the fringe without making the strategic moves that would permanently reinforce the backbone of this sector. This is a critical point because, as suggested by several observers, the deep involvement of the chemical industry could be a decisive factor in developing a technologically advanced environmental industry.

9.5 Conclusions

The impact of the Internal Market on the development of environmental industries is influenced by the highly specific features of this sector, the market being largely "state guaranteed" through regulations, incentives or public sector demand. As a general consequence, additional needs for environmental protection solutions resulting from the Internal Market will actually be met only if adequate environmental policies and instruments are implemented in due time. Needs can not be expected to automatically foster economic demand for environmental technologies and services in the absence of public intervention.

Considering the backlog of environmental protection needs and new needs resulting from the Internal Market, and given the current course of environmental policy making at Community, national or local levels, there is some concern that gaps between needs and actual demand will develop at several levels:

- The overall volume of demand for environmental technology and services may not increase fast enough to ensure a "high level of environmental protection". This is due to inadequate focus, level and timely implementation of economic incentives and standards.

- If current trends are not modified, demand will most likely keep fostering curative solutions rather than preventive action. This is due to the lack of instruments which take into account the specific difficulties of promoting integrated technologies and solution, thereby resulting in a strong reliance on end-of-pipe or remedial solutions.

- The gap between needs for environmental protection solutions and actual economic demand for environmental technologies and services might be especially strong in some regions. This is due to the cumulative effect of : higher than average economic growth, weaker national environmental policy, shortcomings of EC environmental directives/priorities vs local priority problems.

At the end of the eighties, the EC environmental industry is still fragmented and in the making. Only a minority of players can be considered as strongly enough established to develop credible long term strategies. The Community's potential is unevenly distributed among countries. The removal of trade barriers and the opening of public procurement will accelerate the concentration and internationalization of the Community environmental industry. Nevertheless possible use of incomplete harmonization procedures for environmental standards, differing use of economic incentives in accordance with the subsidiarity principle, as well as remaining public monopolies for operations & management of water and waste services will leave for the market strongly segmented.

Today the EC environmental industry is globally well positioned when compared with its American and Japanese counterparts. There is a need for policies accompanying the completion of the Internal Market to take into account the development of R & D and innovation in the environmental field so that the Community environmental industry reinforces its position in this growth sector. Policies should also respond to the fact that the current unbalanced distribution of technical capacities throughout the Community runs the risk of being further exacerbated in the years to come.

CHAPTER 10

MACRO-ECONOMIC IMPACTS OF ENVIRONMENTAL POLICIES

10.1 Environmental and socio-economic objectives

Much of the interest which has been generated by "1992" centres on the prospects for economic growth resulting from completion of the Internal Market and associated developments. The concept of economic growth which underlies the work of the Cecchini Report is of an increase in GDP. This is a conventional economic indicator, but it can hardly be considered as reflecting general economic welfare, because it does not take into account other factors affecting human welfare and the quality of life - among which is the quality of the environment.

This is an important point as the potential increase in welfare due to improvement in environmental quality is not properly reflected in the figures presented, although these improvements may give rise to significant economic impacts (e.g. on health and social security). The increased economic prosperity following the completion of the Internal Market may not therefore be unambiguously beneficial : it will involve increased production and consumption, but also a potential increase in environmental damage.

The costs of measures to combat environmental degradation are not included in conventional economic accounting; some of the benefits of these measures (for example, savings in health costs) would be included but they would not be explicitly identified; moreover, any benefit which is not subject to valuation with market prices would be excluded. This chapter seeks to examine the nature of a sustainable growth path by assessing the potential cost of necessary environmental policy measures. It evaluates the impact of economic growth using a model based on conventional accounting, and estimates the impact of environmental expenditures on key economic variables. As has been illustrated above and was demonstrated by the Cecchini Report, accompanying expansive policy measures using the benefits of the Internal Market offer certain economic advantages (e.g. on employment), at the cost of reducing other benefits (e.g. on inflation and external balance). Policy-makers can move on a trade-off curve exchanging improvements of inflation, external balance and government deficit for higher growth and employment. In this section we will examine how some objectives of environmental policy are related to the objectives of socio-economic policy. The main objective of this chapter, therefore, is to evaluate the macro-economic impacts of expenditures to reduce emissions of pollutants in the European Community.

The main questions regarding the macro-economic consequences of the adoption of a pollution-reduction policy are twofold :

- what are the consequences of an increased demand for equipment goods which are necessary for the reduction of the level of pollution? What is each country's capacity to respond to this technological and economic challenge?

- How will this new type of investment be financed, given the fact that it cannot be considered as traditional productive investment? How will economic agents and crucial economic indicators be influenced according to the different ways of financing environmental expenditure?

To answer these questions, an assessment of the costs and the ensuing macro-economic impacts of different sources for financing the investment focusing on main macro-economic variables has been undertaken using the European-wide macro-economic model HERMES.

10.2 Analysis of the mechanisms involved

The main macro-economic mechanisms involved in the increase of investments aimed at reducing emissions of pollutants can be distinguished as to their stimulating or cost-inducing effects.

In addition, it should be noted that apart from the direct effects there are indirect effects (e.g. due to the changes in GDP).

The stimulating or demand effects include impacts on:

- Private investment, which is influenced by increases in pollution control requirements with further consequences in the form of reduced profitability, changes in the GDP, etc.

- Changes in levels of wages and prices, due to environmental costs.

- Imports and exports, which will also be affected by changes in pollution control expenditure in other Member States.

The results of the above effects depend on the way investment is financed. Generally speaking it is possible to distinguish four types of financing:

- Increase in firms' indebtedness : The financing of the investment is totally supported by the firm by increasing its overall debt.

- Price increase: The financing of the investment is supported totally by firms which increase their production price which influences consumption prices.

- Crowding out effects: In this case firms are supposed to reduce their productive investment, due to limited resources, to finance the emission abatement investment.

- Government financing: The last case assumes that the public sector finances the environmental investment by increasing its subsidies to firms. Financing of pollution control investment will then affect the government budget.

10.3 Evaluation of Effects

The macro-economic implications of the integration of feedback effects resulting from the protection of the environment are multiple and contradictory. Positive effects resulting from the increase in demand are combined with the negative results of an increase in prices and reduction in other types of investment, as well as increases in taxes.

To appreciate fully the quantitative effects on the protection of the environment, an in-depth analysis of a policy plan would be required. Due to lack of time, data and models, the exercise is limited to the evaluation of the impact of an additional environmental investment of 1% of GDP. This corresponds roughly to a doubling of present environmental investments.

The analysis has been carried out for five countries: Belgium, the Federal Republic of Germany, France, Greece and the United Kingdom. All simulations have been effected with the HERMES model and all the assumptions are similar for all countries. The figures presented below are the medium-term simulation results (5 years' time horizon) and concern the percentage deviation from the baseline scenario of completion of the Internal Market with no change in environmental expenditures.

10.4 Stimulating or demand effects

One of the most important consequences of the increased pollution abatement is associated with the stimulative investment impacts on national economies caused by the increase in expenditure by 1% of GDP.

The modelling exercise gave consistent results for all the countries which were studied. Positive effects on both production and employment will occur, while a small increase in prices will reduce competitiveness and exports, with negative effects on the balance of payments.

The mechanisms involved are based on the standard income-expenditure relationship allowing for import leakages, i.e. the increased output will raise disposable income, consumption and imports.

There will be positive impacts on the public sector deficit and unemployment. The former is due to the increase in economic activity, while the latter will be the effect of the rise in employment due to an increase in production.

Table 10.1 "Environmental Protection : Effect of a 1% increase in environmental investments"

	B	D	F	GR	UK
% change					
Gross. Dom. Prod.	0.28	0.97	0.62	0.44	0.47
Consumpt. Defl.	0.23	0.44	0.33	0.21	0.16
Absol. diff.					
Public acc. to %GDP	0.31	0.40	0.27	0.21	0.16
Balance paym. acc. %	- 0.53	- 0.60	- 1.54	- 0.72	- 0.56
Unemployed (thous.)	-14.2	- 81.7	-52.0	- 4.6	-76.9

A European policy scenario

The results depicted in Table 10.1 were obtained by evaluating the impact on each country separately, under the assumption that there are no changes in other countries.

In Table 10.2 we examine the quantitative effects of the same investment increase for four countries (1). In this scenario an increase in imports, for example into Belgium from Germany, is reflected not only in the import figure (for Belgium) but is now also integrated as an increase in exports (for Germany).

The results indicate that the positive effects are significantly higher if a common policy is implemented and when international linkages are considered, compared to a situation where countries act alone and results are taken country by country. The positive results are strengthened both for GDP growth and the public account surplus, while the negative impacts on the balance of payments are reduced (as is shown by a comparison of Tables 10.1 and 10.2). International aspects, when taken into account, seem to have an important positive effect. It illustrates that a combined effort in the Community would increase overall benefits.

The results for Belgium show that the common policy scenario is particularly beneficial in the case of a small open economy in which import leakages can severely reduce the economic stimulus of the demand effect.

(1) To simulate this, the different HERMES models of the 4 countries were linked together.

Table 10.2 "Environment Protection : International Aspects"

	B	D	F	UK
% change				
Gross Dom. Prod.	1.06	1.21	0.90	0.96
Consumpt. Defl.	0.91	0.48	0.54	0.43
Absolute diff.				
Public acc. % GDP	0.58	0.52	0.82	0.44
Balance paym. % GDP	- 0.07	- 0.34	- 0.18	- 0.24
Unemployed (thous.)	-18.3	-106.0	-66.0	-103.0

10.5 Investment financing

To examine alternative solutions for the financing of investment four cases are analyzed. The first deals with the crowding-out effect; the second assumes that the financing of the emission-reducing investment is effected by an increase in production prices; in the third case government financing is supposed to occur by increasing direct taxes and by reducing other forms of public investment. Finally the fourth case is a combination of the first three cases.

The first three scenarios should be seen as extreme cases: the real world outcome is likely to be a mixture of these elements - as in the fourth scenario which comprises a combination of the first three scenarios.

10.5.1 Crowding-out effect

When private firms increase investments in pollution abatement, one possible outcome will be a decline in other forms of investment. The hypothesis adopted assumes that only one half of the investment in emission reduction gives rise to this "crowding-out" effect, while the remaining amount is financed by an increase in company debt.

The reduction in other forms of investment has negative impacts on overall economic activity (as conventionally measured). Imports are increased to combat bottlenecks, while exports are reduced.

However, the combined effect of the increased investment in emission abatement and the crowding-out effect have still positive but smaller overall effects for the countries examined: increased GDP, reduced unemployment and surplus in the public deficit are the main positive aspects, while a small worsening of the balance of payments could occur.

Table 10.3 "Environment Protection : Crowding-out effect"

	B	D	F	GR	UK
% change					
Gross. Dom. Prod.	0.15	0.44	0.28	0.17	0.24
Consumption Defl.	0.44	0.07	0.22	0.13	- 0.10
Absolute diff.					
Public acc. % GDP	0.23	0.24	0.21	0.33	0.02
Balance paym.% GDP	- 0.24	- 0.38	- 1.02	- 0.36	- 0.32
Unemployed (thous)	- 7.0	-45.2	-40.0	- 1.90	-25.1

10.5.2 Production price increase

The increase in pollution control investment would raise firms' cost of production. The resulting price increases could have a "knock on" effect on wage rates and could thus trigger an inflationary mechanism in the economy. The positive results, which were initially created by the increase in emission-reducing investment, are significantly reduced. However, positive results remain in the main components of GDP for Belgium, France and Greece. In all countries the effects on employment are positive, and unemployment is found to be reduced.

The negative impact on the foreign trade balance is more substantial in this scenario due to the reduction in exports and the increase in imports caused by losses in competitiveness. Finally, the above shocks will have positive results on the public deficit.

Compared to the previous case, inflationary pressures are increased while GDP growth and employment creation are lower, and the GDP growth is negative in Germany and the United Kingdom.

Table 10.4 "Environmental Protection : Financing by price increase"

	B	D	F	GR	UK
% change					
Gross. Dom. Prod.	0.05	- 0.09	0.33	0.21	- 0.25
Consumption Defl.	0.69	2.12	1.99	0.58	1.87
Absolute diff.					
Public acc. % GDP	0.25	0.32	0.41	0.24	0.09
Balance paym.% GDP	- 0.43	- 0.51	- 1.15	- 0.87	- 0.36
Unemployed (thous)	-11.6	- 1.1	-20.0	- 2	- 4.1

10.5.3 Government financing

In Table 10.5 investments are paid for out of increased government expenditure which in turn is financed by an increase in direct taxes (for 50%) and by reducing investment (for 50%). This will lead to a reduction in disposable income and consumption which in turn will have multiple depressive effects on the economy.

Such a method of financing emission-reducing investment can have depressive effects on economic activity and on employment while reducing the inflation rate. The lower inflation rate (as compared to the previous scenarios) reduces the negative effect on competitiveness and the balance of payments.

Table 10.5 "Environmental Protection : Public Financing"

	B	D	F	GR	UK
% change					
Gross. Dom. Prod.	0.07	- 0.20	- 0.11	- 0.25	- 0.24
Consumption Defl.	- 0.19	- 0.49	- 0.03	- 0.00	- 0.23
Absolute diff.					
Public acc. % GDP	0.28	0.08	- 0.79	1.06	- 0.44
Balance paym.% GDP	- 0.40	- 0.20	- 0.90	- 0.19	- 0.09
Unemployed (thous)	- 2.20	- 0.30	45.00	1.56	54.54

10.5.4 Combined scenario

The previous scenarios describe, in three extreme cases, the different elements which define the net outcome of the increase in environmental investments. In Table 10.6 we present a combined scenario which is likely to be more realistic. In this case the total emission-reducing investment is financed by a reduction of productive investments (30%), by increases in production price (30%) and by public financing (40%, of which 20% by tax increase and 20% by public borrowing).

The main conclusion arising from this combined scenario is that an increase in environmental investment financed from different sources can be effected successfully, without causing major disequilibria in the main economic indicators. At a macro level the positive demand effects offset the negative cost effects. The effects on GDP, employment and the public account would be globally neutral, while the effect on the balance of payments and on the inflation rate are slightly negative.

Table 10.6 "Environmental Protection : Combined scenario"

	B	D	F	GR	UK
% change					
Gross. Dom. Prod.	0.09	- 0.02	0.14	0.03	- 0.10
Consumption Defl.	0.26	0.46	0.65	0.25	0.44
Absolute diff.					
Public acc. % GDP	0.26	0.20	- 0.13	0.56	- 0.14
Balance paym.% GDP	- 0.36	- 0.35	- 0.29	- 0.33	- 0.24
Unemployed (thous)	- 6.46	-14.02	0.00	0.75	13.05

It should be stressed that these results were obtained in a non-linked scenario. As has been shown above, the positive results will be bigger if all the countries undertake a similar increase in investment and if the international dimension is incorporated in the evaluation.

In this case the negative impact on the balance of payments is likely to be much smaller.

10.6 Assessment of the results

The results of this simplified analysis appear to be not implausible. Numerous studies that evaluate the macro-economic impact of past environmental policies come to the same results; the positive demand impacts are compensating the cost effects, especially in the short run. In other words, the simulation exercise on the Commission's HERMES models confirms these optimistic results for the Community.

Moreover, the results of the present analysis are consistent with a Dutch study which evaluated the economic consequences of a detailed policy scenario aiming at sustainable development. In this scenario, a substantial environmental expenditure amounting to 4% of GDP was evaluated. The results for the medium (1995) and long (2010) term demonstrated that the impact on GDP and employment would be positive in the medium term (1994), while negative (but negligible) effects would occur in the long run (2010) (See Table 10.7). However, if other countries were to apply the same policy measures, also in the long run, these impacts would be positive overall.

Table 10.7 Macro-economic impact of Dutch environmental policy Plan, scenario III (Maximum use of existing environmental technologies)

Accumulated effects in 2010	Economic middle scenario	Deviations from Scenario IIIa x	middle scenario Scenario IIIb xx
GNP volume	+ 99.4	- 4.2	+ 0.5
Real wages	+ 62.0	- 3.4	+ 0.9
Consumption	+ 120.0	- 2.1	- 1.2
Employment (x1000)	+ 1200.0	- 20.0	+ 65.0
Unemployment (x1000)	- 400.0	+ 18	- 58
Deficit balance (% NNI) of payments	- 4.0	- 2.3	- 0.7
Financial deficit	- 3.0	+ 4.0	- 0.4
Interest rate	- 1.3	+ 1.5	+ 0.6
Public debt	- 1.8	+ 1.6	+ 1.1

Source : CPB, 1986; NMP, 1989

x: Scenario IIIa : without the same policy measures by trading partners
xx:Scenario IIIb with the same policy measures by trading partners

10.7 Conclusions

In order to evaluate the macro-economic impacts of the completion of the Internal Market on the environment, a quantitative analysis based on a traditional macro-economic modelling approach has been undertaken. The purpose of this analysis was to estimate the macro feedback effects caused by an increase, equal to 1% of GDP, in investments in the protection of the environment.

The specific objectives were as follows:

- to evaluate the macro-economic impact of the increase in emission-reducing investment and

- to evaluate the possibilities given by the completion of the Internal Market (more growth, gain in benefits) to finance the investment in prevention or pollution abatement.

It is clear from the above analysis that the financing of environmental protection investments will have minor impacts on the main economic variables. Moreover, increased environmental protection will give an impetus for growth in the environmental protection industry. So there is no evidence that expenditure at this level for the implementation of environmental policies would offset the benefits of the Internal Market (as conventionally measured) at macro level.

These results show that our European economies can in the short and medium term sustain a major effort in order to guarantee the environmental conditions for sustainable development. Policy-makers should therefore not feel constrained by short and medium-term socio-economic objectives from taking the necessary actions to guarantee long-term welfare.

CHAPTER 11

THE INTERNATIONAL DIMENSION

11.1 Introduction: sustainable development on a world scale

The Report of the World Commission on Environment and Development - the Brundtland Report - stressed the need to achieve sustainable development for all countries of the world. To take account of the recommendations of this report, it should be ensured that the strengthening of the environmental policy of the Community, concomitant with the completion of the Internal Market, does not have the paradoxical effect of contributing to environmental deterioration in other parts of the world.

According to the Cecchini Report, the completion of the Internal Market will give an important growth stimulus to the Community, reinforcing its competitive position vis-à-vis its main trade partners. If current environmental policies are not reinforced, there is a danger that further economic growth in the EC might imply more resource use, more pollution of the international environmental capital of mankind, and more transfrontier pollution both within the Community, and also between the Community and the rest of the world.

On the other hand, if the Community decides to intensify and to reshape its environmental policy in the light of 1992, this will necessarily have implications for the way the Community handles its external environmental relations and will also affect the development of its economic relations with the rest of the world.

In most areas of environmental policy, completion of the Internal Market with a high level of environmental quality implies the raising of Community environmental standards to higher levels than (or sometimes in line with) those of our developed trade partners. Will this have a negative effect on the Community's competitive position? For other trade partners (notably the Eastern bloc and the developing countries) a higher level of EC environmental protection could imply new possibilities of export of pollution-intensive production processes outside the Community market. Does this mean that the EC is exporting its pollution problems abroad or can it be seen as giving extra opportunities for growth, albeit environmentally damaging, to those countries? More stringent EC product standards will mean additional production costs for trade partners with a less developed environmental policy. Can the EC be accused of using environmental policy as a hidden trade barrier?

In the field of international relations, completion of the Internal Market will enhance the strength of the EC position in the world. In what way can the increased possibilities in the field of international trade policy be used for defending the EC's environmental policy and even for stimulating environmental policy in other countries of the world?

These are the main questions the EC will have to answer with respect to the international environmental dimension of the post-1992 Internal Market.

How can the Community deal with these problems in the light of the constraints and opportunities offered by the completion of the Internal Market?

11.2 The economic/ecological interdependence between the EC and the rest of the world

11.2.1 The globalization of environmental policy

Nowadays it is becoming increasingly clear that the most important environmental problems - depletion of the ozone layer, climate change, etc. - have a global nature and have to be tackled at a global level. It is therefore necessary to promote the adoption and the implementation of an international strategy as a response to such problems. Some steps in this direction have already been taken. In particular, the entry into force of the Vienna Convention and the Montreal Protocol on the protection of the ozone layer, and the adoption of the Basle Convention on transfrontier movements of hazardous waste, are concrete measures which highlight the growing importance of international environmental cooperation. It should be noted that the EC has been in the forefront in the adoption of these Conventions.

The process of globalization of environmental policy means that European industry will have to face, in the years to come, new requirements, the establishment of which will not be decided by national authorities or Community institutions, but agreed at international level. In this context, it is necessary to define the role to be played by the Community in all international fora dealing with environmental issues.

11.2.2 Transfrontier pollution

The environmental policy of third countries is to a certain extent a determinant of environmental quality in the Community. It is important to note in this respect that transfrontier pollution, mostly stemming from stationary sources, is becoming a major problem in Europe. Significant increases of transfrontier water and air pollution, including from across the borders in Eastern Europe, have sometimes neutralized the positive effects resulting from the implementation of Community environmental policy.

For this reason, controlling the inflow of pollution from third countries could be very important for the realization of intra-EC environmental goals. In some cases it is more effective and efficient to reduce pollution in non-EC countries than in Member States. In addition, limiting the inflow of pollution from abroad is often beneficial to the political acceptability of internal environmental policy.

These considerations show that transboundary pollution will remain a key issue for Community environmental policy in the years to come.

11.2.3 The relocation of industry

The reinforcement of Community environmental policy could result in the deterioration of the competitive position of some pollution-intensive industries within the Community. In particular differences between regions and countries in the assimilative capacity of the environment should be regarded as a factor of production that influences the spatial allocation of economic activity; other things being equal, we could expect a relocation of pollution- intensive activities away from regions with a low level, or a high use, of assimilative capacity to regions where the assimilative capacity is still largely available.

The impact of industrial relocation on the European economy must not, however, be overestimated. The assimilative capacity is only one of several possible factors determining the international location of business. Other more determining factors include the availability of labour, transport costs, economies of scale, proximity of markets, etc.

Thus differences in assimilative capacity will not automatically result in reallocation of pollution-intensive industries out of the Community e.g. to the less developed countries and to Eastern Europe. Empirical evidence does not suggest that relative environmental costs are an important factor in international plant location decisions, but stresses on the contrary the positive role of a clean environment in attracting the new industries of tomorrow.

Moreover, because of the access to the Internal Market, firms which as a consequence of environmental policy action in some Member States look for another location, will first consider other Member States with some unused assimilative capacity left over before they move outside the EC. New firms will be attracted by the unified market and will weigh this advantage against the extra cost of higher environmental protection.

The problems associated with a restructuring process (for example, due to environmental policy measures) are always less severe in a smoothly functioning economic system that can adopt quickly to changes in business conditions. In this respect completion of the Internal Market and its dynamic effect on the economy of the Community would facilitate the process of adjustment to higher environmental standards.

11.2.4 Environmental policy and trade

The establishment of environmental standards for industrial products is an essential part of the environmental policy of both the Community and its trade partners.

In this context, it is clear that in a world with intensifying trade in goods on the one hand, and with strengthening environmental quality standards on the other, conflicts may arise and need to be solved in an orderly way. It is particularly important to ensure that countries do not use different product standards as hidden barriers to trade, and that internationally accepted minimum product norms are set at a high level in order to avoid or reduce conflicts.

Similarly, recent development show that trade policy will be increasingly influenced by environmental considerations. The restrictions to international trade in endangered species of wild fauna and flora established in the framework of CITES, and the commercial provisions of the Montreal Protocol on CFCs, are clear examples of the growing use of regulation of international trade as a means to achieve environmental objectives.

Problems concerning transboundary movements of certain specific categories of goods - especially hazardous wastes and dangerous chemicals - should also be very closely examined in view of the risks they involve for both the environment and human health.

The European Community, one of the most important custom unions in the world, actively involved in international trade, is already playing and must continue to play a major role in this field.

11.3 The Community strategy

In the previous paragraphs four main international environmental issues which could have direct impact on the development of the Community Internal Market have been identified: globalization of environmental policy, transboundary pollution, industrial relocation and environmental constraints on trade. It is now necessary to outline the essential elements on which the Community's strategy should be based when dealing with these issues.

11.3.1 The Community response to global problems

a) Action at international level

The importance of the international dimension of the Community's work in the field of the environment has significantly increased in the last few years. As the Community internal environmental policy has been developed and reinforced, so has the Community's role as a leading actor on the international stage. Similarly, the EEC Treaty, as amended by the Single European Act, stresses the importance of Community international activities in the environmental field. Article 130r provides that the Community and the Member States shall cooperate, within their respective spheres of competence, with third countries and with the relevant international organizations in this area.

The significance of Community involvement in international action on the environment is reflected in its participation in a growing number of international conventions. In particular, the Community is a contracting party to the global conventions i.e. to the above-mentioned Vienna Convention on the protection of the ozone layer and the Montreal Protocol on CFCs, and has also signed the Basle Global Convention on the control of transboundary movements of hazardous wastes.

There is a clear need to strengthen and reinforce Community participation in all relevant international conventions, since the existence of a close link between global and regional environmental problems is self-evident. The Community must therefore fully take into account, when defining its own internal priorities, the actions proposed at international level and be actively involved, at an early stage, in international environmental negotiations. Moreover, if the Community falls to adopt a coherent coordinated approach in international fora, this could severely damage the cohesion and consistency of its environmental policy and seriously endanger the completion of the Internal Market.

It is particularly important for the Community to be closely associated with the current work and discussions on climatic change which could result in the drafting of a new global convention aimed at dealing with this vital issue, since the measures to be adopted will probably have a significant impact on European industry because of the heavy responsibility of industrialized countries for emissions affecting the atmosphere. The Community is in fact actively taking part in the work of the Intergovernmental Panel on Climate Change set up under the auspices of UNEP and WHO. This involvement should be pursued and strengthened in the future, including the signing of the Convention when it is agreed upon.

The Community's participation in all relevant international initiatives should not, however, be an excuse to postpone some actions which can already be taken, especially as far as energy conservation and energy efficiency measures, and the development of alternative non-fossil energy sources are concerned. Actions in this field, which could significantly contribute to the reduction of CO_2 emissions, are currently being carried out in the framework of the Community's energy policy and research programmes and should be pursued in the future.

Apart from participating in international agreements and conventions, the Community should also require growing cooperation with many organizations and agencies concerned with issues of environmental protection, population and sustainable development. In particular, it is essential to strengthen the Community's relations (which are already close) with international bodies such as UNEP, OECD and ECE which are successfully contributing to the development of a global response to the new environmental challenges our planet is facing.

b) Cooperation with developing countries

The environmental problems besetting the Third World (desertification, deforestation, degradation of the urban environment, etc.) are undoubtedly the most serious and potentially the most dangerous with which the world is currently confronted. In addition, these problems could become more acute in the years to come due to increased economic growth in developing countries. Neglecting the environmental problems of the Third World would cause a dramatic deterioration of the global ecological balance and could therefore have a very negative impact on the existing environmental situation of the Community and other industrialized regions, particularly in relation to climate change.

This is one more reason for the Community to foster its cooperation with developing countries, with the aim of assisting them to manage their environment properly and ensuring that environmental considerations are fully taken into account in the definition and implementation of development policies.

Over the last few years, the environment has played an increasingly important part in Community development aid policy. The measures taken under the third Lomé Convention, the European Action Plan to Combat Desertification and the Resolutions on Development and the Environment adopted by the Council in 1984 and 1987, clearly demonstrate the Community's will to treat environmental protection and the conservation of natural resources as an integral part of economic development.

In addition, since the entry into force of the Single European Act, the integration of environmental requirements in the Community's development programmes is no longer simply a political priority, but also a legal imperative, since Article 130r of the EEC Treaty as amended by the Single European Act provides that environmental protection requirements shall be a component of the Community's other policies.

Although much has already been done to achieve this objective, these efforts must be maintained in the future, in particular in order to ensure that the new Lomé Convention, now being negotiated, gives prominence to the concept of sustainable development and that the resources available to finance environmental protection measures are significantly increased. Similarly, it is also essential that environmental protection is dealt with in the framework of cooperation agreements with developing countries in Asia and Latin America which, in some cases, are facing more severe environmental problems than ACP countries.

It is important to note, in this respect, that the recent Commission Communication on the conservation of tropical forests stresses that Community aid and development cooperation programmes should, either directly or indirectly, promote activities that avoid deforestation and at the same time should provide alternative solutions, such as the promotion of sustainable techniques, introduction of agro-forestry sound management, creation of plantations, etc.

This essential element of the proposed Community strategy for the conservation of tropical forests is also applicable in other areas of environmental concern such as the transfer of clean and low waste technologies, improvement of the urban environment, waste management, etc. It is particularly important, in this respect, to take the necessary steps in order to ensure that ACP and ALA countries benefit from the rapid developments that are taking place in Europe in the field of clean and environmentally sound technologies, as the Community's environmental policy is strengthened and reinforced.

11.3.2 Community policy on transboundary pollution

Two policy options are available when dealing with transboundary pollution related issues: bilateral agreements with the concerned countries and the adoption of regional conventions aimed at setting up common standards, norms and procedures. Both aspects should be considered as essential components of an integrated strategy against transboundary pollution.

a) Bilateral agreements

Although other countries are also contributing to the aggravation of this problem, transfrontier pollution is being generated in large quantities by the Eastern European countries. Their technological underdevelopment, the deep economic crisis which they confront and the lack of consistent environmental policies are the main factors which explain why these countries are responsible for much of the pollution inflow towards the Community.

The Community has now a unique chance to assist the Eastern European countries properly to manage and protect their environment, thus contributing to the reduction of pollution in the Community. The Community has recently signed cooperation agreements with Hungary, Poland and Czechoslovakia, and is engaged in negotiations for similar agreements with other East European countries. In addition, the Commission has recently been charged with the coordination of Western assistance to Hungary and Poland, including environmental policy.

It is clear in this context that the environment should be high on the list of sectors with regard to which the Community must create an open and comprehensive dialogue with these countries. It is also evident that the financial resources needed to foster environmental improvement in the Eastern European countries should be made available as soon as possible.

Another area of specific concern is the protection of the environment in the Mediterranean basin, primarily because of the severity of the problems facing this region but also in view of the economic importance for the Community's southern countries of high levels of environmental quality in this region. In addition, four of the most economically developed countries which border the Mediterranean are Member States of the Community, making its active participation in efforts to deal with the threats the Mediterranean environment is confronted with all the more imperative.

For these reasons, it is essential that agreements with non-Community countries bordering the Mediterranean are used as tools to strengthen cooperation in the environment sector. Some steps in that direction have already been taken. In particular, the cooperation agreement between the Community and Yugoslavia, signed in 1980, covers environmental issues. Environmental projects in countries such as Egypt, Tunisia and Malta are also being supported by the Community.

These efforts should be considerably intensified in the future, since environmental cooperation with the Community's Mediterranean partners could effectively complement the actions carried out in the framework of the Community strategy for protection of the Mediterranean, making available additional resources to finance measures in areas outside the purview of the Structural Funds.

b) Regional agreements

The Community is participating in a growing number of regional environmental agreements and conventions. It is particularly active in the field of the protection of regional seas and international rivers through its involvement in the conventions for the prevention of pollution in the Mediterranean, the North Sea area and the Rhine. The Community is also a contracting party to the Geneva Convention on long-range transboundary air pollution and to several regional agreements for the conservation of nature.

This area should not be neglected in the future. As previously stated, regional conventions setting up common standards, norms and procedures are an essential part of a coherent strategy to deal with transboundary pollution-related issues. Consequently, the Community should consider in what ways the existing conventions could be complemented and made more effective

In particular, there is a clear need to promote the participation of East European countries in these conventions as a means to move forward the active involvement of such countries in the management and protection of our common European environment. Also, the Community must examine the possibility of participating in some other regional conventions, such as the Helsinki Convention on the protection of the Baltic Sea, to which it is not yet a contracting party. Finally, the Community should consider whether transfrontier pollution-related issues could be specifically addressed in the framework of all (existing and new) regional environmental agreements.

c) Pollution exports from the Community

Logic demands that Community policy fully takes into account the effects of pollution generated by Member States' industries on neighbouring countries. On this basis, a certain number of principles should be applied to reduce the volume of transboundary pollution from Community sources:

i) The Community environmental policy should be based on the integral application of the PPP, taking also into consideration damage caused outside the Community borders. This implies responsibility of Community firms for pollution exports to third countries.

ii) When negotiating regional agreements, the Community should promote the adoption of quality standards that are no less strict than those established by Community legislation.

It is also evident that this issue should be addressed in the framework of the Community's talks with neighbouring countries - especially with EFTA countries - in order to identify the major areas of concern and to agree the measures to be taken.

11.3.3 Industrial relocation

The Community should generally accept the relocation of industrial activities due to differences between the EC and non-EC countries with respect to the assimilative capacity of the environment. The Community should, however, as envisaged in the 4th Environmental Action Programme, consider the adoption of legislation on the export of dangerous industrial processes and plant to non-EC countries on the basis of the experience gained under the directive on major accident hazards, and promote the establishment, at international level, of appropriate codes of practice and guidelines. It should also encourage EC enterprises to apply the same environmental standards when establishing plant outside the EC as those imposed inside the EC. Similarly, it should offer its expertise in relation to prior environmental impact assessment to the administrations of countries who would like to benefit from it in setting their own standards for economic development.

If the relocation of polluting activities is the result of foreign governments (e.g. in less developed countries) allowing a deterioration of their natural environments in order to achieve additional material growth, the problem becomes more serious. The monetary valuation which countries place on the benefits and costs of more polluting material growth inevitably is influenced by the international distribution of world income. It could be argued that some developing countries have no option other than to prefer more material welfare to a clean environment, because their share of world income is too low. Therefore one could advocate a link between an increase in development aid and environmental protection, allowing less developed countries to take the interest of the environment fully into consideration.

The essential advantage of this approach would be that it would enable developing countries to avoid the experience of countries which have achieved a high level of economic development which has given rise to substantial environmental costs. On the other hand, the EC has to shoulder its responsibility for the world environment and has to act against environmental dumping, to correct the creation of a competitive disadvantage on the basis of incorrectly defined environmental standards.

a) Promote the application of the Polluter Pays Principle on a world scale

A global harmonization of principles concerning the sharing of the costs resulting from the implementation of environmental protection measures would be an appropriate initiative to prevent undesirable transfers of polluting industries from Europe to other parts of the world. The final objective of this harmonization shall be to ensure that polluters cover the full environmental costs of their activities.

The EC should use its strengthened international position to promote a world-wide application of the Polluter Pays Principle (PPP). This principle is the subject of Recommendations by OECD (in 1972) and the Community (in 1975)[1] and is designed - inter alia - to combat trade distortions due to differences between countries in the allocation of costs of pollution control measures

Up to now, unfortunately, the PPP does not have a universal endorsement, as it has been formally adopted only by the Community and by OECD countries. Within the UN regional economic Commissions its application is now promoted in an active way. The Community could enhance this situation by including it in its trade and aid relations with third countries which do not belong to the OECD.

Similarly, a close examination of this issue should be very high on the agenda for the 1992 World Conference on Environment and Development. It is clear, in the light of the conclusions of the report of the World Commission on Environment and Development, that environmental costs must be fully taken into account by developing countries when setting up their own economic priorities if sustainable development is to be achieved. Therefore, the most reasonable and sensible policy option is to charge polluters with all the environmental costs resulting from their activities (the "extended" PPP).

b) <u>The need for compensations</u>

A world-wide application of the PPP will certainly create problems of transition. Given the considerable differences which exist between national, political, administrative and legal systems in the world, severe practical difficulties are likely to arise. Therefore, the EC should not only advocate the use of the extended PPP on a world level, but has to provide also for technical cooperation and assistance. The Commission could create incentives for an appropriate transfer of technology in the framework of its existing aid schemes and enforce the use of the PPP by incorporating it in the framework of its trade arrangements with the ACP and other developing countries. It is also evident that the practical and general introduction of the PPP on a world level will be considerably improved if the EC uses it explicitly in trade relations with the Eastern bloc and newly industrializing countries and appropriate initiatives are taken at international level.

[1] Recommendation regarding cost allocation and action by public authorities on environmental matters 75/436/Euratom, ECSC, EEC (OJ L 194/125/7/75)

11.3.4 Environment and Trade

a) Establishment of high environmental standards for industrial products

Quite obvious legal reasons militate in favour of the setting up of common environmental standards for industrial products at Community level. The logic of mutual recognition of product standards (Cassis de Dijon) implies that in principle it is left to the individual member countries to determine what product standards to apply for both imported goods and goods produced inside the EC. If following this approach individual member countries apply product standards to imports from non-EC countries with varying degrees of stringency, economic logic suggests that after a while imports will ceteris paribus be concentrated in the country with the least stringent standards and from thereon will be distributed in the rest of the Community, if the comparison of additional transport costs and the cost implication of the differences in product standards makes this worthwhile. The Community should therefore fully exploit the possibilities offered by the EEC Treaty, as amended by the Single European Act, to ensure a proper functioning of the Internal Market in this important area.

It is also becoming increasingly clear that, as stated in the 4th Environmental Action Programme, the Community has a considerable interest to align itself with the environmental standards of its major competitors. The competitive position of the Community - especially on the markets of its developed trade partners - will depend upon its capability of offering environmentally friendly products in accordance with both the consumers' demands and the sometimes very stringent product standards its trade partners will require before allowing foreign products to enter their markets. European exporters would have to face an additional trade barrier if European product standards were less stringent than those of its main trade partners.

It is important to note in this respect that the discussions that preceded the adoption of the directive on small cars' exhaust emissions highlight the vital importance of this sensitive issue, in relation to both economic and environmental considerations.

These policy orientations are likely to create problems for developing countries exporting to the Community, in view of the high costs that the adaptation of their industrial production to the Community requirements will probably involve. Such problems could be eased through the reallocation of development aid in favour of projects aimed at assisting less developed economies to adapt their export production to Community environmental standards.

b) Bilateral and multilateral contacts

As stated before, the reinforcement of environmental standards throughout the world - a process which is steadily gaining momentum - implies an obvious risk. Certain countries could feel the temptation to use product standards as a means to hamper international trade, thus protecting national industry, since according to article XX of the GATT, the states can adopt or enforce any measures necessary to protect human, animal or plant life or health.

Considerable importance is attached to the continuation of the Community's bilateral links with its industrialized trade partners, notably the USA, Canada and Japan. These links, which chiefly take the form of exchanges of information on environmental policy and legislation, can effectively prevent trade conflict, while at the same time promoting mutual understanding and facilitating harmonized approaches at international level.

A solid basis for informal cooperation on environmental issues with the EFTA countries has also existed since the EC/EFTA Ministerial Conference on the environment held in Noordwijck (Netherlands) in October 1987. In view of the new orientations recently established by the Council and the ongoing dialogue with its EFTA partners, the Community should consider additional measures with a view to reinforcing the EC/EFTA cooperation in this area.

Apart from its bilateral contacts with industrialized countries, the Community should continue to work in the GATT framework to prevent or reduce trade conflicts on environmental grounds. This is a matter of urgency since a considerable increase of such conflicts is to be expected in the near future.
While it is not in the Community's interest that international trade is unnecessarily hampered or limited, at the same time it is important to respect the right of States to adopt legitimate environmental measures. The desirability of creating new early warning mechanisms on forthcoming environmental legislation or reinforcing the existing ones should also be considered.

c) Environmental restrictions on trade

Apart from the impact on international trade which could result from the establishment of different national environmental standards for industrial goods, there is an extremely important additional aspect which should not be neglected. As noted before, international conventions are increasingly making use of trade provisions as a means to achieve environmental objectives e.g. CITES and the Montreal Protocol.

It is essential that the Community continues to pay attention to the coordinated implementation of these international agreements by all Member States. Community regulations on these highly vital issues have already been adopted. The control of their effective application at national level remains, however a priority.

d) Transfrontier movements of hazardous waste

International trade in hazardous waste raises very specific problems. Over the last few years it became increasingly clear that this category of waste could not be subject to the same rules as ordinary goods because of its special nature and the risks it involves. Consequently, there was the need to set up mechanisms strictly to control transboundary movements of hazardous waste.

The Community was a pioneer in this area through the adoption of the 1984 directive on the supervision and control of the transfrontier shipment of hazardous waste. It has also been actively involved in the international negotiations which led to the adoption in March 1989 of the Basle Convention on the control of transboundary movements of hazardous wastes and their disposal.

This Convention, which has already been signed by the Community, is based on three essential principles, the implementation of which should put an end to the abuses that have outraged public opinion in the past: a ban on all exports of waste to countries which are not party to the Convention, the requirement to obtain prior consent of the country of destination and the need to provide for technical guarantees covering the treatment of the waste in the country of destination.

In addition, the Basle Convention allows contracting parties to enter into bilateral, multilateral or regional agreements or arrangements regarding transboundary movement of hazardous wastes or other wastes with other parties or non-parties, provided that such agreements or arrangements do not derogate from the environmentally sound management of hazardous wastes and other waste as required by the Convention. It is also laid down that these agreements or arrangements shall stipulate provisions which are not less environmentally strict than those provided for by the Convention, in particular taking into account the interests of developing countries.

The Community should consider the advisability of making use of this possibility. In particular, it may be necessary to prohibit movements of hazardous wastes between the Community and ACP countries in the framework of the new Lomé Convention. Similarly, arrangements with the Community's Mediterranean partners should also be considered in order to strictly control shipments of hazardous waste in this region.

The above considerations make it clear that, in view of the increasing restrictions regarding transboundary movements of hazardous wastes, the Community must take the necessary steps in order to ensure that wastes generated by European industry are soundly managed, recycled and as a rule disposed of in Europe. In this context, the specific responsibility of Community industries for the management and disposal of the wastes they generate has to be clearly stressed, in accordance with the Polluter Pays Principle. On the other hand, measures aimed at encouraging and promoting the development of new low waste technologies could mitigate the economic impact on the Community of the implementation of the Basle Convention. These technologies should be shared with less developed countries according to the rules of the Basle Convention.

e) Exports of dangerous chemicals

International trade in dangerous chemicals raises similar problems as trade in hazardous wastes. Different schemes for notification and information concerning international trade in such substances have already been set up, with the active participation of the Community, within the framework of several international organizations (OECD, UNEP and FAO).

The Community has already adopted legislation regarding the export of dangerous chemicals that are banned or severely restricted in the Community. In particular, the Council regulation of 16 June 1988 concerning the export from and the import into the Community of certain dangerous chemicals set up rules establishing a common notification procedure which oblige the Community to notify third countries with regard to exports of such substances and to ensure that the rules applicable within the Community for the packaging and labelling of banned or severely restricted chemicals are also applied to these chemicals when destined for export.

The effective implementation of this regulation, which entered into force a few months ago, remains a high priority issue in view of the risks for the environment and human health that the export of dangerous chemicals - especially to developing countries - involve if preventive action is not taken. It will be necessary to reinforce the regulation in the future in accordance with the revised UNEP Guidelines.

11.4 Conclusion

The vital importance of global and international issues in the framework of the reinforcement of Community environmental policy which should run in parallel to the completion of the 1992 Internal Market has been stressed in the present chapter. The specific problems concerning environmental constraints on trade and transfers of pollution and polluting industrial processes and products have also been examined in detail.

In this context, the need to strengthen the already active Community participation in international fora dealing with environmental issues is self-evident. However, in view of both the global challenges the world environment is facing and the priority given to the achievement of sustainable development, on a planetary scale, the most difficult area the Community is confronted with is that of its relations with the Third World, since it affects environmental policy as well as economic policy. In particular, it is necessary to set up a solid basis for an open and constructive dialogue between the EC and the developing countries in an atmosphere of mutual understanding, dismissing all suspicion of use of environmental policy by European countries as an instrument to hinder economic growth in other regions of the world.

It has been acknowledged in several international meetings that the primary responsibility for most global environmental problems - particularly for CO_2 emissions - belongs to the industrialized nations, and that therefore compensations should be granted to developing countries if the measures to be adopted imply any cutback or restriction for their economic growth.

Community action must be fully consistent with this principle. Consequently, the Community should reflect - in the framework of 1992 but also far beyond - on how to assist the Third World towards sustainable development, an objective which could be achieved only by an increase in quantity and quality of aid flows towards these countries. In addition, the Community should support in international fora all initiatives aimed at ensuring that economic development is compatible with environmental requirements. These are the main contributions the Community could make to foster the effective implementation of the recommendations laid down in the report of the World Commission on Environment and Development which will be the basis for international action in the field of the environment for the foreseeable future.

CHAPTER 12

SUMMARY

12.1. Completion of the Internal Market and the Environmental Dimension

With the revision of the Treaty by the Single European Act, the European Community has set the course for its future development. A target date of 1992 is now specified in the Treaty for the removal of intra-Community barriers and the completion of the Community's Internal Market. While a high level of awareness of 1992 has developed within the Community, "1992" should be seen in this context as symbolizing the future progress and aspirations of the Community on a number of fronts. These include the immediate impact of the removal of barriers between Member States (the "static effects") and dynamic effects, comprising the longer term developments which will come about as a result of completion of the Internal Market. The Single Act also set out a series of objectives, which together constitute a framework for the development of the Community in the years ahead. These objectives include:

- development of economic and social cohesion,
- improvements in health and safety of workers,
- strengthening of science and technology,
- economic and monetary cooperation, and
- a set of environmental policy objectives.

Hence the Commission's 1992 programme includes not only the measures designed, in the words of Article 8A of the Treaty (as amended by the Single European Act) to bring about "an area without internal frontiers" but also includes proposals associated with the policy objectives listed above, as well as changes to the Common Agricultural Policy and initiatives in the transport and energy sectors. Of particular significance in the present context are the implications of the doubling of the budgetary commitment to the Community Structural Funds, which is designed to assist the recovery of regions adversely affected by completion of the Internal Market.

In this context the environmental dimension constitutes a factor of considerable significance. With the passage of the Single European Act, the Community acquired, under Article 130r, an explicit legal basis for measures to preserve, protect and improve the environment, to protect human health and to ensure prudent and rational utilisation of natural resources. Article 130r also provides that the environmental dimension is to be an integral component of Community policies, and this provision is reinforced in the context of the Internal Market by a requirement (in Article 100a) that Commission proposals should take as a base a high level of environmental protection.

This shows a recognition by the Community that the economic growth stimulated by the Internal Market must not give rise to adverse environmental impacts which would severely detract from the long-term sustainability of the growth process.

Community environment ministers have recognized the need for an environmental perspective on "1992": at their meeting of 1-2 October 1988, ministers called on the Commission to report to the Council on the environmental dimension of the Single Market. Following this request, the Commission convened a group of independent experts in a Task Force which was required by its terms of reference to identify the key issues and likely environmental impacts of the Single Market, and to advise on policy implications and possible action.

The Task Force has interpreted its terms of reference in a broad sense and has considered the implications not only of the removal of barriers per se ("static effects") but also the longer term development which will come about - directly or indirectly - as a result of completion of the Internal Market (dynamic effects). The Task Force sees the Community as undergoing a process of change, and the development of the Internal Market is one among a number of areas in which the Community will take action, following up the new impetus created by the Single European Act.

The Task Force drew upon existing studies, notably the work undertaken for the "Cecchini Report" (summarized in "The Economics of 1992", European Economy N° 35, March 1988). This report constituted a major contribution but was unavoidably limited by its terms of reference, which did not encompass the wider implications of "1992", and in particular the spatial and sectoral distribution of economic impacts. The Task Force saw its role as in a sense complementing the Cecchini report, by contributing to a broader perspective, albeit with less analytical depth.

The present report appears at a time of growing public awareness of environmental issues and problems, which is highlighted by the findings of opinion surveys and is increasingly reflected in the political agenda, both within the Community and on the world stage. This has been reflected in a series of European Council declarations, including the conclusion of the recent Madrid meeting (26-27 June 1989), that the Community must play an active role in environmental protection, both in terms of Community legislation and also of active participation in international initiatives. The conclusions of the recent world economic summit (held in July 1989) noted the "growing awareness throughout the world of the necessity to preserve better the global ecological balance" and the need for "decisive action .... to understand and protect the earth's ecological balance".

The 1992 programme is to be implemented against a background of considerable diversity, in terms of economic structure, culture, distribution of population, climate and landscape. There is great variation in environmental conditions, and in pressures - and potential pressures - on the environment, between rural and urban areas, between northern and southern regions of the Community, between mountain zones and lowlands and between inland and coastal regions.

The change in the level, structure and location of economic activity associated with "1992" will give rise to environmental pressures, through the use of natural resources and also resulting from the release of wastes to the environment, by emission to air and water and the dumping of solid wastes. These environmental impacts arise against a background of a varied pattern of trends in environmental quality. The principal concerns for Community environmental policy at present include certain forms of air pollution associated with emissions of carbon dioxide (CO_2)), nitrogen oxides (NO_x), hydrocarbons, toxic substances in emissions and wastes and pressures on land use and wildlife habitats.

12.2 The Removal of Barriers

To achieve the objective of a frontier-free Internal Market, the Commission in 1985 drew up a detailed programme and timetable for the completion of the Internal Market. This was set out in a White Paper, which contained a programme of almost 300 legislative proposals for directives to be amended by the end of 1992.

The White Paper distinguishes between three types of barrier which stand in the way of the completion of the Internal Market:

Physical barriers - the delays and costs caused by border controls;

Technical barriers - which exist through different standards, market entry barriers, nationally protected public procurement markets;

Fiscal barriers - differences between rates of VAT and consumption taxes in Member States.

Border controls at present have a significant role as an environmental policy instrument inasmuch as they are used to regulate several types of transfrontier movement which are of environmental concern. Examples include:

- food, plants, animals and veterinary certificates which for reasons of laws on food, plant protection, animal diseases or consumer protection were not permitted to enter individual Member States up until now;
- waste, especially hazardous waste;
- radioactive materials;
- endangered wild animal and plant species (according to the Washington Convention);
- for certain imports of environmentally harmful products for which a charge is levied at the border e.g. waste oil or leaded petrol.

Furthermore, the present Community regulations on transport of waste - including nuclear waste - are based mainly on border controls on imports and exports.

Following the removal of border controls it is proposed that there should be mutual recognition by Member States of each other's checks, controls and inspections prior to certification at the places of origin and occasional spot-checks on certification at the points of destination within the Community. Testing should be transferred "upstream", i.e. at the production stage. The difficulty with this proposal derives from the asymmetry in incentives which is implied: at the point of origin, the main incentive will be to achieve a sale and to facilitate movement. In relation to the removal of border controls for the supervision and control of the transfrontier transport of hazardous and nuclear waste, appropriate new measures should be taken.

In the area of trade in endangered plant and animal species, it is necessary to monitor appropriately the implementation of the Washington Convention at the external frontiers of the Community and/or at the destination points.

The Community has hitherto concentrated on the removal of technical trade barriers by means of a complete and definitive harmonization of national specifications.
As a new additional instrument the Commission is applying the mutual recognition principle towards national regulations, such that products lawfully produced or marketed in one Member State can have access to all Member States. This is known as the "Cassis de Dijon" approach, since it applies the main message of the ruling of the European Court of Justice in 1979 which removed restrictions on the export of the French liqueur to Germany.

As a mixed strategy between complete harmonization and mutual recognition, the Community has also since 1985 followed a so-called "new approach" to harmonization. This dispenses with the earlier type of detailed directives, which were difficult to agree and quick to become obsolete. The new type of directive indicates only "essential requirements" with respect to health, safety, environmental and consumer protection and leaves greater freedom to manufacturers as to how to satisfy these requirements.

With respect to environmental impacts, a distinction may be drawn between toxic and non-toxic pollutants. Harmonization following the new approach may be appropriate only for toxic pollutants. For non-toxic pollutants other approaches may be followed, such as explicit provisions in calls for tender for "environmentally friendly" products, and mutual recognition of "environmentally friendly" products.

With respect to levels of protection, Article 100a on completing the Internal Market empowers the Community to harmonize environmental protection regulations for specific products by 1992. In the process "the Commission in its proposals ... will take as a base a high level of protection", but it cannot be certain that the eventual Community measures will necessarily require the proposed degree of protection. Since in this case decisions can be taken by a qualified majority, and the Member States have only limited powers to adopt national rules, it is very doubtful whether Member States would be able to introduce new, more stringent national rules for specific products on the basis of Article 100a (4) of the EEC Treaty. In any case they would be bound by the European Court of Justice's interpretation

of Articles 30 and 36 of the EEC Treaty, which stipulates that the rules must be necessary and reasonable, though this, of course, by no means precludes autonomous assessment of the risk by the national authorities.

With respect to implementation, a harmonization of the methods of examination and inspection is called for, as well as equivalence in relation to examination procedures, places for examination and examiners, whose independence from industry must be ensured. Otherwise there may be a danger of protectionism in the form of discrimination by national inspection organizations against foreign suppliers. Therefore special attention should be devoted to the question of equivalent product controls.

The effects of opening up of public procurement would depend to a considerable degree upon the extent to which national public procurement regulations take account of environmental objectives and the Polluter Pays Principle (such that polluters are required to cover the costs of environmental damage). It would be desirable to include environmental criteria in contract conditions - and in this context the recent Commission initiative to develop a scheme for green labelling may serve to introduce operational Community-wide environmental criteria for procurement.

The Commission has drawn up a set of action programmes to accompany free trade in goods with additional measures which would facilitate market entry through:

- a common market for services
- free movement of capital
- a common energy market.

The main environmental impacts are expected to be associated with growth in road haulage and in air traffic, with potential for higher levels of atmospheric emissions, noise pollution and land use impacts.

Fiscal harmonization in the form currently proposed would limit Member States' flexibility in setting differential rates of VAT and would severely restrict excise taxes on products other than mineral oil products, alcohol and tobacco. This has potentially serious implications for environmental policy. At present Member States may use taxation as an environmental policy instrument, but it would appear that the proposed form of fiscal harmonization in the Internal Market might constrain the use of tax instruments for environmental policy. Selective taxation of products (either intermediate inputs or final outputs) can give users (firms and final consumers) incentives to limit (and reduce) their consumption of products which give rise to environmental damage.

12.3 Sectoral Impacts and the Environment

The changes associated with "1992" are likely to have significant effects on economic structures, and hence on the sectoral distribution of economic activity. These changes in the context of a general increase in economic growth will give rise to environmental impacts particularly associated with changes in certain sectors.

The Task Force identified the following industrial sectors as having potentially significant environmental impacts:

- Micro-electronics
- Textiles
- Chemicals and Pharmaceuticals
- Food

The production and use of energy (and specifically electricity generation and motor vehicles) has been the principal source of many of the pollution problems within the Community. Electricity generation accounts for some 35% of carbon dioxide (CO_2) emissions within the Community and (with fuel combustion by industry) for approximately 90% of sulphur dioxide (SO_2) emissions.

Over the Community as a whole (with some regional variation), electricity generation accounts for between 25 and 35% of emissions of nitrogen oxides (NO_x).

Projections of emissions of CO_2, SO_2 and non methane hydrocarbons by the year 2000 show emissions 10-20% higher for the EC as a whole with an annual growth rate of 4.5% rather than 2%, illustrating that growth is a major determinant of the amounts of all three energy-related pollutants, unless measures are taken to restrict energy consumption and/or emissions.

Moreover the growth in emissions will be greater in the southern states; the key reasons for this are:

- higher economic growth rates;

- less stringent emission control requirements under EC directives.

Economic growth is a major determinant for emissions of CO_2; unless conservation and other measures are taken, a difference of 1.5 percentage points in the annual rate of economic growth would increase the level of emissions in the year 2000 by 15 %. World total CO_2 emissions are estimated to be of the order of $6x10^9$ tonnes (1988); and the EC is responsible for some 40% of the total at present. This is of particular importance in view of recent thinking that significant reductions in CO_2 emissions may be necessary to avoid serious consequences from the greenhouse effect.

Completion of the Internal Market is likely to stimulate growth in the transport sector, which would in turn give rise to environmental impacts in the form of the air pollution caused by motor vehicle emissions, and in the form of land use impacts, both directly resulting from transport infrastructure development, and also associated with changes in industrial location and in the pattern of population. Increased urbanization and concentration of industry and population - along route corridors and at transport nodes - can have visual impacts on landscape (both natural landscapes and agricultural land) and strain the capacity of infrastructures.

Particularly severe damage can be caused to sensitive and protected habitats. Transport infrastructures can also cause community severance and increase the pressure on urban areas, in the form of congestion and noise - possibly leading to a "vicious circle" of demands for additional infrastructure investment to relieve these pressures.

Mass tourism can give rise to considerable environmental pressures. Substantial seasonal increases in population in tourist locations can severely strain the capacity of local facilities, such as transport, water supply and sewerage treatment.

There are numerous instances of environmentally destructive depletion of ground water reserves, resulting in erosion and salinization, elimination of coastal vistas and destruction of habitat for rare species. Tourist use can disrupt nature and habitats to the extent that survival is threatened. Buildings of character and distinction can be destroyed if they do not suit tourist "needs", and congestion can lead to pressure to widen roads, leading to further destruction.

On the other hand, tourism can also be a very positive environmental force. It can provide a commercial rationale for conserving environments which otherwise would be destroyed. For example, in cases where local residents wish to build houses on a coast, refusal or permission can be justified on the basis that to build would damage tourism and the local economy. Likewise, the conservation of monuments, natural areas, the establishment of national parks, the provision of pedestrian areas, the conservation of buildings and streetcapes all can be, and often are, justified on the basis that the long-term interest of the tourist economy demands that they be conserved.

The development of the Internal Market is likely to give rise to structural changes in agriculture on similar lines to those which are projected for industry. Indeed, in certain areas there may well be considerable "industrialization " of agriculture, in the form of vertical integration by food processing companies taking over the food production stage. An increased market orientation, coupled with easing of market entry through the unrestricted movement of capital throughout the Community may give rise to a "two-track" agricultural structure, increasing the dichotomy between "agro-industrial" enterprises and less productive farms on the margins of profitability.

The environmental problems arising from these contrasting forms of agricultural activity will be quite distinct. In the case of marginal farming operations there may be difficulties with land management resulting from the abandonment of agricultural land: this is likely to be a particular problem in peripheral regions of the Community

Intensive agriculture can exacerbate problems associated with various types of pollution arising from the use of fertilizers and pesticides, and with the disposal of agricultural wastes, particularly animal slurry. Where land is taken over for cultivation, threats can also arise to natural habitats and species diversity, and soil quality may be affected, particularly as a result of deforestation.

Changes in economic activity resulting from completion of the Internal Market would tend - other things remaining the same - to increase waste generation while the removal of intra-Community barriers would facilitate the transport of wastes for treatment and disposal across national boundaries. On the other hand, there is strong evidence of public concern over the transport, treatment and disposal of wastes. This concern will call for policy initiatives, by the Community and by Member States, designed to promote investment in more "environmentally friendly" methods of treatment and to reduce risks of environmental damage. It is expected that policies will emphasize the Polluter Pays Principle as a means of ensuring that those who generate and handle wastes bear the full costs of measures to avoid and, if necessary, to remedy environmental damage.

An essential function of environmental policy in the Internal market would be to ensure that adequate provision is made in all Community Member States to prevent waste disposal arrangements from having adverse environmental impacts and endangering human health. Consequently, a key task will be the creation of a Community-wide infrastructure for waste treatment and disposal which satisfies certain qualitative and quantitative criteria.

As the Community moves towards completion of the Internal Market, there are already severe pressures on the capacity of Member States to treat and dispose of hazardous wastes. Public opinion has become increasingly hostile to the discharge of wastes into rivers and the sea, and, in some areas, to its disposal in landfill sites.

Increasing demand for incineration of hazardous waste has highlighted the inadequacy of existing incineration capacity which currently amounts to less than 10% of the total amount of hazardous waste annually arising.

12.4 The Regional Dimension

The economic gains resulting from the completion of the Internal Market will not be evenly distributed across the Community. Regions which have a relatively high concentration of growth sectors, located near to the centre, with relatively low production costs, should participate fully in the growth. Conversely, regions already in decline, with few growth sectors, on the periphery and with high costs, are unlikely to capture a share of the growth which would allow them to begin to catch up with their more prosperous fellow-regions. With respect to the environmental dimension peripheral regions are of particular interest.

The environmental problems of the periphery differ, in degree if not in character, from those of the rest of the Community. The cities of the periphery are growing more rapidly than elsewhere in the Community, they are less well served in terms of mass transit and environmental management infrastructure, the physical quality of their building stock is very poor, and their systems of environmental management are relatively undeveloped. The rapid pace of urban development also exacerbates the problems of rural areas, with depopulation and decline in the rural economy.

Many of the environmental problems of peripheral regions soil erosion, habitat destruction, visually destructive development, etc. involve large numbers of individual actions which are technically difficult to monitor and control, and politically difficult to restrict.

Throughout the periphery, the protection of areas of importance for habitat and species conservation, and of ancient monuments, is inadequate. Development of land for farming, for roads, for holiday home development, for minerals extraction, etc. all tend to diminish a patrimony which typically is insufficiently protected in legislation, and the legislation which does exist is only sporadically enforced.

There is within the Community a certain tension between the aspirations of the centre, which wishes to see a high priority given to the environment in general and the environment of the periphery in particular, and the situation in peripheral regions which often lack the resources to invest adequately in the protection of Europe's most unspoilt environments.

The environmental effects of the Single Market on areas of industrial decline will depend on the capacity of the regions to transform their economies and environments. Economic renewal depends on the achievement of a high level of environmental quality, which should be a core element of Community regional and environmental policies. In the worst case, a traditional industrial region (TIR) could find itself with a collapsed industrial base, with its derelict land and abandoned mines becoming a destination for waste disposal. Some TIRs will be able to take advantage of the opportunities provided by the Single Market. The physical environment will be transformed, making the cities and their environs attractive places in which to live and work, skills will be adapted such that the labour force can participate in growing sectors of the economy.

The role of the Community in helping finance this transformation in the physical character and skill profile of these regions will be critically important, because investments on the scale required are very unlikely to be forthcoming from the market.

The periphery in general is particularly vulnerable because of low income levels (and the resulting difficulty in finding sufficient resources adequately to implement measures), poor infrastructure and inadequate environmental management, while the areas of industrial decline are vulnerable because they run the risk of being marginalized economically and socially because of high costs, congestion and poor environments.

Although this potential for environmental problems exists, whether the Single Market has positive, negative, or neutral environmental effects depends largely on the policies which are in place to deal with the impacts, and on their implementation. We are not confident that the existing policies (and their implementation) will be sufficient to ensure that the environmental effects will be benign, for the following reasons:

i Provision for Structural Fund expenditure in the periphery has been doubled. The process enacted by the Commission to ensure that, as these funds are expended, the environment will be protected, and the implementation thereof by the applicant countries, are both inadequate as a means of ensuring that the environment is protected.

ii The Community's most vulnerable environments are in general located in those countries and regions with the least financial and administrative resources to protect them, with the greatest pressure to "develop" and with very little incentive in the short term to conserve, because the benefits of development are captured locally. Apart from a few small, relatively specialized funds, there is no source of funds to which regions can turn to help them fulfil their obligations to the Community as a whole.

iii Many of the manifestations of the Single Market will appear in the form of land-use changes, especially near coasts. While decisions on development are typically made at the most local level of government: there is a Community interest in ensuring that there is appropriate knowledge and capability at the local level to allow informed decisions to be made, especially when such decisions bear on environmental assets- built and natural - which are of European significance.

2.5 Economic Growth and Environmental Impacts

One of the main issues which arises from assessment of the environmental dimension of the Internal Market is the extent and nature of the economic growth which is generated as a result of change associated with the 1992 programme. The present report examines the linkage between economic growth in the context of the Single Market and environmental impacts by an analysis which uses both economic and environmental models. The analysis focuses on two major types of pollution - emissions of sulphur dioxide (SO_2) and nitrogen oxide (NO_x) illustrating a methodology which can be of general application and which could be used to analyze other forms of pollution.

The results of the analysis suggest that the potential growth stimulus of the Internal Market is likely to imply a significant increase in emissions of SO_2 and NO_x. It is estimated that unless further measures are taken, emissions of SO_2 and NO_x will by 2010 attain levels which are respectively 8-9% and 12-14% above the levels which would be reached in the absence of the Internal Market.

The increases in emissions would exacerbate the problems of acid deposition. Both with and without the Internal Market, the ecological standard of 1400 acid deposition equivalents is likely to be exceeded in the most industrialized Member States , while all Member States exceed the Scandinavian norms (400 acid equivalents). As these figures are national averages, the situation in the most industrialized regions will be even worse. Acid rain will remain a problem and is becoming worse.

Another major issue highlighted by the analysis is the importance of transfrontier pollution, which highlights the need for international cooperation in the field of pollution abatement, both within the Community and more widely.

The policy response is complicated by the technical constraints on emission reduction, such that the sectors responsible for the increase in emissions are not those best able to contribute to the reduction of emissions. This is especially the case for example in the transport sector. The technical possibilities for any further reductions in NO_x emissions are very limited.

Similarly, reduction in emissions of SO_2 will be sought in the electricity sector and industry which will have to take reduction measures, rather than the transport sector and the tertiary and domestic sectors.

In general (with the exception of SO_2) levels of pollution have stabilized, rather than decreased, suggesting that the effect of economic growth can offset technological progress in reducing emissions.

Past experience shows that incentives in the form of pricing or regulations can have the effect of delinking economic growth and environmental degradation. Thus a policy response should give appropriate incentives for energy saving and, in the absence of technical solutions, to structural changes in the transport sector.

In the absence of an adequate framework to stimulate the necessary further decoupling of economic growth and pollution and the use of ecological thresholds as the basic reference for policies, there is no guarantee that Internal Market growth is likely to be sustainable and to lead to an increase in welfare.

12.6 Community Environment Policy

The establishment of procedures for management of natural resources is an essential precondition to ensure the protection of the environment and sustainable development. Looking forward to 1992 and beyond, the challenge for the Community in the environmental field is to develop a more integrated approach, to take into account interaction at all levels between environmental factors and economic, social and cultural factors, to ensure conservation and renewal of resources in the long term, and to preserve for future generations the potential for alternative uses of media and resources. Possible Community initiatives include the creation of a political climate favourable to improved environmental management, support for educational and information programmes, support for research and development, support for pilot projects to demonstrate the operation of integrated management, and measures to encourage the use of economic instruments.

The main objectives of Community legislation would be to conserve the environment (especially in areas which are particularly sensitive or of Community importance); to control the exploitation of "common) resources, to regulate transfrontier impacts, and to set standards when there are significant environmental impacts associated with the consumption of goods or services.

In the absence of explicit legal provision for Community environmental policies, prior to the amendment of the Treaty by the Single European Act, most existing Community environmental legislation was adopted under Articles 100 and 235 and were to a considerable extent concerned with harmonization, in order to avoid distortions of trade, in addition to the achievement of environmental objectives.

Directives generally allow Member States discretion over the choice of policy instrument for use in implementation. The Community has set out guidance on policy instruments in a 1975 Recommendation which recommended rules for applying the Polluter Pays Principle using standards and charges, or a combination of the two.

It does not appear that the Community or member States have in practice been especially innovative in their choice of policy instruments: Thus far regulatory measures have predominated, ranging from licensing standards and emission limit values to bans or restrictions.

In the context of opportunities which arise from completion of the Internal market and the need to ensure that economic development is sustainable, the following key issues can be identified:

1. Should there be minimum environmental quality standards laid down at Community level?

2. Should greater consideration be given to the application of the Polluter Pays Principle and fiscal incentives?

3. Are the safeguards currently proposed for application of the Structural Funds adequate to protect the environment in the regions?

4. What is the role of the Community in encouraging habitat protection?

5. What is the role of the Commission in enforcing agreed Community legislation?

6. Should special programmes be considered in relation to:

   a. energy use
   b. transport and transport links
   c. agriculture and changing use of agricultural land
   d. environmental infrastructure including hazardous waste facilities?

12.7 Environmental Policy: a Preventive and Decentralized Approach

Recognition of the environmental dimension in the completion of the Internal Market raises issues concerning the future role of the Community in environmental policy, and the nature of policy instruments which are to be used.

These should be consistent with the subsidiarity principle which requires that policy actions should be taken at the lowest appropriate level.

A complete decentralization of environmental policy following the subsidiarity principle may create a conflict between environmental and market integration objectives. Moreover, it could have severe disadvantages, for the Community as a whole, with - in some cases - downward "competitive" pressure on environmental quality. It would also take no account of transfrontier effects, both in the form of pollution spillovers and in the form of movement (facilitated by completion of the Internal Market) of people and goods across intra-Community frontiers.

There is now general acceptance that the Community has a role in setting environmental quality standards - and this is demonstrated by the existence of a substantial body of Community legislation which establishes such quality standards. The amendment of the Treaty by the Single European Act gave formal expression to the Community dimension in environmental policy, since it explicitly provides for Community action relating to the environment on this basis. The Community can be expected to ensure that every citizen enjoys an environmental quality which is at (or above) a minimum acceptable standard.

Individual Member States still must have the option to strive for an environmental quality higher than the minimum Community level environmental quality can be an important factor in influencing the location of economic activities, including service sectors such as tourism. Last - but not least - there may be a public demand for a higher quality environment.

Land use is primarily a national or regional issue, where decisions are taken in a national land use planning framework, and it is clearly appropriate that detailed decisions on specific uses for land should be taken at local, or regional level. On the other hand, broader issues can arise in which there is a Community dimension relating for example to transportation or tourism infrastructure.

The Community has an interest in maintaining the diversity of landscapes, particularly in the face of pressures which have caused this diversity to be reduced. Economic growth and structural changes following completion of the Internal Market are liable to increase pressure on land use. It is therefore of great importance from a Community point of view that overall physical planning and nature conservation policies are adopted to safeguard the environment in the longer term.

A substantial body of the Community's environmental policy can be considered instruments of a preventive environment policy, including

i) environmental impact assessments for specific installations;

ii) licensing conditions for specific installations;

iii) test and notification procedures for marketing new products, chemicals, etc.; or

iv) emission limit values based, for example, on best technological state-of-the-art.

Diffusion Standards for Transfrontier Pollution

Many environmental problems caused by stationary emission sources have a transfrontier dimension. It is important that Community environmental policy should develop policy mechanisms to take account of such international spillovers.

- They lead to a major exception to the principle of decentralization of policy measures;

- They are likely to increase with relocation of industry, if firms leaving one country in reaction to stricter environmental policy may locate at its border and send pollutants back to their original country of residence via environmental media.

One possible approach is to establish transfrontier diffusion standards, with observance of the Polluter Pays Principle although this is generally subject to very severe practical difficulties. As a second best solution general reductions in pollution can be sought, although in this case the costs of environmental quality would be higher than with a more "targetted" approach.

Mobile Emission Sources

Emission standards for mobile emission sources (such as motor vehicles and aircraft) require harmonization if these non-stationary sources can move across borders. This is specially relevant because completion of the Internal Market will involve deregulation of the transportation industry and hence will tend to increase volumes of traffic.

International Environmental Systems

A raising of environmental quality standards in certain parts of the Community may lead - over time - to movement of firms with "pollution intensive " production to countries with lower environmental restraints in the forms of environmental quality standards which are lower than those of most other Member States, and/or a higher assimilative capacity.

Thus a country with environmental standards which are lower than those of other Member States will attract polluting industry but as pollution increases, so will the incentive to raise environmental standards.

Completion of the Internal market will lead to free movement of goods - in many cases without prior harmonization of national regulations. However, conflicts may arise if the achievement of ambient quality standards in an individual Member State requires the application of product standards which are higher than the Community norm. There does not at present appear to be a general solution applicable to every set of circumstances in which the conflict between market integration and environmental objectives might arise.

In circumstances in which consumption of a product has no adverse effect on anyone other than the consumer, the need for product standards depends on the extent to which the consumer is informed with respect to the characteristics of the product and the consequences of its consumption.

Environmental policy in the Internal Market must be based upon the principles set out in Article 130r of the Treaty, as amended by the Single European Act. These principles include:

- subsidiarity: Article 130r (4) limits the scope of Community action to the extent that environmental policy objectives can be better attained at Community rather than national level.

- the Polluter Pays Principle: Article 130r (2) states that Community environmental action shall be based on the principle that "the polluter should pay".

- the prevention principle: Article 130r (2) requires that Community environmental action "shall be based on the principles that preventive action should be taken (and) that environmental damage should.... be rectified at source".

Policy instruments should be designed in such a way that environmental objectives are achieved in an economically efficient manner. Application of the Polluter Pays Principle has a crucial role in this context, since it is the key to full integration of environmental considerations into decision making processes in the various fields of economic activity, and by this means will facilitate compliance with the provision of Article 130r (2) that "environmental protection requirements shall be a component of the Community's other policies".

Economic incentives should, ideally, be linked to the sources of environmental impacts. In the case of polluting emissions, taxes and charges should if possible be based on the pollution load emitted. However, in some circumstances this is not practicable, because the technology for monitoring of individual emission sources is not sufficiently developed, or is prohibitively expensive. In such situations product or input characteristics may be used as a proxy measure, provided that this does not cause unacceptable disturbance to input or product markets in Member States.

In practice the feasibility of market-based instruments is greater for some environmental problems than for others, and varies between Member States within the Community. In accordance with the subsidiarity principle, competent authorities within Member States must decide how, given their particular circumstances, Community environmental quality objectives can best be attained.

12.8 The Environmental Industries and the Internal Market

In common with other forms of economic activity, the environmental industry will be affected by the mechanisms for completion of the Internal Market, and in particular by the removal of trade barriers and the opening of public procurement. This industry will benefit from increases in demand resulting from economic growth and from changes in the framework of economic activity characterized by more flexible access to labour.

On the other hand the impact of the Internal Market on the development of environmental industries is influenced by the highly specific features of this sector, the market being largely "state guaranteed" through regulations, incentives or public sector demand. As a general consequence, additional needs for environmental protection solutions resulting from the Internal market will actually be met only if adequate environmental policies and instruments are implemented in due time. Needs can not be expected to automatically foster economic demand for environmental technologies and services in the absence of public intervention.

Moreover, the linkage to political decision-making renders demand highly uncertain in the short to medium term. This results in a situation where numerous firms maintain an interest in this market but are reluctant to follow up this interest with substantial investment and this uncertainty also limits long-term investment in research and development.

National differences: uneven potentials and contrasting organizations

The Community environmental market has an overall yearly turnover of several dozen billion ECUs; the industry serves markets which are extremely diverse, both in terms of technological fields (such as water, air, wastes, noise, instrumentation, integrated processes for various sectors) and also in terms of service categories (such as planning and engineering, manufacturing, construction, operations and management). It has only recently begun to be considered as a defined industrial sector and has yet to achieve a high degree of consolidation; consequently it cannot be considered as a mature industry. The environmental industry is rather a grouping of various firms and public bodies with very different technological backgrounds and varying degrees of involvement in this market.

There is considerable diversity between national environmental industries with various levels of concentration, differences of balance of power between the public and private sectors: very diverse levels of integration with regard to operations, engineering, equipment manufacturing and research; a varying tendency for companies to work simultaneously in several subsectors.

Markets for environmental technologies are characterized by rapid but short-lived growth, leaving only a limited time span for new suppliers to prepare themselves. Consequently, firms with the advantages of greater and more extensive experience, technological leadership and superior financial means will have a decisive edge. Firms which enjoy these advantages are concentrated in only a few Member States where the industry is more developed. Thus there is a distinct possibility that market development in the peripheral regions would to a considerable extent benefit firms in other regions where markets are better established.

The further development of the industry will depend on a number of factors including : the geographical distribution of market growth, the continuing importance of national legislation in those countries which are the leaders in terms of environmental standards, and the growing importance of markets for replacements and operations and maintenance.

The harmonization of product norms with an environmental dimension and harmonization of emission standards through Community directives will be a significant factor contributing to market opening although there will remain difficulties in reaching agreement on harmonized standards, due to the complexity of the bargaining processes involved.

The removal of public procurement barriers

The opening of public procurement should also contribute to a less segmented environmental industry market, especially in the municipal water, waste water and solid waste sectors. Nevertheless some important limitations will prevent it from having far-reaching effects, notably organizational differences in the operation of public water and waste water services.

Implications with regard to technologies: the need to promote clean technologies

Little use has been made of integrated or clean technologies and until now the environmental technology market has hitherto been dominated by end-of-pipe processes. There is a danger that if appropriate measures are not taken the Community could fail to take advantage of the opportunity created by the accelerated renewal of capital stock to introduce cleaner processes and more generally to move towards "sustainable type" growth.

The establishment of a dependable Community system for setting environmental policy priorities, measures and implementation is a prerequisite for the development of innovative strategies. A second requirement is for standards to be set at the highest world level. Only if these conditions are fulfilled will the Community industry be at the technological forefront. If Community suppliers are faced with a sub-standard EC market, they run the risk of losing ground technologically against non-EC firms and, later on, if and when EC regulations catch up with world standards, innovation in the Community will, to a considerable extent, be hampered by the importing of technology.

12.9 Macro-economic Impacts of Environmental Policies

The macro-economic implications of an increase in investment in environmental protection are somewhat complex. Positive effects resulting from the increase in demand are combined with the negative results of an increase in prices and reduction in other types of investment as well as increases in taxes. A modelling exercise was undertaken to evaluate the impact of an additional environmental investment of 1% of GDP (which corresponds roughly to a doubling of present environmental investments) in Belgium, the Federal Republic of Germany, France, Greece and United Kingdom. All simulations have been effected with the HERMES model and all the assumptions are similar for all countries.

The exercise gave consistent results with positive effects on both production and employment, but with negative effects on the balance of payments. In the case where all countries increase environmental investment together, the positive effects are strengthened.

With respect to the financing of the additional investment four scenarios were examined:

i) reduction in other forms of investment

ii) increasing costs of production

iii) government financing - 50% by direct tax increases, 50% by reduction in other expenditure

iv) a combination of i), ii) and iii) above

The analysis demonstrated that the financing of environmental protection investments will have minor impacts on the main economic variables. Moreover increased environmental protection will give an impetus to growth in the environmental protection industry. So there is no evidence that expenditure at this level for the implementation of environmental policies would offset the benefits of the Internal Market (as conventionally measured) at macro level.

12.10. The International Dimension of Community Environmental Policy

Steps must be taken to ensure that completion of the Internal Market, with a strengthened Community environmental policy, does not contribute to environmental deterioration in other parts of the world.
Four main international environmental issues are of particular significance in the context of the Internal Market : globalization of environmental policy, transboundary pollution, industrial relocation and environmental constraints on trade.

The Community has an important role in the promotion and implementation of an international strategy for the prevention of the depletion of the ozone layer, climate change, etc. Initiatives in this context include the Vienna Convention and the Montreal Protocol on the protection of the ozone layer, and the Basle Convention on transfrontier movements of hazardous waste. When defining its own internal priorities, the Community should take into account actions proposed at international level and be actively involved, at an early stage, in international environmental negotiations. For example, the Community should be closely associated with the current work and discussions on climatic change : a new global convention could have a significant impact on European industry. The Community should also cooperate with organizations and agencies concerned with issues of environmental protection, population and sustainable development, such as UNEP, OECD and ECE.

The environment has played an increasingly important part in Community development aid policy. In this context the Community should assist developing countries in environmental management and ensure that environmental considerations are fully taken into account in the definition and implementation of development policies. The Community should also ensure that the new Lomé Convention, now being negotiated, gives prominence to the concept of sustainable development and that the resources available to finance environmental protection measures are significantly increased. Similarly, environmental protection should figure in relation with developing countries in Asia and Latin America.

The environmental policy of third countries is to a certain extent a determinant of environmental quality in the Community. In some cases it is more effective and efficient to reduce pollution in non-EC countries than in Member States. In addition, limiting the inflow of pollution from abroad is often beneficial to the political acceptability of internal environmental policy.

Two essential components of an integrated strategy against transboundary pollution are : bilateral agreements with the concerned countries and the adoption of regional conventions aimed at setting up common standards, norms and procedures. In order to reduce the volume of transboundary pollution from Community sources, Community environmental policy should be based on the integral application of the PPP, taking also into consideration damage caused outside the Community borders. The Community should also promote the adoption of quality standards that are no less strict than those established by Community legislation.

The Community has now a unique chance to assist the Eastern European countries to properly manage and protect their environment, thus contributing to the reduction of pollution in the Community. With respect to Community relations with countries bordering the Mediterranean it is essential that agreements should be used as tools to strengthen cooperation in the environment sector. Some steps in that direction have already been taken.

The reinforcement of Community environmental policy could result in the deterioration of the competitive position of some pollution-intensive European industries, leading to a certain amount of relocation of pollution-intensive activities away from regions with a low level, or a high use, of assimilative capacity to regions where the assimilative capacity is still largely available. There could be some movement out of the Community, e.g. to the less developed countries and to Eastern Europe. On the other hand a clean environment is a positive factor in attracting the new industries of tomorrow. Moreover completion of the Internal Market and its dynamic effect on the economy of the Community would facilitate the process of adjustment to higher environmental standards.

The Community should generally accept the relocation of industrial activities due to differences between the EC and non-EC countries with respect to the assimilative capacity of their environments. Consideration should be given to developing linkages between development aid and environmental protection, allowing less developed countries to take the interest of the environment fully into consideration.

The EC should use its strengthened international position to promote a world-wide application of the PPP, by including the PPP in its trade and aid relations and should also, where appropriate, provide technical cooperation and assistance. Similarly, the PPP should be on the agenda for the 1992 World Conference on Environment and Development.

To safeguard its competitive position the Community should align itself with the environmental standards of its major competitors. Problems of developing countries exporting to the Community could be eased by use of development aid to assist less developed economies to adapt their export production to Community environmental standards. In the context of trade policy it is important to ensure that countries do not use different product standards as hidden barriers to trade, and that internationally accepted minimum product norms are set a high level in order to avoid or reduce conflicts.
The Community should continue to work in the GATT framework to prevent or reduce trade conflicts on environmental grounds and to promote high environmental standards. It is essential that the Community continues to pay attention to the coordinated implementation of these international agreements by all Member States.

The Community was actively involved in the international negotiations which led to the adoption in March 1989 of the Basle Convention on the control of transboundary movements of hazardous waste and their disposal. This is based on three essential principles : a ban on exports of waste to countries which are not party to the Convention, a requirement to obtain prior consent of the country of destination and the need to provide for technical guarantees covering the treatment of the waste in the country of destination.

The Community must take the necessary steps in order to ensure that wastes generated by European industry are soundly managed, recycled and as a rule disposed of in Europe. This could be done in conjunction with measures to promote the development of new low waste technologies which should be shared with less developed countries according to the rules of the Basle Convention.

The Community has participated in OECD, UNEP and FOA schemes for notification and information concerning international trade in dangerous chemicals.
The Community has already adopted legislation regarding the export of dangerous chemicals that are banned or severely restricted in the Community. This must be reinforced in the future in accordance with revised UNEP Guidelines.

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