SMEs and the Environment in the Local Context

Issues for Southern Member States

EF/00/14/EN

EUROPEAN FOUNDATION
for the Improvement of Living and Working Conditions

SMEs and the Environment in the Local Context

Issues for Southern Member States

EUROPEAN FOUNDATION
for the Improvement of Living and Working Conditions

Wyattville Road, Loughlinstown, Co. Dublin, Ireland. Tel. (+353) 1 204 3100 Fax (+353) 1 282 6456 E-mail: postmaster@eurofound.ie

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

Foreword

Based on the discussions at the first European Round Table on the Role of the Social Partners in Improving the Environment (June 1988), the Foundation carried out, in 1989-90, a study on Education and Training of Categories of Personnel concerned with Environmental Issues relating to Industry (notably SMEs) and, in 1991-93, an enquiry as well as a number of case studies on the Firm in its Local Environment. This research sought, inter alia, to identify and analyse examples of regionally and locally based cooperation initiatives and networks aimed at improving the performance of industry (particularly SMEs) and involving firms, public authorities and environmental expertise. The role of existing mechanisms, e.g. the social partners, industrial federations and chambers of commerce, in this process was also examined as was the role of larger companies in providing assistance and guidance to SMEs. The studies highlighted the importance of existing cooperation initiatives and networks and showed that they were more common in the northern than in the southern Member States. They also pointed to the need for strengthening and extending the scope of them and for developing new ones in regions faced with both environmental and development problems.

These findings and discussions with the services of the Commission led to the decision that the Foundation, in 1993 and the following years, should undertake a detailed demonstration project focusing on specific and vulnerable regions in the southern Member States and combining environmental and development aspects. The original aims of this work were:

- to point to new regional/local cooperation initiatives and their potential in improving corporate environmental performance, environmental quality, technical innovation, technology transfer and economic development in the southern Member States, and to identify the obstacles to such initiatives and the measures required to overcome them;
- to define the role of the various parties, including that of the social partners, in this process;
- to contribute to a better implementation of environmental legislation, particularly EU directives and regulations, within the framework of development efforts and to increased environmental awareness at the regional/local level and, hence, to the implementation of EU policies and actions aimed at sustainable development.

As a result a series of studies were carried out in 1993-97, comprising

- four in Italy, three covering cooperation initiatives relating to water pollution in the regions of Tuscany and Campania and one an initiative regarding the transformation of the waste arising from the tunny fish processing industry in Calabria into fish meal;
- three in Spain, including two on the specific problems of abattoirs in Castilla y León and oil mills in Western Andalucia (notably water pollution) and one on the efforts to reduce the water pollution problem originating from the food processing industry (fruit and vegetables) in the Murcia region through a cooperation between industry, its associations, local and regional authorities and others;
- one in Greece on the setting up and running of a centre for cleaner production; and
- one in Portugal focusing on the definition and start of a new initiative regarding the water pollution problems created by the concentration of pig farming in the Baixo Alentejo region.

A small feasibility study concerning a waste management initiative in the Oporto region was also undertaken but could not be followed up as the initiative itself was not implemented owing to lack of EU funding.

These studies confirmed, to a large extent, the conclusions from the previous Foundation project on the Firm in its Local Environment 1991-93, but they did not bring forward a sufficient number of new elements, particularly in relation to successful and innovative regionally and locally based environmental cooperation initiatives in industry, on which firm recommendations and action could be based. Hence, it was decided that this report should not only bring together and synthesise the findings of the 1993-96 project but should also take into account the work carried out 1991-93 and, in addition, should draw upon other relevant and recent Foundation research on Employment and Sustainability and Training in Environmental Management, as well as on the particular experience of the authors in this area.

The present report was discussed at a meeting on 18 February 1999 in Brussels to enable representatives of the employers, trade unions, governments and the European Commission – the constituent bodies of the Foundation's Administrative Board – to evaluate the overall findings of the work and their presentation. The participants felt that it was a useful report, which, at the same time, created a bridge between the past and the future of the Foundation's work on sustainable development and served to stimulate the debate on the situation in the southern Member States and how improvements could be achieved. It also raised the crucial issue of the difference between the North and South, and this issue would have to be addressed. Thus, there was a clear gap between the driving forces in the northern and southern Member States, and this related to a number of of factors, e.g.:

- time;
- law enforcement;
- environmental awareness;
- willingness to pay for environmental improvements; and
- the funds available.

One of the solutions to the problems of the southern Member States might be – as suggested in the report – to facilitate the transfer of and support for appropriate technology and techniques, but, in addition, there appeared to be a need for providing financial assistance to SMEs and for introducing specific and well targeted education and training initiatives. On the other hand, the use of economic instruments as an incentive to improve the environmental performance of SMEs in the southern Member States was not recommended.

Jørn Pedersen
Research Manager and Coordinator of the Sustainable Development Programme
up to 28 February 1999

Contents

EXECUTIVE SUMMARY

INTRODUCTION

The significance of small and medium sized enterprises (SMEs) in the provision of employment is marked in all Member States. It is more pronounced in southern Member States (SMSs). The issue of how to encourage SMEs to take on board environmental issues is acknowledged as a significant problem in tackling environmental issues across the EU. It assumes a greater significance in the SMSs owing to the significance of SMEs in employment terms in those countries. In less developed parts of SMSs the problem is particularly difficult to tackle.

Firms in SMSs are faced with significant difficulties as they seek to upgrade their environmental performance in line with other countries of the European Union. These relate to:

- the size of the task in hand;
- the significance of SMEs in employment terms
- the relative scarcity of resources available to SMEs to make the required adjustment; and
- the reduced level of resources available at the national level, including the lack of adequate support structures

These issues are compounded by the apparent desire to ignore environmental issues in the past, itself owing in part to the lack of awareness regarding environmental issues, or the failure to award them the level of priority they deserve. Such ambivalence towards the environment can no longer be sustained in a world where environmental issues are given increasing prominence.

The assumption in this particular project has been that because many firms are embedded, socially and politically, perhaps culturally, in their location, and since many environmental problems have a specifically local character, the initiatives most likely to be effective in environmental terms would themselves be local.

HYPOTHESES

On the basis of earlier work for the European Foundation, by ECOTEC, concerning best practice initiatives in other countries, it was hypothesised that replication in SMSs would need to have regard to:

- Weaker Tradition of Public Concern
- Dominance of Economic Development Priorities
- Lack of Environmental Skills / Infrastructure
- Weaker Tradition of Applying / Enforcing PPP
- Importance of SMEs in Economy
- Importance of Larger Companies as Customers
- Decentralised Regulatory Framework
- Lack of Tradition in Networking

Case studies, funded by the European Foundation, were carried out in:

- Portugal
  - National Park Sierra d'Aire e Candeeiros (pig farmers)

- Italy
  - Orbetello Lagoon
  - Solofra tanneries
  - Sarno canneries
  - Pizzo tuna industry

- Spain
  - Osuna olive mills
  - Guijelo abattoirs
  - Alcanterilla and Archena canneries

- Greece - potential for Clean Technology

These were assessed so as to see whether any lessons could be drawn from the examination of the SMS experience.

OBSERVATIONS

In most of the case study material, the firms studied appear to be acting with a high degree of autonomy, and as such, the 'initiatives' are specific responses of the firm itself rather than projects which seek to draw together, in some form of partnership, different actors involved in making the transition towards more environmentally friendly production. The lack of participation of relevant actors in any form of objective setting and goal seeking undertaken by firms suggests, on the one hand, a weakness of driving forces for change and, on the other, a lack of awareness of the need for change on the part of managers, unions and citizens. Indeed, where awareness exists, and even where there is a desire for changed practices, demands for such change may be muted through subordinating such demands to other goals, such as employment, which are accorded higher priority.

The exception to this rule was found in Portugal, There, the efforts of one individual have catalysed an appropriate response that galvanises the parties partly on the basis of their own self-interest.

There was insufficient awareness amongst firms of the potential financial benefits to be derived from adopting environmental technologies. In the main, such technologies are still perceived as imposing net costs on the firm, a view that is not specific to SMSs alone. Indeed, in general, only in larger companies in Member States which have more stringent environmental policies is compliance beyond the law found with any level of frequency.

Notwithstanding the possibilities for early pay-back using some environmental technologies, there is clearly a limitation on SMEs regarding the type of equipment that can be purchased without severely jeopardising the financial well-being of the company. Thus, there would appear to be a pressing need for financial assistance targeted at pollution control expenditure. Important issues need to be raised concerning the terms and conditions on which this is made

available, and for exactly what purposes. Other limitations include issues related to information concerning the availability of environmental technologies, a lack of knowledge concerning their financial implications for the firm, and the lack of training in the use of such technologies.

SYNTHESIS OF THE CASE STUDIES

Following on from the hypotheses mentioned above, the broad conclusions confirm the significance of the obstacles that it was anticipated that successful initiatives would have to overcome:

- public concern was minimal - matters reach a critical stage before action occurs;
- the economic development and employment priorities are reflected in a hands off approach at regional level (there is a reluctance to implement Polluter Pays measures, e.g. Spanish canneries);
- lack of environmental infrastructure is still a problem - regulators are not enforcing laws. The invisibility of SMEs may lead to less action (so that regulation may be applied unevenly, i.e., principally to larger, more visible firms); and
- there is little evidence of networking.

Other key observations include:

overcome:

- firms do things when only they perceive it to coincide with their own interest. The exception was the Portuguese case which was catalysed by an entrepreneur. Notably, it was in this case that success was most clear - the other initiatives all still have obstacles to overcome Because of a lack of awareness, the motivation has to be purely commercial rather than environmental policy-driven

    - Italian tuna initiative motivated by desire to make use of waste (other Italian initiatives motivated by onset of crisis)
    - Spanish canneries motivated by need to reduce water consumption; and
    - olive mills reduced costs through adoption of technologies that happened to be 'clean'.

- financing is a major issue and acts as a break on the adoption of clean technologies. However, the actual impact of investments varies (some adopters actually derive net benefits - adoption could proceed more quickly under well prepared investment appraisals, a pre-requisite of which is knowledge of what it is that one is appraising).
- limited evidence of participatory initiatives - lack of dialogue related to low awareness (exceptions may be Sarno case, and the role of an environmental group, Lega Ambiente. Only in Solofra have unions attempted to take on the 'eco-employment' agenda).

RECOMMENDATIONS

To the extent that any recommendations are based on these studies, they should be treated with some caution given the narrow sectoral emphasis and the small number of initiatives examined. However, if one does take these studies as indicative of the wider situation, the prognosis which arises from the consideration of case studies is somewhat pessimistic. This raises questions as to how the significant obstacles to making progress on environmental protection within the firm can be overcome in SMSs.

The case study material reviewed in this work suggests that the conditions for the emergence of successful initiatives to encourage SMEs to take on board environmental issues are not sufficiently far advanced in the SMSs. If they are, they are not being exploited. In particular, the role of social dialogue in cementing initiatives, which was highlighted in an earlier synthesis report concerning other Member States, appears almost completely absent in the case study material from SMSs.

If local initiatives have an important role to play in promoting a more responsible attitude towards environmental protection, either greater use must be made of existing structures, or new ones must be set up, which have a potential to make further progress in the domain of environmental protection.

What follows is an outline of the sorts of measure and initiative required:

- Take Advantage of Win-Win Solutions
  - requires pro-active advisory services to enrich market with information (possible through twin track regulatory approaches integrating enforcement and advice);
  - demonstration projects (LIFE, etc.);
  - economic instruments could act as signalling mechanisms (most likely candidate given regional development issues is national user charges. No clear role for voluntary / negotiated agreements given their typical lack of SME focus);
  - target financing at measures which sustain themselves;
  - require integration of environmental concerns into work of business start-up advisory / grant-awarding services;
  - aid to SMEs in carrying out investment appraisal (to encourage take-up of win-win technologies); and
  - examine terms upon which credit is made available.
- Tax Incentives for investments in clean technologies (as are in place in Netherlands);

Other issues which are worthy of mention are:

- the significance of the role of education - education promotes
  - awareness, which is a pre-condition to addressing problems pre-crisis;
  - dialogue between partners;
  - awareness of environmental ‘opportunities’ (improved performance, job creation); and
  - perception of ‘wastes’ as potential resources.

SMEs may be influenced through their role as suppliers to other companies with environmental management systems in place, which may require suppliers to meet certain environmental standards. Environmental management systems in larger companies may, therefore, have an impact through their influence on the supply chain;

- as legislation begins to recognise the liabilities of enterprises in respect of environmental damage, shifts in bank lending criteria are likely to occur so that credit is more readily available to environmentally responsible enterprises; and
- given the context in which the case studies have been undertaken (mostly rural areas) the role of CAP reform could be significant. To the extent that rural development funding becomes wedded to environmental criteria, the effect of such cross-compliance may play an important role in encouraging SMEs to consider the environment more seriously.

These are merely some suggestions that arise from the case studies. Their potential domain of application extends beyond SMSs and to other Member States as well. In all Member States, whilst the problem may not be so acute as in SMSs, the question of how to ensure and encourage SMEs to take on board the environmental agenda is a serious one. As such, it is deserving of special measures to accelerate change in a positive direction.

1.0 Introduction

1.1 Environmental Policy Context

It has become increasingly difficult for firms in Europe, wherever they operate geographically, and whichever industrial sector or sectors they operate in, to ignore environmental issues. Those firms that would seek to do so are increasingly being forced to re-consider their activities as a result of new regulations and policy instruments which reflect environmental concerns that have become prominent either locally, regionally, nationally, at an EU-wide level, or even globally. This reflects the fact that different environmental problems have effects over different geographical ranges, and often occur in more or less specific (industrial) contexts.

The degree to which environmental policies have become prominent has varied over time and place. Different Member States, and within these, different regions, have implemented environmental legislation and policies at varied rates. Thus, in certain geographical areas, environmental policy-making is further advanced than in others. In addition, even where policies are in place, levels of enforcement activity vary. Legislation on the statute book alone is insufficient to bring about the desired changes.

Environmental problems reveal themselves in a variety of ways, and exhibit different geographical characteristics. Although many of these are global, several are local. Even where their manifestations extend beyond the locality, they are often local in origin. As such, many environmental problems require local initiatives if they are to be solved. However, effective solution of local problems requires awareness of them as problems, as well as a willingness to deal with the problem effectively.

It is tempting to link the relative rates of progress in setting and implementing legislation and policies to differing levels of public consciousness regarding environmental issues. Such consciousness, after all, where it is effectively articulated, is at least a part of the mosaic of pressures to which policy makers must respond. However, a number of factors affect the rate of development of environmental policies within Member States, amongst which are:

- the effectiveness of public organisations;
- the institutional form of the political process, and the ranking of priorities of citizens, politicians and the state;
- the role played by industry in taking action on environmental issues; and
- the obligations of the state under European and international treaties and agreements.

The increasingly prominent role now being played by the European Union (EU)in the setting of environmental policies is forcing the hand of those Member States which have developed strategies towards the environment more slowly than others. It is generally accepted that southern Member States (SMSs) have moved more slowly than those of northern Europe in the effective implementation of environmental policies, and indeed, the role of European and international policies in shaping legislation is noted in each of the case studies. Whether this is attributable to a lack of environmental consciousness is, for some of the reasons noted above, surely debatable, particularly if one accepts the existence of variation between, and within, SMSs themselves (not least in the timing of their accession to the Community/Union), and in the level of awareness relating to different environmental issues.

Even so, there remain particular problems within SMSs in terms of adjustment to new demands emanating from Brussels, amongst which may be a degree of resentment at having to adapt national policy in ways in which it might not have done so otherwise (or, at least, not so quickly). For countries where environmental policy has lagged somewhat, these adjustment issues affect a range of bodies, amongst which are the following:

- state legislatures - through the requirements generated by European Directives and Regulations, the state legislature is forced to take into account issues which it might otherwise have ignored. As part of the drafting of new legislation, areas of competence and responsibility in terms of implementation and enforcement have to be mapped to the relevant authorities, and in such a way that these do not conflict with the spirit of pre-existing legislation;
- authorities charged with implementation and enforcement - these may find themselves with new responsibilities with regard to issues which they may ill-equipped to understand, let alone deal with. They may also find themselves in conflict with other bodies who feel that areas of their competence are being removed from them;
- productive enterprises, public and private, which are the target of the policy change being implemented.

It is the last of these issues which forms the focus of the analysis in this particular report, yet the adjustment problems faced by firms in SMSs are clearly tied up with problems of adjustment affecting other bodies. To give a simple example, if those charged with implementing and monitoring the enforcement of a given regime are unsure of the role they are required to play, there seems little reason to expect that firms themselves, who may not be able to devote significant resources to compliance with the regime, can, or will, adjust in the desired manner.

This study seeks to shed light on the problems of adjustment which face firms in SMSs as they try to meet the increasing demands placed upon them by evolving environmental policies, and how these problems may best be overcome. The term ‘evolving’ is particularly important in the sense that for a large number, perhaps the majority of firms, the problem of adjustment will not take the form of a one-off investment in a piece of equipment. The firm itself will more than likely be affected by a range of policy changes, and will have to adapt accordingly. As policy evolves, so the firm will be required to adjust too. The challenge is magnified in SMSs owing to the predominance of small and medium sized enterprises (SMEs) in the economy, whose perception will, not unreasonably, be that they can ill afford the time and resources necessary to keep up with mounting demands regarding the environmental implications of the activities in which they are engaged.

The challenge of adjustment that is being addressed in this report reduces to one of promoting, within firms in SMSs, a process of adaptive evolution in the cause of promoting environmental quality.

1.2 Study Programme (history/objectives)

This report builds partly on an earlier synthesis document produced by ECOTEC, partly on some additional and more recent case study material regarding the specific problems of South European SMEs in improving their environmental performance. The ECOTEC document sought to present the findings and conclusions to a research programme which examined the

firm in its local environment. The work was undertaken in the light of recommendations from a Round Table on the Role of the Social Partners in Improving the Environment (June 1988), and comprised three elements:

- a study on education and training of categories of personnel concerned with environmental issues relating to industry (1989-90);
- an enquiry on the firm in its local environment, identifying local initiatives (1991-92); and
- a review and partial assessment of mechanisms and initiatives designed, at a local level, to assist firms to meet their environmental responsibilities (1992-93).

A synthesis report drawing these separate elements together and identifying the central issues and lessons for future policy formulation was produced in November 1993.

The broad aims of the research programme were:

- to identify the most effective ways in which firms can become involved in environmental protection and environmental improvements at the local/regional level, and the conditions and mechanisms required;
- to identify the options for environmentally conscious resource management within the firm having regard to the potential for improved profitability, work safety and public confidence in the performance of the firm;
- to highlight the main obstacles to such developments and how they can be overcome;
- to point to required improvements in education and training provision for personnel concerned with environmental issues relating to SMEs and to required improvements of advisory schemes, networks, etc. in this area;
- to define the role of the various parties, notably the social partners, in this process;
- to contribute to a better implementation of environmental legislation, particularly Community directives and regulations, and increased environmental awareness at the local/regional level.

The first element of the research programme was a study on education and training of categories of personnel concerned with environmental issues relating to industry. This study, initiated at the end of the 1980's, sought to describe the pressures giving rise to a requirement for environmental training and attempted a first overview of the type of training being provided in Europe. The study concluded that:

- inadequacies existed in the skills and competencies of categories of personnel concerned with environmental issues and that improvements were required to ensure that pressures for improved environmental performance by industry could be met;
- the provision of training and advice to SMEs needed to recognise the difficulties facing SMEs in allocating time and resources to environmental training requirements;
- the development of policies to improve environmental management competencies and industrial environmental performance needed to recognise that:

    * improved awareness and motivation among SMEs is a pre-requisite;

- a wide range of organisations have a role to play in encouraging awareness and for improving environmental performance in industry, including the provision of training, information, advice and financial support;
- the encouragement of collaboration and co-operation between organisations is most effective at the local and regional levels.

These conclusions formed part of the background for the second two elements of the research programme, comprising studies on the firm in its local environment. Specifically, it provided the starting point for these studies, i.e. that environmental protection and improvement are best achieved at the regional and local levels in a co-operation encompassing industry and its various organisations and associations, the social partners, public authorities and local communities. Hence, these studies were planned, to indicate the existing and planned procedures, mechanisms and instruments required for such a co-operation; and to identify and analyse existing initiatives before attempting an assessment of the need for improving any schemes and for creating new ones. The research was specifically designed with an appreciation of the specific needs of SMEs, which may sometimes have difficulties in complying with environmental standards owing to a lack of resources and expertise and, therefore, require particular assistance.

The second element of the research programme was a first attempt to look into some examples of local and regional co-operation aimed at improving industrial environmental management, notably among SMEs, and clearly demonstrated the importance of such a co-operation where it existed and the scope for its further development. The work also showed, however, that there are problems to be overcome before successful local and regional co-operation initiatives can become more widespread.

As emphasised at the Round Table on the Role of the Social Partners in Improving the Environment, environmental issues and working conditions are often related and should, in such cases, be solved together. An integrated approach in this area is increasingly being applied in a few Member States, and the Round Table considered that the approach should be practised more widely in the Community in order to avoid unnecessary conflicts. The involvement of relevant public authorities, companies and the social partners in a joint effort, to ensure that both environmental and working conditions are being dealt with together, insofar as they are related, was considered desirable. The extent of the existing integration of environmental policy with working conditions (industrial relations, health & safety) was one of the issues examined in this element.

The third element of the research programme considered, in more detail through case studies, the examples of co-operation and social dialogue (referred to in this report as participation)[1] identified during the second element and has provided more contextual information on environmental pressures and consequent industrial responses by firms, particularly SMEs.

[1] Social dialogue was used in the first synthesis report to refer to the processes of communication and cooperation, not only between the Social Partners (employers and trade unions) but between all interested parties. The term referred to the wider policy debate surrounding environmental improvement and sustainable development and not just to social policy. In this report, the term participation is used to indicate the level of inclusiveness of interested parties in the processes of change.

The case studies were chosen, specifically to indicate:

- the environmental pressures facing industries and SMEs in different regions of the Community;
- the responses of SMEs to these pressures together with some appreciation, by the contractor, of the adequacy of the response;
- the effectiveness of different local/regional initiatives of co-operation designed to improve the environmental performance of SMEs.

The case studies were comprised of three elements:

- a review of the local context and of environmental pressures on SMEs in selected regions;
- an assessment of the effectiveness of the previously identified co-operation initiatives;
  the identification of strengths and weaknesses of each initiative as a basis for identifying "good practice".

The case studies were based on interviews with firms in the selected region, some of which were partners in the co-operation initiatives, together with interviews with local public authorities.

Combined with the results of the earlier elements of the research programme, the study sought to indicate means of improving the effectiveness of environmental policy, through local/regional co-operation initiatives. Specifically, the research programme examined examples of policies which might be used to provide a voluntary, self-regulatory approach to environmental policy, through dialogue and co-operation. These policies could include, inter alia, measures to improve:

- environmental awareness;
- environmental management performance;
- environmental training and education;
- environmental technology transfer;
- the role played by business support networks;
- the role played by the social partners;
- the effectiveness of co-operation initiatives.

The earlier study concluded that initiatives with the greatest chance of success in meeting their objectives would:

- be appropriate to the local/regional context (eg. legislative framework, level of environmental actions etc).
- require focus and strategy.
- be dynamic, adapting to changing needs and/or must be clearly focused.
- be pro-active,
  * participation of SMEs will require stimulation
  * participation of local industry representatives desirable.

- be practical,
    * requires strong technical skills to be credible and productive

- involve networking with a purpose,
    * balance the need to involve a wide range of partners with a manageable network.

- be independent,
    * but will benefit from involvement of regulators
    * need for financial independence.

Since, ultimately, the research programme sought to provide a "good practice" guide for national and local public authorities on the actions that could be taken to help firms to improve their environmental performance, it was felt appropriate to examine the specific problems facing SMSs in this regard. Consequently, the Foundation contracted four pieces of research on local adaptation in SMSs in the face of the need for improved environmental performance. These studies were carried out 1993-1997 and, following the synthesis report produced by ECOTEC in the Autumn of 1993, this report aims to draw into a new synthesis the lessons from these case studies.

The previous synthesis report argued that replication of co-operation initiatives in Objective One regions in southern countries must have regard to specific characteristics in these areas:

- the lack of a tradition of public concern over environmental conditions;
- the dominance of economic development priorities;
- the decentralised regulatory framework;
- the lack of a tradition of networking;
- the importance of SMEs in economic activity;
- the importance of larger companies as customers;

- the lack of environmental skills and infrastructure; and
- the lack of a tradition of applying the PPP.

These observations can be regarded as a set of hypotheses to be carried forward, albeit not in a rigid manner, in the new report.

1.3 Purpose and Structure of Report

Chapter Two examines the position of SMSs relative to other Member States in terms of chosen economic, environmental and social indicators. It also compares expenditure on environmental protection equipment and services across Member States. Chapter Three sets out some of the key policy drivers which are forcing SMSs to raise environmental standards. It continues with an attempt to understand some of the difficulties which face SMSs in adapting to these new demands. Chapter Four analyses the case study material in the light of some of the hypotheses carried forward from the earlier synthesis report. Chapter Five seeks to draw some pertinent conclusions from case study material in the light of the hypotheses advanced in the earlier synthesis report. An attempt is made to understand ways in which the meeting of environmental policy objectives might most easily be achieved in the light of the evidence from the case study material.

2.0 MEMBER STATES IN CONTEXT

In this section, an attempt is made to outline the context of the issues under investigation. Each Member State has different characteristics with respect to economic structure, and as a result, the significance of the challenge of adjustment varies from place to place. Furthermore, it should be appreciated that the national level data masks significant variation at the regional level. Thus, the national level statistics should be treated with a degree of caution.

2.1 Economic Structure

Per capita GDP is generally lower in the SMSs than in other Member States. GDP growth rates have been higher than average in Spain and Portugal since their accession to the Community in 1986, but for Greece it has been below average, whilst Italy has achieved something like the Community average. The regional disparities within Member States are far greater than those between them. The ten richest regions had average GDP per capita more than 3 times that of the ten poorest (CEC, 1997).

The contributions of the different sectors to gross value-added vary somewhat across Member States. There are few meaningful conclusions that can be drawn from the relative magnitude of the sectoral contributions to gross value-added besides the fact that the significance of agriculture is greatest by far in Greece (Table 1).

Disaggregated by services and industry, there is little difference across the Member States. However, in the SMSs, agriculture accounts for a significantly higher percentage, and services, a lower percentage, of total employment than in other Member States (Table 2). This reflects partly the size distribution of agricultural holdings in SMSs which is heavily weighted towards smaller plots (see Table 3), and partly the increased significance of industry vis-à-vis services in the SMSs.

Table 3 also highlights some other important indicators for the EU15 which are pertinent to the ongoing study. Earnings in the SMSs are generally lower than in other EU Member States, yet the level of social protection is much lower. Thus, the impact of unemployment may be more severe in these countries although greater cohesion of families, and informal community support networks may be stronger in these countries. Such cohesion, and the prominence of the family, may also account for the low activity rates in SMSs. Certainly, the activity rates for females, which are lower in all Member States, are much lower than for males in the SMSs. The suggestion is that in SMSs, a higher percentage of families are reliant on income provided by males only. With the exception of Spain, unemployment rates in SMSs are not exceptionally high, but this must be set in the context of their lower activity rates.

Even though the level of social protection as a percentage of GDP is relatively low in SMSs, the central government deficits and debts are fairly large in terms of GDP. This suggests an already existing strain on government finances in providing support for expenditure on environmental protection, which could be made worse as the SMSs seek to maintain or to meet the convergence criteria for European Monetary Union. This, of course, is not a problem which is unique to the SMSs, but here, the problem is likely to be compounded by existing strains on the public sector budget.

The maximum and minimum rainfall figures show that the regions with lowest rainfall in the EU15 lie in Greece, Spain, and Italy, though the variation across the country is considerable.

Issues of seasonality of rainfall are also important in SMSs owing not only to the high percentage of the population engaged in agricultural activity, but also, to the fact that seasonality will influence the extent to which effluents discharged into surface waters are diluted to acceptable levels. The case studies indicate that water pollution is a major problem for the SMSs, as indeed is the rate of water extraction. The possible influence of long-term changes in climate on levels of annual rainfall are of particular significance for the more arid regions of these countries SMSs.

The problems associated with water use and pollution are of great importance where industrial and agricultural production competes with tourism. Tourism in SMSs employs a higher percentage of the total employed in services than in other Member States. Since the location of tourist activity often coincides with areas of high sunshine and low rainfall, the tourist industry is likely to be most prominent where, potentially, problems associated with industrial pollution are greatest. Not only will the two, in general, compete for an increasingly scarce resource, but the very existence of the tourist industry is likely to be threatened by issues of pollution not just of water, but of land and air also. The case studies indicate that problems of air pollution and solid waste are common to the countries studied.

Table 1: Economic Indicators for the EU 15

	EU 15	B	DK	D	F	IRL	L	NL	A	FIN	S	UK	NON-SMS AVERAGE	GR	E	I	P	SMS AVERAGE
GROSS DOMESTIC PRODUCT																		
current prices (bn ECU)	6192.0	192.2	123.7	1724.8	1121.9	44.5	11.6	278.5	165.8	82.4	165.7	856.6	433.4	80.3	407.1	843.2	73.9	356.1
r inhabitant (1000 ECU)	16.7	19.0	23.8	21.2	19.5	12.5	28.8	18.1	20.7	16.2	18.9	14.7	19.4	7.7	10.4	14.8	7.5	10.1
GROSS VALUE-ADDED BY SECTOR (%) *																		
riculture, forestry, fishing	2.2	1.7	3.7	1.0	2.5	7.5	1.5	3.6	2.4	5.2	2.8	1.6	3.0	13.7	3.7	2.9	5.1	6.4
dustry	31.5	29.3	27.0	34.3	27.6	34.3	31.0	28.4	39.0	32.7	39.1	31.0	32.2	25.8	33.3	32.0	33.6	31.2
vices	66.4	69.0	69.3	64.7	69.9	58.2	67.5	68.0	58.7	62.1	58.1	67.4	64.8	60.5	63.0	65.1	61.3	62.5
GENERAL GOVERNMENT DEFICIT (% GDP)		5.3	3.8	2.5	6.0	2.1	-2.2	3.2	4.5	5.8	10.4	6.8	4.4	11.4	6.6	9.0	5.8	8.2
GENERAL GOVERNMENT DEBT (% GDP)		135.0	75.6	50.2	48.4	91.7	6.1	78.0	65.7	59.8	79.7	50.3	67.3	113.0	63.0	125.4	69.4	92.7

e : EUROSTAT (1996). Facts Through Figures: A Statistical Portrait of the European Union. Luxembourg: Office for Official Publications of the EC.
res for Greece and Spain are for 1993; for Portugal and Luxembourg, 1992.

Table 2: Persons in Employment by Economic Activity (NACE Rev.1) ('000s)

NUMBERS (IN 000's)	Eur15	B	DK	D	F	IRL	L	NL	A	FIN	S	UK		G	I	P	E	
Total Industry	44751	1072	703	12883	5946	349	41	1535	1180	556	1065	7079		886	6405	1421	3630	
Mining and Quarrying	648	12	4	253	55	5		10	12	5	9	113		16	76	15	64	
Manufacturing	31114	763	520	8930	4160	236	22	1082	810	412	789	4908		577	4564	1005	2336	
Electricity, Gas and Water Supply	1356	35	16	356	203	13	1	48	37	26	28	222		42	201	39	90	
Construction	11632	261	163	3344	1528	95	17	395	322	113	240	1835		252	1565	363	1139	
Agriculture	7829	102	114	1134	1080	151	6	252	270	156	135	533		780	1489	507	1119	
Total Services	95474	2619	1779	21765	15019	757	114	4788	2225	1302	2933	18203		2154	12049	2488	7279	
Wholesale and Retail Trade, Repairs	22388	578	369	5165	2990	175	23	1107	573	229	512	4064		624	3342	654	1983	
Hotels and Restaurants	5830	125	64	1053	736	69	8	237	187	50	101	1161		223	840	204	772	
Transport and Communication	8939	283	189	2058	1398	57	11	400	242	149	274	1655		248	1065	193	717	
Financial Intermediation	5198	154	77	1334	718	48	15	217	137	49	86	1155		92	675	127	314	
Real estate and Business Activities	10301	224	185	2210	1847	79	8	655	198	161	384	2419		149	943	198	642	
Public Administration	11411	385	157	3145	2071	70	16	543	237	119	215	1546		272	1540	327	768	
Other Services	31408	871	740	6800	5259	259	33	1628	651	545	1360	6203		545	3645	784	2084	
Not Stated	353		4		12	4	1	207				122						
Total	148406	3793	2601	35782	22057	1262	162	6782	3675	2016	4134	25936		3821	19943	4417	12027	
Of which Full time (%)	84	86.4	78.4	83.7	84.4	87.9	92.1	62.7	86.1	88.2	74.2	75.9		95.2	93.6	92.5	74.2	
Part time (%)	16	13.6	21.6	16.3	15.6	12.1	7.9	37.3	13.9	11.8	25.8	24.1		4.8	6.4	7.5	24.8	

Source: EUROSTAT Labour Force Survey: Results 1995. Luxembourg, OOPs of E.C. 1996

Table 2: Persons in Employment by Economic Activity (NACE Rev.1) ('000s) – Cont.

AS % OF TOTAL	Eur15	B	DK	D	F	IRL	L	NL	A	FIN	S	UK	NON-SMS AVERAGE	G	I	P	E	SMS AVERAGE
Total Industry	30%	28%	27%	36%	27%	28%	25%	23%	32%	28%	26%	27%	28%	23%	32%	32%	30%	29%
Mining and Quarrying	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Manufacturing	21%	20%	20%	25%	19%	19%	14%	16%	22%	20%	19%	19%	19%	15%	23%	23%	19%	20%
Electricity, Gas and Water Supply	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Construction	8%	7%	6%	9%	7%	8%	10%	6%	9%	6%	6%	7%	7%	7%	8%	8%	9%	8%
Agriculture	5%	3%	4%	3%	5%	12%	4%	4%	7%	8%	3%	2%	5%	20%	7%	11%	9%	12%
Total Services	64%	69%	68%	61%	68%	60%	70%	71%	61%	65%	71%	70%	67%	56%	60%	56%	61%	58%
Wholesale and Retail Trade. Repairs	15%	15%	14%	14%	14%	14%	14%	16%	16%	11%	12%	16%	14%	16%	17%	15%	16%	16%
Hotels and Restaurants	4%	3%	2%	3%	3%	5%	5%	3%	5%	2%	2%	4%	4%	6%	4%	5%	6%	5%
Transport and Communication	6%	7%	7%	6%	6%	5%	7%	6%	7%	7%	7%	6%	6%	6%	5%	4%	6%	6%
Financial Intermediation	4%	4%	3%	4%	3%	4%	9%	3%	4%	2%	2%	4%	4%	2%	3%	3%	3%	3%
Real estate and Business Activities	7%	6%	7%	6%	8%	6%	5%	10%	5%	8%	9%	9%	7%	4%	5%	4%	5%	5%
Public Administration	8%	10%	6%	9%	9%	6%	10%	8%	6%	6%	5%	6%	7%	7%	8%	7%	6%	7%
Other Services	21%	23%	28%	19%	24%	21%	20%	24%	18%	27%	33%	24%	24%	14%	18%	18%	17%	17%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%	100%	100%	

Table 3: Miscellaneous indicators for EU 15

	EU 15	B	DK	D	F	IRL	L	NL	A	FIN	S	UK	Non-SMS Average	GR	E	I	P	SMS Average
1993 ANNUAL RAINFALL (mm)																		
station with minimum average		549	557	435	368	502	832	632	581	512	373	530	534	197	185	227	518	282
station with maximum rainfall		1150	905	1495	1234	1332	832	959	1443	589	1041	1648	1148	730	1587	1319	1069	1176
1993 AGRICULTURAL HOLDINGS ('000S)	7814.8	76.3	73.8	606.1	801.3	159.4	3.4	119.7	267.4	191.9	91.5	243.5		819.2	1383.9	2488.4	489	
by size groups (ha AAJ, (%)																		
<5	56.9	35	2.6	31.6	27.6	10.4	25.7	34.1	34.7	34	15.2	15.2	24.2	75.7	58.1	77.5	78.1	72.4
5-20	24.3	33.6	39	34.1	22.6	42.1	17.1	34.9	37.2	44.2	41.2	27.8	34.0	21.4	26.9	17.1	16.9	20.6
20-50	11.5	24.5	36.2	23.4	25.6	35.6	22.9	25.4	21.8	18.9	26.8	24.2	25.9	2.4	8.3	3.8	3	4.4
50-100	4.8	5.9	16.4	8.1	16.5	9.5	28.6	4.9	4.1	2.5	12.2	16.9	11.4	0.3	3.6	1.1	0.8	1.5
>100	2.6	1.2	5.8	2.7	7.6	2.3	5.7	0.8	2.3	0.4	4.6	15.9	4.5	0.1	3.1	0.6	1.1	1.2
EARNINGS (Purchasing power standard)																		
4/1995 industry (manual)		10.13	10.97	10.96	7.14	8.87	10.06	9.38	7.82	7.71	7.77	9.03	9.08	5.47	7.7		3.5	
4/1995 industry (white-collar)		2530	2052	2643	2086	2402	3083	2207	1782	1672	1684	2464	2237	1442	1812		1149	
4/1995 Commerce (white-collar)		1970		1897	1557		1885	1743	1388	1271	1488	1890	1677		1300		895	
1994 CIVILIAN WORKING POP. ('000s)	165,924	4,148	2,759	3,267	24,869	1,368	170	7,224	3,957	2,512	4,266	28,398		4,154	15,488	22,584	4,759	
1994 TOTAL CIVILIAN EMPLOYMENT ('000s)	147,285	3,748	2,537	35,840	21,720	1,155	165	6,706	3,809	2,048	3,923	25,657		3,786	11,728	20,024	4,440	
1994 ACTIVITY RATE	55.3	50.3	64.4	58.2	55.5	53.3	52.7	58.9	60.9	61.2	60.5	61.7	58.0	49.1	48.4	47.4	58.5	50.9

Table 3: Miscellaneous indicators for EU 15 (continued)

		EU 15	B	DK	D	F	IRL	L	NL	A	FIN	S	UK	Non-SMS Average	GR	E	I	P	SMS Average
1995 UNEMPLOYMENT RATE																			
total	!	10.7	10.2	6.7	8.3	11.5	14.4	3.9	7.0	:	17.2	9.2	8.8	9.7	8.9	22.7	11.9	7.2	12.7
men	!	9.5	8.1	5.9	7.2	9.5	14.0	3.1	6.3	:	17.6	10.1	10.1	9.2	6.0	18.1	9.1	6.6	10.0
women	!	12.5	13.2	7.7	9.7	13.8	15.1	5.2	8.2		16.7	8.2	7.0	10.5	13.7	30.3	16.5	7.9	17.1
aged under 25	!	20.8	23.7	8.3	8.1	27.3	21.8	8.1	10.7		29.9	19.4	15.9	17.3	27.7	41.7	33.5	16.6	29.9
1993 SOCIAL PROTECTION BENEFITS	*																		
in ECU per head		4500	4702	7190	5698	5408	2315	6444	5546	5112	5595	8767	3699	5498	1145	2425	3643	1269	2121
as % GDP at market price		28.2	26.4	32.4	29.7	29.2	20.5	23.7	31.9	28.1	34.4	39.7	26.7	29.3	15.5	23.2	24.7	17.6	20.3

Source: EUROSTAT (1996). Facts Through Figures: A Statistical Portrait of the European Union. Luxembourg: Office for Official Publications of the EC.

* Data for Finland, Sweden and Austria are for 1992.

! Figures for Greece and the Netherlands are for 1994.

2.2 Firm Size in Member States and Contributions to Employment

The economic importance of SMEs in the EU is illustrated in Table 4. The term SME is defined in different ways in different Member States. The EU definition is given in Box 1.

Table 4 : Significance of SMEs in the EU Economy

EU-15, 1992	Small (1-49)	Medium sized (50-249)	SMEs Total	Large (250+)	All
Number of Enterprises ('000)	15,600 (98.9%)	146 (0.9%)	15,746 (99.8%)	31 (0.2%)	15,777 (100%)
Employment (millions)	51.8 (51%)	15.1 (15%)	66.9 (66%)	34.2 (34%)	101.1 (100%)
Turnover (ECU billions)	5334 (46%)	2231 (19%)	7565 (65%)	4071 (35%)	11,636 (100%)

Source : KPMG (1997)

BOX 1 : EU Definition of SMEs

In the Official Journal of the European Communities (Vol.39, 30 April 1996), small and medium sized enterprises were defined as follows:

Small - less than 50 employees; independent; annual turnover not exceeding ECU 7 million or annual balance sheet total not exceeding ECU 5 million.

Medium - less than 250 employees; independent; annual turnover not exceeding ECU 40 million or annual balance sheet total not exceeding ECU 27 million.

A breakdown of the significance of SMEs by member state is given in Table 5. Although SMEs actually predominate in terms of number of enterprises in all Member States, the employment levels in SMEs in terms of total employment is larger in SMSs and in Ireland, with Austria and Denmark also having high shares. The importance of SMEs in Europe as a whole declines somewhat when one examines their contribution to total industrial employment. Here again, however, the shares in SMSs are much higher than in other EU member states. Thus, whilst the number of SMEs in all Member States presents policy makers with difficulties in encouraging adjustment towards sustainability, the matter is compounded in SMSs by virtue of the greater importance of SMEs in terms of employment, and the lower per capita GDP in these countries.

Table 5: Contribution of SMEs to Employment in EU Member States

	Size Class Dominance	SMEs % Share of Total Employment	SMEs % Share of Industry Employment Small (1-49)	Medium (50-250)	Total SMEs
Austria	Small & Medium	68	17	34	51
Belgium	Large	56	25	19	54
Denmark	Small & Medium	73	36	n/a	n/a
Finland	Large	57	21	20	41
France	Large	63	26	21	47
Germany	Large	60	22	16	38
Greece	Very Small	86	41	29	70
Ireland	Very Small	79	n/a	n/a	n/a
Italy	Very Small	79	53	19	72
Luxembourg	Small & Medium	72	36	20	56
The Netherlands	Small & Medium	61	28	24	52
Portugal	Very Small	78	39	32	71
Spain	Very Small	81	47	20	67
Sweden	Small & Medium	65	32	10	42
United Kingdom	Large	58	23	22	45
EU Total	Small & Medium	66	32	18	50

2.3 Expenditure on Pollution Control by Member State

The issue of expenditure on pollution control relates both to the environmental situation and to the issue of employment. Harmonisation of standards across EU Member States would lead, or so one would expect, to a degree of evening out of the environmental expenditures in the different countries. If anything, one would expect that those states that most need to 'catch up' in order to meet ever tougher standards would be forced to spend most on pollution control. It is questionable whether SMSs require, in the main, greater expenditure on environmental protection than other Member States. On the one hand, many environmental problems are not as far advanced in the country as a whole, particularly those relating to air pollution, which are confined to the larger metropolises. On the other hand, the lack of expenditure in the past has probably worsened matters as regards the impact of some pollutants on the environment, and may require substantially greater clean-up expenditure in the future as a result.

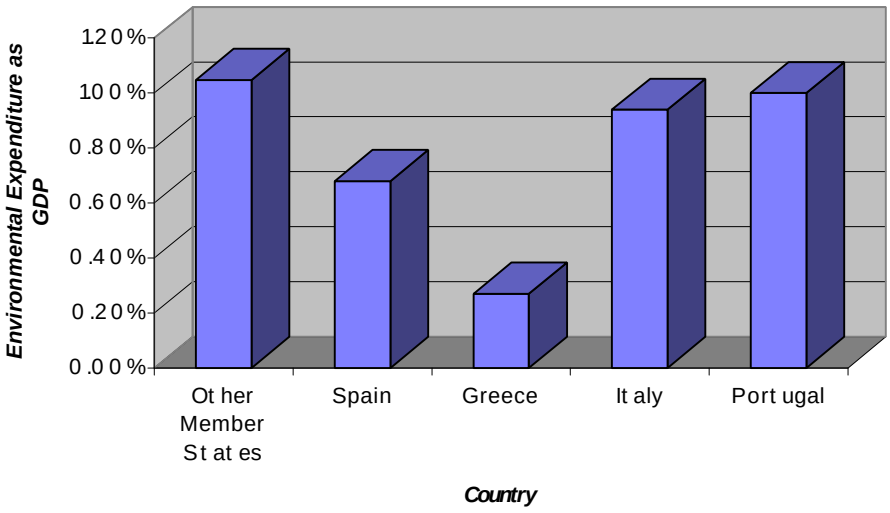
Notwithstanding these arguments, two factors make it unlikely that expenditure will increase significantly in the short term:

- SMSs, like other EU Member States, are constrained in terms of their public spending, by their attempts to meet the convergence criteria for European Monetary Union; and
- the lack of effective application and enforcement of environmental standards allows many firms to carry on their existing way of doing things, reducing overall expenditure.

The total EU market for environmental protection goods and services is just below 90 billion ECU. Figure 1 shows environmental expenditure expressed as a percentage of GDP for SMSs relative to other Member States (more comprehensive data is given in Appendix 1). Expenditure on pollution control in Italy is quite considerable, but for other SMSs, it is very low. This is true both in absolute terms, and in relation to GDP. Indeed, although Italian expenditure is relatively high, in terms of GDP, it too is relatively depressed compared with other Member States. The breakdown of public expenditure by public and private sectors reveals that, for Greece, Spain, Portugal, and to a lesser extent, Italy, public expenditure dominates private expenditure. To some extent, this is a reflection of exactly the issue under consideration here, that of encouraging firms to take pro-active steps in improving environmental performance. Much of the environmental expenditure currently undertaken does so with financial assistance from the public sector.

There are enormous disparities between sizes of the markets for each subsector of the pollution control industry. The markets for air pollution control (APC), waste water treatment (WWT) and waste management (WM) account for the majority of eco-industry expenditure in the EU. Indeed, 90 per cent of all EU eco-industry expenditure is devoted to these three domains (although, it should be noted that some expenditure on CLR and NVC is included in expenditure on WM as some companies include these categories in WM expenditure). The environmental problems facing SMSs are likely to reflect the relative significance of these markets.

Figure 1: Environmental Expenditure as % GDP by Member State



2.4 Employment in Pollution Control Industries

The anticipated growth of eco-industries can be a source of employment opportunities in the EU, yet the estimates as to direct and indirect effects have been subject to wide variation. The figures below (Table 6) are conservative estimates of total employment since they do not consider the employment generated by provision of intermediate inputs.

However, since they relate to the expenditure within the EU Member States, they do not reflect trade effects. Employment within a given country should reflect the extent to which countries generate a net surplus or deficit in terms of trade in pollution control industries. It seems probable that SMSs are running trade deficits in pollution control equipment and services. Relatively lax enforcement regimes have allowed companies in other states in the EU and further afield to develop their pollution control industries more quickly than those in the SMSs. To a degree, therefore, the requirement for firms in SMSs to comply with EU legislation and standards concerning the environment will represent lost opportunities in terms of industrial development and employment within their borders. Thus, the conservatism underlying the nature of the estimates given below, based on the expenditure within Member States, is to some extent counterbalanced by a probable over estimate due to the fact that SMSs are probably net importers of pollution control equipment and services.

Table 6: Employment in Eco-Industries in the EU

	Direct Employment				Indirect	Total	
	APC	WWT	WM	Other	Total	Employment Total	Employment (Direct + Indirect)
Austria	4900	18600	13100	4900	41500	10900	52400
Belgium	1800	4900	8800	0	15500	10600	26100
Denmark	1900	8100	4200	1700	15900	6400	22300
Finland	1200	7700	2600	2400	13900	7600	21500
France	7500	87100	82700	23500	200800	121800	322600
Germany	61600	142200	104900	7800	316500	131400	447900
Greece	600	1600	900	2100	5200	2900	8100
Ireland	500	4100	3200	800	8600	3800	12400
Italy	7700	24200	57600	11100	100600	65000	165600
Luxembourg	300	1000	400	0	1700	100	1800
Netherlands	6200	21800	37400	23300	88700	18600	107300
Portugal	800	7600	6400	2300	17100	7700	24800
Spain	3200	8000	21700	4700	37600	15300	52900
Sweden	1400	11400	10100	17800	40700	32000	72700
UK	9100	53600	62100	15600	140400	22100	162500
Totals		401900	416100	118000	1044700	456200	1500900

Source: ECOTEC et al 1997

Direct employment includes services and direct employment in provision of goods.

Notwithstanding the sources of error in the employment estimates, they do provide an indication of the contribution to employment that pollution control expenditures can generate. The direct employment effect of environmental expenditure is considerable, creating just over one million jobs in the EU, a figure which increases by 50% if indirect effects are accounted

for. Thus, whilst the issue of the firm's adjustment to environmental quality issues presents problems of adjustment for some, for others, the adjustment process presents opportunities. Unfortunately, for the SMSs, certainly in the short-term, the opportunities are likely to be grasped by foreign rather than domestic firms. The leakage of expenditure to other countries will tend to magnify the perceived downside to the adjustment process in the eyes of SMS governments and policy makers, particularly where employment concerns are very high on the agenda. Interestingly, the Spanish study mentions, but does not elaborate upon, the existence of PITMA (Environmental Technological Industrial Programme). This initiative began in 1989, and was launched by the Spanish Ministry of Industry (see Box 2.2 for details).

There is one aspect of the size of the adjustment required, however, that some firms may be able to turn to their advantage. Whilst environmental expenditure has traditionally been devoted to end-of-pipe clean-up processes, the trend appears to be towards more integrated techniques of dealing with pollution. The emphasis has shifted from minimising the environmental impact of pollutants and waste towards minimising their production in the first place. These techniques are likely to have more beneficial impacts on the company's performance in terms of profitability through reduction of waste materials, energy use, and output of pollutants. An optimistic scenario, therefore, perceives firms adopting newer integrated pollution control techniques, and leap-frogging over those which have relied upon end-of-pipe solutions, which, to the extent that they are bolt-on solutions to problems of pollution, are also bolt-on costs.

BOX 2.2 : Objective and Activities of PITMA
(the information in this box comes from Hartnell, Skea and Garayalde 1996)

PITMA's objectives were:

- to assist manufacturing firms in overcoming environmental problems; and
- to promote the emergence of an environmental industry.

Its beneficiaries are public and private sector companies, trade associations, private not-for-profit bodies and individuals. Three types of assistance are available:

Financial support is in the form of non-returnable grants (Table 7). The grant varies according to the size of the firms and the type of assistance (A, B, or C). SMEs receive a higher percentage of their investment than do large firms. The three types of financial support are :

- Assistance type A is for firms affected by severe environmental problems. Support is given for the acquisition of better equipment and transforming existing production process.
- Assistance type B provides support for innovation and environmental audits in firms that already satisfy environmental requirements.
- Assistance type C provides either training on environmental issues or promotes the diffusion of environmental information amongst manufacturing firms.

BOX 2.2 (continued)

Information on PITMA programme grants is not available beyond 1992, although the programme was still running in 1994. During the period 1990-1992, 1,229 projects were supported out of 2,570 projects proposed. The support given by the programme has amounted to 13,000 million pesetas which has resulted in a total investment of more than 349,000 million pesetas. The PITMA programme has supported the diffusion of environmental services by means of a data base (BRISA) of information on firms providing environmental services.

Table 7: PITMA Programme – Grant Coverage as a percentage of total Environmental Investment

Assistance	**Size Class**	
	SMEs(1)	**Large Firms**
Type A		
Minimum standards of environmental protection	25%	15%
Higher standards of environmental protection	30%	25%
Type B		
Basic research	60%	50%
Applied research	40%	30%
Type C		
(1) SMEs are firms with no more than 150 employees and turnover less than 20 mECU	100%	100%

Source : Ministry of Industry and Energy

The main features of the PITMA are as follows:

- roughly two-thirds of the financial support has been devoted to solve problems related to air pollution and water pollution (Table 8);
- despite the programme being targeted at SMEs, the latter account for only 38.3% of the overall funds provided. The bulk of the money has been taken up by large firms;
- although most of the funding is given to large firms, a growing amount of money is being directed towards SMEs. Support in 1992 was nearly twice as high as in 1991 and three times as high as in 1990. Likewise, the share of public aid in total SMEs environmental investment enjoys a significant upward trend (Table 9).
- more emphasis is being put on projects subject to assistance type B.

The first PITMA programme ended in 1994 and was followed up by a new programme (PITMA II) for the period 1995-1999. PITMA II has similar aims and objectives as PITMA.

BOX 2.2 (continued)

Table 8: Investment generated by the PITMA Programme 1990-1992 (million pesetas)

Areas	Investment
Land pollution	42,000
Atmospheric pollution	120,000
Water pollution	115,000
Others	72,000
TOTAL	**349,000**

Source : Ministry of Industry and Energy

Table 9: SMEs benefiting from the PITMA Programme 1990-1990 (million pesetas)

	1990	1991	1992
Investment (A)	32000	36000	39000
Public Aid (B)	863	1493	2620
Aid Ratio (%)	2.7	4.1	6.7

2.5 Summary of Key Points

The requirement for SMEs to adjust to currently required and anticipated levels of environmental performance has to be recognised in the context of the different national and regional circumstances which prevail. Southern Member States are characterised as having:

- lower output per capita;
- greater reliance on agricultural activity;
- greater share of economic activity produced by SMEs;
- relatively smaller firms within any given size-band.

The level of environmental protection in SMEs, measured by the level of environmental expenditure per GDP or per capita, is lower than in the rest of the EU partly reflecting lower environmental standards and lower levels of enforcement activity. As a consequence the extent of adjustment, and the background level of environmental quality, is also different. To achieve EU level standards and increasing national standards SMEs, in particular, in southern Member States are faced with a relatively large adjustment problem; in the context of considerable environmental degradation.,

The policy responses at different geographic levels provide the drivers for improved levels of environmental performance in SMEs in southern Member States, and the rationale for public policies to aid adjustment.

3.0 Policy responses

3.1 Role of International, National, Regional and Local Policies

Although environmental issues have waxed and waned in importance since the 1960s (which is not to deny their longer history), there are compelling reasons to believe that, although still subject to some fluctuation in this regard, they are now firmly on the political agenda. A number of reasons can be cited, not least of which is the establishment of a growing number of organisations and mechanisms assigned with responsibility of addressing environmental issues. Such bodies now exist at global, European, and national levels, and where they are lacking, pressure exists to hasten their emergence.

3.1.1. Global

Few industries have remained unaffected by the growing tide of environmental concern which, though its history is much longer, began to surface with renewed vigour in the 1980s. One of the buzz-phrases of the day is sustainable development, a term which recognises the importance of a successful marriage between environment and development, the two having too often in the past been perceived as unrelated.

At the global level, the World Commission on Environment and Development (WCED), which was set up in 1983, placed sustainable development firmly on the global agenda when it reported in 1987 (in the so-called Brundtland report). The report, entitled 'Our Common Future,' defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987). This definition, widely quoted out of context, can be, and has been used to justify a range of beliefs so that, though conceptually useful, it has acquired the status of a catch-all dependent on one's views as to what constitutes development. In fact, the WCED report stressed the overriding priority that should be accorded to the world's poor, thus bringing an additional distributional dimension to the debate. Sustainable development speaks of quality of life, quality of the environment, and the need to ensure the meeting of basic needs across all peoples.

By 1989, plans were being laid for a conference to carry forward some of the issues which the WCED had highlighted in their report. The outcome was the United Nations Conference on Environment and Development (UNCED) of 1992, the so-called Earth Summit, which was attended by more heads of state than any other meeting held before or since. In a global sense, if this was not already clear, the environment had arrived on the political agenda. Furthermore, it appears that notwithstanding past fluctuations in the intensity of concern for the environment, this time, it is here to stay. One of the Conference's outputs, Agenda 21, outlines some guiding principles for pursuing sustainable development and initiates significant institutional changes. In the Autumn of 1992, the UN General Assembly accepted and enacted the recommendations of Agenda 21 and established a Commission on Sustainable Development to oversee its implementation. The concept of sustainable development is now ingrained within the UN system.

There had been earlier signals that the environment would become a major political issue. Many environmental problems, particularly those related to air pollution and climate change, are inherently democratic in that they affect rich and poor alike, emphasising the elements of commonality in the futures they share. Often highlighted as a success in terms of international

co-operation, the Montreal Protocol has been responsible for the phasing out of the use of ozone depleting chemicals. The Intergovernmental Panel on Climate Change (IPCC) also brought together in, at times, acrimonious debate the nations of the developed and developing world to discuss the issues at hand. The work of the IPCC led to the Framework Convention on Climate Change entering into force shortly after the UNCED was concluded.

As in any other field of international relations, policies designed to protect the environment are difficult to negotiate. Typically, two issues surface in the context of negotiations and implementation respectively:

- the gap between the rich and the poor
- the gulf between agreed systems and processes for implementation and the short-term interests of parties to the agreement/convention/protocol concerned.

The former issue relates to the contradictions inherent in the view that collective action is required to address common threats in the environmental domain, but no such action need be forthcoming to overcome differentials of wealth. On the one hand, the wealthy offer a vision in which environmental futures are common, but on the other, uncommon futures distinguish the haves from the have-nots.

The latter related issue speaks of the interests of individual states in the face of obligations under international agreements. An absence of consensus implies that agreements require compromises to be made between the interests of the individual and that of the collective. The effectiveness of the agreement depends on the consensus holding.

3.1.2. European

Environmental concerns within the European Union can be traced back to the 1972 Paris Summit. There, it was affirmed that economic expansion should not be an aim in and of itself, but that it should also improve the quality of life through attention to non-material values and environmental protection. There followed the development by the Commission of successive programmes of Action of the European Communities on the Environment.

The Single European Act in 1987 marked a new phase in EC environmental policy in so far as it provided a formal legal basin in the Treaty of Rome for the growing body of environmental legislation and set out three objectives : protection of the environment, human health, and prudent and national use of natural resources (art. 130r). It also expressed that environmental protection should be taken into account when defining and implementing other Community policies, a call which was reflected in the Fourth Action Programme.

Environmental concern was strengthened in the Treaty on European Union of 1992 which formally established the concept of sustainable development in EU law. This development found its expression in the Commission's White Paper on 'Growth, Competitiveness and Employment: The Challenges and Way Forward into the 21st Century', and most obviously of all, in the Fifth Environmental Policy and Action Programme (5EAP), 'Towards Sustainability', which outlines the route to be followed if the ambitions (in environmental terms) of the Treaty on European Union are to be met. The White Paper stresses the significance of the pollution control industry and consumer demand for environmentally friendly products. It also addresses the issue of clean technology, and notes the need for training initiatives to further developments in this regard. The 5EAP includes a number of targets and goals with respect to environmental quality. The use of information and education

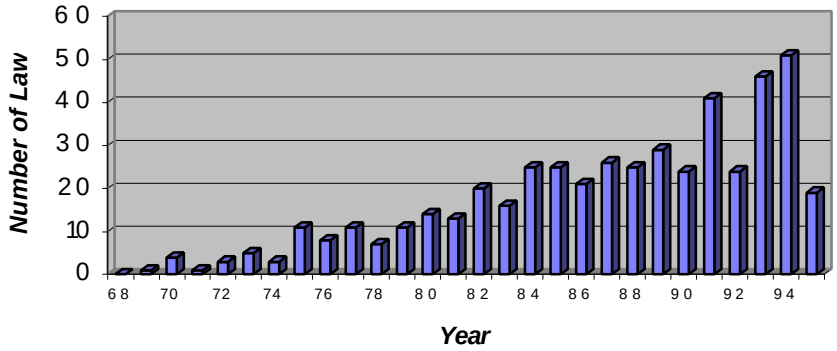
to further these goals is mentioned, as is the possibility of setting standards across the Union for products and production processes with respect to the environment.

In addition, the 5EAP deals with other policy initiatives to be used in pursuit of its goals. Over time, the European Union has made known its intention to make greater use of alternative instruments (to regulation), particularly those that work through the market mechanism, in pursuit of environmental goals. However, the very same instruments, though they have always been subject to critiques from those who view the working of markets with some scepticism, are now the subject of sterner examination on the basis both of their performance, and (not unrelatedly) the limited extent of their implementation. Interesting developments are now occurring regarding the where, what and how of environmental policy instruments. The range of criteria against which to measure the success or failure of an instrument is therefore broadening all the time to include dynamic effects, as well as institutional issues and barriers.

Notwithstanding the apparent growth in concern to address environmental issues, the Review of the 5EAP made it clear that key objectives were unlikely to be met and that stronger measures would be needed to deal with: climate change and acidification; urban issues such as air quality, noise and waste; and ground and surface water quality. Least progress was seen in agriculture, tourism and transport. A look at EU environmental law since 1968 shows that 1995 saw fewer regulations and directives adopted by the EU than in any year since 1983 (see Figure 2 below). Though this may, in part, be interpreted as a shift towards voluntary approaches to environmental problems, which have gained favour with the Commission, together with growing difficulties in passing new legislation aiming at ever tightening standards, a more likely explanation is, in fact, the substantial number of new regulations/directives (including the revision of existing ones) adopted in 1990-1997. However, the 'marginal political cost' of an added increment to existing environmental policy may increase over time, and affected industries may be more effective in lobbying against imposition of further measures, particularly in the light of globalisation of markets.

Note: The data includes revisions of existing regulations/directives, which account for a significant proportion of the number in any given year.

Figure 2: Number of Environmental Laws adopted by the EU since 1968



Source: IEEP

Despite, or perhaps because of, the criticisms levelled at the 5EAP, the pressures for further measures to protect the environment are still in evidence. Under consideration, and of considerable significance to the issue under discussion, is legislation concerning environmental liability, but this now seems unlikely to emerge in advance of work concerning approaches to valuation of environmental damage and compensation for environmental assets. Also of great relevance, the European Parliament has approved a Draft Resolution calling for EU-level monitoring of national environmental inspection agencies. This follows a European Commission communication concerning improving implementation and enforcement of EU environmental law. In this latter regard, some pollution control industries complain that their markets are effectively being reduced in size by failure to enforce the letter of the law.

The trend, therefore, even if it may be slowing somewhat, is towards more stringent environmental policies, and importantly for SMSs and firms located within them, there are moves to ensure compliance and enforcement of these through awarding greater powers to the European Commission within Member States' legislative procedures. The issue of enforcement is a clear issue in the context of the Italian and Greek case studies, and to a lesser extent, that in Spain. Clearly, the issues involved for countries with large numbers of SMEs in any given industrial sector are rather different from those countries where markets are characterised by more oligopolistic or oligopsonistic producers or consumers. Such large firms are more visible in their activities. Partly because of this visibility, the extent of compliance is likely to be higher in such firms than in SMEs.

The adoption of and follow-up to the Amsterdam Treaty is a clear indication that environmental pressures are not going to ease in the future. In so far as the Treaty makes sustainable development one of the overriding objectives of the European Union and considerably strengthens the commitment to the principle that future development must be based on this objective and a high level of protection of the environment. The latter must therefore be integrated into the definition and implementation of all the Union's other economic and social policies, including trade, industry, energy, agriculture, transport and tourism.

3.1.3. National Policies

The case studies carried out in Greece, Italy, Portugal and Spain broadly confirm that national political agenda have been shaped to a considerable degree by evolution in EU policy. Although this is true for all Member States, the extent to which matters were already moving in directions paralleling that in the EU varied (as mentioned above) across Member States, and it is broadly accepted that SMSs were required to make greater adjustments in this regard than other Member States. A relevant issue here is the date at which the different Member States acceded to the European Community. Though Italy was a founder member of the European Community, Greece became a member in 1981, whilst Spain and Portugal acceded in 1986. For countries joining the Community relatively late, enacting environmental law has entailed some quite substantial changes, both in terms of the implied targets and the institutional means through which to achieve these (although this has not been true of Scandinavian countries). Such changes have often had to be considered in the midst of structural changes to the economy, some of which can also be attributed to membership of the EU.

The priority accorded to environmental issues varies across Member States, not just the SMSs. Notwithstanding the obligations which Member States have to fulfil as a condition of

their membership, this is reflected in the importance of the relevant ministry or agency in national governments, and in the coherence of policy-making across local and regional authorities. The presence or absence of clear boundaries delineating the responsibilities of the relevant bodies is a critical factor in determining the effective implementation and enforcement of environmental policies.

The case studies carried out for the Foundation highlight some of the difficulties which SMSs have had to confront in this regard:

Greece
The Greek study suggests an adequate legal framework but a lack of resources available for enforcement and application. There is a lack of supporting research and development concerning environmental issues, as well as a low level of awareness as to the possibilities for gaining financial assistance through agencies of the European Commission regarding investments made for environmental protection purposes. Despite the enthusiasm which exists in the European Commission for the use of market-based instruments, only one fiscal instrument has been applied in Greece even though legislation allows for these to be imposed both by government ministries and local authorities. No local authority has made use of this provision despite its being in existence for more than a decade.

Italy
The Italian study shows how problems have arisen with regard to the environment owing in part to the 'absence of the state' in the past. However, the pressures emanating from Brussels, as well as growing awareness amongst the general populace (not least with regard to eco-products) have made it imperative to re-consider the institutional structure of the system charged with enacting, and enforcing EU Directives and Regulations. Yet the 3 year Environmental Protection Programme for 1994-96 has been subjected to heavy criticism. In particular, the respective responsibilities of the newly formed National Agency for the Protection of the Environment and the regional, and autonomous-province, agencies are confused, with matters being made worse by continuing existence of earlier provisions which gave powers to other bodies.

Spain
The case of Spain is particularly relevant regarding the distribution of powers and competencies between state and regional authorities since politically, the country has been moving steadily toward a more regionalised political set-up. According to the Spanish study, environmental policy originated in the 1970s with the creation of the Interministerial Commission for the Environment (CIMA), prior to which specific problems were dealt with in piecemeal fashion. Further elaboration of policy was made in the Spanish Constitution of 1978. However, in the Spain of early 1980s, environmental policy was in its infancy and precise responsibilities had not been defined. It appears that this has been somewhat fortuitous since this meant that Autonomous Regions assumed powers relating to the environment in advance of these being completely fixed at the national level. This resulted in a degree of diversity in terms of the organisational structures charged with dealing with environmental issues. As the report makes clear, these Regions were faced with a common problem of making up for lost time in matters of pollution control and environmental clean up. The autonomy enjoyed by the Regions appears to have minimised the possibilities for conflict with national government, and should make it possible to design region specific solutions regarding environmental matters.

The above snapshots indicate a diversity of forms, and rates of change, in the policy-making organisations of SMSs. The organisational framework for policy making and its evolution clearly have an important bearing on the effectiveness of implementation of environmental policy, and this is borne out in Chapter 4 (see below).

3.2 Requirements for Adjustment Policies

The magnitude of the adjustment required by SMSs is, as noted above, likely to be large relative to that required by other Member States. The problems associated with seeking to make these adjustments are likely to be correspondingly big. The sorts of quantum leap that may be required of some firms may be tantamount to asking them to completely reorganise their production processes, and with it, their attitudes and perspectives toward the environment. This is unlikely to be a costless process. Nor will it be easy if firms are essentially required to undergo a Saul-like conversion in their attitudes toward the environment in the absence of greater awareness in the public at large. Taken together, the predominance of SMEs in SMSs, the relative difficulties which small firms may face vis-à-vis large firms in terms of their capacity to adapt, and the issue of the importance of SMEs in SMSs in terms of employment levels, make it clear that adjustment to environmental legislation is unlikely to occur spontaneously and smoothly. More often than not, assistance, financial and otherwise, will be required not merely to smooth the adjustment process, but in some cases, to enable it to take place at all.

Although the effective implementation of policy is likely to depend critically, for reasons outlined above, on meaningful engagement by authorities, the effectiveness of policy in affecting change is dependent on its bringing forth firm level adjustments to the new policy environment. On the one hand, this depends on the enforcement of legislation and policy, the difficulty of which relates to the number of enterprises involved. On the other hand, from the perspective of the firm, it depends on a whole host of issues relating to information, technology, training, finance, education, research, and last, but not least, a clear understanding of what it is that they are adjusting to, and why they are required to do so.

A balance of instruments and approaches is required, therefore, between enforcing the letter of the law so as to penalise firms which continue to pollute, and making it easier for firms to adjust to the new legislative and policy framework. Too rigid an application of the law, in the absence of policies which assist the adjustment process, is likely to have undesirable impacts in terms of employment implications. Once again, SMSs find themselves in an awkward situation in that (with the exception of Italy) firms have not had the benefit of watching policy evolve, let alone of influencing its development, and they are therefore required to make rapid changes without prior knowledge of the timing and extent of change required.

The ultimate nature of the firm's adjustment will, most likely, take the form of one or more of the following:

- use of pollution control and waste management techniques;
- changes to production methods and process management to minimise environmental impacts;
- changes to the product to improve its environmental performance during use and disposal;
- alternative choices of raw material and energy use;
- advice to/from suppliers and customers relating to environmental performance;

- education/training of the workforce of environmental issues;
- management awareness/motivation;
- management and conduct of environmental audits;
- education/training of the workforce in new environmental conscious practices;
- clean-up of contaminated industrial land.

The selection from, and implementation of these different practices will be bound up with the nature of the problem whose resolution is sought, the industrial sectors involved, and the location of the firm.

Obstacles to adjustment include following factors:

- the problem of inertia (i.e. reluctance to change current, in some cases, traditional ways of doing things, perhaps underpinned by a belief that enforcement penalties are not high, or that the probability of being caught not complying is very low);
- lack of awareness of existing regulations;
- lack of knowledge as to how to change practices so as to comply with regulations;
- lack of available technologies/techniques, or awareness thereof, enabling appropriate changes to be made;
- mis-matching of skills with respect to the types of change required; and
- prohibitive costs of the required adaptation.

Although some of these obstacles can be addressed, at least to an extent, through nationwide initiatives, many seem more likely to find their solution in approaches which begin at the local level. Not least of the reasons for this is the often local nature of the problem. Nationwide initiatives are unlikely to be applicable across all regions and may fail to create the required level of resonance needed to encourage action.

Many of the issues that arise in the context of adjustment to demands relating to the environment are not really new. They are, by and large, the same issues which need to be considered in any programme seeking to promote employment and development in the context of structural adjustment. Training (of trainers, and of managers) and re-training (of employees and the unemployed); education (in terms of the need for adjustments and how they might be made); research and development (to foster the development of industry through, for example, partnerships between academic research groups and private sector companies); and last, but by no means least, financing to assist in the above initiatives, as well as the concrete adjustments in terms of equipment and services which need to be purchased. This issue is revisited in the final Chapter.

4.0 Role of firms in local initiatives

4.1 Summary of Experience to Date

It is apparent to ECOTEC, from involvement with environmental management markets over a considerable period of time, that corporate awareness of environmental issues has contributed to the development of environmental management over the last 4-5 years. Increasingly, industrial managers are coming to realise that a sound environmental record, both in terms of products and processes, is a powerful marketing and public relations tool, which can only work to the company's advantage in highly competitive markets. This is also borne out by work carried out for the European Foundation by Ulhoi et al (1996; see also the volume edited by Fischer and Schott 1993), in which the most often cited drivers for corporate environmental management were legislation, customer demand and corporate image. The Italian case study makes it clear that more and more companies are becoming aware of the significance of being seen as green in the context of markets driven by customers who themselves are beginning to seek out green products.

Although the situation varies considerably between countries and between industries, it is no longer true that legislation is the sole determinant of environmental management activity and the requirement for environmental goods and services: often the intention is to pre-empt or surpass legislation rather than merely achieve compliance. This trend will continue, creating a demand for services such as environmental auditing and technical studies and the development of increasingly sophisticated environmental management responses. However, the distance which companies may be willing to travel down this road will be influenced both by:

- their ability to finance such changes;
- their sheer size, and therefore, public visibility;
- where they are situated in the supply chain; and
- the degree to which they feel pressure to change (including the rigour with which environmental legislation is enforced).

Generally, there is increasing awareness among industrialists of the potential for waste reduction and recycling and the positive effects this can have on unit costs. In addition, the prospect of substantial financial benefits arising from investing in pollution abatement, clean technologies, low waste manufacturing processes, etc can be a significant driver for better environmental management. This is over and above the impetus given by legislation. Further impetus can be given, where no legislation exists, through international companies, who may be conscious of their image in terms of environmental performance, exerting pressure on suppliers in other states.

However, there is substantial variation between the Member States. This exists both with regard to the awareness of the potentially positive impact of clean technologies and processes on industry, and the pressures which are brought to bear on industry itself. An example from a study which sought to highlight some of these differences is given in Table 10.

Table 10: Environmental pressure impacting upon SMEs

	Foundries		Auto components	
	West Midlands	**Basque**	**West Midlands**	**Basque**
Legislative	High	Non-existent	Medium	Medium (preventing river discharges)
Public Pressure	Medium - high in some cases	Non-existent in majority of cases. Medium in a few	Low in majority of cases	Non existent
Customer Pressure	Non-existent	Non-existent	Medium	Low

Source: Hartnell, Skea and Garayalde 1996

Furthermore, the financial requirements for improving environmental performance are not insignificant and the lack of information/advice concerning the making of appropriate changes represents an important barrier. The existence of these barriers tends to have a sectoral or regional focus which makes them amenable to action at a local/regional level. Initiatives to support firms in their local environment as they adjust to demands for improved environmental performance in SMSs (Italy, Spain, Portugal and Greece) have been the subject of research supported by the European Foundation.

4.2 Case Study Material

The case study material for Greece is somewhat different to that for Spain, Portugal and Italy. The aim of the Greek study was to identify successful initiatives elsewhere that might be transferable to Greece, whilst the other studies sought to identify successful initiatives already undertaken. For this reason , the Greek study will be treated separately from the other two.

Spain, Portugal and Italy

The Spanish, Italian and Portuguese case studies are summarised in Table 11.

Motivations for Firm Behaviour

The Spanish and Italian case studies elaborate little on the reasons why certain initiatives were undertaken, and what actually led to their emergence. What is clear in the Italian study, both in the case of the Sarno and that of the Orbetello Lagoon, is that both areas had been declared, in 1993, areas ‘at high risk of environmental crisis.’ Such designation, the study points out, implies that objectives of a clean-up operation would be defined, as well as a deadline and guidelines for ‘drawing up a plan to identify the emergency measures necessary to remedy the risk situations and restore the environment of the area in question.’ To this end, the initiative was more from the top down than from the grass roots level.

Table 10: Key Characteristics of Case Studies

Area	Environmental Problems	Key Rationale	Ongoing and Planned Initiatives		Parties Involved	Expected Results	Obstacles to Success	Possibility of Synergy	Progress so Far
			Objectives	Content					
Orbetello (Italy)	Clean-up of Lagoon	Declaration of an area of environmental crisis following years of inaction	Reduce the environmental impact of industrial activity	Plan to construct phytopurification plant for fish-farming	Orbetello Pesca Lagunare spa	Self-financing project. Can be extended to other producers	Difficult relations with local people who distrust the productive activities in the lagoon	Dissemination of a behavioural model compatible with the needs of the lagoon. Research, information and population consensus	Limited progress owing to delays •Not clear
			Reduce pollution of lagoon waters	Construct infrastructure for purifying domestic and industrial waste discharged in the lagoon.	Orbetello commune/ Commissioner for the lagoon European Union	Preventative treatment of waste in lagoon. Lagoon crisis management	Delays in executing projects. Little participation by other economic operators		
			Reduce organic biomass	Collection of algae	Orbetello commune/ Commissioner for the lagoon (Min. Of Env.)	Reducing putrescent residues	Excessive algal growth and fication of water		Limited progress owing to delays
			Slow down silting up process	Dredging the lagoon bed	Orbetello commune/ Commissioner for the lagoon (Min. Of Env.)	Maintenance of aquatic ecosystems	Excessive silt production soon frustrates the measures taken		Not clear
Solofra (Italy)	Treatment of tannery waste water and disposal of waste	Declaration of area as one of environmental crisis following inaction, several firms closed down for infringing laws on environmental protection	For the tanneries, pretreatment of waste Tab. C law 319/76 and for the joint treatment plant (CODISO), of waste water Tab. A	Project to re-start the two existing units for chemical/ physical treatment and construction of a new biological plant for the complete treatment of domestic and industrial waste	Tanners' Association and CODISO (consortium to clean up Solofra), State, commune	Gradual compliance with rules governing waste dumped in the Solofrano stream	Differing declarations about the quantity of waste sent for treatment reducing efficiency of the process (when there is more waste than declared)	The trade union organisations have proposed setting up a limited company between the commune, CODISO, the company recycling tannery waste (CORCOSOL), the tannery owners and the unions for disposal of industrial and urban waste water (with] effects on the environment and employment)	The water pollution problem has proven intractable - a deputy commissioner has been appointed to implement measures to improve matters
			Recovery of tannery waste, specialised solid urban waste collection	Marketing roasted leather (nitrogenous fertiliser) for environmental and employment purposes	Tanners' Association and CODISO, CORCOSOL, State, commune	Increased turnover of roasted leather	Proliferation of firms collecting and storing solid tannery waste		

Table 10: Key Characteristics of Case Studies (continued)

Area	Environmental Problems	Key Rationale	Ongoing and Planned Initiatives		Parties Involved	Expected Results	Obstacles to Success	Possibility of Synergy	Progress so Far
			Objectives	Content					
Sarno (Italy)	Cleaning up the Sarno/potential environmental conflict with the Solofra area	Declaration of area as one of environmental crisis	Solution to water and health/sanitation emergency in the area, re-use of tomato processing waste	Information and awareness campaign; waste monitoring; corporate treatment plants; building treatment plant for domestic and industrial waste water; reduction of water consumption and possible re-cycling of process-ing waste water	Region of Campania, ANICAV (Producers' Association), commune, Legambiente, State	Improvement of local environment	Old plan for cleaning up the Sarno obsolete, no new plan	Integration of future (new) plan for cleaning up the Sarno with the Basin Plan and ANICAV and Legambiente initiatives	Major canneries have improved their environmental performance and there has been an improvement in the situation. However, smaller companies have been slower to change practices
Pizzo (Italy)	Optimum re-use of waste from tuna industry	Competitive threat from foreign companies	Economic and environmental benefits from waste	Installation of an extrusion plant	Private companies	Environmentally friendly production	Delay in identifying potential public funding sources (to co-fund the project)	Synergy between different commodity sectors in the food-processing industry	Not clear
Osuna, Andalucia (Spain)	Reduction in use of water in olive mills, reduce production of and pollution due to olive water	Not clear, possibly Osuna Council, also economic benefits	Economic and environmental benefits from reduction in water and labour use. Olive water problem transferred to bagasse oil extractors	Invest in continuous production system	Private companies, EAGGF, PITMA, MAPA	Reduction in water and labour use. Increase in energy use. Olive water problem displaced to bagasse oil extractors.	Funding to help cover investment		Probably, a reduction in water use by mills
	Adaptation of bagasse oil extractors to new milling process	Changes in olive milling process, which passed on problem of olive water from mills to bagasse oil extractors	Environmental benefits from dealing effectively with olive water problem, and from making use of waste materials	Technological upgrading and marketing of bagasse lees (including as fuel)	EAGGF, MAPA, Local Govt., Council of Andalucia	Retain profitability in the wake of technological upgrading	Funding to help cover investment. Identification of markets for wastes	Use of waste to generate energy and employment in conjunction with electricity company (Local Govt. to guarantee price)	The situation in the region as a whole is not clear. Only one firm was interviewed and the initiatives are in the pipeline
Guijelo, Castile-León (Spain)	Clean up of water pollution and other wastes	Community hygiene legislation	Treatment of wastes and effluents	Separation and collection of by-products, installation of wastewater treatment purifiers.	EAGGF, PITMA, Castile-León Council	Reduced pollution to water, reduced level of organic waste	The problem of disposing of bristles has proven intractable. Some abattoirs continue to use old processes, especially those that are publicly owned, and those attached to meat factories		An improvement has occurred owing to change in industrial abattoirs, but the problems of hairs and bristles persists

Table 10: Key Characteristics of Case Studies (continued)

Area	Environmental Problems	Key Rationale	Ongoing and Planned Initiatives		Parties Involved	Expected Results	Obstacles to Success	Possibility of Synergy	Progress so Far
			Objectives	Content					
	Financial provision for cost recovery of services for removal and purification of water	Environmental problems associated with effluent	Effluent tax		Town Council	Revenue generation, incentives for firms to install and operate	Industries in industrial estates feel discriminated against since taking samples to determine the level of the tax is easiest in these areas.		Not clear
Alcanterilla and Archena, Murcia (Spain)	Water scarcity and overexploitation of groundwater	Incidents of rationing at peak times in annual production cycle Salinization of groundwater	Reduce water use	Use of reverse osmosis and cooling towers	Canneries	Reduce scarcity of water, reduce extent of saline intrusion in groundwaters	Groundwater is obtained free of charge from unregistered wells Water use is a small % of companies' total costs		Some progress. More could be done, and some companies have limited plans in this regard
	ack of treatment of wastewater purification systems (effluents discharged into municipal sewers containing organic matter, and other suspended solids. And caustic soda	Blockages of sewers. Contamination of rivers.	Basic treatment of waters (mainly chemical)	Neutralisation of alkaline water, filtration	Canneries	Basic mprovements in wastewater quality	Companies don't see it as their problem. Charge for municipal water includes disposal fee – water from wells carries no such charge		Limited
			Install and maintain wastewater purification systems	Study followed up by 10yr. Regional Clean-Up plan.	Regional govt. Ayntamientos. EU (funding)	To have every locality with >10,000 people served by treatment systems that meet EU standards by 2006	Funding and allocation of responsibility	Coordination between Regional Govt and Ayuntamientos – achievement of national standards at local level	None so far due to lack of funding
	Atmospheric pollution (especially ??? ?? particulates)	Relations with neighbourhood	Reduce pollution	Humidifiers and follow-on	Canneries (one)	Improvement in air quality	Not perceived as a priority problem.		Limited
National Park of Serra d' Aire e Candeeiros (Portugal)	Problem of pig manure disposal	To reduce pollution in National park resulting from disposal	Energy generation from biogas plant Also fertiliser produced as by-product		Farmers, National Park manager, EU and State (funding)	Reduction in pollution, generation of energy	Need for scale economies and funding, but these have been resolved		Good

Sources: Italian and Spanish case study material

There appears to have been no such crisis in the case of the Pizzo tuna processing case study presumably because, as mentioned above, the motivation for those changes that took place was primarily commercial, not environmental. Partly for this reason, the initiative can be traced more directly to those concerned at the local level.

In the Spanish study, the changes implemented by the olive mills again (as mentioned above) appear to have been motivated primarily by commercial concerns. Only in the case of the abattoirs does the motivation in any way seem directly traceable to EU policies. Thus, although EU policy is seen as a major driving force behind changes to policies in SMSs in this regard, in only one of the six case studies in Spain and Italy are they directly driving the changes under consideration (the indirect impact in this regard is not clear. In the case of the Spanish canneries, the main motivation appears to have been a recognition of the need to reduce water consumption, which had led to restrictions on use in drier periods, especially summer, the period of peak operation).

In the Portuguese study, the inspiration for the initiative appears to have been that of one warden involved in the supervision of the National Park in which the initiative took place. This person acted as an entrepreneur in the Schumpeterian sense of one who gets things done.

The important issue which this discussion appears to highlight is that unless the commercial benefits of a given adjustment are apparent to those targeted, the drivers for change will tend to come from higher tiers of administration, though not necessarily the EU. Only in the Portuguese case did an initiative arise more or less spontaneously, and then partly on the basis of the benefits that could be gained through collective participation in a scheme whose capital costs were fully funded. The question as to what drives firms to make environmentally beneficial changes is important in the context of our understanding of the level of participation by a range of actors in the process of change (see below), and in our coming to appreciate the level of awareness in local communities/authorities where such initiatives occur. Will they, for example, only occur where crisis situations are such that local communities/authorities demand a response from the firms in question?

Incentives for Firms' Change of Behaviour

The Italian case study notes, as mentioned above, the limited degree to which the state sought to intervene 'on behalf of' the environment. It also notes that both industrialists and consumers are increasingly aware of the importance of environmental issues. It is suggested that three key issues have a major influence on the adjustment path open to firms:

- firms necessarily have to account for the environmental impact of their work;
- the depressed European and national economic climate has affected financial viability; and
- there is an increasing shortage of public financial resources for cleaning up the environment (presumably, in part, because of the depressed economic climate as well as the efforts to the aim to meet the convergence criteria for EMU; a viable programme in the latter regard is a precondition for receipt of Cohesion Funds).

Signs that things are moving in the right direction are that firms are recognising that benefits can arise from improving their image along environmental lines, and that firms are collaborating and carrying out projects either in place of, or as part of those funded by public money. In addition, the state, now recognising the importance of environmental issues, and seeking simultaneously to address problems of unemployment, is sponsoring environmental

schemes that employ 'surplus' labour, as indeed are trade unions and private firms. This type of activity emphasises the issues of adjustment which this report seeks to highlight, and indeed, there may be considerable potential for such schemes (see EA.UE 1997).

Although the Italian report highlights awareness of firms in terms of the importance of a green image, the report's discussion shows less appreciation of the possibilities for reducing costs through adopting environmentally sound processes. The report states that for most firms, the major barriers to adopting environmental strategies are firstly, economic and financial (a view echoed in the Spanish report - see below), and secondly, technological. Yet one of the case studies, that on processing tuna, addresses an initiative that has arisen out of the effects of international competition. The setting up of a company to utilise what was once regarded as waste as a raw material for the manufacture of animal feed should enable the firms involved to generate new income and jobs whilst reducing environmental impact. Indeed, the choice of this case is interesting since the positive environmental impacts seem to be merely secondary in the context of the company's aims to reduce its costs.

Furthermore, in the Solofra study, CORCOSOL collects solid waste from the tanneries (it seems that about 50% of total tannery waste is collected by them) and through hydrolysis, it processes the nitrogenous wastes into a fertiliser known as roasted leather. Wastes from the process are stored in metal containers provided by transport firms who then take it to dumps. CORCOSOL makes no profit, but the study argues that it could by being more pro-active in selling its product rather than selling it to other producers of organic compound fertilisers. Furthermore, noting its beneficial impact on employment and the environment, the study notes the potential for expansion of activities in the processing of other solid wastes, both general urban waste, and that from the treatment plant. Indeed, in the only case of their active involvement in the studies, the trade unions have suggested setting up a company involving the communes, Codiso, Corcosol Spa, tannery owners and the unions, which would deal with waste disposal and the treatment of waste water in an effort to promote, simultaneously, the goals of employment generation and environmental protection.

The conclusions to the Spanish study recognise clearly the potential benefits to be derived from the use of clean technologies. In the study on olive mills, [2] the change in processing technique from the traditional discontinuous process to the three - and two-phase continuous processes has reduced the costs of water and labour in the production process. (It is worth noting that the technologies employed, though adapted for use by Spanish engineers, were German or Italian.) In fact, the prime reason for companies adopting the newer continuous process techniques was, according to the report, not environmental but economic. [3]

It is not entirely clear what motivated the actions in respect of pollution control undertaken by the canneries in Spain. There may have been sound financial reasons for reducing water use since overdependence on a resource, particularly one so scarce as to be rationed at times of peak activity, may have had implications for the business beyond those quantifiable in predictable ways. In matters of effluent treatment, only relatively costless measures have been taken (the charge for water use levied by the Council includes the charge for disposal).

[2] It would be interesting to compare environmental initiatives across SMSs in this sector since it is, more or less, SMS specific.

[3] According to the study, the transition from three to two phase is on environmental grounds, though the report itself seems to suggest that this is not as green a transition as the equipment manufacturers suggest.

Lastly, in the Portuguese case, farmers' were motivated firstly by the efforts of the Park manager. They may have been encouraged to participate in the energy generation scheme since they were not forced to pay all the start up costs of the scheme (see Financing Issues below), and partly because the scheme was able to recoup its costs. There was, therefore, no net loss to the participating farmers, who also saved on disposal costs.

The studies show, therefore, the potential role to be played by environmental technologies in improving profitability. Indeed, it seems realistic to point out that where companies are aware of such opportunities, they are more likely to adapt on the basis of enlightened self-interest. However, a key point is that this enlightened self-interest often needs to be pointed out by would-be participants.

Effectiveness of Initiatives

In some of the cases, the success or otherwise of the initiatives is difficult to ascertain. This is either because initiatives are not yet fully underway, or because the implications for the environment are not entirely clear. Where initiatives have been delayed, this does not preclude possibilities for subsequent success, but it does suggest problems with the initiatives.

In the olive mills case, the local council, certainly in the past, was principally concerned with water use in the milling process, so the technical change has improved matters in this regard. However, another important issue, which is relevant to the oil mills study, is that of olive water. The switch in techniques from discontinuous to continuous processes has been extremely problematic for bagasse oil extraction firms, which process the bagasse by-product of olive oil extraction. The report notes that the 1990s marked a time of crisis for the bagasse oil extractors. Various attempts have been made to alleviate their difficulties, amongst which are encouraging the use of the component products as fertiliser and charcoal, and a more recent scheme to generate energy from bagasse lees and other by-products of processing. This would also contribute to employment which is important since the continuous processes of milling reduce demand for labour. They also increase demand for energy.

The abattoir case study illustrates the changes which occurred in the wake of EC regulations concerning plant modification from the sanitary point of view. In the face of these, the abattoirs have introduced measures with some financial support from PITMA, EAGGF and Castile-León Council. The performance of different firms appears to have varied significantly. Thus, whilst some firms have responded positively to environmental challenges, others (particularly in the public sector) have been slower to grasp the nettle.

The canneries in the Spanish report have clearly made some efforts to address issues of water use and pollution. However, they do not feel they have responsibility for treatment of waste water and solid wastes. On the other hand, neither is the Council able to finance the necessary investment to improve matters in this regard. Thus, it seems likely that the problem associated with wastes will remain. Although future actions are being considered by three of the five companies interviewed, only in one case has the possible impact of the investment been analysed in any way.

The Italian case study on the clean-up of Orbetello lagoon states that, in response to the issues of water pollution (and resultant malodorous air), through which tourism stands to be affected, as do local people, a three tier plan was devised consisting of :

- a medium-term infrastructure plan
- a short-term clean-up plan; and

- corporate measures

The first two were to be funded by the state (Fio, the investment and employment fund, and the Ministry of the Environment), the EU (Envireg), and possibly, local authoritie s.

The infrastructure plan, as well as funding needed to carry it out, has been held up since 1992 owing to administrative and bureaucratic problems. The clean -up phase was also delayed owing to a political matter regarding the division of responsibility , as Commissioner for the Lagoon, between the Communes of Orbetello Lagoon and Monte Argentario. Thus, the various initiatives had not been implemented (though some of the work had been contracted) at the time the study was revisited. as a result, one cann ot make any statement about the success or otherwise of the projects, and even if implemented successfully in their own terms, apparently, there remain problems associated with the disposal of dredgings from the lagoon's bed.

Only the private company's initiative, the phytopurification of the lagoon, appears not to have been plagued by problems. It is not clear whether the firm involved, Orbetello Pesca Lagunare spa, is an SME or otherwise. Furthermore, the conclusions state that this is a self -financing project, whilst the case study suggests that Envireg funds will be made available. The impact of the initiative is not known. In the study's conclusions, the suggestion is made that the technology used in phytopurification could be extended to other produce rs, yet it is not clear whether there are concrete measures in place to achieve this. One suspects not given the experimental nature of the initiative.

The Sarno cases illustrate the problems associated with reduced water flow. This reduction was due partly to rainfall reduction and partly to the presence of large numbers of water collection points. In the 1970s Casmez (Cassa per il Mezzogiorno) drew up a Special Project for cleaning up the Gulf of Naples following a cholera epidemic. The work was effectiv ely held up for many years. The intervening period brought about changes which necessitated a re-think of the Special Project.

Canneries, partly on the basis of advice from Anicav, have (at least in the cases of larger companies) managed to adapt behaviou r to bring their performance into line with standards laid down by legislation. Pollution from tanneries, on the other hand, does not seem to have been addressed adequately.

Perhaps the clearest example of a success is that of the Portuguese case. Here, the problems of disposal were addressed through a scheme which was able to take advantage of the scale economies which made energy generation from agricultural wastes a viable proposition. In doing this, not only was the disposal problem solved, but energy was generated with fertiliser as a by-product (which was given to participating families).

The case studies, therefore, show mixed results. This raises questions as to what factors lie behind successful and unsuccessful adaptations, and whether action is being taken to improve matters where success has not been assured.

Levels of Local Awareness

In the Sarno basin, the absence of the state is singled out as a major factor behind the considerable environmental damage caused by water consumption and pollu tion. On the other hand, the state has actively subsidised the canning industry. The canneries, through their trade

association, Anicav, have been the target of a campaign to increase awareness of environmental issues. When the canneries were singled out by Lega Ambiente and local associations, they responded by commissioning a study to evaluate the extent of pollution from the canneries. Given their past awareness campaigns, their belief, which was partly confirmed by the study, was that the canneries were not primarily responsible for water pollution. The main wastes, tomato peel and seeds, are being examined for their suitability as fertiliser and components of animal feed.

Anicav was also responsible for commissioning a study examining the problem of waste water from the industry and residential areas, and possibilities for its treatment. Interestingly, the project that has been proposed would involve private and public bodies, environmental associations and trade union organisations (see below).

Local awareness was also a feature of the Solofra study, yet it seems this awareness was brought on by the courts closing down tanneries for infringing the laws on environmental protection. The local authority aims to bring firms operating without a licence into line and relocate those operating in the urban centre. The initiatives that the study investigates have involved the state, the commune, the Tanners' Association, and a company managing processing waste named CORCOSOL (whose shareholders are, in the main, tannery owners - the majority shareholder is CODISO (see below)). There were significant delays between completion and putting the treatment plant into operation (5 years), one reason for which was the lack of a management body (the region subsequently appointed CODISO, a body 49% owned by the Tanners' Association and 51% owned by the commune of Solofra, which had been set up for this express purpose). The other reason was the lack of a suitable dump for sludge from the treatment process which was likely to be toxic.

Awareness of the issues in the Spanish case study on canneries has apparently been attenuated by concerns for employment. This is as true, it seems, for the local population as it is for the Council, which fears plant relocation if it applies environmental standards too rigorously.

Financing Issues

SMEs may be a credit risk owing to their more precarious position, and the fact that they are less able to guarantee their continued existence over the pay-back period of a piece of capital equipment. If credit were available on more favourable terms, the need for grants might be less than it currently appears, particularly in cases where the technical change improves the firm's competitive position. Ironically (see below), in the case of abattoirs, grant funding covered less of the investment funding than in the case of olive mills. In the latter case, the impact on the firm's competitive position was positive, yet if anything, adoption of new technology in the former case has had a detrimental impact on the firms' competitive position. Even so, only one of the four oil mills surveyed which have installed, or are considering installing the equipment, would have done so without financial assistance.

Grants for the abattoirs have covered, where they have been available, around 10% of the investment costs of the equipment installed. The study notes that, having taken these measures, the survival of the firms is far from assured owing to high maintenance costs of the plant and the impact of loans used to purchase the new technology, and competition from abattoirs directly attached to meat processing factories that have made less investment and have lower costs per head of animal slaughtered.

Finance is an issue for virtually all of the companies interv iewed, and constitutes a major brake on the adoption of environmental technologies. This is true in both countries, and not only for firms. It is possible that regulatory authorities might consider levies or charges as a means to assist in the financing of environmental improvements. In the Spanish abattoirs study, in an attempt to recover costs of removing, and purifying, excreta, rain, waste, and contaminated water collected in municipal sewers, the Town Council established an effluent tax. Since this is levied on the basis of the chemical oxygen demand of each factory's effluent, it is hoped that this will encourage appropriate measures to deal with waste water. There appears to be an underlying suspicion that poorly operating or undersized purifiers are a problem. There is no indication from the study as to whether the Council plans to use the funds for clean-up.

In the Portuguese case, the scheme was financed partly by EU funds, and partly by the state. This money was used to purchase tanks for the pig slurry, and since the project was financed at full costs, users are only required to pay for operation and maintenance costs. Once the scheme was up and running, the costs have been covered by income from the sale of energy (which the electricity company is obliged to buy).

Enforcement of Legislation

As with financing, the issue of enforcement of legislation and standards is common to all the case studies. It is difficult to tell whether matters have improved in this regard over time. The Spanish study addresses the relationship between regulator and regulated in each case. It is somewhat illuminating that in most cases, the relationship seems to be fairly good. Certainly, it would be difficult to conclude that (with the possible exception of the Hydrograph ic Confederation) the regulatory agencies apply the letter of the law with any degree of rigour. In the canneries case, this is related to the importance of the industries in terms of local employment. Reading between the lines of the Italian case studies suggests a similar laxity in the enforcement of policy.

In the Portuguese study, there is a suggestion that the enforcement of the law is uneven across units of different sizes. The Polluter Pays Principle is applied to the larger units, but the problem of smaller units remains. As the study illustrates, the fallacy of this approach is that a number of small units operating in a poorly regulated environment can cause significant damage, and this may occur in highly sensitive regions. Yet on the other hand , rigid application of the law would almost certainly lead to the bankruptcy of a number of small farm units, which would itself create its own environmental (and social) problems.

Greece

The Greek study begins by outlining the development of EU environme ntal policy. It sets out the Greek environmental situation, and then proceeds with a useful snapshot of some international initiatives concerning the promotion of the use of clean technologies. The Greek study, like the Italian study, appears to lack appre ciation of the possibility that environmental technologies can improve a company's competitive position through reducing costs. Indeed, the size of the global environmental industry is grossly underestimated at 'at least 100 million English pounds.' This is three orders of magnitude less than then true size of the global market (see Section 2.3 above). As in the Italian study, the benefits of clean technology are seen primarily in terms of corporate image, and the increasing significance of green products in world markets. There is a lack of appreciation of the role that clean technologies can play in reducing costs.

The Greek study analyses innovations from the point of view of their transferability to the Greek context. Ten projects from other EU Member States are chosen and scored against ten different criteria. These scores are then added to rank the ten projects according to the ease with which they could be transported to the Greek context. The laudable aim of the study is to suggest the possibility of an initiative in the field of clean technology in Greece where there is an absence of such schemes and of relevant information.

One of the problems with this approach is that it scores the projects in terms of the total, adding up the ten scores against the individual criteria. It is questionable whether this methodology is the best to use, as the applicability of any given programme to the Greek situation may be constrained by the lowest individual score against the different criteria. In other words, the programmes would only be as good as their weakest link, in which case, although the two highest ranked initiatives would retain their position, all other initiatives would be ranked equally (badly). Furthermore, there is no explanation of the scoring system, and as a result, it seems to be a highly subjective exercise.

Perhaps most importantly, some of the criteria against which initiatives are scored seem themselves to be the very issues that initiatives might seek to address. Thus, the culture and attitude of the workforce are not only determinants of the effectiveness of certain initiatives. Altering them is the aim of some others, and for good reasons. The same could be said for the environmental infrastructure in which the initiative operates. As interesting, therefore, as an assessment of the transferability of initiatives would have been an examination of the possibilities for overcoming what, in the study, are perceived as constraints to such transfer.

One should, however, appreciate the importance of work now being undertaken as a consequence of this initial exploration in so far the Clean Technology initiative has made an important start in the process of educating authorities and industry associations regarding the importance of clean technology. Its work in terms of information dissemination will, one hopes, be received in a more positive light as a result of such efforts.

4.3 Role of Participatory Initiatives

The extent of participation alluded to by the case studies is fairly limited. Even where initiatives have involved in some way a number of actors, the extent and nature of participation is not always clear in the case study material. If the conclusions of the Spanish study are to be taken at face value, this is hardly surprising. There , it is noted that:

- managers are not in general sensitive to environmental problems;
- locally, citizens also tend to lack sensitivity to environmental issues except in instances of disaster; and
- trade unions are more concerned with strictly labour-related matters than they are with the environment and only at the federal level are they engaged, in any way, in environmental issues, and then in cross-sectoral matters such as drought and desertification (with an important recent exception).

Thus, the absence of dialogue may be due, in no small part, to an absence of anything (environmental) for the parties to discuss. The Spanish study states; ‘with regard to the possibilities for co-operation of the different social agents on environmental matters, scarcely any initiatives have as yet been developed.’ Later, the view is expressed that; ‘the principal social agents (employers’ associations and trade unions), do not appear to be sufficiently well

informed and aware of the importance of the environmental problems caused by the olive oil and abattoir industries.'

In the case studies in the Italian report, again, participation is not a prominent feature. In the Orbetello case, it is not clear how the three tiers of initiatives developed and whether, and if so, how they are linked. The study's conclusions refer to 'close co-operation between local authorities and the fishermen's co-operative,' which also runs some of the aquaculture operations in the lagoon, but also, to the 'difficult relations with local people who distrust the productive activities in the lagoon.' The latter point suggests that participatory initiatives that include the local community will be made more or less possible by the past record of the firm, or firms involved. Why should communities trust those who have negatively affected their livelihoods or quality of life in the past?

On the other hand, the Sarno case study alludes to an important role played by Lega Ambiente, the environmental association, and a number of local associations in proposing change and future strategies for the clean-up of the river. This, and the fact that the study mentions growing awareness amongst Italian consumers in terms of their choosing 'eco-products,' suggests that consciousness of environmental pollution and the problems it creates is far from non-existent. The waste water treatment project proposed by Anicav through a study commissioned from Castalia, a company in the IRI group, has already involved private and public bodies, as well as environmental associations and trade unions. The evolution of this project is particularly worthy of examination. In a footnote, the study notes:

'This project, designed to interact with the plan for cleaning up the Sarno, aims to resolve the environmental problems as a whole. In fact, it is not just a question of making firms observe the legal provisions, but also of finding a solution which includes reducing consumption.'

The involvement of social partners in this case is either the outcome of, or what has enabled, the project's more encompassing aims. Which of the two is not clear, nor is the important question as to how these partners were approached.

The Solofra case is the only one in which trade unions have become actively involved in a proposal. Only in this case does the union appear to have recognised, and acted upon, the potential for employment generation of environmental protection issues. In general, however, one is left with limited understanding concerning the genesis of the various initiatives in terms of the social partners involved, and why they happened when, and in the way that they did. The Portuguese study is more clearly a bottom-up initiative in whose success the participation of farmers in the locality was a pre-requisite.

The Portuguese case appears to point to the importance of the individual entrepreneurs in particular circumstances. The awareness of one individual who had responsibility for the National Park of Serra D'Aire e Candeeiros led to the individual units co-operating in solving a particular problem which could not have been solved. Essentially, the scale economies which co-operative action made possible made treatment with biogas recovery a viable proposition.

5.0 policy lessons

5.1 Review of Initiatives

It will be recalled that in Section 1.2, it was hypothesised that successful initiatives in SMSs would have to overcome:

- the lack of a tradition of public concern over environmental conditions;
- the dominance of economic development priorities;
- the decentralised regulatory framework;
- the lack of a tradition of networking;
- the importance of SMEs in economic activity;
- the importance of larger companies as customers;
- the lack of environmental skills and infrastructure; and
- the lack of a tradition of applying the PPP.

The case studies which we have examined suggest that these are indeed significant hurdles which such intiatives must overcome. Arguably, only the Portuguese case manages to come close to coping with these obstacles.

In what follows we try to draw some lessons from the studie s. A note of caution should be sounded here since we are effectively trying to generalise on the basis of a small number of studies carried out in rural areas and concentrated on the processing of agricultural products (and 'wastes'). There is good reason to ask how representative these studies are, and therefore, how solid is the base from which we seek to draw conclusions.

5.1.1. Motivation

To the extent that several of the studies cover companies who take measures of their own 'free will,' it seems fair to say that there is little that can be learned in terms of best practice regarding the processes by which to achieve adjustment other than to allude to the important role that could be played by training and education in speeding up this process, as well as the signalling effect which could be played by economic instruments. The question of funding and its availability remains important.

There does seem to be a difference in the way in which public sector and private sector firms have responded in Spain (in the abattoir case study). Furthermore, the state has subsidised the tomato canning industry in Italy, but it has ignored its environmental impact. One hesitates to draw conclusions on the basis of such a small sample, but one might expect the private s ector response to be more disciplined by changes in the institutions that shape the market.

5.1.2 Financing Issues

The question of how firms are assisted, financially, in making the transitions which are required of them in order to meet, or go beyond en vironmental standards (or help to fulfil them) is an interesting one, the more so since the studies make it clear that it is the costs of adjustment which loom largest in the minds of companies contemplating such changes. Yet to the extent that the lack of any adjustment implies the imposition of external costs on others, a rigid application of the Polluter Pays Principle would require the full costs of adjustment to be met by polluting enterprises.

The sheer magnitude of the problem in places, illustrated by the fact that the Italian government has seen fit to designate 17 areas as being at high risk of environmental crisis, suggests the need for assistance, whatever ones views on the desirability of elements of subsidy. It is not clear from the limited sample which mechanisms employ what criteria to judge the eligibility or otherwise of a given scheme. As a result, it is difficult to draw any lessons from the case studies regarding 'best practice' in financing (for example, to maximise additionality).

Some technical changes offer win-win outcomes, and as long as credit is readily available on favourable terms, the benefits of the investment should more than cover their costs. The most significant issue, therefore, may be that related to the availability of credit and the terms on which it is made available. Companies concerned with day-to-day survival are unlikely to invest in technologies with long payback periods (and at higher levels of interest, short payback periods begin to look increasingly lengthy). It is very important to make sure that companies understand, if they do not already, that investments in clean technology can improve their competitive position, and that environmental regulation need not imply imposition of a cost. The commentary on the studies suggests that awareness of this as a possibility is scant. If this is true, then the studies themselves - the case of tuna processing, the case of the olive mills, and potentially, the processing of waste materials for use as fertiliser in Solofra - might constitute a contribution to raising such awareness. In turn, this would hopefully encourage new and existing industries, domestically, to invest in clean technologies and processes, as well as environmental clean-up.

In other cases reported, particularly with regard to discharge of effluents and disposal of by-products for which no use can be found (wastes), the necessary infrastructural investments are of such a scale that public sector involvement may be warranted. Alternatively, project finance may be a viable route to follow, but in either case, cost recover would be desirable, and would require the levying of realistic user charges which would presumably have their own incentive effect.

One issue which any increase in the availability of financial assistance may have to overcome is a tendency to eschew initiatives that engage a group of actors. Should grant aid be given only to initiatives which include a number of social partners? It does seem that the more social partners that can be included in a given initiative, the more encompassing the solution is likely to (have to) be. The conditionality which might be applied in awarding grants is an important area worthy of proper exploration.

5.1.3. Changing Perceptions of a Problem

Some of the case studies show how important it is for firms to re-consider their concepts of 'waste', and how waste is defined. Typically, waste is defined as material which an individual or firm is seeking to discard. Whether a material is or is not discarded presumably reflects a perception of its value. In the cases of canning in the Sarno basin, the treatment of waste in Solofra, tuna processing in Pizzo, and the initiatives of bagasse processors in Andalucia, one sees again and again the importance of companies' re-assessing the value of erstwhile wastes, and transforming it into useful, and marketable products. ECOTEC's experience also shows that similar considerations apply when companies address the extent of waste (rather than its nature), and compare the costs of waste materials with the level of profit as a percentage of company turnover. Typically, the two are similar so that reductions in waste lead to similar

increases in profit margins. This is an important issue for SMEs, especially in manufacturing, where margins are often quite low, making the company vulnerable to market fluctuations.

One important point made in the Portuguese study is that the awareness of solutions which are viable can itself alter perceptions of an existing problem. There is something to be said for the view that, especially for actors functioning at subsistence levels, a problem will only be perceived as an issue worthy of attention when it is clear where the solution lies, and that the solution is implementable. In a sense, the arriv al of a viable solution allows those who live with a problem to overcome their denial of the problem.

5.1.4. Participation, Awareness, and Regulation

The case studies suggested a rather limited extent of participation. Is the lack of participation a result of a lack of awareness, or is the lack of awareness is the result of a lack of participation? If there is limited interaction between those responsible for implementing and enforcing policies and those targeted by them, it should come as no surprise that awareness is low, and initiatives are slow to emerge.

This is an important point since there is a suggestion that awareness amongst citizens in the countries concerned is predicated upon the emergence of crisis situations. One thing is clear. The longer action is delayed, the greater the damage caused, and the greater the distrust displayed by those affected toward those who create the problem, the fewer opportunities there will be for dialogue as a result, and the more costly the process of clean -up, if indeed, clean-up is possible (the damage may be irreversible). In such circumstances, crisis management becomes more likely (if not necessary) than measures promoting smoother adjustment over a period of time. Furthermore, such crises place the spotlight o n regulators, who are forced to take visible actions, often in the form of punitive fines, or worse still, plant closures (partly for reasons of political expediency). If this leads to adversarial relations between the regulator and the regulated, then an opportunity will have been lost in the sense that a comprehensive environmental policy should seek to do more than demand adjustment: it should facilitate it. In short, the regulator should 'propose' solutions rather than bluntly 'oppose' prevailing pract ice.

In this context, the Portuguese study makes the point that the enforcement of regulatory legislation should be contextualised by the sectoral conditions, and the economic position of the regulated body, which exist. The problem with this approach is that a large number of actors would escape regulation. What this suggests is that traditional approaches to regulation may need to be reconsidered so that the regulator does not only consider enforcement issues, but also seeks to propose ways in which env ironmental improvements can be made. Not only would this create a less adversarial atmosphere, but it could raise environmental awareness and even to lead to proposals of win -win technologies / collaborative enterprises that improve the regulated entities' competitive position.

5.2 Complementarity with Other Initiatives

This neatly leads us in to consideration of policy measures available to promote adjustment toward more environmentally responsible management within firms. Typically, as is well known, the options for policy-makers are characterised as market -based, or regulation-based (command and control). The first works through changing the incentive structure which companies are forced to confront. The second imposes a standard of one or other type up on a firm. Thus, each sends a message to the firm, but with the exception of the imposition of a

specific technical/technological standard, none gives much assistance to firms regarding how to make the sorts of change which are desired. Thus, where such policy instruments are applied, they invariably need to be complemented by other measures to help firms respond to the message the instrument sends.

The need for such complementary measures is paramount in environments that are not rich in information, and for companies for whom the cost of acquiring such information appears prohibitively high. The first of these characterises the SMS situation, and the second is a problem confronted by most SMEs. Thus, SMEs in SMSs will be more heavily dependent than most on such measures. Information concerning the available technical and technological alternatives, as well as the likely cost implications of these, is crucial in enabling adaptation to meet environmental concerns. Where such information is not available, and where the scope for adaptive change becomes more limited as a result, the use of any policy instrument and its enforcement may condemn companies to their demise. It is quite understandable, therefore, that local authorities, even where they have the power to do so, have tended not to raise taxes at the local level (the Guijelo effluent tax is an exception). As soon as local and regional authorities tax companies at different levels, they change the decision-making framework for would-be investors, with impacts on the employment prospects of the area for which they are responsible. Questions of environmental justice would also surface (as with toxic waste dumps in the US - see Harvey 1997) as those least able to bear the loss of environmental services were required to bear them.

Typically, the sorts of initiative that can be employed include:

- awareness raising mechanisms - it should not be assumed that solutions need to come from outside the firm. Once those who are familiar with the company's productive processes are educated in ways that raise their understanding of the environmental problems it creates, they are likely to be the ones best placed to implement changes which can be readily introduced. Similarly, they may be best placed to adapt technologies or techniques used elsewhere to the firms specific circumstances;
- promotion of the dissemination of environmental technologies - policies in this regard may take the form of national, regional, or local level initiatives. Evidently, the regional distribution of a given industry plays a role in determining the level at which such initiatives should concentrate. One form of this type of initiative is the demonstration project, another, the types of initiative aimed at ascertaining best practice within an industry with the aim of promoting its subsequent spread. Other forms include media for disseminating experience in similar industries facing similar problems elsewhere in Europe (and beyond);
- encouraging firms to carry out their own assessment of costs and benefits of environmental investments, and helping them to do so - through such measures, firms can be encouraged to analyse more closely the likely impact of such investments on firm performance; and
- encouraging innovations in environmental technologies - in many countries, this takes the form of inter-firm, or private-public sector interaction (e.g. between firms and universities) with the aim of promoting pollution control technologies and processes. In others, the fiscal system has been used to encourage investments in such technologies (both by private firms through accelerated depreciation allowances, and differential taxes on equity investments). This has the advantage of stimulating activity along a technological trajectory which is likely to become increasingly globalised in years to come. With such globalisation will come global market opportunities.

Unfortunately, not all of these measures are likely to yield results as quickly as might be desirable. The pressing need to cope with serious pollution problems that seems to typify the case studies suggests actions are needed in the short, or at worst, medium term. In the longer term, environmental problems will not disappear, and the trend, as mentioned above, is toward tighter not looser standards. The significance of historical developments in environmental policy and its application must be seen in this light. It is surely incumbent upon the institutions of the European Union to be more alive to the issues facing SMEs, especially in Southern Member States, so as to encourage further progress in the environmental field.

There are EU-level initiatives and programmes which are relevant in seeking to promote the sorts of change in which we are interested here. One possible avenue for addressing, simultaneously, the issues of employment, environment, and funding for necessary adjustment processes is through the Structural and Cohesion Funds of the EU. Indeed, one of the priorities for the Structural Funds to the end of 1999 is Environment and Sustainable Development. To some extent, a shift in priorities appears to be underway. The move is away from infrastructure projects and towards preventive approaches, including business support and the dissemination of best practice in the environmental field. In part, this reflects the significance accorded to the Polluter Pays Principle in the Maastricht Treaty.

Also on the horizon is a Directive on Strategic Environmental Assessment, which would require Member States to undertake environmental assessment of all large funding programmes. The shift towards greater emphasis on environmental issues also extends to the EU's thinking on CAP reform, as set out in the Agenda 2000 documentation. There, the beginning of a shift further away from price support and more clearly towards rural development funding is underway. Not only is it possible, therefore, that payments to farmers will increasingly be made conditional on the pursuit of sound environmental practices, but also, the integration of support within programmes of a more developmental nature may occur.

Lastly, initiatives such as the LIFE programme could play a catalytic role. LIFE funds innovative projects in the environmental field and could be a conduit for demonstration projects and information disemmination (including the identification of best practice elsewhere - see below).

5.3 Policy Conclusions and Recommendations

Based on the work on which the first synthesis report was based, it was generally believed that initiatives with the greatest chance of success in meeting their objectives would:

◊ be appropriate to the local/regional context (eg. legislative framework, level of environmental actions etc);
◊ require focus and strategy;

be dynamic, adapting to changing needs and/or must be clearly focused.

◊ be pro-active,
  * participation of SMEs will require stimulation
  * participation of local industry representatives desirable.
◊ be practical,
  * requires strong technical skills to be credible and productive

- ◊ involve networking with a purpose,
  - * balance the need to involve a wide range of partners with a manageable network.
- ◊ be independent,
  - * but will benefit from involvement of regulators
  - * need for financial independence.

The case studies raise serious questions as to whether these factors, which are those that appeared to influence the success or failure of local initiatives in other Member States, are transferable to the SMSs context.

The Spanish study concludes that, in the sectors analysed, there is a complete absence of personnel qualified to control and mo nitor pollution in sectors analysed. It mentions the lack of R&D in Spain, and the fact that more attention is paid to the consequences of pollution than addressing its source. It laments the lack of environmental training for employers. Such training is very much the exception rather than the rule. It calls for more training, and greater exchange (and continuity in that exchange) of information between social partners and those engaged in activities to improve the environment at EU level. The authors also call for greater use of meetings between employers' associations and trade unions, attended also by local authorities, where problems and solutions can be highlighted and discussed.

The conclusions to the Italian study are couched firstly in terms of conf lict resolution. In this context, the resolution of environmental problems through negotiation and resolution of conflicts, rather than through administratively imposed (techno -scientific) fiat, is encouraged. It notes, as has ECOTEC in a report on volunta ry initiatives, the problems which can arise in this context where the relevant public agencies see their interests in protecting a particular party to the dispute. The study states that in addition, decision -making processes have been rather unpredictable, and this is compounded by the shaky ground on which claims to knowledge are based concerning certain environmental problems.

It seems unclear that, as the study claims, the problems regarding conflict can be solved through US style methods (for reasons mentioned above). Indeed, the study highlights the fact that firms' initiatives only took place once the areas in which they operated had been designated crisis areas. Until recently, the attitude towards the environment had been one of indifference on the part both of firms and competent authorities, as well as local residents. Whether the environment in which such negotiations might take place has changed sufficiently for there to be an acceptable negotiated solution is surely open to question.

In most cases, financial problems appear to have been less insurmountable than technical ones, and the simple fact remains that many of the initiatives have either not worked, or have been unable to cope with the sheer magnitude of the problem. Furthermore, even w here, as in the Sarno case, major canneries now appear to abiding by the law, medium, and especially smaller firms approach environmental legislation with both eyes fixed firmly on evasion.

The Italian study advocates more funding of projects designed at complying with environmental legislation; more studies on the pollution caused by certain industries; research designed to perfect new production techniques; and the promotion of information campaigns relating to the existence of such technologies. Various synergies are sought between these measures, and also, the study advocates more meetings of interested parties.

The conclusions of both studies seem sensible and appropriate. However, with regard to advocating the setting up of more meetings between interested parties, the authors' experience suggests there would be little use in carrying these out for their own sake. Such meetings of minds invariably work best when ideas and objectives are well focused. If awareness generally is low, and if companies are indifferent to environmental issues, such meetings are unlikely to lead to easily negotiated solutions to environmental problems, and may simply serve to emphasise the extent of confrontation. The relevant parties cannot be dragged to the negotiating table, though political strategies might bring reluctant parties forward.

In addition, the call for greater financing is too blunt. It will be impossible for firms to have all environmental investments funded by public bodies and grant making organisations. These bodies need to prioritise investments, and ensure that their financial resources are put to the best use. There are cases where firms have been given grants to purchase air pollution control technology, but these have remained unused because of high operating costs, and the local authority's lack of concern for the problem of air pollution. This would suggest some logic in having grant-giving bodies imposing conditionality upon potential users (and where leverage over regional authorities exists, cross-conditionality in developing regulators equipped to suggest solutions).

A clear need exists for education aimed at illustrating to firms the possible synergies between improved profitability and complying with environmental legislation (above and beyond those associated with the image of the company and its products). This would, it seems, be a useful strategy in breaking down firms' indifference to environmental issues, but it is by no means a problem confined to SMSs. Companies need, however, to have the overall costs and benefits of certain investments spelt out to them, or better still, they need to be assisted in carrying out their own investment appraisals. Enlightened self-interest could prove a key motivating factor in changing companies' perceptions. Furthermore, as a number of the studies show, environmental initiatives can create new markets and expand employment opportunities. This message could usefully be conveyed to trade unions who have, thus far, failed to recognise the potential up-side in terms of labour demand, which might follow from the adoption of pollution control technologies. This is not to say that in all cases, profits and employment are increased as environmental problems are addressed. It does seem necessary, however, to stress that it is not the case that the need to become more green leads inevitably to a loss of employment and a fall in profitability.

One way in which the a change in practices would be encouraged would be through banks and other financial institutions (insurance companies etc.) seeking to channel their funds away from activities which may be environmentally sensitive. The approach of banks will, in part, be shaped by the existing liability legislation. Thus, a recent survey of US banks found that 46% of them had stopped granting loans to companies in areas deemed to be environmentally sensitive (KPMG 1997). Some European banks have made moves in this respect but the movement has been slower in Europe, and the insurance business appears to have changed even more slowly. Liability legislation in European countries appears insufficiently strong to create such shifts at present.

Another possible avenue for encouraging change is through larger companies' supply chains. The power that these firms may exert in the marketplace, and the importance of contracts from them for SMEs makes the views of larger companies potentially a very persuasive carrot-and-stick approach to influencing the environmental performance in SMEs. KPMG (1997) report that the Spanish department store, El Corte Inglés, has reported making

environmental demands of its suppliers, whilst AUTOEUROPA (a joint venture between Ford and Volkswagen) in Portugal requires suppliers of some components to make them recyclable, and demands that packaging from sup pliers be made from recyclable, or recycled, material. Similarly, in the public sector, procurement policies can influence the performance of would-be suppliers. In Spain, some regional authorities employ environmental criteria in their procurement process , and have ruled that all official documents will be printed on recycled paper.

Legislation emanating from Brussels is asking that Member States look ever more closely at the impact of firms operating within their borders on the environment. In many cases , Member States are given leeway in terms of how they go about achieving certain objectives. Over time, the Commission has shifted the focus away from regulation towards economic instruments. More recently, the optimistic light in which economic instrument s were first cast has dimmed somewhat. A more eclectic view is replacing the earlier, more dogmatic position of either regulation, or economic instruments. One reason for this has been the apparent inability of policies to encourage the changes desired (at the required pace).

The Commission has looked favourably upon the use of voluntary approaches to environmental policy. ECOTEC has recently carried out a study for the European Environment Agency evaluating the performance of these approaches, the result s of which suggest that, where they are well designed, they can perform a useful role in encouraging firms to adapt their behaviour in more environmentally responsible directions (EEA 1997). The role of SMEs in such agreements may not, however, always be p articularly prominent and the power of larger firms in a given sector may not always take the interests of SMEs seriously.

Some such initiatives have been present in SMSs. However, just as one senses that the SMSs have been left behind in the setting of p olicy itself, so it also seems they may have been left behind in the evolution of policy. If a degree of participation is a pre -requisite for voluntary initiatives, they seem less likely to occur in SMSs because of the rarity of such participation. Furthermore, such initiatives may be best suited to industries that are dominated by few players precisely because of the difficulty of bringing on board SMEs. Regarding economic instruments, relatively few have been applied in SMSs.

A combination of economic in struments and regulatory techniques, complemented by some of the measures mentioned above, is likely to prove most effective. In considering the weight of regulation and economic instruments to be used, key points are likely to be the enforcement capability of the implementing body, and the relative costs of the different options. The issue of time is also critical for two reasons. The first relates to the actual time available for action, either because matters have reached emergency proportions, or becaus e of targets the country is required to meet. The second relates to sequencing of policy interventions. The sequencing should also be influenced by the time available for action (how critical has the situation become?), and the prevailing situation in term s of available techniques and technology (if there is sufficient time, and if available technologies are unsuitable, measures to promote innovation should be put in place and should be followed by the announcement of the future likelihood of economic, or r egulatory instruments being implemented). Sequencing issues should affect the way in which policy initiatives are announced. For example, a tax should be announced in advance, and if it is envisaged that it should be increased over time, the tax's evolution should be outlined as early as possible.

In the short- and medium-term, the best option for SMSs may be to identify appropriate technologies and techniques in use elsewhere in the country, or in other Member States, or even outside them, in order to present firms with options from which to choose. The mechanism through which such information is to be disseminated could take a variety of forms varying from best practice brochures, through to directing companies towards existing sources of information (from, for example, United Nations agencies such as UNIDO - a number of initiatives are outlined in the Greek report). In addition, effort may take place at the federal or regional level, often in conjunction with firms. To the extent that some industries are more or less non-existent outside SMSs (olive mills, for example), the menu of options is unlikely to be extensive beyond those regions. Whether it can be enriched in the short - to medium-term may depend on links with would-be suppliers, and appropriate identification of possibilities for improvement.

In all policy initiatives, it will be important, for reasons of clarity, cost, and overall effectiveness, to ensure that policy initiatives at different tiers of government (and from different units within a given tier) are complementary, and pull in the same, environmentally positive, direction. Specifically, environmentally damaging subsidies, which by definition set up tensions with environmental policy, need to be removed. The issue of environmentally damaging subsidies is arousing increasing concern in OECD countries.

To sum up, the magnitude of the problems facing SMSs, the predominance of SMEs within their industrial sectors, and the importance of the issue of employment, makes the challenge facing SMEs in SMSs as they seek to adapt to higher EU-wide standards of environmental performance particularly significant. The case studies make it clear that the challenge is compounded by the fact that in many cases, it needs to be met rather quickly. There is little time to lose, but also, much that could be lost if adjustment is not carefully thought out and carried through. The only thing that seems certain is that adjustment cannot be put off forever, and the longer it is put off, the more damaging the consequences of continued pollution are likely to be, and the greater the instability resulting from the need for even more drastic changes than are required at present.

APPENDIX 1

Box 2.1 summarises the definition of industries included for purposes of quan tifying expenditure on pollution control. This definition is consistent with the 'Core' definition proposed by the Joint EUROSTAT/OECD Working Group on the environment industry.

BOX 2.1 : WHAT IS THE ENVIRONMENTAL INDUSTRY?

The environmental industry has been defined as comprising sectors, or environmental domains, consistent with the OECD/Eurostat 'core' definition. These are, in summary:

- Air Pollution Control (APC): defined as products, systems and services for the removal of gaseous and particulate p ollutants from air.
- Waste water Treatment (WWT): defined as products, systems and services for the removal of pollutants from municipal waste water (sewage) and industrial waste water. Waste waters are taken to include cooling waters, but activities for p urifying drinking water are excluded.
- Waste Management (WM): defined as products, systems and services for the collection, disposal and treatment of municipal, commercial and industrial wastes. To the extent that discrete waste recycling activities can be defined they are included.
- Contaminated Land and Water Remediation (CLR): defined as products, systems and services for the identification, assessment and remediation of contaminated sites.
- Noise and Vibration Control (NVC): defined as products, systems and services for the abatement of noise pollution.
- Environmental Research and Development (R&D) : defined as discrete research and development activity specifically attributable to environmental objectives
- Environmental Monitoring (EMI): defined as pro ducts, systems and services for the monitoring of environmental standards and conditions, both directly and remotely
- Environmental Consultancy Services (ES): defined as more general consultancy services

The definition does not include: -

- water supply (abstraction and distribution);
- "environmental improvement" activities, such as landscaping or site conservation;
- the management, control and treatment of radioactive waste.

It does include the specification, design, manufacture, construction, installation , commissioning and operation of projects, together with the services and consumables associated with the operation of plant and other pollution control and waste management

activities. Civil engineering work specifically associated with the above activities (for example in waste water treatment) is included. Expenditure on clean technologies is also included to the extent that additional costs of cleaner, compared with dirtier technologies has been defined, but there is clearly a difficulty in identifying and quantifying the industry sectors selling such equipment and services.

Data concerning pollution control equipment is difficult to come by. Such data as exists exhibits marked discrepancies, again for reasons associated with definitions, which vary across countries and sources. The figures presented here are the best available for the respective Member States, and come from a major study of expenditure on eco-industries in the EU carried out by ECOTEC, in association with BIPE Conseil and IFO.

The total EU market is just below 90 billion ECU. Whilst a degree of confidence can be attached to this figure, as one moves to lower levels of aggregation, confidence in the data is reduced. This is true both for disaggregation by sector and by Member State.

Table 1 below shows the expenditure for individual Member States (also in Figure 1). Also shown are the turnovers as a percentage of GDP (Figure 2), and the break down between public and private expenditure by Member State (Figure 3).

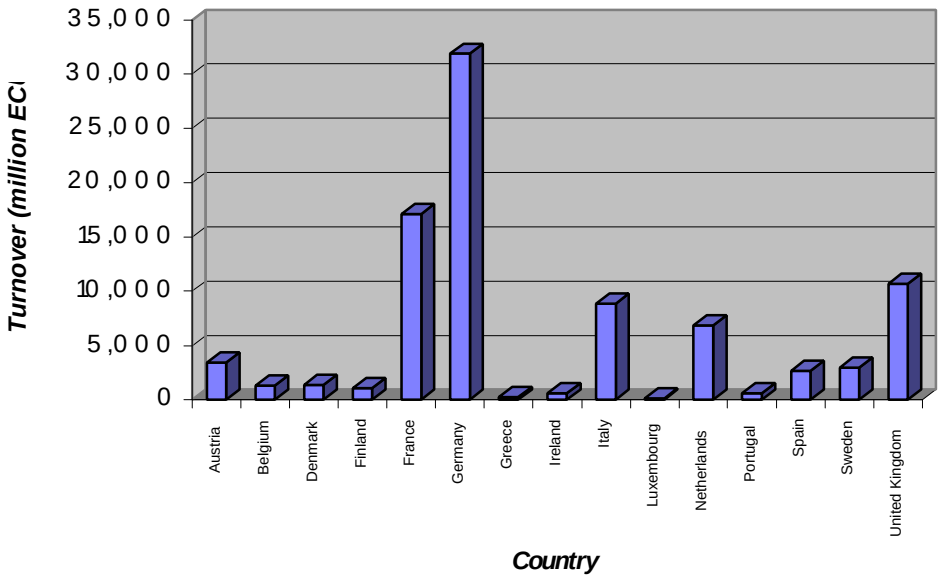
TABLE 1 : ENVIRONMENTAL EXPENDITURE DATA FOR EU MEMBER STATES

Country	Total Expenditure	Environmental Expenditure as % GDP	Public Expenditure as % of Total	Private Expenditure as % of Total
Austria	3420	2.55%	58	38
Belgium	1320	0.77%	57	37
Denmark	1380	1.44%	71	24
Finland	1070	1.23%	51	44
France	17120	1.45%	49	43
Germany	31870	2.03%	45	50
Greece	230	0.27%	72	23
Ireland	610	1.09%	51	42
Italy	8870	0.94%	60	35
Lux.	120	0.49%	45	49
Neths	6880	2.34%	52	43
Portugal	600	1.00%	81	18
Spain	2680	0.68%	75	5
Sweden	2940	1.28%	67	31
UK	10700	1.00%	25	66

Source ECOTEC et al 1997

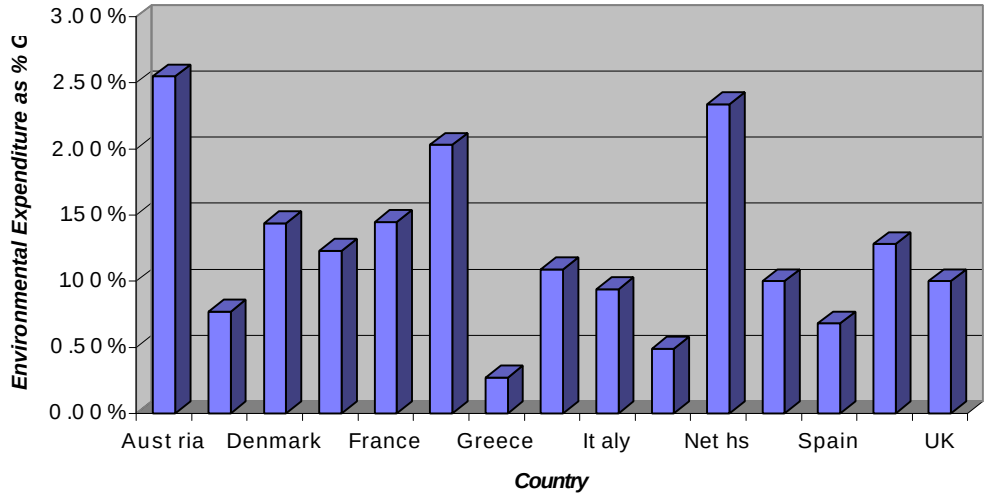
N.B. percentage figures do not sum to 100 since household expenditure is not included.

Figure 1: Turnover (MECU) of EU ECO-Industries, 1994



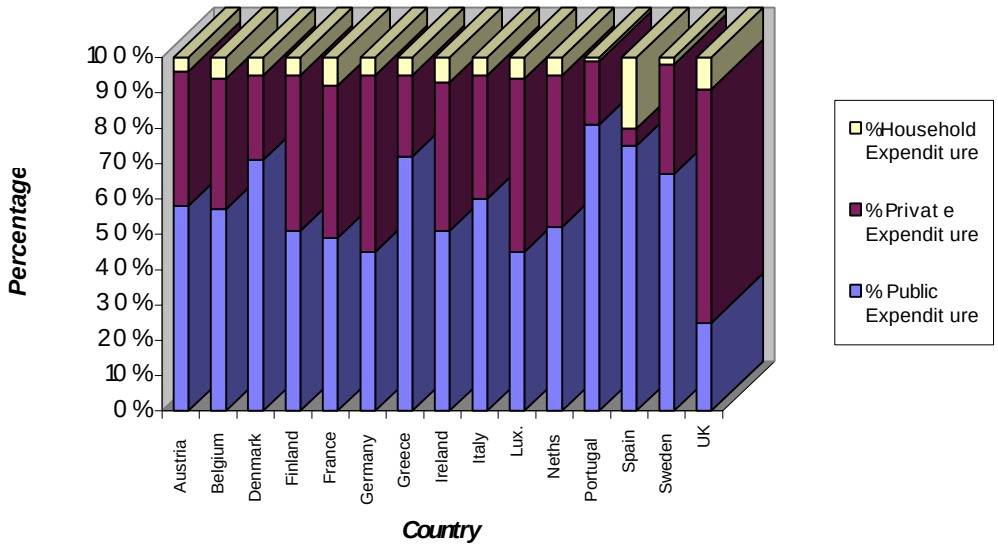
Source: ECOTEC et al 1997

Figure 2: Environmental Expenditure as % GDP by Member State



Source: ECOTEC et al 1997.

Figure 3 Member State Environmental Expenditure by Sector of Origin



Source: ECOTEC et al 1997.

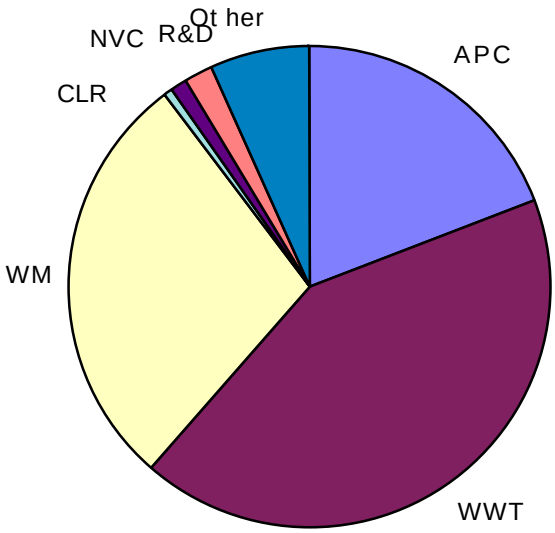
Expenditure on pollution control in Italy is quite considerable, but for other SMSs, it is very low. This is true both in absolute terms, and in relation to GDP. Indeed, although Italian expenditure is relatively high, in terms of GDP, it too is relatively depressed compared with other Member States.

The breakdown of public expenditure by public and private sectors reveals some interesting facts. The percentage of eco-industry markets accounted for by public expenditure is unusually low in the UK, reflecting the UK's greater emphasis on the role of the private sector in this regard. The reverse is the case for Greece, Spain, Portugal, and to a lesser extent, Italy, each of which also has relatively low expenditure levels in terms of GDP. To some extent, this is a reflection of exactly the issue under consideration here, that of encouraging firms to take pro-active steps in improving environmental performance.

There are enormous disparities between sizes of the markets for each domain as shown in Figure 4. The markets for air pollution control (APC), waste water treatment (WWT) and waste management (WM) account for the majority of eco-industry expenditure in the EU. Indeed, 90 per cent of all EU eco-industry expenditure is devoted to these three domains. However, it should be noted that some expenditure on contaminated land and water remediation (CLR) and noise and vibration control (NVC) is included in expenditure on WM as some companies include these categories in WM expenditure. The environmental problems facing SMSs are likely to reflect the relative significance of these markets.

N.B. Refer to Box 1 for meaning of abbreviations. Expenditure on EMI and ES is frequently included as part of other domains, so data are only given for the other six domains

Figure 4: ECO-Industry Expenditure by Environmental Domain



Source: ECOTEC et al 1997

APPENDIX 2

BIBLIOGRAPHY

ECOTEC / BIPE / IFO (1997). An Estimate of Eco -Industries in the European Union 1994. Birmingham: ECOTEC.

EEA (European Environment Agency) (1997). Environmental Agreements: Environmental Effectiveness. Environmental Issues Series No. 3 - Vol. 1. Copenhagen: European Environment Agency.

Fischer, Kurt and Johan Schott (eds.) (1993). Environmental Strategies for Industry: International Perspectives on Research Needs and Policy Implications. Washington D.C.: Island Press

Harvey, David (1997). Justice, Nature and the Geography of Difference. Oxford: Blackwell

KPMG (1997). The Environmental Challenge and Small and Medium -Sized Enterprises in Europe. Background Paper for the Dutch Ministry of Housing, Spatial Planning and the Environment in preparation for the Informal Environment Council, Amsterdam, April 1997. The Hague: KPMG

Pieters, Jan H. M. (1997). Subsidies and the Environme nt. Paper prepared for the UN Fourth Expert Group Meeting on Financial Issues of Agenda 21, January 8 -10 1997, Santiago, Chile. Paris: OECD

Robson, Charles (1997). Report on Employment and Sustainability - Work by the European Foundation 1993 -1997. European Foundation for the Improvement of Living and Working Conditions, Dublin.

Ulhøi, John P., Henning Madsen, Pall M. Rikhardsson (1996). Training in Environmental Management - Industry and Sustainability, Part 1: Corporate Environmental and Resource Management and Educational Requirements. European Foundation for the Improvement of Living and Working Conditions, Dublin, EF/96/17/EN

WCED (World Commission on Environment and Development ((1987). Our Common Future. Oxford: Oxford University Press

CASE STUDIES

ADEA (1996). The Firm and the Local Environment. European Foundation for the Improvement of Living and Working Conditions, Dublin, EF/98/17/EN

ECOTER (1996). The Firm and the Environment - Regional/Local Cooperation in the Southern States - Italy. European Foundation for the Improvement of Living and Working Conditions, Dublin.

Hartnell, Gaynor, Jim Skea and Inigo Garayalde (1996). Employment and Sustainability in the EU Manufacturing Sector: Foundries and Mechanical Engineering. European Foundation for the Improvement of Living and Working Conditions, Dublin, EF/98/31/EN

Hitchens, David et al (1996). The Firm, Competitiveness and Environmental Regulations; A Study of the European Food Processing Industries. European Foundation for the Improvement of Living and Working Conditions, Dublin and Edward Elgar Publishing Limited, UK, EF/98/21/EN

Lévêque, François et al (1996). Local Sustainability and Competitiveness: The Case of the Ceramic Tile Industry. European Foundation for the Improvement of Living and Working Conditions, Dublin, EF/98/32/EN

Valiantza, E. (1994). Transfer of Innovations and Clean Technology for Improvement of the Environmental Performance of Companies (especially SMEs) in Greece. European Foundation for the Improvement of Living and Working Conditions, Dublin.

