



ENVIRONMENTAL AGREEMENTS

Environmental Effectiveness



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PREFACE

The present report on Environmental Agreements, in conjunction with the report on “Environmental Taxes; Implementation and Environmental Effectiveness”, published in 1996, (both undertaken following a request from the European Parliament in 1996) are two examples of the work of the EEA relating to the review and evaluation of environmental policy instruments.

The ‘mission’ of the EEA includes the ‘provision of timely and targeted information’. This report on Environmental Agreements is targeted at policy makers and the public and is timed to assist the European Parliament’s debate on the European Commission’s Communication on Environmental Agreements published in November 1996.

Both reports are part of the Agency’s work which is intended to contribute to the best available information to policy debates. The reports are also intended to be accessible to non-experts so as to encourage the wider involvement of European citizens in policy development and implementation, thus enriching the “prior consultation” process requested by Parliamentarians.

Environmental Agreements are relatively recent in the policy arena so the available literature on the subject is scarce and consists mainly of theoretical studies with very little on the practical application of these instruments. In order to fill this gap this report examines 6 Agreements covering various countries and environmental issues, and tries to evaluate their environmental effectiveness.

Quantitative assessments of the environmental effectiveness of the case studies was hampered by lack of available and reliable information. The results of the analysis seem to show that some environmental improvement has been achieved during the period of some of the Agreements. However, due to a lack of monitoring and reporting it is not possible to establish well-founded cau-

sal relationships between this improvement and the Agreement. Other factors may have played a part, such as existing regulations or other policy instruments.

Qualitative evidence however seems to indicate other valuable benefits resulting from the Agreements, such as consensus building, sharing of information, awareness raising and an improvement of environment management in businesses. These are in line with the spirit of shared responsibility embedded in the Fifth Environmental Action Programme.

Parliament, NGOs and others have raised concerns about some aspects of the Environmental Agreements, such as their legal nature, transparency during the negotiation process, access to information on the agreements and their implementation, and compliance with the EU Treaty. Some of these issues are mentioned in the report, but an in-depth analysis is outside the scope of this study.

The report also includes a synthesis of a survey on Environmental Agreements undertaken by the European Commission during 1996 which shows that over 300 Environmental Agreements, are currently recognised by national authorities of the countries of the European Union. Given the growing enthusiasm for this instrument, and in particular the support it has gained from industry, it is important to make a joint effort to improve the design and implementation of Environmental Agreements in order to make it possible to monitor and assess their effectiveness vis-à-vis other policy tools.

The European Commission’s Communication on Environmental Agreements provides guidelines on the improved use and implementation of Environmental Agreements. By providing practical information on the application and monitoring of a few Agreements and attempting to evaluate their

environmental effectiveness the Agency aims to make a valuable contribution to the on-going debate, not only in the European Parliament, but also in national parliaments, in the Commission, and among the public in general.

The Agency produced this report based on an initial draft provided by ECOTEC Research and Consulting Limited. The project was co-ordinated and edited by Teresa Ribeiro (Project Manager). Kai Schlegelmilch made substantial contributions to the editing with some help from David Gee. Martin Büchele and Keimpe Wieringa provided support to the development of the project.

The report was reviewed by an Advisory Group consisting of Frank Convery (EEA Scientific Committee), Peter Dröll (EC- DGXI), Pedro Hen-

riques (EC -DGIII), François Lévêque (CERNA, Ecole des Mines, Paris), Nicholas Ashford (Massachusetts Institute of Technology, Boston), Peter Wiederkehr (OECD), Jan Willem Biekart (Netherlands Society, for Nature and Environment), Jan van den Broek (VNONCW/UNICE), Mara Carboara (CEFIC/UNICE), and representatives of the Secretariat of the Committee on Environment, Public Health and Consumer Protection of the European Parliament.

Additional technical consultation was undertaken with the EEA NFP/EIONET Group.

I would like to thank the EEA team and the other contributors for their efforts in producing this report.

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Executive Director

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- 2. CASE STUDY 2: Sweden: Agreement On Producer Responsibility For Packaging**
- 3. CASE STUDY 3: Declaration by German Industry and Trade on Global Warming Prevention (1995) and the Updated and Extended Declaration by German Industry and Trade on Global Warming Prevention (1996)**
- 4. CASE STUDY 4: The Netherlands: Declaration on the Implementation of Environmental Policy in the Chemical Industry**
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EXECUTIVE SUMMARY

Main Conclusions

- 1 *Since the late 1980s, there has been increased use of Environmental Agreements (EAs) as policy tools in EU Member States, especially in industry and waste management. This approach to environmental management mirrors current trends of consensus-building and participatory processes in public policy and complements the traditional command-and-control approach. EAs reflect both the development of shared responsibilities and the integration of environmental considerations into company management structures.*
- 2 *Some concerns have been expressed, however, about the rise of EAs as a new policy instrument, particularly by parties that are not involved in their negotiation, such as the European Parliament and NGOs. If EAs are to be used more widely, it is necessary to improve their credibility and accountability. **This calls for the setting of clear targets, for greater transparency during the negotiation, implementation and evaluation of EAs and for the introduction of reliable monitoring and reporting arrangements.** In the European Commission's Communication on Environmental Agreements, guidelines were presented for the use of EAs, aimed at improving both their credibility among the various stakeholders and their effectiveness. These guidelines include: the setting of quantified objectives, the monitoring of results, periodic reporting, the verification of results, and provisions for access to information and for the accession of third parties.*
- 3 *Compared to other policy instruments, e.g. taxes, few evaluations of EAs, whether ex-ante or ex-post, have been made and there is little literature available on their use. The report aims to help fill this gap by trying to assess the*

environmental effectiveness of six different EAs. These particular EAs were selected in order to cover various countries, sectors and themes, and, being recent, they include more complete monitoring and reporting requirements.

- 4 ***In most cases it was not possible to make a quantitative assessment of the environmental effectiveness of the agreements due to the lack of reliable monitoring data and consistent reporting,** which prevented comparisons being made between the current situation and what would most likely have happened if no agreement had been concluded (the 'business-as-usual' situation). Some wider benefits were found, however, including environmental improvements on the situation prior to the agreement and the encouragement of environmental management in business.*

- 5 *EAs appear to be of most use as complements to other policy measures, such as regulations and fiscal instruments, where they can make a valuable contribution, especially in terms of their ability to raise awareness, create consensus and to provide a forum for information-sharing among different parties. EAs also seem to be useful in improving environmental management in industry and business.*



Key Points

Policy Context

The European Union's Fifth Environmental Action Programme (5EAP) is seen as part of the longer-term re-focusing of environmental policy in EU Member States and is aimed at integrating EU policy-making into a sustainable framework for economic and social development. Towards this end, the 5EAP highlighted the need for a broadening of the range of policy instruments to complement the regulations, including the increased use of economic and market-based instruments and those based on 'shared responsibility', such as awareness raising measures, financial support mechanisms and voluntary environmental policy instruments.

On 9 December 1996, following the proposal from the Commission for a review of the 5EAP, the 'Environment' Council reached a political agreement in view of the adoption of a common position on Article 3 relating to broadening the range of instruments. In relation to developing market-based instruments (including economic and financial instruments) at an appropriate level, it was decided that particular attention should be given to the use of Environmental Agreements, which pursue environmental objectives while respecting competition rules.

In this context and with a view to ensuring the proper implementation of Community environmental legislation, the European Commission recently produced the above-mentioned Communication on the use of Environmental Agreements, which concludes that:

"Environmental Agreements with industry have an important role to play within the mix of policy instruments sought by the Commission.... They can offer cost-effective solutions when implementing environmental objectives and can bring about

effective measures in advance of and in supplement to legislation. In order to be effective, it is essential, however, to ensure their transparency and reliability."

Purpose of the Study

Aims and Objectives

The present report was produced following a request from the European Parliament for an overview report on 'Voluntary Agreements'. It is part of the work currently being undertaken by the EEA on reviewing and evaluating environmental policy instruments, in conformity with Council Regulation (EEC) No 1210/90, which established the Agency, and sets out that one of the tasks of the Agency shall be:

"to provide the Community and the Member States with the objective information necessary for framing and implementing sound and effective environmental policies;...."

(Art. 2 (ii))

Given that Environmental Agreements (EAs) are an emerging force in the policy arena, the EEA is interested in assessing how effective such approaches are. This task is, however, greatly hampered by the lack of empirical data, studies and literature available.

The present study builds on the survey of Environmental Agreements undertaken by the European Commission and focuses on their environmental effectiveness. Other important issues such as competition, legal status and involvement of third parties are outside the scope of this study. The aim of the study is to inform policy makers and the general public on the use of Environmental Agreements in the countries of the European Union by providing:

- a brief review of current application of EAs in Member States

- an overview of the current debate and positions of the various stakeholders
- a first assessment of the environmental effectiveness of a selected number of EAs
- recommendations on further work required in the area of EAs.

Definition of Environmental Agreements

There is no standard definition of 'environmental agreements', which are also known as 'voluntary agreements', 'negotiated agreements' or 'covenants'. The term covers different types of agreements, ranging from voluntary 'codes of conduct' to legally binding agreements. For the purposes of this study, Environmental Agreements (EAs) are defined as covering only those commitments undertaken by firms and sector associations, which are the result of negotiations with public authorities and/or explicitly recognised by the authorities. Other voluntary approaches, such as codes of conduct, fall outside the scope of the study.

Approach

The present assessment is based on a review of the available literature (limited as it is), the inventory of EAs prepared for the Commission and the detailed investigation of six EAs. These EAs were selected to demonstrate the range of national and economic contexts and different approaches and, more particularly, to include both 'target-setting EAs' and 'implementation EAs'. The former agreements occur where negotiation determined the environmental policy targets, such as in France and Germany; the latter are found where negotiation was directed to implementing policy targets determined outside the EA, as is the case in Denmark, the Netherlands, Portugal and Sweden.

Particular attention was given to establish a baseline against which to measure environmental effectiveness. The difficulties in establishing this baseline are well known and affect all policy evaluations.

Main Findings

The use of EAs

By 1996 more than 300 EAs had been concluded at the national level in the EU. This figure is deceptively low because it excludes EAs that have been concluded at the sub-national level. A few agreements have been in place for over two decades but it was only in the late 1980s that there was a noticeable increase in their use; since then, the number of EAs concluded per year has increased steadily over time. National trends show a less uniform picture.

All EU countries are reported to have EAs. The Netherlands leads the way in the development of EAs with over 100 in place and the Netherlands and Germany account for approximately two thirds of the EAs surveyed. There are a higher number of EAs in some smaller countries, such as Austria, Belgium, Denmark and Sweden, than in the larger countries of France, Italy and the UK. This may indicate that EAs are used more often in countries where environmental policies have matured and where there is a tradition of decentralisation, consensus-building and negotiation in decision-making processes.

Other non-EU countries, such as the USA, Japan, Canada and New Zealand, have also applied agreements as environmental policy tools.

In some countries which are more advanced in the use of EAs, such as the Netherlands, agreements have been concluded in almost all the environmental policy areas identified under the 5EAP. Furthermore, in a large number of the countries where EAs are evident, a range of 5EAP themes have been covered. All countries with EAs have agreements operating in the waste management sector. Many of the EAs implemented in the Member States to date are found in those sectors where most pollution occurs - such as metals and metal finishing, chemicals, energy, transport - with more

than 20 % of the total number of EAs operational in the chemical sector.

Many of the agreements surveyed in the EU do not include monitoring and reporting requirements, which poses the following problems: a) it damages the credibility of the instruments; b) it denies their accountability; and c) it makes it extremely difficult to conduct ex-post evaluations of their effectiveness. However, the most recent agreements incorporate some monitoring and reporting requirements.

Environmental effectiveness

It is difficult to draw general conclusions about the environmental effectiveness of EAs because of the small number of case studies assessed in this report. The variations between EAs in terms of their objectives and approaches, as well as variations in the cultural, political, economic and environmental contexts in which they are negotiated and function also make it difficult to generalise on the effectiveness of EAs.

Ideally, the environmental effectiveness of a policy instrument should be assessed against an alternative policy scenario. Such assessments are normally speculative as there is usually no data to back up these alternative policy scenarios. A second option is to use a 'business-as-usual' scenario against which to compare the current situation, whereby one assumes, having determined the changes that would have happened in the absence of the instrument, that any additional changes are attributable to the EA. If this is not possible due to lack of data, then all that can be done is to compare the situation with that prior to the agreement, but without being able to attribute any environmental improvement to the EA.

Problems encountered in trying to assess the environmental effectiveness of the six EAs in question relate to:

- the general absence of a quantitative baseline ('business-as-usual' scenario) against which to assess effectiveness of the EA
- a lack of quantitative data on the reference situation, prior to the agreement
- a lack of quantitative data on the current situation.

The definition of the 'business-as-usual' scenario is essential for any ex-post evaluation of the instrument's effectiveness. This problem, coupled with the related difficulty of disentangling the effect of the different instruments of a policy package, is also faced when trying to evaluate other policy instruments such as regulations or taxes. However, evaluating EAs is made more complicated since: they are relatively new in the policy arena and relevant theoretical and empirical analysis is scarce; their targets are often expressed in terms of percentage reductions of unspecified quantities (e.g. emissions levels when the agreement was established); and, unlike other instruments (e.g. taxes), they have not hitherto been the object of evaluations (whether ex-ante or ex-post).

Table 1: SUMMARY CONCLUSIONS ON THE ENVIRONMENTAL EFFECTIVENESS OF ENVIRONMENTAL AGREEMENTS

ENVIRONMENTAL ASSESSMENT				
Case Study EA	Environmental Improvement (Reference Situation)	Environmental Effectiveness (Trend Baseline)	Technical Change (Environmental Management)	Remarks (wider outcomes)
Target setting				
French End of Life Vehicles	?	?	+	Targets demonstrated as technically feasible. Shared responsibility and cooperation reinforced. Restructuring of the sector promoted. Doubt about economic feasibility.
German CO ₂ -emissions	?	?	0/?	Introduced to avoid CO ₂ energy tax/waste heat ordinance. Agreement was reviewed due to criticism on promised "effort" and targets not being stringent enough: In 1996, reference year was changed from 1987 to 1990 making targets partly more stringent.
Implementation				
Swedish Packaging Waste	+/?	?	?	Target for corrugated paper and glass bottles for wine and spirits exceeded slightly. However, data indicates that target might already have been achieved in 1992. Other targets (not all) making good progress. Reference situation data seemed to be too optimistic. For half of the materials, reference data are missing. Possibly less costly than alternative municipal collection systems.
Dutch Chemicals	+++	+ / ?	+	Availability of data and monitoring allows for confirmation of environmental effectiveness. Encouragement of application of company environmental management systems. Facilitation of permissions and an increased trust and co-operation are important features.
Portuguese Pulp Paper	++	?	+	EAs helped reinforce regulation, that firms were hardly complying with. However, threat of penalties and public pressure were needed too. The EA also increased understanding of the issues and trust between parties, and improved motivation and eco-management within the sector.
Danish Transport Packaging Waste	+/?	?	+/?	Through a focus on easily collectable transport packaging, the EA might allow to meet EU Packaging Directive at a low cost. Information on this kind of waste will help to increase re-use or material recycling.
+/++/+++ = slightly positive/positive/ very positive 0 = absent or negligible ? = uncertain outcome (no data available, unknown effect)				

Main findings on the case studies

Table 1 summarises the assessment of the environmental effectiveness of the six EAs. The main findings are that:

- generally, there have been environmental improvements since the EAs were signed, although these cannot be conclusively attributed to the EAs. However, since they were part of a policy package one can expect that EAs played some part in this improvement;
- due to the lack of reliable and consistent data, conclusions on the environmental effectiveness (assessment against the 'business-as-usual' scenario) of the EA cannot be drawn; only in the case of the Netherlands was data partially available indicating some environmental effectiveness;
- technical change (the adoption of environmental management measures at corporate level) occurred as a result of the agreement, in the case of France, the Netherlands, Portugal and possibly Denmark;
- in the case of the Netherlands, Portugal, Sweden and Denmark, EAs have been applied as a supporting measure, following or complementing other instruments (regulations);
- strong incentives (subsidies, or the threat of regulation, taxes or penalties) accompanied the negotiation of the six EAs surveyed.

Concluding Observations

The study provides an overview of the current use of EAs and the debate surrounding them and investigates a small number of EAs in some detail. Bearing in mind the wide variation in the nature and focus of EAs and the wide range of views on their effectiveness, the following observations could be made:

- 'implementation EAs' can be useful and complementary environmental policy tools, as long as they follow the type of guidelines set out in the EC Communication;
- 'target-setting EAs' are much more difficult to assess in terms of their role and performance and raise wider questions concerning the role of Government and other stakeholders in the formulation of environmental policy;
- EAs which are currently in operation provide a testing ground for the development of transferable models and for establishing good practice; however, replication needs to be driven by the interests and objectives of the parties concerned in a given situation;
- the independent verification of EAs raises political and practical questions which need to be addressed if the credibility and accountability of EAs is to be improved.

The case-study research also indicates that EAs have the potential to contribute to the achievement of policy goals. In particular:

- EAs provide a basis for environmental policy where regulatory or fiscal instruments would be difficult to administer; 'implementation EAs' essentially complement regulatory policy and rely on regulatory (and often fiscal) sanctions or the threat of alternative instruments as a backup;
- EAs provide a framework for pro-active environmental management, for awareness-raising on environmental issues and for testing new policy responses;
- EAs can facilitate flexible responses and the identification of new mechanisms by improving information flows and promoting awareness of new technical and management practices;

- evidence suggests that EAs may contribute to the overall improvement of the environment; if more stringent targets are necessary, however, EAs will have to be used as part of a broader package of policy instruments.

Future implementation of EAs should take into account key requirements for the improvement of

their effectiveness, most importantly the establishment of reliable and verifiable monitoring and reporting mechanisms and the setting of clear targets.

The table below illustrates some of the requirements for the improved use of EAs.

EAs are most suitable for:

- pro-active industries or businesses
- small number of partners or high organisation level of signatory partners
- production of goods (i.e. industry)
- sectors which have matured and face limited competition (i.e. where there are few opportunities for 'free riders')
- environmental problems of limited scale (national and regional environmental problems)
- limited number of sources of pollution
- long-term targets (early signal).

Implementation is more effective when:

- clear targets are set prior to the agreement
- the agreement specifies the baseline against which improvements will be measured
- the agreement specifies reliable and clear monitoring and reporting mechanisms
- technical solutions are available in order to reach the agreed target
- the costs of complying with the EA are limited and are relatively similar for all members of the target group
- third parties are involved in the design and application of EAs.

Recommendations for further work

Listed below are a number of suggestions for areas for further work related, firstly, to the continued research into the operation of EAs and, secondly, to the assessment of their impact:

- assessment of the synergies and counteractions between the operation of EAs and other policy instruments;
- empirical research into the relative effects of EAs and alternative policy instruments on the behaviour of individual companies, including their impacts on market structure and competition issues;
- appraisal of the role and motives of governments in EAs which are used to negotiate targets;
- investigation into the suitability of targets set through EAs, including comparisons with alternative ways of target-setting by the government;
- independent empirical research into the evolution of 'target-setting EAs', regarding the respective roles of those directly involved in their negotiation and of those effectively excluded from this process;
- investigation into the most appropriate operational structure for EAs, according to their specific application (e.g. in relation to EAs at different geographic levels);
- examination of the effect of the EA process (incl. information exchange) on technical change, innovation and the integration of environmental management into sector and corporate activity;
- investigation into why similar activities (e.g. information exchange) had not been launched prior to the EA, including a 'barrier analysis'; or investigation into the best practices of such activities, where they did occur in advance of the EA, or where no EA was applied at all;
- consideration of the methods and resources needed for EAs to encourage local public participation and dialogue;
- review of the links between the operations of different environmental management systems and the reporting and information requirements under the EA;
- further independent research into the environmental (and cost-) effectiveness of EAs and their ability to promote sustainable development (by encouraging systemic behavioural and technological change), in comparison with other policy instruments;
- development of guidelines for standardising EA monitoring and reporting requirements in order to improve the data available and allow for comparable and reliable environmental assessment.

1. INTRODUCTION

1.1 The Policy Context

The Fifth Environmental Action Programme and Sustainable Development

The European Union's Fifth Environmental Action Programme (5EAP) has made explicit the need for market-based and other economic instruments, awareness-raising measures, financial-support mechanisms and voluntary environmental policy instruments. It is recognised as part of a longer term re-focusing of environmental policy in European member states.

The promotion of sustainable growth, with respect for the environment, was a principle objective in the 1992 Treaty on European Union (TEU). Building on a foundation set by the common environmental policy enabled by the Single European Act, the TEU founded a long term strategy for the EU, to fuse its economic growth objectives with protection of the environment. In stating,

“The Community shall have as its task... to promote... sustainable and non-inflationary growth respecting the environment,”

in Article 2, the TEU set a new agenda for the EU's common environment policy.

Previous environmental policies, at the EU and national levels, relied mainly on traditional command and control regulations (environmental standards, emissions limits, etc.). In the early 1990s, it was recognised that successful long term development requires not only more effort in environmental protection but also the need to integrate environmental protection into all areas of activity and to involve all members of society, in the spirit of shared responsibility between public administrations, public and private sectors and the general public.

The 5EAP has called for a broad mix of instru-

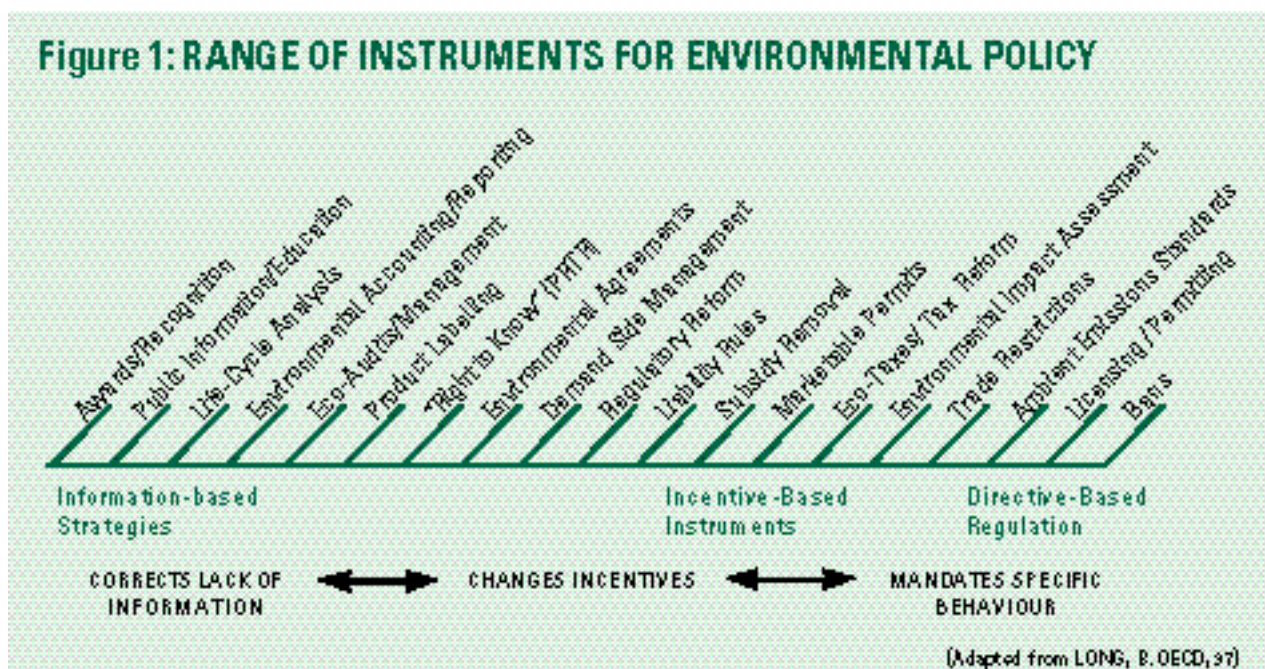
ments to be applied in environmental policy making:

“In order to bring about substantial changes in current trends and practises and to involve all sectors of society, in a spirit of shared responsibility, a broader mix of instruments needs to be developed and applied. Environmental policy will rest on four main sets of instruments: regulatory instruments, market-based instruments (including economic and fiscal instruments and voluntary agreements), horizontal supporting instruments (research, information, education, etc.) and financial support mechanisms.”

The overall objective of the 5EAP is to move policy making in the EU towards a sustainable framework of economic and social development. The strategy developed under the 5EAP has been to concentrate on five key sectors of economic activity: energy; industry; transport; tourism and agriculture. It's objectives are targeted at ten theme areas, including:

1. climate change
2. acidification
3. ozone depletion
4. air pollution and quality
5. urban environment
6. inland water quality
7. coastal and marine zones
8. waste management
9. nature and biodiversity
10. risk.

The 5EAP responded to the challenge of meeting these targets by calling for wider approaches to be used in environmental policy, in particular for more policies to be based on shared responsibility. Environmental agreements are one among a range of policy tools (see table below, adapted from Long/OECD,1997) which can contribute to achieving the overall objective of sustainable development.



The Revised 5EAP Action Plan

The 5EAP is intended to run until the year 2000. As intended, a review of progress in the implementation of the 5EAP approach was carried out in 1995. The results were presented in a progress report published by the Commission, and the European Environment Agency's State of the Environment Report (both produced in 1995).

This evaluation confirmed the strategy adopted under the 5EAP, but highlighted the need to accelerate the development of EU environmental policy to ensure that the objectives and targets set out in the 5EAP can be met by 2000. The review of progress identified five key priority areas in which Community action needs to be stepped up. These include broadening the range of instruments to bring about changes towards sustainable development, including the use of environmental agreements, but emphasising the use of market-based instruments.

Following the proposal for an European Parliament and Council Decision on the review of the 5EAP, presented by the Commission in January 1996, at its meeting on 9th December 1996 the 'Environment' Council reached a political agreement in view of the adoption of a common position on Article 3, relating to broadening of the range of instruments. In particular (in relation to the development, at an appropriate level, of effective market-based and other economic instruments, as a means to implement policy), special attention will be given to, among other factors, environmental agreements which pursue environmental objectives while respecting competition rules.

European Commission Communication on Environmental Agreements

In the context of the strategy established in the 5EAP, and the need to ensure the proper implementation of Community environmental legislation, the European Commission has produced a

communication on the use of Environmental Agreements as an instrument for the implementation of environmental policy in the Community (COM (96) 561 final, European Commission, November 1996). The Communication concludes that:

“Environmental Agreements with industry have an important role to play within the mix of policy instruments sought by the Commission... They can offer cost-effective solutions when implementing environmental objectives and can bring about effective measures in advance of and in supplement to legislation. In order to be effective, it is essential, however to ensure their transparency and reliability.”

The Communication states that EAs have the potential to: (I) promote a pro-active attitude on the part of industry, (II) provide cost-effective, tailor-made solutions and (III) allow for a quicker and smoother achievement of objectives. The Communication sets guidelines for the effective use of EAs, conditions for their use in the implementation of certain European Directives, and identifies how EAs can be used at European Community level.

As stated by the Commission on the Communication, in the development of new legislation the potential use of environmental agreements for the implementation of certain provisions might be considered on a case by case basis. The communication provides a recommendation to Member States, giving a clear framework for the use of EAs in the implementation of European Directives. It includes the following check list for the use of Environmental Agreements:

Box 1.1: CHECKLIST FOR ENVIRONMENTAL AGREEMENTS

- I. Reasons for the choice of the instrument
 1. Advantages compared to legislative and economic measures (environmental- and cost-effectiveness, feasibility)
 2. Sector coverage, strength of business associations
 3. Public awareness of the issue
 4. Previous involvement of legislator in setting objectives
- II. Content
 1. Parties to the agreement (associations and/or individual firms)
 2. Subject
 3. Definition of terms
 4. Quantified objectives
 5. Staged approach
 6. Specification of obligations
 7. Monitoring of results
 8. Periodic reporting
 9. Access to information
 10. Arrangements for collection/evaluation/verification of results
 11. Sanctions
 12. Accession of third parties
 13. Duration
 14. Revision
 15. Termination
 16. Legal nature of the agreement
 17. Jurisdiction
- III. Compliance with EC Treaty
 1. Notification to the Commission required?
 2. Free movement of goods affected?
 3. Competition affected (competitors excluded, prices fixed, etc.)?
 4. State aid rules applicable and respected?
 5. Distortion of competition justified on environmental grounds?
 6. Distortion a proportionate means to reach the objective?
- IV. Publication

Source: COM (96) 561 final, European Commission, November 1996

1.2 Definition of Environmental Agreements for the Purpose of the Study

There is no standard definition of ‘environmental agreement’, also called ‘voluntary agreement’. It is recognised that the often used term ‘voluntary agreement’ does not really capture the true nature of many agreements. Terms such as ‘negotiated agreement’ or ‘covenant’ are used to reflect more accurately the nature of the instrument. For the purposes of this study, environmental agreements (EAs) will be defined as in the Commission’s Communication, i.e., as covering only those voluntary commitments undertaken by firms and sector (s), which are the result of negotiations with public authorities and/or explicitly recognised by the authorities. Other voluntary approaches, such as codes of conduct, fall outside the scope of the study.

The role of public authorities and the legal basis of EAs is not always clear. However, this definition does not imply that all EAs are legally defined such that non-compliance automatically attracts a penalty. The role of the public authority may be limited to only formally recognising an EA (e.g. Austria, Germany), rather than being a signatory to the EA. In some national legal systems public authorities will not be able to sign the EA. In this study we have interpreted this definition to imply formal recognition of the EA by the relevant public authorities.

1.3 Aims and Objectives

The present report was produced following a request from the European Parliament to produce an overview report on ‘voluntary agreements’ and it is part of the current work of the EEA on reviewing and evaluating environmental policy instruments. This activity conforms with the Council Regulation (EEC) No 1210/90 of 7th of

May, which establishes the Agency and sets out that one of the tasks of the Agency shall be:

“to provide the Community and the member States with the objective information necessary for framing sound and effective environmental policies;”

(Art. 2 (ii))

Therefore, to the extent that Environmental Agreements are an emerging force in the policy arena, there is an interest on the part of the EEA to develop a sense of the effectiveness of such approaches. However, this task is greatly hampered by the lack of empirical studies and literature available.

The present study builds on the survey of Environmental Agreements undertaken by the European Commission and focuses on the environmental effectiveness of such instruments.

The aim of this study was to inform policy makers and the public in general on the use of Environmental Agreements (EAs) in the European Union, by providing: a) a brief review of the current application of EAs in Member States; b) an overview of the current debate and positions of the various stakeholders; c) a first assessment of the environmental effectiveness of a selected number of EAs; and d) recommendations on further work required in the area of EAs.

1.4 Approach to the Study

The assessment has been conducted on the basis of a review of the available literature, the inventory of EAs prepared for the Commission and detailed investigation of six EAs selected to illustrate the range of national and economic contexts and different approaches. In particular, the case studies were selected to include both target-setting EAs, where negotiation determined the environmental policy targets (cases in France and Germany), and

implementation EAs, where negotiation was directed to implementing policy targets determined outside of the EA (cases in Denmark, The Netherlands, Portugal and Sweden).

Particular attention was given in the assessment not only to the effects of the EA but to understanding the likely progress which would have been made in securing environmental policy objectives, in the absence of the EA. The difficulties of establishing this ‘counterfactual’ position are well known and affect all policy evaluations.

A summary of the actions taken to address each of the objectives is given below (Box 1.1).

1.5 Report Structure

The report continues with a review of EAs in section 2. and a review of the arguments for and against the use of EAs, with respect to the various sets of interested parties involved, in Section 3. Section 4. presents an assessment framework for the environmental effectiveness of EAs. Section 5. provides a synthesis of the environmental assessment of the Case Studies. Conclusions and recommendations are set out in Section 6. The detailed Case Studies are presented in Volume II of this report.

Box 1.2: REPORT STRUCTURE

Section	Objective	Actions
2	Review of the Main EAs	Brief review of the EAs identified in the Commission study, according to 5EAP sectors and themes and other criteria.
3	Overview of Main Arguments of Different Interest Groups	Literature review and consultations with Ministries and Regulators, Industry Associations (UNICE), NGOs and other parties.
4	Development of Framework for Evaluation of Environmental Effectiveness of EAs	Use of existing literature and the experience of Experts.
5	Environmental Assessment of EA case studies	Use of data from monitoring reports from existing EAs, baseline data and primary research.
6	Conclusions and Recommendations	Synthesis of conclusions on the use and effectiveness of EAs, recommendations on further work.

2. REVIEW OF THE MAIN ENVIRONMENTAL AGREEMENTS IN USE

2.1 Introduction

This section presents a review of the use of environmental agreements (EAs) in the EU to-date. The review has been based mainly on the inventory of EAs, produced by the European Commission (CEC, 1996a), henceforth referred to as the Commission study. Use has also been made of information presented in the EC Communication on EAs (CEC, 1996b). The EAs have been classified in the review according to the sectors and themes covered in the 5EAP (section 2.2). Other review criteria have also been applied to the EA inventory (Section 2.3), to expand the discussion.

2.2 Number of Environmental Agreements and Classification According to 5EAP

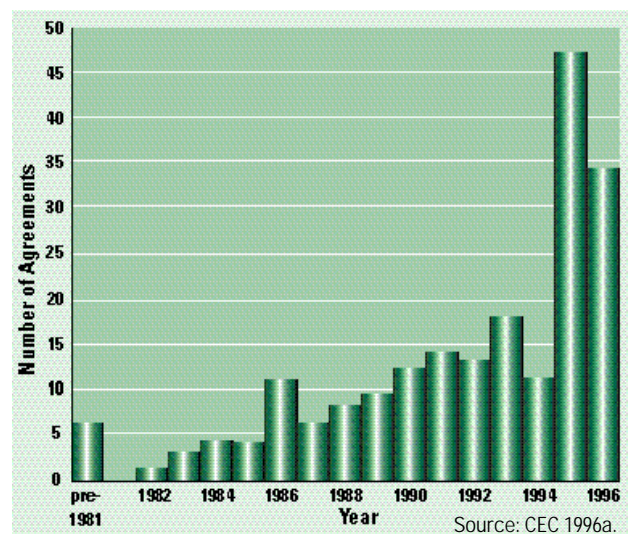
Trends in the Use of Environmental Agreements

In 1996 the total number of EAs concluded at a national level in the EU was estimated at approximately 300 (CECa, 1996a). In fact, the total is probably somewhat larger as the survey concerned covered a limited inventory. In addition, a number of EAs have been concluded at sub-national level.

The trend in the number of EAs in the EU has been estimated by the Commission (CEC, 1996a). Yet there are problems with the analysis as presented relating to sample bias in the sample of 137 agreements (almost a quarter of the agreements are from one country, Germany). Indeed, this problem would remain even if a complete assessment of all EAs concluded in member states was made. The bias becomes even more problematic since two countries (the Netherlands and Germany) account for more than two thirds of the agreements. At the other end of the spectrum, eight of the member states have not reached double figures as regards the number of EAs implemented.

Notwithstanding these problems, which stress the need for caution in seeking to elicit trends for the European Union as a whole, the change in EA use over time is illustrated in Figure 2.1 below. In the Figure, the total number of EAs in EU member states for which the date of agreement or start date is known (a total of 201 from the sample of 305) is plotted against the year of agreement, or, where this is not known, its commencement. This shows that the number of EAs concluded per year has increased steadily over time. The cases of the individual countries give a far less uniform picture.

Figure 2.1:
NEW ENVIRONMENTAL AGREEMENTS IN
EU MEMBER STATES BY YEAR



Environmental Agreements Classified by 5EAP Sectors/Themes

The EAs that have been concluded in member states can be classified by sector and/or theme of the 5EAP. Table 2.1 illustrates the 5EAP priority sectors for which EAs have been concluded in each member state. Table 2.2 illustrates the much broader spread of EAs across environmental themes.

Table 2.1:
CLASSIFICATION OF EAs BY MEMBER STATES AND BY 5EAP SECTOR

Member	5EAP Sector					Total
State	Agriculture	Energy	Industry	Transport	Tourism	Community Survey ¹
Austria			✓			20
Belgium		✓	✓			6
Denmark	✓	✓	✓			16
Finland			✓			2
France		✓	✓			8
Germany		✓	✓			93
Greece ²		✓	✓		✓	72
Ireland			✓			1
Italy			✓			11
Luxembourg		✓	✓			5
Netherlands	✓	✓	✓			107
Portugal	✓		✓			10
Spain			✓			6
Sweden	✓	✓	✓			11
UK			✓			9
EU Total						305

Sources:

¹ European Commission : Inventory of Voluntary Agreements, CEC, 1996 (Draft Final).

² Ministry for the Environment Physical Planning and Public Works, Greece

N.B.

- For the purpose of this Table the term 'sector', used in the definition of EAs (Section 1.2), has been taken to mean, variously, agricultural, energy, industry, transport, tourism etc..
- 'Transport' sector refers to the transportation of freight and people.
- Changes that affect the transport industry (i.e. vehicle manufacture, recycling, petrochemical production) are reflected under 'Industry' sector.
- 'Energy' refers to activities by any firm that derives it's main revenues from the supply, distribution or sale of energy.
- 'Agriculture' is defined as activities at the farm level. Thus, the agro-chemicals, farm packaging and forest products sectors are not included.
- Tourism is defined as related economic activities (e.g. hotel services)

Table 2.2: CLASSIFICATION OF EAs BY MEMBER STATE AND BY 5EAP THEME

Member	5EAP Theme						Total
State	Climate Change	Inland water Resources	Waste Management	Air Pollution & Quality	Soil Quality	Ozone Depletion	Community Survey ¹
Austria	✓		✓	✓			20
Belgium		✓	✓	✓	✓	✓	6
Denmark	✓	✓	✓	✓	✓	✓	16
Finland	✓		✓				2
France	✓	✓	✓		✓		8
Germany	✓	✓	✓	✓		✓	93
Greece ²	✓	✓	✓	✓		✓	72
Ireland			✓				1
Italy			✓	✓			11
Luxembourg	✓		✓				5
Netherlands	✓	✓	✓	✓	✓	✓	107
Portugal		✓	✓	✓			10
Spain		✓	✓	✓		✓	6
Sweden	✓		✓	✓			11
United Kingdom	✓	✓	✓			✓	9
EU Total							305

Sources:

¹ European Commission: Inventory of Environmental Agreements, CEC, 1996 (Draft Final).

² Ministry for the Environment, Physical Planning and Public Works, Greece.

Some of the countries which are more advanced in the use of EAs, such as the Netherlands, have concluded agreements in almost all areas identified under the 5EAP. Furthermore, in a very large number of the countries where environmental agreements are evident, four or more 5EAP themes have been covered. All but Greece, where there are no EAs, have operating EAs in waste management, by far the most popular use of EAs by theme. Note that the two available surveys of EAs in the EU (1996a, b) differ in their assessment of the number of agreements in existence in different countries.

A large number of the EAs so far initiated in member states are found in the economic sectors where most polluting activity takes place (metals and metal finishing, chemicals, energy, transport). A survey by the CEC (1996a) suggests that one of the sub-sectors examined - 'manufacture of chemicals, chemical products and man-made fibres' - is included in more than 20 % of the total number of 305 EAs concluded. Other sectors represented in EAs are:

- the manufacture of food products, beverages and tobacco (12 %);

- transport, storage and communication (11 %);
- manufacture of basic metals and fabricated metal products (11 %);
- manufacture of other non-metallic mineral products (10 %);
- manufacture of rubber and plastic products (10 %);
- electricity, gas and water supply (10 %).

The percentage figures given (which are those given in Table 2, CEC 1996a, 13) are slightly misleading owing to double counting. Clearly, whether or not an EA covers more than one sector depends on where one draws sub-sector boundaries.

When considering the take up of EAs across member states, the perceptions of those involved as to the objectives of the agreements are of importance. Beyond attempting to provide better levels of environmental quality, some EAs concern themselves with much broader objectives. The provision of information on the environmental impacts of products, or the initiation of discussion on how best to satisfy other legislative requirements, are secondary objectives of many agreements.

2.3 Review of EAs by Member State According to Assessment Criteria

The criteria which have been used to describe the use of EAs in each Member State are:

- number of EAs;
- year of first EA;
- economic sector (e.g. metal finishing);
- coverage by 5EAP theme / environmental issue;
- legal status;
- use of sanctions;
- use of other instruments;
- the main signatories.

The following is an overview of the situation in each member state. The number of agreements is mostly that given in CEC (1996a). It is actually extremely difficult to find consistent data concerning the number of EAs concluded in any given country. One reason relates to the definition of an EA, another to the timing of studies undertaken. The data given in terms of the number of agreements in the boxes, which is one of few complete data sets (i.e. an entry for each country), does not square with data given in other reports where country summaries seem more thorough. Indeed, even the study conducted for the Commission (CEC 1996a) exhibits discrepancies between its survey data and its country studies (in Annex 4). Thus it seems unwise to pay too much attention to the figures other than to the extent that they indicate the relative prominence given to the approach in different member states.

The boxes list the main sectors affected and are also those given in CEC (1996a). It is quite possible for the number of sectors listed to exceed the number of agreements for the simple reason that not all EAs are sector specific. Where a small number of EAs have been concluded in any given country, the 'main sectors' entry effectively implies most of the sectors affected by those EAs con-

cluded this far (evidently the number of sectors affected by a given EA depends on how one draws the sector boundaries).

Austria

Number of EAs	20
Year of First EA	1986
Main Sectors:	Manufacturing of transport equipment; Manufacturing of chemicals and chemical products, and man-made fibres; Manufacturing of pulp, paper and products; Construction.
Main Themes:	Batteries; End-of-life vehicles; Global framework; Labelling; Packaging; Product phase-out; Recycling.
Legal Status:	Some non binding, some binding.
Sanctions:	Weak threat of legislation on failure of EAs.
Other Instruments:	None/not known.
Main Signatories:	Ministry of Environment; Federal Economic Chamber; Large Firms.

Austria has 25 EAs in operation (CEC 1996a,b), although some of these are simply commitments by individual firms and do not fall within the definition of EAs used by the current study. Of those agreements that can be considered as more formal EAs according to the present study, there are three types:

- the phase-out EA, which seeks to eliminate use of a specific input material within a specified time period;
- labelling and user information EAs, which are based on simple targets to be attained by a specified date (similar to phase-out EAs);
- EAs that seek to reduce waste products.

The latter type may be based around targets for reduction of specific forms of waste, in which case they bear similarities to the other two types of EA. Alternatively, owing to the complex nature of managing waste streams, they may encompass broad goals, specific reduction targets and/or the means by which such targets can be attained. Agreement on acceptance of materials for collection and recycling, for example, needs to be included within a waste management EA for it to be fully operable.

Waste management EAs also tend to involve more partners, and more economic sectors, than do the more simple EAs based on eradication of inputs or provision of information. This too adds to their complexity.

The EAs that have been concluded so far in Austria address the following environmental issues:

- batteries;
- end of life vehicles;
- labelling and environmental information of products;
- packaging;
- phase out of specific inputs (detergents industry);
- materials recycling (vehicle tyres).

One EA is aimed at increasing the recycling rate of end of life vehicles (from 75 % of material weight at present) and improving the techniques used in current recycling activities. The agreement encompasses all stages of the vehicle life, involving the design and construction of vehicles with higher recoverability, as well as new markets for recycled components. A set of targets contained within this EA is supported by an agreement on the part of Austrian cement firms to use tyre crumb as a cheap fuel for heat generation purposes.

The chemicals manufacturing sector accounts for 40 % of all EAs in Austria. The second most important sector is vehicles manufacturing which accounts for 30 % of all EAs in the country. Other important sectors are pulp and paper manufacture and construction.

Belgium

Number of EAs	6
Year of First EA	1988
Main Sectors:	Man. of chemicals, chem. prods. & man-made fibres.
Main Themes:	Batteries; CFCs; Emissions reduction; Product phase-out.
Legal Status:	Non binding.
Sanctions:	Not known.
Other Instruments:	None/not known.
Main Signatories:	Federal government (product related EAs and energy EAs); Regional government (EAs on standards, packaging and waste management); Industry Associations; Individual (small) firms.

The number of EAs concluded in Belgium is relatively small at fewer than 10. These are divided between those in operation at a Federal level and those at a regional level.

Federal EAs are focused on the reduction of harmful inputs in products or production processes - CFCs in aerosol sprays, or battery materials, for example. These are based on specified targets for reduction or removal of certain substances. Two important EAs concluded at the federal level have focused on SO₂ and NO_x reductions in the electricity generation sector.

Regional EAs are largely concerned with waste management issues, encompassing recycling and packaging standards, and not with product or target specific agreements. EAs concluded at both levels in Belgium follow from legislative requirements, usually set down by EU Directive.

The breadth of EAs in terms of environmental issues covered is narrow. The issues that are covered are:

- battery content and disposal;
- the use of CFCs in aerosol sprays;
- emissions reduction from key industrial sectors;
- reduced waste/increased recycling in key industrial sectors (e.g. aluminium);
- the replacement of specific environmentally-harmful input materials.

Sectors of most importance to the use of EAs in Belgium at present are: chemicals manufacturing, to which 50 % of all agreements are targeted, and, equally by number of agreements, metals and metal finishing, plastic and rubber products, the vehicles repair sector, electrical equipment manufacturers and energy production.

Denmark

Number of EAs	16
Year of First EA	1987
Main Sectors:	Manufacturing of chemicals, chemical products & man-made fibres; Transport, storage and communication; Wholesale and retail, repair of motor vehicles, motor cycles, personal goods.
Main Themes:	Batteries; CFCs; CO ₂ /Energy Conservation; Emissions reduction; Product improvement; Packaging; Product phase-out; Recycling; Site remediation,
Legal Status:	Non binding.
Sanctions:	None but threat of legislation on failure of EAs.
Other Instruments:	None/not known.
Main Signatories:	Environment Protection Agency; Danish Energy Agency; Industry Associations

There are currently 15 EAs in operation in Denmark. The existing EAs only cover energy and industry, being targeted at a narrow range of environmental themes: climate change, air quality and waste management only. Two thirds of all agreements in Denmark are directed at emissions reductions, usually through the planned phasing out of input materials in specific production processes (volatile organic compounds or PVC for example).

Denmark is the only country where EAs are backed by legislation but this has not been used as yet. Most EAs, therefore, are not subject to the application of sanctions in the case of non-compliance. This is under review at present, with the 1992 Danish Environmental Law setting the precedent for the Ministry of the Environment to establish the legal support for agreements to inclu-

de sanctions in future. In fact, a tax on nickel-cadmium batteries was introduced, after an environmental agreement on the collection of used batteries of this kind had failed (Danish Ministry of Finance, 1995, p. 23f.).

Finland

Number of EAs	2
Year of First EA	1989
Main Sectors:	Manufacturing of food products, beverages and tobacco; Manufacturing of pulp, paper and products; Manufacturing of rubber and plastic products; Manufacturing of chemicals, chemical products & man-made fibres; Manufacturing of basic metals and fabricated metal prods.; Hotels and restaurants; Wholesale and retail, repair of motor vehicles, motor vehicles, personal goods; Transport, storage and communication.
Main Themes:	CO ₂ /Energy Conservation; Packaging.
Legal Status:	Non binding.
Sanctions:	None.
Other Instruments:	Limited financial assistance available for SO ₂ EA.
Main Signatories:	Ministry of Trade & Industry; Local government; Industry Associations.

The economic structure of Finland has, to a large extent, defined the extent of EAs in the country. Only one quarter of all economic activity is provided by industrial sectors, the remainder being made up from agriculture and services. There is, however, a large dependency on energy which has resulted in a number of EAs targeted explicitly at

the reduction of energy use and consequent reduction of greenhouse gas emissions.

The type of agreements concluded in Finland tend towards more general statements of objectives, rather than being concerned with explicit targets. Targets have been set for reductions in energy consumption; by 10 - 15 % by the year 2005. This agreement has built on an existing programme of government-sponsored energy-efficiency measures (CEC, 1996b). In general, Finnish agreements have followed international developments (CFC reduction) or national policies (SO₂ emissions reduction) rather than set a new agenda in themselves.

Due to the atypical nature of the economy, there are relatively few economic sectors affected by EAs in Finland, the main ones being electricity and energy production and the metals, metal products and construction industries. These industries are not representative targets of EAs in the other EU member states. Furthermore, there are no agreements that target the chemicals manufacturing sector, the most popular sector to have concluded agreements elsewhere within the EU.

France

Number of EAs	8
Year of First EA	1971
Main Sectors:	Manufacturing of basic metals and fabricated metal products; Construction; Electricity, gas and water supply.
Main Themes:	CO ₂ /Energy Conservation; End-of-life vehicles; Product improvement; Packaging; Product phase-out; Recycling; Site reform
Legal Status:	Binding and non-binding EAs exist.
Sanctions:	Financial sanctions for non-compliance with binding EAs.
Other Instruments:	None. EAs often used in advance of more traditional regulatory approaches.
Main Signatories:	Ministry of Environment; Regional authorities; Industry Associations; Large firms.

The history of EAs in EU member states began in France, where an agreement was signed between the cement industry and the Ministry of Environment in 1971. The subsequent development of EAs has led to coverage of most environmental issues. Of the six 5EAP themes identified in Table 2.2, EAs have been concluded in all but two. There is a high concentration of agreements focused on packaging and recycling issues. At present there is a relatively slow adoption of EAs concerned with CO₂ reduction, with only one of a total of ten planned EAs being concluded to date. In contrast to many member states where EAs have followed from national and international legislation, in France the targets set within EAs have often been used to develop new legislation. Thus, whereas elsewhere agreements have followed rather passively, in France they have tended to be used as development tools for new policy. This is thought to be due to the longer history of EAs in the country (CEC, 1996b).

Germany

Number of EAs	93
Year of First EA	1980
Main Sectors:	Manufacturing of chemicals, chemical products & man-made fibres; Manufacturing of basic metals and fabricated metal products; Manufacturing of other non-metallic mineral product; Electricity, gas and water supply.
Main Themes:	Batteries; CFCs; CO ₂ /Energy Conservation; Emissions reduction; Product improvement; Packaging; Product phase-out; Recycling; End-of-life vehicles; Global framework; General Statement of purpose; Labelling; Waste management.
Legal Status:	Non binding.
Sanctions:	None/not known.
Other Instruments:	None/not known.
Main Signatories:	Federal government; Länder governments; Associations of Industry, Trade and Commerce.

The number of EAs found in Germany exceeds that of any other EU member state, apart from the Netherlands. There have been more than 80 EAs concluded, most of which have been agreed in the past five years. The most significant difference between the type of agreements found in Germany and those elsewhere in the EU is that many do not involve federal or regional (Land) government agencies. Many agreements are initiated by industry associations and cover their members only. This is, in part, due to the relatively large number of such associations in existence in Germany, but also because of the specific policy of government authorities to stimulate such an arms-length, deregulated, approach. As such, most agreements are informal and do not involve sanctions for non-compliance. Production process changes and materials substitution have been formally included

in many agreements. These are very rarely found in EAs outside Germany.

In general, German EAs cover four environmental areas:

- waste management;
- phase-out of harmful materials (CFCs and asbestos);
- labelling of products;
- emissions reductions (CO₂ and harmful substances to water).

Of most significance at present is the CO₂ reductions EA, initiated in 1995, to which firms from 20 economic sectors are now signatories. There has previously been a heavy weighting in Germany towards EAs that cover emissions reduction, with three quarters of all agreements continuing to be directed in some way to the reduction of emissions. The reason for this is historic; during the 1980s, many agreements were concluded that addressed substances harmful to water. Nevertheless, the range of agreements concluded in Germany remains the broadest of any member state. Of 14 subject areas (e.g. end of life vehicles, labelling, packaging, etc.) covered by a recent survey, German EAs cover 13 of these (CEC, 1996a). The rise in the number of waste management EAs, and the CO₂ agreements now being signed, have strengthened this breadth further. However, the large number of EAs in existence in the country leads one to expect such broad coverage.

Greece

Number of EAs	7
Year of First EA	1985
Main Sectors:	Chemical industry; Industry in general; Municipalities; Households; Transport; Tourism /Hotel/ Construction.
Main Themes:	Toxic waste; Household waste and packaging materials; Emissions; CFCs; Water; Energy efficiency.
Legal Status:	Binding/non binding.
Sanctions:	None/termination of funding by Ministry of Environment; Increased prices for higher consumption of water/energy.
Other Instruments:	None/not known/financial assistance by Ministry of Environment.
Main Signatories:	Greek Chemical Industries; Ministry of Environment and Others; Municipalities; Public Organisations; Power Corporation; Local and Regional Authorities; Hotels; Hotels Association.

The number of EAs in Greece is relatively small at 7 (Greek Ministry for the Environment 1997).

They are focused mainly on:

- energy (and water) savings;
- chemicals;
- waste.

It is of interest that two of the agreements particularly addressed the tourism industry.

Ireland

Number of EAs	1
Year of First EA	1996
Main Sectors:	All sectors using packaging materials.
Main Themes:	Packaging (recycling) .
Legal Status:	Non binding.
Sanctions:	None.
Other Instruments:	None/not known.
Main Signatories:	Department of Environment; REPAK (Relevant Industry Associations); IBEC industry Task Force.

There is only one EA in Ireland at present. This covers waste management by considering packaging volumes and voluntary recycling initiatives in a number of economic sectors. The EA is coordinated by an industry-representative organisation and is known as REPAK.

A further agreement is being considered at present by the Irish Vehicle Manufacturers and Suppliers Association, to cover battery recycling.

Italy

Number of EAs	11
Year of First EA	1988
Main Sectors:	Manufacturing of pulp, paper and products; Manufacturing of machinery and equipment.
Main Themes:	Batteries; General Statement of purpose; Product improvement; Recycling.
Legal Status:	Non binding.
Sanctions:	Not known.
Other Instruments:	Not known.
Main Signatories:	Ministry of Environment Trade Associations; Large firms.

The number of EAs in Italy is relatively small at 11. These are focused on a small number of environmental issues as follows:

- battery recycling;
- general waste recycling initiatives.

Due to the concentration of packaging related EAs in Italy, all agreements are target driven and techniques are left to the definition of individual members of the agreement.

A recent report suggested that the role of EAs in Italy will be significantly increased in the near future (CEC, 1996a). There appears to be a widespread support for their use from industry, government agencies (centralised and regional) and the general public.

Luxembourg

Number of EAs	5
Year of First EA	1989
Main Sectors:	Manufacturing of food products, beverages and tobacco; Manufacturing of rubber and plastic products; Manufacturing of chemicals, chemical products & man-made fibres.
Main Themes:	CO ₂ /Energy conservation; Packaging; Recycling; Waste management.
Legal Status:	Non binding.
Sanctions:	None.
Other Instruments:	Government funded infrastructure support for construction waste EA; Public information programmes for selected EAs.
Main Signatories:	Ministry of Environment; Trade Associations/Chambers of Trade; Large firms.

There are very few EAs concluded in Luxembourg. Only 5 have been identified. There are two areas covered by the existing agreements:

- CO₂ emissions reduction through energy efficiency;
- packaging and waste minimisation.

All EAs have followed as extensions of existing national legislation or programmes. The food and drinks sector is one of the sectors most affected by EAs due to the concentration of packaging related agreements and the importance of this sector in the national economy.

Netherlands

Number of EAs	107
Year of First EA	1987
Main Sectors:	Agriculture, hunting & fisheries; Manufacturing of food products, beverages and tobacco; Manufacturing of rubber and plastic products; Manufacturing of chemicals, chemical products & man-made fibres; Transport, storage and communication.
Main Themes:	Batteries; CFCs; CO ₂ /Energy conservation; Emissions reduction; Product improvement; Packaging; Product phase-out; Recycling; General Statement of purpose; Labelling; Waste management.
Legal Status:	Early EAs non binding, recent EAs legally binding.
Sanctions:	Operating licenses.
Other Instruments:	NOVEM unit set up to undertake negotiations (energy efficiency EAs).
Main Signatories:	Ministry of Housing, Spatial Planning and Environment; Ministry of Economic Affairs; Local authorities; Industry Associations; Large firms.

The Netherlands has concluded the most EAs among the EU member states. There are currently over 100 agreements, known as covenants, in the country. Some of these are only sub-agreements of a larger agreement as defined in this study. The total number reported should therefore be reduced by at least 20 % in practice. The large number of agreements is attributed to the general co-operative nature of the legislative process in the Netherlands (Opschoor & van der Straaten, 1993 and others).

There are two types of agreement in the Netherlands at present:

- long term EAs (involving the Ministry for Economic Affairs);
- other EAs (involving the Ministry of Housing, Spatial Planning and Environment).

Agreements falling into the latter category tend to have more defined targets attached to them, whereas the former type are generally concerned with the broad movement towards target ranges and methods of operation.

Short term EAs are dominated by a number of Declarations of Intent on Implementation of Environmental Policy. These are driven by specific emissions reductions targets already contained within national legislation - over 50 % of all Dutch EAs contain emissions reduction targets (CEC, 1996a).

The Netherlands is one of only two EU member states to have concluded EAs that cover all of the 6 SEAP themes (Table 2.2). In addition, agreements have affected almost all economic sectors (excluding tourism and transportation). The most affected sectors are transport and chemicals manufacture.

In future, the use of EAs in the Netherlands is likely to continue, both in sectors already involved in an EA and extending to other areas of economic activity.

Portugal

Number of EAs	10
Year of First EA	1987-8
Main Sectors:	Manufacturing of food products, beverages and tobacco; Manufacturing of basic metals and fabricated metal products.
Main Themes:	Emissions reduction; Global framework; Product improvement.
Legal Status:	Non binding.
Sanctions:	None.
Other Instruments:	Protocol for Sectoral EAs launched in 1995 - to promote EAs in specific sectors; Limited government funding available for administrative cost of concluding EAs.
Main Signatories:	Ministry of Environment & Natural Resources (Directorate of the Environment); Large firms.

Ten EAs have been concluded in Portugal at present. The pulp paper EA was followed by three environmental agreements for other industry sectors: for leather in 1989 (3 years), glass packaging (1.5 years) and cardboard packaging for liquids (drinks industry - TETRAPAK) in 1990 (1.5 years).

In 1994, following the considered success of the pulp paper EA, the government passed the EA General Framework agreement which formed the basis of a range of new EAs to be signed including the metallurgy sector, the federation of oils/margarine/soaps, marble/granite, pigs/swine breeding and agriculture.

However, in the first quarter of 1996, after the change of the government, the new minister decided to freeze all EAs. The reason given was that all the necessary legislation was now in place and

would ensure that environmental improvements are made, and thus EAs were no longer necessary. It is widely expected that a new agreement will, in due course, be reached by the government and industry, and that the EAs will again be supported as a bona fide instrument of Portuguese environmental policy.

Spain

Number of EAs	6
Year of First EA	1989
Main Sectors:	Manufacturing of rubber/plastic products; of coke, refined petroleum products and nuclear fuel; of pulp, paper and products ;of chemicals, chemical products & man-made fibres; Electricity, gas and water supply; Hotels and restaurants; Wholesale and retail, repair of motor vehicles and cycles, personal goods.
Main Themes:	CFCs; End-of-life vehicles; Emissions reduction; Recycling.
Legal Status:	Binding and non-binding EAs exist.
Sanctions:	None.
Other Instruments:	Government financing programmes favour EA signatories (energy efficiency, emissions reduction).
Main Signatories:	Ministry of Public Works, Transportation & Environment; Ministry of Industry & Energy; Regional governments; Industry Associations; Large firms (mostly public sector).

Spain has 6 EAs in place at present. These cover a narrow range of 5EAP sectors; only industry and transport. The environmental themes that this relatively small number of agreements cover is, how-

ever, somewhat broader: water resources, waste management, air quality and ozone depletion.

The most affected economic sectors are: paper and pulp, energy materials, motor vehicles and transport equipment. The chemicals sector is not covered by existing EAs, a departure from the situation in most other member states.

Spanish EAs have, in general, tended to be developed with respect to international and national legislation (CFC phase out following the Montreal Protocol and the national waste management plan for example), following and satisfying these rather than extending them, in a similar fashion to agreements in Finland. Nevertheless, a significant growth in the use of EAs is forecast, with their use in defining national environmental policy, rather than proceeding from it, increasing as well (CEC, 1996a).

Sweden

Number of EAs	11
Year of First EA	1978
Main Sectors:	Manufacturing of coke, refined petroleum products and nuclear fuel; Manufacturing of pulp, paper and products; Manufacturing of transport equipment; Wholesale and retail, repair of motor vehicles, motor cycles, personal goods.
Main Themes:	Batteries; CO ₂ /Energy Conservation; Product improvement; Packaging; Product phase-out; Recycling.
Legal Status:	Non binding.
Sanctions:	Threat of introduction of tax on failure of EA.
Other Instruments:	Limited financial assistance for energy efficiency and automotive industry EAs.
Main Signatories:	Environment Protection Agency; Industry Associations; Public groups.

There are currently 14 concluded EAs in Sweden. The coverage by 5EAP theme area is similar to that found elsewhere in the EU, even though the total number of EAs is relatively low. Indeed, more of the 5EAP priority sectors are covered by EAs in Sweden than anywhere else in the EU (four out of a possible five).

The characteristics displayed by Swedish EAs are much wider than those found elsewhere too. Five potential types of EA have been identified (CEC, 1996a):

- producer responsibility agreements;
- EAs concerning energy conservation;
- emissions-reduction agreements;
- the phasing out of harmful products;
- EAs to promote research and development.

Most of the agreements in Sweden, to date, cover waste management. There are agreements covering car tyres and paper, and associated packaging materials and construction materials. The vehicles manufacturing sector is covered by one third of all agreements, reflecting its importance to the national economy.

A significant development in the use of EAs has been an agreement having as its main objective the promotion of research and development in the vehicle industry, to promote the use of alternative fuels. Other member states have yet to conclude such an agreement having as its specific objective the stimulation of research and development.

There is a longer term movement in Sweden away from prescriptive (target-based) environmental policy towards the use of a framework approach, specifying only broad goals and targets. This implies an increased use of EAs as part of the package of environmental policy instruments in future.

United Kingdom

Number of EAs	9
Year of First EA	1972
Main Sectors:	Agriculture, hunting & fisheries; Manufacturing of rubber and plastic products; Manufacturing of chemicals, chemical products & man-made fibres; Transport, storage and communication.
Main Themes:	CFCs; Product improvement; Product phase-out; Recycling.
Legal Status:	Non binding.
Sanctions:	None.
Other Instruments:	None/not known.
Main Signatories	Central government (Department of the Environment); Industry Associations.

A relatively small number of EAs have been concluded in the UK, despite there having been a significant impetus for the deregulation of all markets in the past 10 to 15 years. The low number is also surprising as the first such agreement was put in place during the 1970s. There is a general perception that EAs allow for too much deregulation; self-regulation of industry being particularly unpopular with the general public.

There are currently 8 active EAs in the UK. These cover only one 5EAP sector, industry, but a broader spread of 5EAP themes (4 out of a possible 6). Of the total number of EAs, the largest proportion (around 80 %) involve the chemicals sector. Other economic activities significantly affected by EAs are: agriculture, transport, plastics manufacture, fisheries and, to a lesser extent, transport equipment (including vehicle manufacturing) and general machinery. A packaging waste agreement has failed to be successfully adopted in the past two years.

There are three types of agreement in use in the UK:

- phasing out of harmful products/materials;
- product handling agreement (pesticides);
- recycling and waste management.

An environmental approach adopted for pesticides-packaging in the UK agricultural sector is no more than a code of conduct and has therefore been excluded from this current study.

The European Community

To date, at EU level, only a limited number of non-binding agreements have been concluded. No binding agreements have been concluded thus far with the European Community as party to the agreement. For the foreseeable future, the Commission is likely to be limited to making use of agreements of a non-binding nature.

The Commission has also been involved in other forms of initiative involving stakeholder participation. The ‘Priority Waste Streams Programme’ provides an example of an approach based on consultation, with the aim of reaching consensus (see Box 2.1). The Commission has been in discussions with industry associations regarding a possible EA on energy efficiency with respect to televisions and VCRs (DGXVII, 1996, personal communication).

Box 2.1: THE CASE OF WASTE MANAGEMENT AT COMMUNITY LEVEL

The Priority Waste Streams (PWS) Programme, established by the European Commission in 1990, provides an early example of a consultative approach at the European Community level. The programme focused on 5 priority waste streams: used tyres, end of life vehicles, healthcare waste, construction and demolition waste and waste from electrical and electronic equipment.

The initiative was inspired by the participatory approach that resulted in the agreement of covenants in the Netherlands, with the initial idea of obtaining a consensus on quantitative objectives between different stakeholders. Working groups for each waste stream were set up under the PWS programme, including representative of Member State governments, industry and retailers, environmental and consumer associations and the Commission. However, targets were not set at a European level.

The PWS Programme only partially succeeded in reaching a consensus on quantified objectives. It has been suggested that the process was hindered by uncertainties (the lack of reliable Community wide data on the waste streams and on their environmental impacts and the difficulties in assessing the cost and benefits of the wastes), the fact that some parties were more prepared and informed about the issues than others and the lack of mandate for negotiation for many of the parties involved in the working groups. However, the PWS work improved the information on the waste streams and provided potential solutions to the problems encountered, although this has not always been sufficient for the preparation of new legislation.

Source: Communication from the Commission on the Review of the Community Strategy for Waste Management, COM (96) 399 final.

Non-EU EA Experience

A review of non-EU EAs has been collated in Box 2.2.

Box 2.2: NON-EU EXPERIENCE WITH EAS

USA

Number of EAs:	Not known.
Main Sectors:	Iron & steel; Non-ferrous metals; Chemicals and chem. prod.; Refining; Automotive manufacturing; Wood & forest products.
Main Themes:	Climate change (dominant theme); Energy efficiency; Emissions reduction - air (esp. metals industry); Recycling; R&D.
Legal Status:	Non-binding.
Sanctions:	No financial sanctions, removal from scheme only.
Other Instruments:	None/not known.
Main Signatories:	Industry (individual firms and trade groups); DOE; EPA.

JAPAN

Number of EAs:	> 2,000 per year (on site by site basis).
Main Sectors:	Iron & steel; Non-ferrous metals; Energy production; Automotive manufacturing.
Main Themes:	Air quality (SO _x , NO _x); Energy efficiency; Materials recovery/recycling; Climate change (relatively few).
Legal Status:	Not known.
Sanctions:	Not known.
Other Instruments:	None/not known.
Main Signatories:	Industry, regional government, local authorities and residents. Environment Agency (climate change only).

NEW ZEALAND

Number of EAs:	17
Main Sectors:	Iron & steel; aluminium; Chemicals; Energy production.
Main Themes:	CO ₂ emissions reduction; Energy efficiency; Air quality.
Legal Status:	Not known.
Sanctions:	Threat of carbon tax if sectors under-perform (CO ₂ EA).
Other Instruments:	Supporting energy efficiency policies.
Main Signatories:	Central government (Ministry of Energy); Industry (usually individual firms).

CANADA

Number of EAs:	Not known.
Main Sectors:	Iron & steel, Non-ferrous metals; Refining (aluminium); Mining.
Main Themes:	Energy efficiency (industrial competitiveness).
Legal Status:	Not known.
Sanctions:	None.
Other Instruments:	Not known.
Main Signatories:	Ministry of Natural Resources; Industry (individual firms).

Source: Boyd, 1996; IEA, 1995; Ministry of Commerce NZ, 1995; Solsbery & Wiederkehr, 1995; Storey, 1996.

In general, the experience of non-EU countries has followed a similar parallel to that of EU member states - focusing on broad environmental objectives, involving specific economic sectors, etc.

The use of EAs in the US is rather more advanced than in most countries due to the impetus given to them by the Environmental Protection Agency (EPA). The EPA has experienced a great success in its 33/50 Program a voluntary initiative with the purpose of preventing the release and transfer of toxic chemicals. The objective of the programme is not to achieve greater environmental effectiveness in terms of absolute reduction - indeed, analysis of 1993 data has shown that companies outside of the agreement at least matched those inside with respect to pollution reduction (Arora and Cason, 1995) - but to achieve targets more quickly, thereby benefiting the environment faster.

There is strong support for the voluntary approach in the US regarding toxic chemicals. Twenty six states had their own EAs in place before the national programme was implemented by the EPA. Subsequently, the programme has been used by the individual states and several companies as the basis for other voluntary initiatives.

A further extension of the 33/50 Program has been the meeting of a panel of representatives from industry, state administrations and environmental groups to determine whether programme awards should be made to selected companies whose pollution reduction achievements can be considered exemplary (EPA, 1995).

In Japan, efforts have been made to broaden the range of parties involved in concluding EAs. For example, individual households are involved in energy efficiency EAs; a sector of the population seldom formally included in negotiations or final agreements elsewhere. However, the role played by individual households is limited to commen-

ting on drafts of the agreement. The means of achieving targets rests with energy suppliers.

2.4 Main Conclusions of the Country Review

In summary, the review of the use of EAs has indicated that:

- By 1996, more than 300 EAs have been concluded at a national level in the EU. This figure understates the total number of agreements because it excludes EAs that have been concluded at sub-national level. Although a few agreements have been in place for over two decades, it was only in the late '80s that a marked increase in their use was noticeable. Since then, the number of EAs concluded per year has increased steadily over time. National trends show a less uniform picture.
- The Netherlands is the leading country in the development of EAs with over 100 in place but all EU countries except Greece are reported to have EAs. The Netherlands and Germany account for approximately two thirds of the EAs surveyed; some smaller countries - Austria, Belgium, Denmark and Sweden - tend to present a higher number of EAs than larger countries such as France, Italy and the UK. This may indicate that EAs tend to be applied more often in countries where environmental policies have matured and where there is a strong tradition of decentralisation, consensus-building and negotiation in decision-making.
- In many countries EAs have tended to follow national or international developments in legislation rather than set a new agenda for environmental policy itself. This is pronounced in countries such as Finland and Belgium. For example, the Commission Directive on Packaging Waste

(94/62/EC) has driven the adoption of EAs in these and many other member states.

- Some of the countries which are more advanced in the use of EAs, such as the Netherlands, have concluded agreements in almost all environmental policy areas identified under the 5EAP. Furthermore, in a large number of the countries where environmental agreements are evident, a range of 5EAP themes have been covered. All countries (except Greece, where there are no EAs) have operating EAs in waste management. A large number of the EAs so far initiated in member states are found in the economic sectors where most polluting activity takes place (metals and metal finishing, chemicals, energy, transport), with more than 20 % of the total number of EAs affecting the chemical sector.
- There is clearly a significant absence of EAs addressing environmental issues in the transportation and tourism sectors, although those in Sweden and France cover the sector marginally.
- There are four agreements, as defined under the

current study, that cover the agricultural sector. Sweden presents a case of the use of an EA to promote research and development. This is unique in member states at present but promises a further use of such agreements to assist environmental policy in the future.

- The history of the various administrative structures in each country appears to be the most important factor in the adoption of EAs. Countries such as Germany and the Netherlands, built on a solid administrative culture of co-operative development between national and regional environmental legislation, have been the centre of environmental activities to date. In general, countries such as Spain or Ireland, where regional structures have not been fully developed or have been responsible for conflict in policy making, have not experienced the same level of uptake of voluntary approaches.
- Other non-EU countries, such as the USA, Japan, Canada and New Zealand, have also applied agreements as environmental policy tools.

3. OVERVIEW OF THE MAIN ARGUMENTS USED BY DIFFERENT INTEREST GROUPS

3.1 Review of Arguments

The following review of the arguments surrounding the debate on EAs addresses some of the key points raised in the ‘effectiveness debate’. Various authors have identified possible performance criteria for the assessment of environmental policy instruments such as EAs. These have evolved over time (see Opschoor and Vos 1989; Sterner 1994; Storey 1996) and now include:

- environmental effectiveness;
- cost effectiveness;
- dynamic effects on technical change (or even innovation);
- conformity with prevailing institutional framework, in particular, the Polluter-Pays Principle;
- soft effects (e.g. changes in attitude);
- wider economic effects (on price levels, trade, distribution, barriers to entry, etc.).

The review below concentrates on the first three points, it being difficult to generalise on the last three to any meaningful degree.

Environmental Effectiveness

EAs do not always take the form of negotiation between industry and public authorities, but other types of agreement are out of the scope of this study. In this context, it is important to understand the role of governments in encouraging these agreements. The critical issue is whether they perceive their role as trustee for the environment or as arbiter between the major conflicting parties, environmental interests and polluters. The significance of the non-inclusion of environmental interests has to be understood in this light.

To the extent that negotiation occurs at all, the per-

ception of many critics of EAs is that the targets for environmental quality are being set lower than might otherwise be the case (Glachant, 1994; FoE, 1995; ZEW, 1996). Yet this assumes that the standard itself is up for negotiation. This is not the case with all EAs, some of which relate, not to the setting of targets per se, but to the achievement of targets already set (for example, compliance with EU Directives). In such cases, negotiation concerns mainly the implementation of a given standard/target.

On the other hand, it would appear that industry can, and does, use EAs as a way of forestalling the perceived onward march of regulation (CEC, 1996a; FoE, 1995). This seems most likely to occur where the EA lacks mechanisms for enforcing compliance with the agreed standard. Some authors speak of the possibility of regulatory ‘capture’, yet it may be that the chances of such capture occurring are no stronger than in the orthodox regulatory approach, where industry may influence governments through lobbying rather than negotiation, and that EAs simply make this possibility more visible.

Lastly, and relevant to the issue of the chosen baseline, EAs seem particularly well-equipped to address environmental issues for which the solution is not easily found in other market mechanisms, or where public knowledge of an issue is not far advanced, for example in the case of waste streams such as end-of-life vehicles (Aggeri and Hatchuel, 1996). Pollutants produced in the manufacture of intermediate products or capital goods may be good examples of cases where market-based instruments appear ill-equipped to address the matter in hand. In such situations, indivisibility, and linkages to up- and down- stream suppliers, may limit the ability of those targeted by

the measure to respond to market signals. The use of EAs or regulatory approaches may be the best alternatives.

Cost Effectiveness

Theoretical literature is fairly clear as to what is generally meant by the ‘cost-effectiveness’ of an instrument. It can be assessed against the alternative policy, including additional new instruments, that would have been applied in the absence of the instrument examined. Cost-effectiveness has thus to be considered on a macro level. However, in the debate, the term ‘cost-effectiveness’ is often used to refer to cost-savings on a micro (company) level. Furthermore, in the case of environmental agreements, literature has not been very specific. There is hardly any empirical literature providing evidence on the cost-effectiveness of EAs.

Environmental agreements are often presented as being more attractive than traditional regulation to both regulatory agencies and regulated parties, due to their ability to reduce the overall costs of environmental policy (CEC, 1996b). However, other views also have to be considered:

“Solutions to the problem of reducing emissions are economically cost-effective if each emitter fixes his contribution to the reduction in such a manner that the overall economic avoidance costs are minimised. Individual emitters neither know the avoidance costs nor are they interested in including them in their decision-making, hence, these signals have to be sent through environmental policy. Levies and permits in particular are classic textbook instruments meeting the economic efficiency criteria, because they send out these signals in the form of a correction of relative prices. On the other hand, a reduction in emissions with minimal costs for the overall economy is unlikely to be achieved via a voluntary agreement (...), for instance, due to the restriction to certain sectors and the free-

rider behaviour to be expected on the part of the members of the associations. For companies economically speaking the application of clean technology is also in the short term linked with increasing costs and financial risks. Disadvantages of integrated technologies from the point of view of an entrepreneurs’ investment calculations, are higher access and information costs, adjustment and changeover costs, funding bottlenecks, long decision-making horizons and greater economic risk. Here negotiated agreements may be able to provide an additional impetus for adjustment and changeover, but an adjustment to ecological requirements in a way that minimises the costs for the overall economy is not to be expected with voluntary agreements in view of the restriction to certain technologies and the expected free rider-behaviour on the part of the companies. Concerning dynamic efficiency (...): Once the goal has been achieved, there are no further incentives for progress in terms of environmental technology.”

Source: ZEW, 1996, p. 26f

Cost effectiveness refers to the cost of the policy measure per unit of reduction in environmental costs. It says nothing about the level of reduction of environmental costs. Thus, even if EAs are cost-effective policy measures, they may actually achieve very little in terms of reduction in environmental costs.

Another argument advanced in favour of EAs is that they can achieve prompt implementation of policy (CEC, 1996b). Though this may be true in some cases, since EAs may have the potential to circumvent the lengthy (and costly) legislative process, it is not always the case that implementation costs of EAs are as low as has been suggested (ZEW, 1996). Furthermore, where large numbers are involved in negotiations, the distribution of information between those in the negotiating process can affect the speed and success of negotia-

tions themselves. Where important prior information is held by relatively few of the negotiating partners, there is some doubt over whether an agreement can be reached quickly. The presence of asymmetrical information tends also to increase the costs of reaching consensus (Mailath and Postlethwaite, 1990; Harsanyi, 1977). However, some authors have argued that agreement can also be hampered by the availability of too much information, even where it is relatively evenly distributed (Hawkins, 1983; Mol, 1996).

In addition, with respect to the negotiation issue, the relatively large number of participants sometimes involved in negotiations has been cited as a reason for the failure of some EAs. Not only do the costs of negotiated agreements rise rapidly with increasing numbers of participants (Glachant, 1994), but such large numbers increase the possibility for free riding within EAs. Free riding, or inaction, by one or more parties to the agreement, occurs where those parties take advantage of the commercial benefits that arise from doing nothing, whilst those around them are taking action, at positive economic cost, to attain targets set down by the agreement. These issues reduce both cost-effectiveness and environmental effectiveness of the EA concerned.

Compliance costs might be increased, at least for some parties involved, under certain conditions. This would result from a small number of firms party to an agreement being able to negotiate an agreement favourable to themselves, through negotiating objectives with which only a few firms could comply at reasonable cost.

Lastly, the fact that governments may end up relying on industrial interests to furnish them with information concerning the extent of pollution can be construed as an abrogation of responsibility. The reduction in costs implied by not monitoring developments has to be set in the context of the

very real costs which might arise from having inadequate, possibly erroneous, data on environmental problems perceived to be of importance to society. Indeed, the passing over of any monitoring function by government may be regarded as giving up its role as trustee of the environment.

Regulatory administrative costs are said to be reduced by an environmental approach because the pursuit of information on which policy instruments are designed is reduced. Indeed, most EAs involve the volunteering of information to the regulator by regulated parties. Firms' compliance costs are also said to be potentially lower under an environmental approach. This is because the flexibility of the approach allows for the lowest cost method to be undertaken by firms in attaining targets (Hahn, 1989). Such cost reductions are likely to be greatest where the marginal abatement cost curves of firms differ.

Dynamic Effects on Technical Change (Innovation)

Ideally, an instrument of environmental policy will affect the rate and direction of an industry's evolution such that the issues which the instrument seeks to address are addressed in continuous manner.

There is not a clear definition of what is meant by the terms 'innovation', 'technical change' and 'technological change'. The following definitions are offered by way of clarification. Some authors such as Ashford (1996, 2) believe that innovation requires a 'new technical idea', but many innovations may involve a combination of old ideas and new technologies (such as the application of biotechnological methods to extract metabolites from plants identified through knowledge which has resided with indigenous peoples for centuries).

Technical change is, by definition, a change in technique. Technique can be broadly understood

as a way of doing things, so that technical change implies doing things in a different way. Any technique requires the use of that which one might understand as tools or technologies, both material objects and know-how. Technological change involves the use of different tools. The terms ‘technical innovation’ and ‘technological innovation’ refer, respectively, to the first commercial use of a particular technique and technology.

Whether any changes, technical, technological or innovation, will indeed take place might depend on a number of factors, not all of which appear, at first glance, to be amenable to manipulation through design of the policy instrument concerned. Innovation, technical change and technological change must be understood as activities affected by a multiplicity of factors, and any EA must acknowledge that its impact on the course of any such change will be difficult to determine. Much will depend on the existing industry structure. One author has even referred to the ‘innovativeness of an industrial sector’ as ‘inherent to that sector’ (Ashford, 1996).

The success of EAs in encouraging such changes is likely to be related to the extent to which the EA changes, or reflects a change in, a given enterprise’s view on such matters. It seems impossible to make any general conclusions about EAs in this regard. There has been some mention in the literature of the positive impacts on companies’ competitive position, arising as a result of their need to address environmental issues in more comprehensive ways than was earlier the case. It seems reasonable to assume that, where such outcomes occur, they do so as a result of a combination of technological, technical changes and innovations arising out of a search process promoted by heightened awareness of problems relating to, for example, resource throughput.

It is worth noting, in passing, that there have been

cases where the initiation of a voluntary approach has induced a process in which firms have favoured older, less economically efficient or environmentally effective, technology as a means to achieve targets. This stimulation of the use of out of date technologies occurred for example, during the French regionalisation of water pollution policy during the 1970s (Harrison and Sewell, 1980; Hassan and Nunn, 1996).

The critical importance of available options in determining the environmental effectiveness of any policy instrument is noted by the OECD (1993, 36). Regarding the longer-term dynamic situation, it is certainly not clear that EAs are any more effective than other economic instruments with regard to incentives for continuous technological change, and they may even be less effective (ZEW, 1996). Nor, indeed, is it clear that regulatory approaches are completely useless in this regard. The policy makers’ dilemma lies essentially in the fact that the stimulus to innovation given by an EA is likely to be correlated with its stringency, but that the EA’s chances of achieving success on its own terms are more likely to be assured through less stringent agreements. The difficulties in finding the right approach should not be under-estimated.

The OECD (1984, 29) mentioned, in a paper on environmental policy and technical change, that; ‘as a firm matures, it becomes increasingly “locked in” to a rigid production sequence which greatly reduces its ability, and its managerial propensity, to introduce major product or process changes.’ The same paper cites important work by Abernathy (1979) and Utterback (1979) concerning the life cycle of the firm. Opschoor, de Savornin Lohman and Vos (1994, 36) comment that innovation is;

“more often than not the result of firms’ market based interactions with others (clients, suppliers etc.), these interactions produce multiple influences on the products’ and processes’ environmental performance ‘upstream.’ Pure efficiency considerations can, in such circumstances, only play a limited role.”

They go on to add that ‘Innovation must then be seen as the outcome of a complex process within a “structure of co-operation”. Depending on, for example, the level and type of innovation (process or product) and the parties involved, different policy instruments may provide different stimuli resulting in different environmental impacts’ (Opschoor, de Savornin Lohman and Vos, 1994, 36). Thus, there is recognition, though no in-depth examination, of the issue of lock-in (see Arthur, 1988a,b; 1989; 1990), though recent work by Faucheux (1997) is an exception.

The issue of the ability of EAs to generate significant changes in behaviour and to stimulate innovation in the desired direction clearly needs to be revisited in the light of modern theories of technological change. It is more than likely that a range of supporting instruments and institutions will be needed to foster the desired changes in behaviour.

An important matter to consider at the outset relates to the credibility of the policy changes being proposed. Where uncertainties are prevalent in this regard, the response to the policy change is likely to be, at best, guarded. This is a fundamental issue, the empirical evidence for which seems quite in keeping with the theory, and it applies with equal force to all policy instruments, economic and otherwise.

3.2 Views of Various Stakeholders on Voluntary/ Environmental Agreements

The following pages try to summarise the views on the subject held by different stakeholders, namely Industry (small and large firms), Trade Unions, NGOs, the Commission and the European Parliament.

Industry: Large Firms

There is a substantial amount of support for the use of EAs in the private sectors of member states. The initial justification for this appears to be the ability to reduce the costs of compliance by allowing flexibility in the choice of method by which environmental performance targets are met (section 3.1).

In addition, a number of other advantages of the approach often considered as “voluntary”, have been expressed by larger firms and their respective trade associations.

The usual reason presented for this is that they represent a re-focusing of policy design towards the level most eligible to deal with the problem at hand, i.e. following the principle of subsidiarity. The extended negotiations that characterise most EAs, i.e. their “bottom up” policy making style, are also favoured by large firms, compared to the alternative approaches of regulation or use of economic instruments in which policies are, to a large extent, imposed upon them. Several industry groups have expressed their support in this manner, reporting that the alternative policy approaches have too often failed to consider the specific circumstances of the industry involved (EURELECTRIC/UNIPEDE, 1994; UNICE, 1995; ACEA, 1995).

The flexibility of EAs in allowing for various methods of attaining targets has also led some industry associations to highlight the ability of the

voluntary approach to stimulate innovation. The benefits from an increase in flexibility, however, are delicately balanced. There have been instances where the flexibility allowed to firms has led to inaction. This has been observed in the case of an EA concerning the metals industry (ENDS, 1994a).

Many industry groups also favour EAs because of their general philosophy. They are usually framed in terms of positive rewards rather than negative threats of action (fines for non-attainment of environmental standards, for example). By getting industry to sign up to meeting a target, rather than imposing the target as a legal requirement, EAs may generate a greater commitment from industry. The representative from Renault suggested that this was true in the case of end of life vehicles in France.

Furthermore, there are often positive spin-off benefits from being part of an EA, such as consumer awareness or increasing the environmental profile of the sector as a whole. There are examples of EAs that have been implemented solely for the purpose of generating these spin-offs. In the UK there is interest in the use of EAs in this manner. (ICER, 1994).

However, there have been a number of cases where firms have expressed concern over the use of EAs in their sector. This has extended, in some cases, to the industry association asking for traditional regulations to be put in place instead of initiating an environmental agreement for that sector. In the UK, for example, the Industry Council for Electronic Equipment Recycling (ICER) has rejected the use of EAs in favour of a more traditional form of regulatory activity, claiming that the potential for inaction under an EA was too high and that this might harm the packaging industry's public image irreversibly (ICER, 1994). Industry associations in Denmark have also been rather cri-

tical of the use of EAs (Lorenzen et al. 1994).

There are also cases where companies have initially been uneasy about the prospect of negotiating with government agencies. For example, when the Dutch Chemical Industries Association (VNCI) suggested entering into negotiations with the government leading to the Chemical Industry Declaration (section 5.4), the companies' response was guarded. This is thought to have been due to a lack of trust. In this case, the EA has led to the initial mistrust being largely overcome.

Clearly, most large firms and trade organisations have sufficient knowledge and capacity to become involved in further EAs should these arise. However, there is a general feeling that there has been insufficient experience of concluding EAs on an European scale, and that an information/awareness gap exists at this level. Thus, UNICE, the Union of Industrial and Employers' Confederation of Europe, has called for European institutions to develop a framework for what it terms 'negotiated agreements' (so as to distinguish voluntary approaches by business which require no negotiation) between public authorities and industry (1995). UNICE believes that public authorities should set up 'carrots' or 'ticks' as incentives for implementation of the agreement, the former including tax incentives, undertakings on the part of regulatory bodies not to implement regulatory initiatives, and subsidies to research (UNICE 1995). This would appear to explain the dropping of the word 'voluntary' in favour of the term 'negotiated'. The UK's Confederation of British Industry is also positively disposed to the idea of EAs (Greenpeace, 1996).

UNICE recently expressed its views on the Commission's Communication on Environmental Agreement (UNICE final, March 1997). In its final position paper, UNICE welcomes the recent communication and supports and calls for the use of EAs as defined by the Commission, considering

that they represent cost-effective and pro-active ways of achieving environmental goals and stipulate several conditions for their success concerning, among others; objectives, enforcement, transparency and monitoring of EAs. Box 3.1 below illustrates some of these views.

Box: 3.1: VIEWS OF INDUSTRY

- Environmental agreements will neither replace all legislation and regulation, nor be a panacea for solving present and future environmental problems. Appropriate legislation will remain necessary to set the democratically chosen targets for achieving Sustainable Industrial Development.
- Clear, achievable objectives and targets are needed.
- Legal enforcement is important to keep both industry and governments to their obligations. However, more important for the success of environmental agreements are the mutual benefits for both parties, rather than the legal form or enforcement clauses in the agreement.
- There are several ways to enforce compliance using legal and other instruments such as fines, adaptation of environmental permits and public pressure.
- Parties should publish concluded environmental agreements so that third parties can scrutinise them. This may be a driving force for compliance as well.
- Provisions must be made for appropriate monitoring systems and regular reporting to all parties involved, including the provision of appropriate information to the public.
- Free-riders must know explicitly what consequences they could face.

Source: UNICE final, March 1997

Industry: Small Firms

There are very few instances of EAs which have been convened specifically between government bodies and small firms. There is, perhaps, only one type of EA, involving participation in an environmental management and auditing system (EMAS), where small firms have been involved to any significant extent.

A major factor limiting small firms' involvement in EAs has been found to be their lack of sufficient human, technical and financial resources to become involved in what is perceived by many to be a highly peripheral activity (Biondi et al, 1996). Although views of Small and Medium-sized Enterprises (SME) tend not to be represented, i.e. they are not generally involved in the negotiating stages of an EA, they are affected by them in a number of cases. SME involvement in an EA can occur directly through membership of a trade association, or indirectly through supply chain pressures where the firm is commercially dependent on supplying a larger firm, which is itself inside an EA. An example of the latter is provided by the French case study on end-of-life vehicles (see section 5.1). In this context, competitive issues also have to be mentioned because it is possible that SMEs are affected, possibly even endangered, by agreements of larger companies in a way such that markets tend to become oligopolies or even monopolies. Experiences in Austria, e.g. in the waste sector, show that, where EAs are agreed, a market economy can lead to distorted price structures, if competition is not promoted by government.

Direct involvement through a trade association generally tends to display a high degree of free riding by SMEs. Although this might not significantly affect the environmental performance of the agreement, it is of concern to its stability - i.e. the actions of SMEs in free riding might jeopardise the whole agreement.

Trade Unions' Views on EAs

It was not possible to identify many official positions of different Trade Unions on Environmental Agreements. However, the European Trade Union Confederation (ETUC) has expressed its view on the subject on an EEB/ETCU Workshop on "Double Dividend, Budgetary and Fiscal Reforms" held in Rome, 5-6 of June 1996 (ETUC, June 1996):

"The ETUC does not view voluntary agreements and regulation at national or European level as a contradiction; they complement one another. Regulations remain an efficient instrument to achieve environmental improvements. They are setting the framework and the goals to be achieved, and they have to set a clear timetable for the realisation of commonly agreed objectives. Voluntary agreements can be a valuable instrument for the realisation of these goals. They should, however, clearly define the obligations and tasks of the respective partners. Any agreement should be negotiated with the participation of trade unions, and the representation of workers will have an important part to play in the surveillance of the agreements."

An Austrian Trade Union complains about the unclearness of EAs (Bundesarbeitskammer 1997) and is quite sceptical about monitoring and democratic aspects, because, for instance, neither consumer organisations nor trade unions are involved, although the impact on consumers and employees may be substantial. For example, they hardly have access to all the EAs in force, and cite a case of batteries that are likely to continue to be dumped although an EA exists that requires recycling.

Environmental Non-Governmental Organisations (NGOs)

European NGOs have been active in the debate on the use of EAs for some time. Greenpeace International's European Unit has been highly critical of what it deems to be an overly optimistic view of EAs on the part of the European Commission. Underlying this view is the opinion that industry should not be allowed to take over the public policy process in effectively setting the goals of environmental policy (Greenpeace, 1996). In addition, Greenpeace feels that, given that environment and industry are still in a relationship characterised more by conflict than co-operation, the necessary conditions which would need to be attached to any EA in order for it to be a useful instrument of environmental policy are such as to make the distinction between EA and regulation all but meaningless.

The European Environmental Bureau's (EEB) view on EAs is that there may be advantages and disadvantages in the EA approach. Advantages include the contribution of industry expertise and the level of involvement of industry throughout. On the other hand, significant problems are observed, particularly with respect to NGO participation and transparency. As a result, EEB sees EAs not as a form of deregulation, but as a complement to regulation (EEB, 1996).

In a paper for the European Environmental Bureau, the Dutch SNM (Stichting Natuur en Milieu) (1996) sees both opportunities and risks in the EAs (like UNICE, they use the term 'negotiated agreements') approach. The success or failure of EAs, for SNM, hinges on their credibility, which relates to the degree of democratic control over agreements and progress made, the clarity and ambition of the targets set, the means to deal with free-riders, the extent to which industry is held accountable for results and the degree of public access to all relevant documentation and data.

Friends of the Earth (FoE) have conducted a review of the use of EAs in the UK and hold the view that they are largely ineffective in achieving many of the advantages that both government and industry bodies have claimed for them (FoE, 1995). FoE's main point of contention is that EAs are generally compared to existing, traditional forms of regulatory activity such as technology based standards and emissions limits. For EAs to be evaluated correctly, the authors of the FoE report argue, that they should be compared with other, newer forms of policy approach such as financial incentive mechanisms, market based instruments and insurance based policies.

The ability for those inside the negotiation process to shape future environmental policy targets appears to be one of the main points of contention highlighted by many other NGO reports on EAs (Greenpeace, 1996; SNM, 1995). The consideration of this issue becomes more important as the potential hazards from failing to set sustainable target levels of environmental protection become larger. This has become an increasingly acute problem when addressing issues connected with problems such as pollution of the human food supply or drinking water resources (ENDS, 1995).

In general, there has been much criticism of EAs in Denmark, notably from industry associations as well as environmental NGOs. The latter have claimed that EAs have tended towards the lowest possible targets instead of forcing more strict, and therefore more environmentally effective, targets (Lorenzen et al, 1994).

There is a wider debate commented on by environmental, and other, NGOs, concerning the undemocratic nature of the EA. Many EAs are characterised by negotiations between a limited number of partners - i.e. industry groups and regulators - and are therefore rather more closed than the traditional policy making process which is

subject to parliament ratification and is accessible to the public. NGOs feel that, if they are excluded, then, unless they can be sure that the public body involved in negotiations will accurately reflect their interests, the undemocratic nature of negotiations is likely to lead to weak EAs. Furthermore, NGOs feel that they suffer from insufficient resources and expertise to properly follow and contribute to highly technical discussions requiring very specific knowledge. Finally, they fear that the use of EAs might lead to government effectively ceding its responsibility for areas of environmental policy to the private sector (FoE, 1995; SNM, 1995; Biekart, 1995).

The absence of public groups as signatories to EAs in the country review (section 2.3) certainly suggests that more could be done to develop the public accountability of EAs. NGOs' concerns with EAs are closely related to the question of how the government perceives its role in negotiations, as discussed above. If governments are committed to a strong trusteeship role, the non-participation of NGOs might pose less of a problem than in cases where the government seeks to act as arbiter between conflicting parties, with one of those parties absent.

The box below reproduces the position taken by over twenty NGOs which participated in a meeting to discuss the significance of environmental agreements with industry, held at the headquarters of the EEB in Brussels on 19 November 1996.

Box 3.2: VIEWS OF ENVIRONMENTAL NGOS

1. They do not support the use of Environmental Agreements by Member States unless the use of other instruments has been demonstrably and publicly considered and it is made clear why an environmental agreement is thought to be more effective in reaching environmentally relevant results.

As a general rule, Environmental Agreements must not be used in isolation, but should be part of a mix of instruments, preferably implementing or anticipating legislation. Especially in the first case, an Agreement is much more meaningful because it strongly binds the parties to such an Agreement.

2. The NGOs do not consider that the use of Environmental Agreements as an alternative to national legislation as a means of transposing EC directives is legally valid. However, they are of the opinion that Agreements may be used in addition to the transposition of directives into national law, offering some advantages to those parties in industry which wish to go further than demanded by that law.

The NGOs would be strongly opposed to the idea that the Commission would draft more communications instead of directives in order to provide legal justification for an increased use of Environmental Agreements.

3. At present, the NGOs do not regard Environmental Agreements at the EU level as a credible response to environmental degradation. In particular, we wish to stress the fact that, whereas Member States may apply sanctions for non-compliance with environmental protection requirements, the Commission may not apply sanctions to either industrial federations or industrial enterprises. EU-level Agreements are therefore likely to damage the credibility of the Commission.

4. For a Member State to convincingly and publicly demonstrate that an Environmental Agreement is an appropriate instrument, it must meet the following terms:

- the targets of an Agreement must be set beforehand at the policy level and be confirmed by Parli-

ament. They must not be negotiable by industry;

- the targets of an Agreement must be quantitative and carry a long-term character, while intermediate targets and end dates must be defined;

- the binding power of an Agreement must be maximised by requiring individual companies to sign the Agreement, companies outside an agreement ('free-riders') should be prevented from obtaining any advantage of not signing the agreement and companies which have signed, but perform below the standard agreed upon, must be treated as free-riders;

- it must be possible to re-negotiate the rules and targets of the Agreement after a reasonable period of time if that is demonstrably necessary and tacit extension of an Agreement must not be possible;

- public and Parliament must be actively informed about the intention to make an Agreement, about its contents and about the progress in its implementation;

- all documents concerning an Agreement must be made readily available to public inspection;

- an Agreement must be notified to the European Commission;

- the implementation of an Agreement must be monitored and verified in direct relation to its targets and evaluated by an independent body on an annual basis and the results of the monitoring (of both individual companies and cumulative) and evaluation must be made public.

5. Finally, the NGOs stress that the parties to an Agreement must have a strong commitment to its targets. In particular, the government needs to have a strong position, both with regard to the environmental ambitions, as with regard to the negotiating position. A government prepared to undertake action when trouble arises is vital.

EEB, Brussels, 19 November 1996

Other NGOs have focused on the problems associated with the incentive to free-ride (SNM, 1995). An important distinction must be made in this respect between those agreements that are legally binding and those which are not. The general lack of legally binding agreements - only 10 member states have concluded binding EAs - has created an incentive for EA participants to choose not to comply and free-ride on other's continuing compliance (Lorenzen, 1994; Greek Ministry for the Environment, 1997). A number of potential agreements in the UK have failed, due in part to such concerns.

Where recourse to the legal system is allowed through binding agreements, such as in the Netherlands, the incidence of free-riding is much lower.

EAs covering domestic consumption are relatively rare. A survey done by the International Energy Agency (IEA) of around 200 agreements found that only one fifth covered the residential or institutional sectors. Of these, most were focused on household energy efficiency improvements or the promotion of specific energy efficient products (Solsberg and Wiederkehr, 1996). These agreements tend to have longer-term targets for effectiveness, due mainly to the long time periods needed to effect larger changes in building efficiency.

The European Commission

The Commission has expressed a great deal of interest in the use of EAs in member states in the recent past. Interest follows, on the part of the Commission, from the recognition of the need to diversify the range of instruments used in environmental policy and adopt a broad approach based on the principle of shared responsibility. This was formally documented for the first time in the Fifth Environmental Action Programme (section 1.1).

The Commission, due to its limited experience with EAs to date, faces three concerns regarding the use of the environmental approach (EE, 1995a):

- (I) What criteria should be used to accept or reject an EA concluded by a member state?
- (II) Should EAs be allowable policy instruments to achieve objectives laid down by EU legislation?
- (III) What requirements are needed to allow for EAs between the Commission and sectoral bodies of industry?

Throughout the Commission's various documents on EAs there is a strong desire to promote the interests of other bodies in the Union, i.e. the European Parliament and Council of Ministers (Bjerregard, 1995).

The European Parliament

The European Parliament (EP) has expressed some concern over the use of EAs. MEPs have recently been reported to be "deeply sceptical of voluntary agreements" (ENDS, 1995). In response to the growth of EAs in member states, the Chairman of the EP's Environment Committee formally requested a report on the progress of voluntary approaches and the timetable for any intended Commission proposals on the subject during 1995. In a recent document (Report A4 - 0040/97) the Environment Committee expresses the opinion that it

"believes that voluntary agreements may possibly complement but may never substitute legislation within the chemical sector."

4. FRAMEWORK FOR THE ASSESSMENT OF THE ENVIRONMENTAL EFFECTIVENESS OF EAS

4.1 Methodological Considerations

The environmental assessment can be done against:

- (I) additional **alternative policy instruments scenario** (like taxes or regulation) that would have been applied instead of an EA;
- (II) the **trend scenario (business as usual)** in the absence of the EA and in the absence of additional instruments (apart from those already applied);
- (III) the **reference situation** prior to the EA.

These alternative baselines (or reference situations) are ranked here according to their appropriateness for comparison, as whether a comparison is feasible or not depends on the data available. For the case studies, only (II) and (III) were finally chosen as comparisons since there was no data available for (I). The comparison with the trend scenario (II) is termed the environmental effectiveness, since it tries to isolate the impacts of the EA from those of other instruments. The comparison with the reference situation (III) is termed the environmental improvement.

The environmental assessment of each case study EA, therefore, should capture as far as possible:

- the net environmental impact of the EA compared with the above baselines/reference situations;
- the economic characteristics, e.g. the incentives and impacts of the EA;
- the wider outcomes associated with the EA, e.g. cost-effectiveness (in comparison to alternative policy instruments) and technical change.

4.2 A Common Framework

A common framework was required to assess the net environmental impact of the EA which can be attributed directly to the EA. This requires the specification of a baseline as indicated above (options I and II).

However, a problem common to this type of evaluation is the establishment of a baseline, for example: What is the baseline representing the trend development that would have taken place anyway (II)? What is the baseline reflecting alternative policy instruments that would have been applied in the absence of EAs (I)? And what emissions levels are involved with the different scenarios? The main purpose of defining a baseline is to isolate the effect of the EA in comparison to other instruments applied (e.g. in a policy package).

Where it is not possible to define a baseline (options I and II) to isolate the environmental impact of the EA, the third best option (III) is to assess the environmental improvement against the reference situation prior to the start of the agreement. In effect, this assumes that the environmental performance would have remained unchanged in the absence of the EA (Box 4.1), which, in practice, is unlikely. For example, changes in industrial emissions and energy consumption are affected by factors such as oil prices and the general health of the economy, both of which are subject to unforeseen events. These effects have to be separated from the effect of the EAs, which may be difficult. These uncertainties are common to economic and environmental assessments, cannot be solved satisfactorily, and thus have to be accepted. Not establishing a baseline implies also that the environmental improvement (in comparison to the reference situation) cannot be attributed to the EA, which makes a judgement very difficult.

**Box 4.1:
THE ASSESSMENT FRAMEWORK**

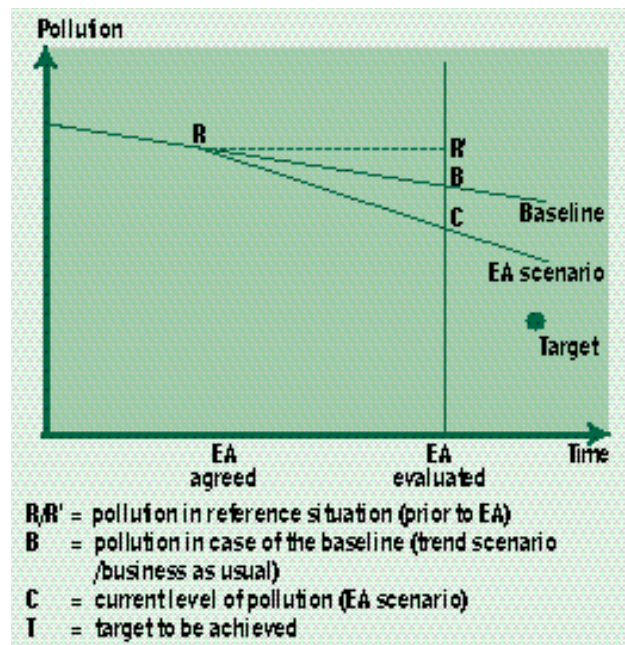
When a pollution problem is perceived to be creating too much pressure, a target for a reduction in pollution may be set (time: EA agreed) to be reached in the future.

In Figure 4.1, the level of pollution is assumed to be decreasing anyway (baseline), but it could equally be stabilising or increasing. For the environmental assessment of each EA, the reference situation (R/R') corresponds to the start of the agreement (time: EA agreed). The current situation (C) is the level of pollution at the time of the monitoring and evaluation (time: EA evaluated). The current situation (C) is compared to the baseline (B). The environmental effectiveness of the EA corresponds to (B-C), assuming (B) can be defined and a causal link between the reduction of pollution and the application of the EA can be made.

Where the policy baseline (trend scenario/business as usual) is unknown, the current level of pollution (C) can be assessed against the level of pollution in the reference situation (R/R'). In this case (R'-C) it is assumed that, without the agreement, the level of pollution remains unchanged (R'). This kind of comparison is called here 'environmental improvement'. However, an unchanged situation is not very likely and the environmental improvement cannot conclusively be attributed to the EA, because no baseline could be established.

Figure 4.1 allows representation of the process in time as well as the important fact that an evolution will take place anyway. Furthermore, one can discuss the possible evolution of the baseline and the difficulty of defining it a posteriori. In the figure, the assumption is made that the EA scenario is below the business as usual, representing an envi-

Figure 4.1.
ILLUSTRATION OF POSSIBLE
BASELINES FOR ENVIRONMENTAL
ASSESSMENT



ronmentally effective EA. This may well be the other way round.

For the case studies, the following approach has been chosen: if data is available, the **environmental effectiveness** considers the EA against the baseline of the trend scenario (business as usual), and in doing so isolates the impact of the EA on the environment. If there is a lack of data on the trend scenario, the reference situation is taken for comparison with the EA scenario. This comparison is called the **environmental improvement**.

The assessment framework has been used to develop a checklist of questions to be used in the interviews with key parties. The main themes investigated in the evaluation were:

- the Purpose: the reasons for the initiation of the EA, their reasons for involvement, motivation/incentives;
- the Context: for example, history of regulation and environmental policy, the national context, structure of the sector, the structure and membership of their organisation;
- the Objectives and Targets;
- Application and Enforcement, including arrangements for monitoring and reporting, avoiding free riders etc.;
- the Results (compared to the objective);
- the Baseline and counterfactual/alternatives (data was collected on the baseline and on the alternative instruments and the likely development in case of their application);
- Conclusions: the actor's own assessment of the overall effectiveness of the EA.

Data on the case study EAs has been collected through a series of face to face interviews with key parties, phone interviews, and review of existing reports and assessments. The range of parties consulted are listed in Table 4.1.

Table 4.1:
PARTIES CONSULTED FOR THE ENVIRONMENTAL ASSESSMENT

Category	Type
<input type="checkbox"/> Economic Parties	Industry Associations Producers in the EA Producers out of the EA
<input type="checkbox"/> Regulators	Central Regional
<input type="checkbox"/> NGOs	Environmental NGOs
<input type="checkbox"/> Policy Makers	Environmental Industrial
<input type="checkbox"/> Researchers/ Experts	Scientific Institutions

4.3 Selection of Case Studies for the Environmental Assessment of Environmental Agreements

Six case studies were selected for detailed assessment (Table 4.2). The case studies were selected to provide a sample which takes account of a variety of factors which may influence the effectiveness of EAs, including the environmental issue, the national context, the structure of the sector and the focus of the EA (i.e. on the product, the process or the waste product). The sample was not intended to be representative of all EAs. The case studies were intended to cover:

- the anticipated availability of monitoring data and reports to allow for quantitative assessment;
- a range of EU Member States, to allow some assessment of the impact of national context on the success of an EA;
- a range of economic sectors, to include sectors which are both national and international in character;
- a variety of environmental themes, although two case studies with the same theme (packaging) were selected to allow a discussion of the other factors influencing the effectiveness of EAs;
- the age of the EA, to select agreements initiated recently (but which should have had time to have an effect), due to the expected evolution in design of recent agreements, namely concerning clarity of targets, monitoring requirements and reporting mechanisms.

Further analysis of the case studies indicated that a differentiation between two types of EAs makes sense, as they may differ substantially in character:

1. target setting EA - the target as such was negotiated and set;
2. implementation EA - the aim of the EA is compliance with previously set targets.

Table 4.2: CASE STUDIES SELECTED FOR ASSESSMENT

Country	Type of EA	Environmental Agreement
France	Target setting EA	Framework agreement on the reprocessing of end of life vehicles.
Sweden	Implementation EA	Producers responsibility for packaging.
Germany	Target setting EA (partly also Implementation EA)	Up-dated declaration of German Industry on precautionary measures for the protection of climate.
The Netherlands	Implementation EA	Declaration of intent on implementation of environmental policy in the chemical industry.
Portugal	Implementation EA	Environment protocol between the Ministries of Industry and Environment and the pulp industry.
Denmark	Implementation EA	Agreement on the recovery of transport packaging.

For the target-setting agreement, an evaluation of the appropriateness of the target itself would have been pertinent but it fell outside the scope of the study.

5. ENVIRONMENTAL ASSESSMENT OF CASE STUDIES

This section presents the assessment of the environmental effectiveness of the six case study Environmental Agreements (EAs). The assessment is based on the framework described in Section 4. of this report and is informed by the series of consultations with stakeholders, both internal and external to the EA.

Each case study summary (presented in Sections 5.1 to 5.6 below) contains:

- an overview of the institutional and sectoral aspects of the EA;
- a description of the motivating forces, including the reasons for the involvement of the different parties to the agreement, the sanctions in case of failure to comply with the terms of the agreement and any driving forces for environmental improvement;

- the assessment of environmental effectiveness;
- an assessment of the wider impacts (including a rough estimate of the cost-effectiveness and the induced technical change/innovation);
- a description of other features considered important to the impact of the EA.

Further details on the various EAs can be found in the more comprehensive case study descriptions. The purpose of the extracts presented in this chapter is to focus on the environmental effectiveness and to make some general remarks on the involved costs. However, a statement on the cost-effectiveness in such a way that the costs of different baselines are compared is not possible due to the lack of data and the complexity of such an estimation.

5.1 Case Study 1:

France: Agreement on the Treatment of End-of-Life Vehicles (ELVs)

Overview of the Environmental Agreement

Case Study 1: France - Agreement on the Treatment of End of Life Vehicles (ELVs)	
□ The Environmental Issue	The treatment of end-of-life vehicles, and design of cars to improve the recovery, re-use and recycling of materials.
□ Start Date	1993
□ Target	No more than 15% of total car weight land-filled by 2002 (maximum of 200kg). No more than 5% in the long term. From 2002, new models must allow 90% recovery, re-use or recycling.
□ Time-scale	9 years- to be reviewed for 'long term' target date.
□ Number of Signatories	24 signatories.
□ Parties	- The Ministries of Industry and Environment; - 2 French car manufacturers and 12 importers; - 8 trade associations covering the dismantlers, shredders and recyclers, material producers and equipment suppliers.
□ Type of EA	Target setting EA, with distribution of responsibilities, for a widely accepted target.
□ Sanctions/ Enforcement Mechanisms	Implicit threat of legislation. No explicit sanctions. Certification Schemes are being developed for Dismantlers and Shredders. Certification will be required to do business with other large parties (e.g. car companies and insurers).
□ Other provisions/ principles	- Shared responsibility between parties for meeting targets; - Respect for market forces; - Free choice between material re-use, re-cycling and energy recovery.
□ Legal Basis	Moral Obligation.

Motivation

Participation in the EA

For the car manufacturers: the threat of regulation from the French Ministry of the Environment in response to proposals for a German regulation on ELVs, including provisions requiring manufacturers to take back their cars.

For government: uncertainties concerning the impacts of regulation on the car sector, and the need to minimise intervention and reduce the administrative costs associated with new regulation. Other parties were sensitive to the require

ments of car manufacturers, who are important clients.

Industry and government faced 'shared uncertainty' with respect to the treatment of ELVs (Aggeri and Hatchuel, 1996). There was insufficient knowledge of the problem and the likely impacts of the different options available for the formulation of effective regulation on ELVs and the situation was complex and evolving. Tackling the problem requires the development of new technologies, sectors and firms, through co-operation between the parties.

Sanctions and Driving Forces for Environmental Improvement

There is no explicit threat of sanctions in the case of non-achievement of the targets but there is an implicit threat from government of a regulation or tax. However, a number of groups in the chain face the threat of commercial sanctions if they do not comply with the EA. A certification scheme, including environmental performance criteria, has been established for dismantlers, and a second is being developed for the shredders. The car distribution networks and insurance companies have stated that they will use only those sites which are certified. The scheme for dismantlers is currently being implemented. It might deter free riders since, if implementation is successful, certification will become a requirement for survival, as restructuring occurs in the dismantling sector.

Environmental Assessment

The Reference Situation

Prior to the signature of the agreement in 1993, a maximum of 75 % of the weight of an ELV was recycled.

The Targets

Although the targets in the EA are not set in French legislation, the targets for 2002 of 15% disposal by land-filling for the average car and of 90% recyclability of new cars correspond with the targets resulting from the Priority Waste Streams work on ELVs initiated by the European Commission (see box 2.4 in section 2.3.16). The ELV expert group set up in 1991 (co-ordinated by the French) published a strategy in 1994 which indicated the following targets for the sector at EU level:

- a maximum of 15% land-filling of waste per car, for all cars, by 2002 at the latest;
- for models produced from 2002, no more than 10% land-filling of waste;
- no more than 5% disposal by 2015.

These targets include the use of energy recovery but with a preference for material recovery. No date has been set as yet under the French agreement for achievement of the long term target of 95 % recovery.

The Baseline

Business as Usual

In reality the business as usual baseline (the situation in the absence of the EA) would be influenced by two factors, with opposite effects on the amount recycled:

- the trend for the increased use of plastics in cars (estimated to rise from 10% to 13% between 1985 and 1995);
- the tax on land-filling introduced in France in 1994.

These factors have not been evaluated so the scale of their effects cannot be determined.

Alternative Policies

The EA was negotiated in response to a threat of regulation in the form of a decree from the Ministry of the Environment. However, there is no information available on the possible nature of this decree.

Given the difficulties in determining the baseline under business as usual and the lack of information on the alternative policy that would have been applied in the absence of the EA, it is assumed that in the absence of the EA the situation would have remained unchanged, giving a static baseline of 75% recycling of ELVs.

Environmental Effectiveness

There is no quantitative monitoring data at present that allows assessment of progress towards the targets for the average ELV. However, there are results from trials and demonstration activities

undertaken by the parties to the EA which demonstrate the technological possibilities for a small sample of vehicles, and demonstrate moves towards the achievement of the objectives. Tests demonstrate that it is technically possible to recover or recycle approximately 94% of the weight of ELVs but it is hardly possible to say whether the economic incentives would be strong enough to ensure the realisation of these technical possibilities. Many measures are underway to improve the recyclability of cars but the impacts are difficult to assess in quantitative terms.

Assessment Of Wider Impacts

Cost Effectiveness

The EA distribute responsibility for meeting the objectives between the parties according to their areas of expertise, to make best use of the knowledge and skills available. The EA represents a commitment on behalf of the parties. Some trade associations (CNPA) consider that greater producer responsibility should be introduced because of the relative financial strength of producers. It is estimated that it costs between 400,000 and 1,500,000 French Francs to reach the standards required for certification, and there are concerns over the dismantlers' ability to achieve a sufficient return to cover this investment (Aggeri, Pers. Com., 1997). Producers consider that an imposed measure would not generate the same level of collaboration and commitment. All respondents agree that the EA has led to increased co-operation and trust between the parties in the car chain. Though some cost savings are expected, a comparison between the costs involved in the baseline and the EA-scenario can not be made.

The focus under the agreement has been on improving the current, labour intensive dismantling system. This contrasts strongly with the mechanised dismantling chains being developed in Germany and the Netherlands. The result, under the French EA, requires less capital investment and is arguably better adapted to the diversity of ELVs entering the dismantling chain.

Technical Change/ Innovation

The approach taken under the French agreement has been to focus on improving the recyclability of new models through design, and improvements to the existing dismantling and treatment processes. This has resulted, for example, in the development of new tools to speed up the dismantling of recoverable parts and simplifying car construction to ease dismantling. The EA has also led to the development of new technical specifications for vehicle design and manufacture, in relation both to the use of particular materials and the construction process.

Conclusions

Quantitative assessment of environmental effectiveness is not possible due to a lack of monitoring data, although monitoring arrangements are being improved. The target set for the year 2002 is generally viewed as being technically achievable, but some trade associations and independent experts are more sceptical regarding the economic incentives to apply to these techniques. A number of actions are underway to improve the economic viability of re-use, recycling and energy recovery. However, a comparison between the costs involved in the baseline and the EA-scenario can not be made.

5.2 Case Study 2: Sweden: Agreement on Producer Responsibility for Packaging

Overview of the Environmental Agreement

Case Study 2: Sweden: Agreement on Producer Responsibility for Packaging	
<input type="checkbox"/> The Environmental Issue	Collection, recycling and material recovery of waste from packaging.
<input type="checkbox"/> Target	Targets for re-use or re-cycling, by January 1997, from the Ordinance on Producer Responsibility for Packaging: <ul style="list-style-type: none"> - 50 % of Aluminium, other than beverage containers; - 30 % of Card, paper or cardboard; - 65 % of Corrugated paper; - 30 % of Plastic, other than PET beverage containers; - 50 % of Steel; - 95 % of Standardised glass bottles for beer and soft drinks; - 90 % of Glass bottles for wine and spirits, filled in Sweden; - 70 % of other glass containers.
<input type="checkbox"/> The Start Date	1. 10. 1994
<input type="checkbox"/> Time-scale	2 years & 4 months, and a new ordinance is proposed to run to the year 2000, with higher targets. The scheme set up under the EA is continuing.
<input type="checkbox"/> Number of Signatories	8,200 companies have registered with the 'REPA' (short for Reparegistret - The Swedish Packaging Collection) scheme (covering 85% of packaging used by weight), established through a voluntary industry initiative and recognised by government. Companies have the option of registering with and paying a fee to REPA, or setting up their own collection, recovery, recycling and reporting system to fulfil their legal obligations under the ordinance.
<input type="checkbox"/> Parties	Producer companies (manufacturers, importers and sellers of packaging or packaged goods) register via Reparegistret with the appropriate materials companies, set up under the EA.
<input type="checkbox"/> Type of EA	Implementation Agreement, for Ordinance on producer responsibility for packaging.
<input type="checkbox"/> Sanctions/ Enforcement Mechanism	Complements Ordinance 1994: 1235 on producer responsibility for packaging which sets legal requirements for producers to collect and recycle or recover packaging materials, to meet the targets above, and provide data to the EPA. The ordinance is enforced by the municipalities and the EPA.
<input type="checkbox"/> Other provisions/ principles	5 separate companies established under the EA, each to ensure collection and recycling of different materials, allowing competition between the materials according to cost. Registration and collection is administered by REPA, and a second company is responsible for information. These 2 general companies are owned by the 5 material companies.
<input type="checkbox"/> Legal Basis	System voluntarily established by the Trade Associations, recognised by government and implemented through non-profit making companies which form commercial contracts with each producer firm.

Motivation

Participation in the EA

The agreement was initiated by the Swedish Industry Association in response to the Ecocycle Law passed in 1993, and the proposed ordinance on producer responsibility for packaging.

It was important for industry to control the costs of meeting the targets, for which they are legally responsible under the ordinance. Industry also wanted a national system to meet the targets which are set at a national level, moving away from the existing, varied municipal waste collection systems operated by the municipalities.

By accepting the EA, the government and EPA avoided the need to establish an alternative system for reaching the targets in the ordinance.

Sanctions and Driving Forces for Change

The legal requirements under the ordinance (making provisions for collection and recovery of

waste packaging, reporting to the EPA on the use of packaging materials and meeting the targets for recovery and recycling) are likely to change behaviour at company level. However, the fees paid by companies registered with REPA could also have an impact on the amount and type of packaging used. The fee paid to the individual material companies is determined by the amount of packaging used by each company, but also reflects the costs of collecting and treating the different types of packaging material. However, the fee paid by companies is relatively low. It is too early to identify any changes in behaviour resulting from the agreement.

Environmental Assessment

The Reference Situation

Estimates for recovery and recycling of certain materials covered by the EA exist for 1992 (Table 5.1). No information is available for metals, plastics or card, paper and cardboard.

Table 5.1: Progress Under The Swedish EA On Producer Responsibility For Packaging By 1995, Compared To Baseline And Targets

Material	Level of recycling and re-use		Target for
	Estimates for 1992	Estimates for 1995	January 1997
Aluminium - other than beverage containers	-	1-5 %	50 %
Card, paper and cardboard	-	19.5 %	30 %
Corrugated paper	65 %	77 %	65 %
Plastic other than PET beverage containers	-	5%	30 %
Steel	-	25%	50 %
Re-usable glass bottles for beer and soft drinks	100 %	97-99 %	95 %
Re-usable glass bottles for wine and spirits	90 %	100 %	90 %
Other glass containers	55 %	61 %	70 %

Source: Swedish Ministry of Environment, 1997

The Targets

The targets are set in the ordinance on producer responsibility for packaging, and were established following studies (including life cycle assessments) co-ordinated by the Swedish EPA. The time scale (2 years and 4 months) for meeting the targets can be considered ambitious, especially for those materials for which there was no existing collection system at the start of the agreement.

The Baseline***Business as Usual***

It is not possible to establish the change in recycling and re-use levels that would have occurred in the absence of the EA.

Alternative Policies

The EA allows the implementation of the ordinance on producer responsibility for packaging. There were no alternative policies or mechanisms considered at the time when the EA was established.

As it is not possible to establish a baseline, based on either the business as usual situation or on the use of alternative policy instruments, against which to assess the effectiveness of the agreement, the reference situation (1992) is used for an assessment of environmental improvement.

Environmental Effectiveness

Estimates of progress (Table 5.1) show an increase in the rate of recycling for 2 of the 3 targets for which reference data exists: corrugated paper, re-usable bottles for wine and spirits and other glass containers. For re-usable glass bottles for beer and soft drinks, there is a slight decrease in the estimated rate of recovery, from 100% to between 97 and 99%. In all three of these cases, however, recovery was at a high level before the beginning of the agreement. The deposit refund scheme for re-usable glass bottles was already in place. The existing glass collection and recycling system was integrated into the REPA system, accounting for

high levels of recycling of 'other glass' achieved by 1995.

There was also some recycling and recovery of the other packaging materials by 1995, but it is impossible to assess the impact of the EA on this because of a lack of data for the reference year (1992).

REPA is confident that all the targets established in the ordinance were met or exceeded by December 1996, with the exception of those for aluminium and steel for which data was not available. The figures for 1996 have not yet been published.

It is important to note that this data reflects progress made in one year after the establishment of the EA. For materials other than glass, new collection points had to be established. It is generally agreed that the metals and plastics materials companies have been slower in providing collection bins. This is reflected in low levels of recycling and recovery for these materials.

Assessment Of Wider Impacts***Cost Effectiveness***

The industry association considers that the targets will be met at a lower cost to industry than under the existing municipal collection system, by allowing industry, through the competing of materials companies, to control the costs of collection and treatment, with open tenders for services. However, the system imposes some extra, external costs on the public as it requires their participation in bringing waste packaging to central collection points, and there is also a perceived threat to jobs associated with municipal waste collection.

Technical Change

There is no evidence to date that the agreement has resulted in technical change. However, the agreement has been operating for just over 2 years. More time is required to identify whether any impacts on technical change occurred, and to

disassociate the effects of the agreement from other factors, such as Sweden's accession to the EU.

Conclusions

Progress in moving towards the targets in the ordinance, and therefore increasing the recovery and recycling of packaging waste, is mixed, but the assessment is based on data from early in the life of the EA; progress in achieving the recovery and

recycling targets for metals and plastics may have accelerated since 1995.

The REPA system, with the separate materials companies, is considered to allow the Ordinance on Producer Responsibility for Packaging to save some costs, but it also imposes some external costs to the public through bringing the waste to collection points.

5.3 Case Study 3:

Germany: Declaration by German Industry and Trade on Global Warming Prevention (1995) and the Updated and Extended Declaration by German Industry and Trade on Global Warming Prevention (1996)

Overview of the Environmental Agreement

Case Study 3: Germany - Declaration by German Industry on Global Warming Prevention (1995) and the Updated and Extended Declaration by German Industry and Trade on Global Warming Prevention (1996)	
The Environmental Issue	1995 & 1996 Version: Climate change/global warming - focus on CO ₂ emissions.
Target	1995 Version: up to 20 % specific CO ₂ reduction by 2005 with a base year of 1987 - for combined sectors (one association offered an absolute target). 1996 Version: 20 % specific CO ₂ reduction or specific energy consumption by 2005 with a base year of 1990 - for combined sectors with separate targets for each association (12 associations committed themselves to absolute targets). No targets for companies.
The Start Date	1995, updated 1996.
Time-scale	Continue at least until 2005, and until 2015 for electricity.
Number of Signatories	1995 Version: 17 1996 Version: 21 + RWI There are no real "signatories" as there is no signed contract, with the exception of RWI, the external verifier.
Parties	1995 Version: 15 Associations (5 with BDI representing part of its members) 1996 Version: 19 Associations (5 with BDI representing part of its members) No individual companies. Ministries of Economics, the Environment. RWI (Monitoring role) following 1996 version.
Type of EA	EA - target based (total & specific energy savings & CO ₂ reduction targets). Mainly process based.
Sanctions/ Enforcement Mechanism	Apart from public pressure, the discussed introduction of a carbon/energy tax and/or a waste heat ordinance contributed substantially to the agreement on the EA.
Other provisions/principles	Monitoring considered as a means of providing access to data on the environmental performance for the public.
Legal Basis	None - Gentleman's agreement, "morally" binding.

Motivation

For participation in the EA

The motivation for companies to adopt the EA was to avoid implementation of a CO₂/energy tax or waste heat ordinance. For the government, the

EA forms a core element of German strategy to meet CO₂ emissions reductions targets. The EA was required for the 1995 Berlin 1. Conference of the Parties (COP 1) as a statement of their real commitment to the Framework Convention on

Climate Change (FCCC). Also, the German government preferred an alternative approach to meeting environmental objectives, as taxes had already been increased to cover the costs of unification.

Sanctions and Driving Forces for Change

Apart from the threat of a tax or a waste heat ordinance, public and third party pressure is a driving force for change at sector and company level if the targets are not met.

Environmental Assessment

The Reference Situation

Data exists for a number of possible reference points: the base years used for the targets set under the EA (1987 and 1990), and the initial year of signature (1995). However, the data is variable in quality and coverage, demonstrating the need for clearer reporting in the EA, even in the 1996 declaration of several associations.

The Targets

The EA targets for associations are presented against a base year of either 1987 or 1990, and are couched in terms of reductions by the year 2005. On the basis of the interview programme, many of the associations are already some way towards the 2005 targets, not least because of the “wall fall profits” in Eastern Germany where industrial production has decreased dramatically, without an active climate policy, even after the base year 1990 and it is generally accepted by the parties that the targets will be met. This, however, tends to reflect:

- the progress made over the period 1987 to 1995, before the EA was signed;
- the fact that the targets can be easily achieved for most of the associations.

This can be seen in Table 5.2 which shows the

historic improvements (in specific terms). In the case of the glass, cement and ceramic associations, improvements in energy efficiency before the EA signed, but within the target time-scales, represent more than half of the total target over the whole time period for the EA. Specific targets imply that overall emissions might increase in the case of growing production offsetting efficiency gains which would hamper the achieving of environmental benefit.

The latter point - of easily achievable goals - reflects the fact that the targets were often set with the express intention of being easily achievable given the measures adopted by the companies. It also reflects the fact that the real targets for the EAs to achieve are less ambitious than a first appraisal would suggest, given past progress, and indeed very much in line with historical trends in energy efficiency improvements and CO₂ reductions (see next subsection). When considering the declarations of different associations it becomes clear that several emissions reductions are likely to have been counted twice and not all parts of the economy are yet included (e.g. investment and consumption goods as well as food). Though the quality of the commitments of some associations has improved and the suggested monitoring may be considered as detailed, there were several conditions linked to the declaration that reduce its value, e.g. the demand for political consensus on continuing with nuclear policy. Thus it may even be questionable as to whether an agreement between the signing ministries and the associations on the targets has really been made.

However, the EA is a flexible, on-going process which allows for revisions and improvements. These could include establishing tighter and staged targets and company-specific commitments. Indeed, there are already some discussions of tightening the targets given existing progress.

The Baseline

Business as Usual

The environmental effectiveness of the Climate Change EA should be assessed against a baseline which takes account of the energy efficiency improvements that German industry would make independent of the EA. This baseline should reflect the continuous incentives to save energy and cost, technological improvements and new investments to replace capital stock. Table 5.2 shows the

historic improvements in energy efficiency and CO₂ emissions for specific sectors party to the EA - presenting estimates for the annual energy efficiency improvements and the annual CO₂ emissions reductions where available. However, it should be noted that past improvement rates may not be a good indicator of future improvement rates - both because of changes to the industry structure and the fact that recent investments might limit the potential for future efficiency gains (and vice versa).

Table 5.2:
HISTORIC IMPROVEMENTS IN ENERGY EFFICIENCY & CO₂ REDUCTIONS

Sector	Period	Reduction Over Period*		Average Annual Reduction*		Target Reduction** by 2005*	
		CO ₂	Energy	CO ₂	Energy	CO ₂	Energy
1 Cement	1987-1994		15%		2.2%		En: 20% (A) '87
2 Bricks	1975-1990	25%	40%	1.9%	3.3%	CO ₂ : 15% (O) '90 70% (N); '90	
4 Refractory industry - old Länder - new Länder - old Länder	1987-1995	8%			1.0%		
	1987-1995	51%			8.5%		
	1975-1995	15%		0.8%		CO ₂ : 15%-20%; 87	
5 Ceramic tiles	1987-1994		17%		2.6%		En: 25% (A); 87
	1990-1994		12%		3.1%		En: 20% (A); 90
6 Glass	1970-1987	57%	47%	4.8%	3.7%		CO ₂ : 25% (A); '87
	1987-1994	16%	14%	2.5%	2.1%		En: 20% (A); '87
8 Paper & Pulp Paper	1970-1995		50%		2.7%		
	1975-1992		38%		2.8%		En: 20% (A); '90
	1987-1995		11%	1.6%	1.4%		
9 Chemical Industry	1970-1990		37%		2.3%		En: 30% (A); '90
10 Non-ferrous metals	1975-1992		42%		3.2%		En: 22% (A); '90
11 Steel	1960-1993		45%		1.8%		
	1975-1992		28%		1.9%		
	1987-1995	12%		1.6%			
	1990-1995	9%		1.8%			
13 Textiles - old Länder	1987-1994	18%	16%	2.7%	2.4%		

* Only some sectors shown - where information detailed in their EA Declaration

** O: Old Länder; N: New Länder; A: All Länder

Sources: VA (1996), E. Jochem & W. Eichhammer (1996)

Alternative Policy

The performance of the EA should also be assessed against the policies which would have been adapted in the absence of the EA. The EA was negotiated against a background of proposals for a carbon/energy tax and a waste heat ordinance.

Environmental Effectiveness

It is too early to assess the environmental effectiveness of the EA. Monitoring data on progress since the signature of the EA is not yet available (first monitoring report expected Autumn 1997). However, in the Enquete-Commission of the German Bundestag, a reference scenario (baseline) was agreed upon by all parties comprising the likely development of industry emissions without further strengthening of climate policy (business as usual). Neither the 1995 declaration of German industry nor the 1996 one promised to achieve this reference emissions scenario (Wuppertal Institut, 1995 and 1997).

Although the data available does not allow a quantitative assessment of the environmental effectiveness of the EA compared to the likely alternatives (the CO₂/energy tax and the waste heat ordinance), it is generally accepted that the tax and ordinance would have introduced stronger incentives for energy efficiency improvements than currently exist under the EA.

A recent study assumed the target set in the EA to have been achieved (RWI/ifo, 1996). Still, the methodological approach, the scenarios and in particular the measures assumed to be applied, were criticised (Wuppertal Institut, 1997a).

Assessment Of Wider Impacts*Cost Effectiveness*

There is no data available on the actual additional cost of implementing the EA and thus a comparison with the costs the companies would have bor-

ne had the waste heat ordinance or a carbon energy tax been implemented is not possible. In any case, the costs of these alternative instruments would have been dependent on their design and implementation (for example, the mechanism for levying the tax, the use of revenues, the flexibility in the implementation of the ordinance etc.). It also appears that the costs under the EA to date are only slightly higher than the expenditure on improving energy efficiency purely for cost saving reasons.

Technical Change

There is no evidence to date that the EA has resulted in technical change. The structure of the EA would suggest that technical change in terms of improving energy efficiency is likely to arise as a response to on-going commercial incentives. However, given the importance of the dissemination of technical information and good practice under the EA, there may be some acceleration of the uptake of new technologies and techniques.

Conclusions

The German EA is unique in its broad coverage of different industry sectors. It also establishes a process which can be adapted and improved. The first revision (1996) has led to some improvements to the declaration. However, the original version was not environmentally effective when judged against the most probable counterfactual policy.

While the 1996 EA is a partial improvement on the 1995 EA, it still runs the risk of achieving little more than an increase in the dissemination of information by the industry associations on opportunities and obligations for greenhouse gas emissions reductions, whilst resulting in many companies achieving little more than business as usual. Initiatives to ensure broader and deeper company involvement are likely to be required.

5.4 Case Study 4: The Netherlands: Declaration on the Implementation of Environmental Policy in the Chemical Industry.

Overview of the Environmental Agreement

Case Study 4: The Netherlands: Declaration on the Implementation of Environmental Policy in the Chemical Industry	
□ The Environmental Themes	Climate Change, Acidification, Diffusion, Eutrophication, Waste Disposal, Disturbance, Parching, Wastage and Company-based environmental management.
□ Targets	Targets set out in the Integrated Environmental Target Plan (IETP) for the Chemical Industry, based on the targets set in the National Environmental Policy Plan (NEPP), NEPP-plus and other relevant action plans covering the themes listed above. There are 61 quantitative emissions reductions targets for 2000 & 2010, with 40 for 1995, for pollutants covering: climate change (4 pollutants), acidification (4 pollutants), dispersion to air (19 pollutants), water (32 pollutants) and eutrophication (2 pollutants).
□ Start Date	1993
□ Time-scale	Targets set for 1994/1995, 2000 and 2010
□ Number of Signatories	108 (all the parties listed below)
□ Parties	<ul style="list-style-type: none"> - The Government (3 Ministries); - The Association of Provincial Authorities; - The Union of Netherlands Municipalities; - The Association of Water Control Boards; - The Association of the Dutch Chemical Industry; - 103 Individual Companies.
□ Type of EA	Implementation Agreement, under the Target Group Approach to meet the targets established in the NEPP.
□ Sanctions/ Enforcement Mechanism	Complements the existing legislation for operation licences, issued by the Water Boards and the Municipalities/ Provincial authorities. The existing licensing system applies for non-signatories. Companies in the EA benefit from a simplified, more flexible licensing process.
□ Other provisions/ principles	Each company in the EA produces a Company Environmental Plan (CEP) every 4 years, covering plans for an 8 year period, approved by the licensing authority, and used as the basis for the operating licence.
□ Legal Basis	As signatories to the agreement, the individual companies are bound by private law.

Motivation

For participation in the EA

Government accepted that the challenge of meeting the targets set in the NEPP could not be achieved through traditional command and control approaches, and that industry's commitment would be needed. Integrated agreements, such as

that implemented for the chemical industry, evolved as a policy measure through discussions under the Target Group Approach.

The negotiation allowed the chemical industry to discuss the targets of the NEPP with government. All companies whose CEP is approved by the

licensing authorisation benefit from greater flexibility in planning environmental investments and a simplified licensing procedure.

Sanctions and Driving Forces for Change

There is no explicit threat of sanctions in case of non-attainment of the targets. Individual companies who do not produce satisfactory CEPs will be subject to the traditional licensing system, losing the benefit of the simplified procedure. As individual signatories to the agreement, the companies in the EA are bound by private law.

Other driving forces include discussions between parties and the exchange of information between companies and between the regulator and industry.

Environmental Assessment

The Reference Situation

The base year used for the quantitative emissions reduction targets in the EA is 1985 (with the exception of climate change pollutants for which 1986 and 1989 data is used, and waste management where 1986 data is used). However, emissions data is also available for 1992, and this provides a better reference point for assessing the effectiveness of the EA, which was adopted in 1993.

However, the base year for the targets set for waste management is 1986 and this provides the only reference point data for waste. No data is available for 1992.

The Targets

The targets to be met under the agreement cover a wide range of environmental issues: climate change, acidification, diffusion, eutrophication, waste disposal and disturbance, focusing on priority substances and waste streams. The EA is also aimed at meeting some broader objectives covering, for example, soil contamination and the uptake of environmental management systems by companies.

The targets are set out in the Integral Environmental Target Plan (IETP) for the Chemical Industry, which is derived from the NEPP, NEPP Plus and other official plans covering water, energy management and other specific issues (CFC action plan, Hydrocarbons 2000 project, Acidification Abatement Plan etc.). The IETP is provided as an annex to the Chemical Industry Declaration.

The Baseline

Business as Usual

Estimating a baseline to take account of the likely situation in the absence of the EA is difficult because:

- the baseline would have to estimate what legislation would otherwise have been made on a wide range of environmental issues and pollutants;
- there is insufficient information to attribute environmental improvement directly to the existing legislation.

However, using data on emissions from the base year used in the EA monitoring (1985, 1986 or 1989) and from 1992, it is possible to establish a rough trend that can be used as an indication of changes in emissions which might have occurred in the absence of the EA. Waste management is an exception, as data is only available for 1986 so the assessment of progress can only be made against this reference point.

Alternative Policies

The agreement complements the existing legislation relating to licensing of plants, and is aimed at implementing targets established in a number of different policy documents and plans. No single alternative instrument was considered to provide this type of integrated approach to reaching long term targets.

Environmental Effectiveness

Two assessments have been conducted:

- the first against the reference situation, with assessment for improvements in waste management against the situation in 1986, and for changes in all other emissions against 1992; (environmental improvement)
- the second against the estimated baseline of emissions 1992-1995 based on historical trends, for all areas except waste management (environmental effectiveness).

The results of the assessment for waste management are shown in table 5.4. The results for the other environmental issues are presented in detail in table 6 (in the case studies).

The main results are summarised below:

- a reduction in waste production for all the waste streams covered by the agreement (of between 4% and 78%), and an increase in the proportion of disposal by incineration through a reduction in dumping (3 of the 4 targets set for the switch from dumping to incineration for the year 2000 had almost been achieved or had been exceeded by 1995);
- for the other areas covered, assessment against the reference situation reveals that there have been reductions in emissions since 1992 for all except 4 pollutants: atmospheric emissions of carbon monoxide and ammonium, and emissions into water of copper and lead;
- assessment against the baseline suggests that progress during the EA has resulted in emissions reductions for 33 of the 61 pollutants covered, above the level which might have been expected according to past rates in emissions reductions.

However, it is important to note that the latter baseline reflects the historic trend in emissions reductions. It does not seek to reflect the impacts of individual pieces of legislation or tighter standards for certain pollutants, such as regulations on ozone depleting substances and NO_x process emissions from the fertiliser industry, which are considered to be important in meeting the targets set (Biekart, 1997, Pers. Comm.). Another fact that has to be taken into account when looking at these comparisons is that the baseline has apparently been estimated based on past rates. Hence, this approach does not take into account fact that abatement costs normally increase when pollution is approaching the zero-emission level. Hence, the baseline and the above statement on the effectiveness should be interpreted with caution.

Those areas where significant improvements had been made between 1985 and 1992 may perform badly against this rough baseline because of difficulties in achieving additional improvements beyond those already obtained. This may be the case for acidification and climate change pollutants. The assessment may also overestimate the effectiveness of the EA for pollutants where little abatement effort had been made between 1985 and 1992.

It is important to note that this assessment is based on emissions reductions achieved within 2 years of the establishment of the EA. The targets for 1995 covered 40 of the 61 pollutants prioritised by the agreement. The signatories believe that there will be a problem in achieving 3 of the targets set for 2000: those for vinyl chloride, NO_x and CO.

Table 5.4: PROGRESS TOWARDS THE TARGETS SET FOR WASTE DISPOSAL

Type of Waste	1986 production (thousand tonnes)	1995 production (thousand Tonnes)	Recycling/ re-use (prevention) in % in 1995 (and in thousand tonnes)	Target for prevention/ recycling/ reuse by 2000	Remainder for disposal (after re-use/recovery) in 1995 (thousand tonnes)	% incinerated in 1995	Target for incineration by 2000
Priority Waste Streams							
Phosphoric Acid Gypsum	1,976	1,462	n.a.	90%	n.a.	n.a.	0%
Plastic Waste	19	11	63% (7)	76%	4	30%	100%
Halogenated hydrocarbons	50	32	78% (25)	92%	7	99%	100%
Other Processing Waste	n.a.	124	31% (39)	41%	85	92%	33.8%
Other wastes							
Fly ash/furnace slag	51	43	100% (43)	100%	0	-	-
Other waste/ sludges from environmental facilities	n.a.	87	4% (4)	14%	83	20%	16%
Total Waste (excluding Phosphoric Acid Gypsum)	737	678	n.a.	n.a.	251	47%	n.a.

n.a. = no data available

Source: FO , 1996/Report from the Consultative Group for 1995.

Assessment Of Wider Impacts

Cost Effectiveness

The increased flexibility for companies under the EA allows planning of environmental improvements to fit in better with the companies' investment plans, so reducing the costs of the investments to individual firms.

The integrated approach to environmental improvement under the EA leads to better prioritisation of environmental measures by firms. It also requires co-operation between the two licensing authorities (the regional authority/ municipality and the water board) reducing the costs for firms of obtaining an operating licence.

The EA has the wider objective of increasing the use of environmental management systems. Respondents agree that greater use of such systems should result from the EA. This could produce environmental improvements through changes in management practices, and may also lead to cost savings through increased efficiency.

The monitoring committee is looking into the feasibility of a tradable-permits scheme for NO_x. If established, this would lead to burden sharing between the companies in the EA, which would reduce the overall costs of reducing NO_x emissions.

Apart from these general statements it is not possible to provide concrete data on the cost-effectiveness of the EA, let alone the comparison of costs between the EA-scenario and the baseline.

Technical Change

The environmental improvements that have occurred to date are thought to have resulted to a large extent from the use of end of pipe technologies, although there is no quantitative data available to back up this impression. There is an ongoing debate in the Netherlands on how best to bring about the more radical innovation/ re-design required to meet the ambitious targets set in the NEPP for the year 2010. The EA provides a forum for discussions of the options for the Chemical Industry.

Conclusions

The quantitative assessment suggests that the EA has contributed to bringing about greater emissions reductions for 33 of 61 priority pollutants compared to those emissions reductions (according to historic trends/rates) that would have occurred in its absence, (although these could only be roughly estimated. Government and industry believe that these improvements are being achieved at a lower cost to industry than would have been the case under conventional regulations. Since 1986 Improvements have also been achieved in

waste management, with progress towards the targets in the agreement. However, the data does not allow an assessment of the extent to which this progress is due to the EA or other policy instruments.

The targets set under the EA for 2010 will present a greater challenge to the chemical industry. A debate has begun on how to stimulate the re-design and innovation required to meet these more demanding targets.

5.5 Case Study 5: Portugal: Environmental Protocol between the Ministries of Environment and Industry and the Pulp Paper Industry

Overview of the Environmental Agreement

Case Study 5: Portugal: Environmental Protocol between the Ministries of Environment and Industry and the Pulp Paper Industry.	
<input type="checkbox"/> The Environmental Issues	Environmental impact from Pulp Paper Sector: <ul style="list-style-type: none"> • waste water quality; • emissions to air; • waste and energy reductions.
<input type="checkbox"/> Target	Specific targets for: <ul style="list-style-type: none"> • waste water quality: <ul style="list-style-type: none"> - TSS 44 340 kg/day (implicit target given plant output), - BOD5 55 860 kg/day (implicit target given plant output); • emissions to air, per boiler unit (caldera): <ul style="list-style-type: none"> - Particulates 150 mg/nm³, - H₂S 10 mg/nm³; - SO₂ 500 mg/nm³.
<input type="checkbox"/> The Start Date	1988
<input type="checkbox"/> Time-scale	Initial Negotiation 1987/88 Signature 1988 (June) Official End-date (targets binding) 1991/92 Inspection 1991/92 Unofficial end-date 1995
<input type="checkbox"/> Number of Signatories	3
<input type="checkbox"/> Parties	Government: <ul style="list-style-type: none"> - DGA (Environment Ministry); - DGI (Industry Ministry). Industry: <ul style="list-style-type: none"> - CELPA - Pulp Paper Association.
<input type="checkbox"/> Type of EA	Implementation agreement to achieve compliance with existing regulation.
<input type="checkbox"/> Sanctions/ Enforcement Mechanisms	Monthly emissions data from each plant to DGA and DGI and annual report.
<input type="checkbox"/> Other provisions/ principles	<ul style="list-style-type: none"> • Grants from PEDIP and PEDIP II; • Threat of fines for non-compliance.
<input type="checkbox"/> Legal Basis	Legally binding.

Motivation

Participation in the EA

The pulp paper EA was the first EA in Portugal. It was chosen by the government as an appropriate first EA given its very real environmental impacts, significant potential for improving environmental performance and also due to the fact that they had the economic might and international contacts to enable them to meet the requirements of the EA. In addition, the Government thought that the pulp paper sector would be a good example for other industries - such as oil, soap and metallurgy - which subsequently signed EAs in 1991 and 1992. Other motivational issues included:

- the use of a EA to allow a negotiated approach to meeting targets - industry is less likely to be shocked by sudden imposition of new environmental legislation;
- a route to improving the relationship and trust with government;
- the opportunity for a structured approach to making environmental improvements, in the case where the investments required were inevitable (although they could have been delayed). Sanctions, and Driving Forces for Change in Behaviour

The key sanctions to ensure that companies complied with the EA was the recourse to the legal system - mills not meeting standards set by the EA had to pay fines, and, if they repeatedly breached standards, stood to face the threat of closure. These formal sanctions were complemented by public pressure; the government used television both to reward the pulp paper association and to castigate it, at different stages of this EA.

There were also financial driving forces for change in company behaviour, including environmen-

tal grants from the PEDIP programme as well as cost savings resulting from environmental improvements (in some cases).

Environmental Assessment

The Reference Situation

The reference situation is given by the level of environmental performance at the time of signature of the EA in 1987.

The Targets

The main targets for environmental improvements set by the EA focus on water emissions and air emissions. Other targets exist for water consumption, energy savings, raw materials use and product recovery, and for reducing used oil, waste, PCBs, oil spills etc. The EA standards set were considered demanding for air emissions but less so for emissions into water.

The Baseline

Business as Usual

Had there been no EA, it is likely that little would have been invested in environmental measures beyond those improvements linked to required investments due to changes of capital stock. If the existing regulation had been implemented, several companies would probably not have complied with these regulations, and gone through a period of fines, negotiation and eventual investment or closures. The environmental performance is therefore likely to be only somewhat better than that noted in the reference year, 1987/88.

Alternative Policies

The alternative policy would have been strict regulation. It is unlikely that other instruments such as taxes would have been implemented.

Environmental Effectiveness

The EA started with only 2 of the 8 mills making significant investments in environmental improve-

ments. Only 2 mills and 1 company, SOPORCEL, met the standards by the deadline of 1991. Following pressure through fines, court cases and negotiation, a further 5 mills made serious efforts to improve performance. Consequently, 7 of the 8 mills showed marked environmental impact improvements over the time-scale 1987 to 1993 and further improvements by 1995. The greatest improvements were in water quality. Reductions in specific air emissions were also very signifi-

cant. There were more modest improvements for waste reduction. See Table 5.6.

By 1993 nearly all mills met the standards defined in the EA, and in many cases far surpassed them. Averaged over the sector as a whole, the environmental performance achieved was significantly better than the standards set by the targets. All mills (except one which closed on economic grounds) are considered to have met the standards by 1995, although no data is available to support this.

Table 5.6:
PERFORMANCE AGAINST BASELINE AND AGAINST TARGET, FOR 1993

	Baseline 1987 emissions*	1993 emissions	Environmental assessment (Performance vs. Baseline*)	Effective Target (given plant output)	Performance vs. Target*
Waste Water Quality					
TSS	63070 kg/day	10330 kg/day	-84%	44340 kg/day	-77%
BOD5	122800 kg/day	37070 kg/day	-70%	55863 kg/day	-34%
Air Quality**					
Particulates	23290 tonnes/year	4290 tonnes/year	-82%		
Sulphur	17830 tonnes/year	4080 tonnes/year	-77%		
H ₂ S		3.2 mg/Nm ³		10 mg/ Nm ³	-68%
SO ₂		84 mg/ Nm ³		500 mg/ Nm ³	-83%
*Note: The improvements in the baseline are likely underestimated, thus the environmental effectiveness is probably over-estimated.					Source: DGA
**Note: Targets for main boilers, and performance averages for all mills.					

Assessment Of Wider Impacts

Cost Effectiveness

The time scale of the EA allowed the investments to be made more in line with the investment cycle than would probably have been the case had mills suddenly needed to meet new legislation. Furthermore, there has been some exchange of experience between companies which may have led to some cost reductions. However, it is unclear whether the EA can be considered as cost-effective.

Technical Change

To meet the water and air emissions targets, many of the mills had to make technical changes to their plants. For example, one mill needed to invest in secondary treatment to meet the BOD targets, while another improved process efficiency to meet the same targets. To meet air emissions targets, low sulphur fuels were used and burn efficiencies increased. Insufficient information was available to draw conclusions on whether there was any degree of true innovation.

Conclusions

The Portuguese Pulp Paper EA, the first EA in Portugal, appears mainly to have enforced already existing regulations. Hence, it did not try to achieve new targets. However, it is believed to have been influential in the development of a whole series of other EAs across a range of sectors.

Many of the pulp paper mills did not actually meet the standards within the given time-scale, and only

finally met them following pressure through fines, court cases and negotiation. Delays in meeting the standards and the lack of data on the environmental performance underline the need to continuously monitor and enforce the EA, and to set staged targets to ensure that action will be taken early enough. The EA seems thus to work best in the presence of complementary threats like economic instruments.

5.6 Case Study 6: Denmark: Agreement on Recycling of Transport Packaging

Overview of the Environmental Agreement

Case Study 6: Denmark: Agreement on Recycling of Transport Packaging	
□ The Environmental Issue	The recycling and/or re-use of transport packaging: packaging typically used to transport raw materials, semi-manufactured goods and some finished goods. Recycling, according to the Agreement, includes the reuse of packaging and recovery/recycling of materials.
□ Start Date	August 1994
□ Target	80% of the volume of transport packaging (paper/cardboard and metal) should be collected and recycled, either through direct re-use or material recovery, by the year 2000, with staged targets for the different types of materials for 1996, 1997 and 1998.
□ Time-scale	Five years; to August 2000.
□ Number of Signatories	Two main and two acceding.
□ Parties	The Danish Ministry of Environment and Energy with Dansk Industri (Federation of Danish Industries), acceded to by Plastindustrien (Plastic Industry Federation) and Emballageindustrien (Paper and Board Federation).
□ Type of EA	Implementation Agreement, based on a target derived from the 1992 Government Action Plan for Waste and Recycling for the implementation of the EC Packaging and Packaging Waste Directive (94/62/EC).
□ Sanctions/ Enforcement Mechanisms	There are no explicit sanctions. Public and peer pressure are seen as a threat to free riders. Implicit sanctions were given through the threat of either regulation or tax. The EA complements the provisions of the 1992 Government Action Plan for Waste and Recycling from 1993-1997 for industry, the 1992 Waste Management Plan for municipalities, and the framework Consolidated Environmental Protection Act 1994, together with seven regulations concerning waste and recycling since the mid 1980s.
□ Other provisions/ principles	The agreement was used by industry to apply the 'shared responsibility' principle for the costs of meeting the target.
□ Legal Basis	A politically binding gentleman's agreement. The Agreement has no legal basis.

Motivation***For Participation in EA***

Government was interested in finding the most cost and environmentally effective solutions to meet the targets of the EU Packaging Directive. The incentive for industry was to avoid the implicit threat of regulation or a fiscal instrument. Dansk Industri is keen to move away from regulatory to voluntary approaches.

Sanctions and Driving Forces for Change

There are no explicit sanctions in the case of non-achievement of the targets set out in the agreement. The main incentive for compliance by individual companies is the legal requirements placed on them by legislation which complements the EA. Companies may be obliged to sort waste for municipal collection, for example. The parties interviewed also see public and peer pressure as important driving forces for compliance with the EA. However, the negotiating parties were also aware of the implicit threat of either regulation or an economic/fiscal instrument like a tax.

Environmental Assessment***The Reference Situation***

By 1994, the rates of recycling of transport packaging were 30% for plastics and 56% for paper and board. These figures are taken as a reference situation. Before, the amount of plastics used for transport packaging is estimated to have decreased between 1991 and 1994, whilst the amount of paper and cardboard used has increased.

The Target

The target, of 80% recycling of transport packaging (paper/cardboard and metal), is derived from the 1992 Government Action Plan for Waste and Recycling, from the overall goal of 50% recycling of all waste by year 2000, and from Regulation 882 (1986) on the municipal collection of recyclable materials and products from companies. However, the specific goals for materials, the

means to achieve targets and the allocation of responsibilities were negotiated. Interim targets were also set during the negotiations, using predictions of recycling and collection capacities. A target for plastic transport packaging has not yet been set but is expected for 1997 and is likely to be at least 50% (awaiting the final conclusions of a pilot project).

The Baseline***Business as Usual***

A baseline could not be established due to lack of data.

Alternative Policies

The EA was negotiated under the implicit threat of a regulation or fiscal instrument. There are no details available on the likely structure of an alternative instrument.

Environmental Effectiveness

Since data on the level of pollution in 1995 (which, when the case study was chosen, was expected to be accessible by June 1996) are still not available, neither an environmental assessment against the business as usual situation, nor against the reference situation, could be made.

Assessment Of Wider Impacts***Cost Effectiveness***

The EA introduced a form of burden sharing. It aims to reduce the overall cost of complying with the EU Directive on Packaging and Packaging waste in Denmark, by focusing collection and recycling efforts on transport packaging. Transport packaging is easier to collect and manage than other types of packaging waste.

The cost effectiveness of the EA has been assessed against packaging waste management systems in other EU member states. In 1993, the Danish EPA estimated that the EA would be around 80% cheaper than the German DSD system which, however,

does not focus only on transport packaging. However, an estimation of the cost effectiveness of the chosen instrument compared to the baseline was not possible due to lack of data.

Technical Change

Some of the interviewees suggested that there has been some limited technical change, particularly in the area of plastic recycling. It is not possible to determine to what extent this can be linked directly to the EA.

Conclusions

The only monitoring data available dates from 1994, the first year of the agreement. This data shows an increase in the rate of recycling of transport packaging since 1991 (although the 1991 reference points and the 1994 figure for the recycling of plastics are all estimates). It is not

likely that the EA had any influence on the rate of recycling at this early stage. As the EA complements a number of waste regulations, it will also be difficult to determine the importance of the EA in bringing about future improvements in recycling. However, the EA is considered by the signatories to provide a lower cost means of meeting the targets of the EU Packaging Directive than alternative policy measures.

5.7 Summary of the Environmental Assessment of the Case Studies

Differences between EAs, variability in the available data and uncertainty over the respective baselines makes it extremely difficult to provide a simple overview. A summary for each case study is given in Table 5.7. The conclusions of the assessment are given in chapter 5.8.

Table 5.7:
SUMMARY OF THE ENVIRONMENTAL ASSESSMENT OF THE CASE STUDIES

Agreement (Type)	Target	Baseline Business-as-Usual -Scenario Reference Situation	Current Situation	Environmental Improvement Effectiveness	Various Remarks (Wider Impacts)
Framework Agreement on the Reprocessing of End of Life Vehicles - France (Target Setting Agreement)	No more than 15% of total car weight land-filled by 2002 (maximum of 200kg). No more than 5% in the long term. From 2002, new models must allow 90% recovery/reuse/recycling	a) 75% recycling of ELVs b) ?	No monitoring data available on current situation.	a) Cannot be assessed quantitatively. However, the parties are involved in many joint actions aimed at meeting the targets. Trials show that 94% recycling and recovery is technically feasible but it is uncertain whether economic incentives would be strong enough to achieve this rate. b) ?	Achieving greater collaboration than alternative instruments. Though some cost savings may be achieved, a statement on the cost-effectiveness, comparing alternatives, cannot be made. Certification and commercial pressure used as a deterrent to free riders.
Producer Responsibility for Packaging-Sweden (Implementation Agreement)	Targets for re-use or recycling, by January 1997: - 50% of Aluminium, other than beverage containers - 30 % of Card, paper or cardboard - 65% of Corrugated paper - 30% of Plastic, other than PET beverage containers - 50% of Steel - 95% of re-usable glass bottles for beer and soft drinks - 90% of Glass bottles for wine and spirits, filled in Sweden - 70% of other glass containers	a) Estimated level of re-use/ recycling in 1992: 65% of Corrugated Board, 100% Re-usable glass, bottles for beer and soft drinks (likely to be an overestimate), 90% re-usable wine bottles, 55% of other glass. b) ?	Estimated level of recycling/re-use in 1995: - 1-5% of Aluminium, other than beverage containers - 19.5% of Card, paper or cardboard - 77% of Corrugated paper - 5% of Plastic, other than PET beverage containers - 25% of Steel - 97-99% of re-usable glass bottles for beer and soft drinks - 100% of Glass bottles for wine and spirits, filled in Sweden - 61% of other glass containers	a) -There has been an increase in recycling and recovery of corrugated paper and other glass. The recovery for re-usable glass bottles for wines and spirits seems to have dropped slightly. b) ?	The REPA scheme is considered by the parties to be a more cost-effective system than the existing municipal solid-waste collection system, allowing the targets in the ordinance to be met at a lower cost to industry (may also be due to a focus on cities where collection is cheaper than in villages, which are neglected). Progress in moving towards the targets is mixed. Thought to be due in part to the time taken for, and some delays in, establishing collection points.

<p>Declaration of Industry on precautionary measures for climate protection- Germany</p> <p>(Target Setting Agreement)</p>	<p>1995 Version: up to 20% specific CO₂ reduction since 1987 - for combined sectors.</p> <p>1996 Version:</p> <p>20% specific CO₂ reduction since 1990 - for combined sectors with separate targets for each association.</p> <p>No targets for companies</p>	<p>a) ? data incomplete</p> <p>b) available data only allow the establishment of a rough trend scenario, derived from past trends of emissions reductions.</p>	<p>Insufficient monitoring data available to get a picture of the current situation.</p> <p>First monitoring report due autumn 1997.</p>	<p>a) ?</p> <p>b) ? Cannot be assessed quantitatively. Unlikely to result in much more than the trend scenario without further improvements.</p>	<p>The targets were revised and strengthened between 1995 and 1996; monitoring was introduced.</p> <p>The EA is an ongoing process allowing for further revisions and improvements.</p> <p>Threats of tax or regulation acted as a driving force for the establishment of the EA.</p> <p>Still, the "additional efforts" promised do not even meet the trend scenario/business as usual as established by the German Enquete-Commission "Protecting the Earth's Atmosphere, in 1994.</p>
<p>Declaration of Intent on the Implementation of Environmental Policy in the Chemical Industry - the Netherlands</p> <p>(Implementation Agreement)</p>	<p>Targets set out in the Integrated Environmental Target Plan (IETP) for the Chemical Industry, based on the targets set in the National Environmental Policy Plan (NEPP), NEPP-plus and other relevant action plans.</p> <p>There are 61 quantitative emissions reductions targets for 2000 & 2010, with 40 for 1995, for pollutants covering: climate change (4 pollutants), acidification (4 pollutants), dispersion to air (19 pollutants) and water (32 pollutants) and eutrophication (2 pollutants). There are also quantitative targets for waste management.</p>	<p>a) Emissions of the pollutants in 1992- data available for all 61 pollutants with targets, except for waste where the reference situation is 1986.</p> <p>b) Based on the trend /change in emissions between 1985 (or 1986/1989) and 1992, except for waste.</p>	<p>Monitoring data for 1995, covering emissions of all 61 pollutants covered by quantitative targets.</p>	<p>a) Emissions reductions for all pollutants except for 4- carbon monoxide, ammonium, copper and lead during time of the EA.Reduction in waste production (of between 4% and 78%) for all the waste streams , and an increase in the proportion of disposal by incineration, through a reduction in dumping.</p> <p>b) Emissions reductions for 33 of the 61 pollutants.</p>	<p>Increased flexibility for companies in planning environmental investments.</p> <p>Encourages the uptake of company environmental management systems.</p> <p>Considered to have increased trust and co-operation between parties.No statement can be provided on the cost-effectiveness of the EA.</p>

Agreement (Type)	Target	Baseline Business-as-Usual -Scenario b) Reference Situation	Current Situation	Environmental Improvement a) Effectiveness b) Effectiveness	Various Remarks (Wider Impacts)
<p>Environmental Protocol between the Ministries of Industry and Environment and the Pulp Industry- Portugal (Implementation Agreement)</p>	<p>Specific targets for</p> <ul style="list-style-type: none"> waste water quality; emissions to air. 	<p>a) Emissions into water in kg/day: TSS 63 070 BOD5 122 796 COD 467 543 Emission to air in tonnes/ year: Sulphur 17 826 Particulates 23 291 b) ?</p>	<p>Only data on 1993 are available: Emissions to water in kg/day: TSS 10 333 BOD5 37 075 COD 106 092 Emissions to air in tonnes/year: Sulphur 4 082 Particulates 4 291</p>	<p>a) Reduction in emissions to water: Sulphur 77% Particulates 82% Reduction in Emissions to air: TSS 83.6% BOD5 69.8% COD 77.3% b) ?</p>	<p>The EA helped ensure that the pulp sector complied with an existing environmental legislation, that companies were obliged to implement before, but not.</p> <p>The EA increased understanding of the issues, increased trust between parties, and improved motivation and eco-management within the sector. No judgement of the cost-effectiveness can be made, but accompanying economic instruments and sanctions obviously helped crucially to ensure compliance.</p>
<p>Agreement on the Recovery of Transport Packaging - Denmark (Implementation Agreement)</p>	<p>80% of the volume of transport packaging should be collected and recycled, either through direct re-use or material recovery, by the year 2000, with staged targets for the different types of materials for 1996, 1997 and 1998.</p>	<p>a) By 1994, the rates of recycling of transport packaging were: 30% for plastics 56% for paper and board. b) ?</p>	<p>No data on 1995 are available, though expected by June 1996.</p>	<p>a) ? b) ?</p>	<p>The EA allows to meet the EU Packaging Directive by focusing on transport packaging, which is easier to collect than other packaging waste.</p> <p>It will improve the information available on the fate of transport packaging. It is seen by parties as fairer than alternative measures.</p>

5.8 Conclusions on the Environmental Assessment of the Case Studies

The environmental effectiveness of a policy instrument, such as an EA, should be assessed against an alternative policy scenario. However such assessments cannot be entirely accurate because the alternative policy scenario is only ever an estimation based on the limited data available. The next best choice is to compare the current situation against a “business as usual” scenario: by determining the changes that would have occurred in its absence, one can attribute any additional changes to the EA. If the data is insufficient to perform this second assessment, a third alternative is to assess the current situation against the reference situation, evaluating the environmental improvement that has occurred. In this case, however, the improvement cannot be attributed to the EA with any certainty; indeed it is highly unlikely that there were no other factors involved.

For the six case studies, the major problems that arose in assessing the environmental effectiveness relate to:

- a) the general absence of a quantitative baseline (“business as usual” scenario) against which to assess the effectiveness of the EA;
- b) lack of quantitative data on the reference situation, prior to the agreement.

The definition of the “business as usual” scenario is crucial if ex-post evaluations on the instru-

ment’s effectiveness are expected. This problem, and the related difficulty of disentangling the effect of the different instruments in a policy package, is not exclusive to EAs and also affects other policy instruments such as regulations or taxes. However, in the case of EAs, this problem is aggravated since:

- a) they are relatively recent in the policy arena compared to other instruments (e.g. taxes) and therefore the theoretical and empirical analysis available is insufficient;
- b) their targets are sometimes expressed in terms of percentage reductions of unspecified quantities (emissions levels when the agreement was established);
- c) unlike other instruments (e.g. taxes) they have not hitherto been the object of ex-ante evaluations or ex-post evaluations.

While the discussion above concerns quantitative evidence, the assessment also considered qualitative evidence (based on interviews with involved parties) on other benefits of the EAs. A large part of this evidence refers to valuable benefits of the EAs such as increased co-operation and trust, awareness-raising and consensus building (see table below). It would appear that, by their nature, EAs are likely to be more effective than taxes or regulations at generating these benefits (such benefits are rarely claimed for, or attributed to, regulations or taxes, except as possible stimulants to technical change).

Table 5.8: ASSESSMENT OF ENVIRONMENTAL AGREEMENTS: REVIEWING THE EVIDENCE

Quantitative Evidence	Target setting EA		Implementation EA			
	FR	D	S	NL	P	DK
• Environmental effectiveness	?	?	?	+/?	?	?
• Environmental improvement	?	?	+/?	Yes	Yes	+/?
• Part of policy package	No	No	Yes	Yes	Yes	Yes
• Cost effectiveness	?	?	?	?	?	?
• Sanctions/Incentives	Yes	Yes	Yes	Yes	Yes	Yes
Qualitative Evidence*						
• Awareness raising	Yes	Yes	Yes	Yes	Yes	Yes
• Increased co-operation and trust	Yes	Yes	Yes	Yes	Yes	Yes
• Creating consensus on the problem/actions	Yes	Yes	Yes	Yes	Yes	Yes
• Forum for information exchange	Yes	Yes	Yes	Yes	Yes	Yes
• Testing ground for new policy ideas	Yes	Yes	Yes	Yes	Yes	Yes
• Technical change/environmental management	Yes	?	?	Yes	Yes	+/?

? No data available, unknown effect

+ Partial evidence

Yes strong evidence

No strong (negative) evidence

* Based on the interviews with stakeholders

FR France

D Germany

S Sweden

NL Netherlands

P Portugal

DK Denmark

Despite the difficulties in the evaluation it is possible to draw some useful conclusions from the case studies:

1. There is quantitative evidence for environmental improvement in most of the case studies. The Dutch and Portuguese studies show definite environmental improvement, whereas the French and German studies do not. In the case of Sweden and Denmark, there is insufficient data to support a conclusive statement, but the data available seems to indicate an improvement.

2. There is no quantitative data available from which to determine the “business as usual” baseline (i.e. the situation in the absence of the EA) for any of the case studies except the Dutch and German ones. Therefore, this study is inconclusive on the environmental effectiveness of the case studies, except in the case of the Netherlands where limited quantitative evidence seems to indicate that the Agreement might have been effective. The German case study could not be assessed because the EA was established only recently and there is insufficient data on the current situation.

3. Wherever environmental improvement was noted, the EA was accompanied by other measures or incentives. More sophisticated analysis would have been necessary to separate the effects of the EA from those of these other factors.
 4. The quantitative data available does not prove, for any of the 6 case studies, that the EA was more cost effective than other measures would have been. However, in 5 of the 6 case studies, the interviewees thought that the EA was more cost effective. The issue of cost effectiveness is always particularly difficult to evaluate. For example, even though there is much more research data available on environmental taxes than EAs, the EEA was not able to find sufficient quantitative evidence to evaluate the cost effectiveness of taxes in its recent report (“Environmental Taxes”, EEA, 1996, p. 29), and therefore a cost effectiveness analysis was not attempted. The OECD, in a large study into the cost effectiveness of taxes and regulations, recently concluded that “whilst the ex post evidence available so far cannot conclusively prove the efficiency of economic instruments, it is clear that it would be substantially more difficult to demonstrate the alternative thesis, that regulatory approaches are more efficient than economic instruments.” (OECD, 1997, p.127).
- Further research should support future judgments about the cost effectiveness of EAs.
5. According to the qualitative evidence (from interviews), all of the case study EAs contributed other benefits, such as raising awareness, enhancing co-operation and trust, increasing information exchange and testing new policy.
 6. Technical change was reported for the French, Portuguese, Dutch and possibly the Danish studies, whilst the German and the Swedish studies do not provide qualitative evidence of this. The technical change reported refers mainly to the adoption of environmental management measures.
 7. One general conclusion is that EAs are valuable as complementary tools that can improve the effectiveness of environmental policy measures. EAs seem to be particularly effective in aiding the implementation of other environmental policy tools. However, as with other policy instruments, their effectiveness depends on their design and on the detailed circumstances of their implementation. The checklist provided by the Communication on Environmental Agreements (at the end of section 3) can be used to help stakeholders maximise the effectiveness of EAs.

6. CONCLUDING OBSERVATIONS

The study provides an overview of the current use of EAs and the debate surrounding them and investigates a small number of EAs in some detail. Bearing in mind the wide variation in the nature and focus of EAs and the wide range of views on their effectiveness, the following observations could be made:

- implementation EAs' can be useful and complementary environmental policy tools, as long as they follow the type of guidelines set out in the EC Communication;
- target-setting EAs' are much more difficult to assess in terms of their role and performance and raise wider questions concerning the role of Government and other stakeholders in the formulation of environmental policy;
- EAs which are currently in operation provide a testing ground for the development of transferable models and for establishing good practice; however, replication needs to be driven by the interests and objectives of the parties concerned in a given situation;
- the independent verification of EAs raises political and practical questions which need to be addressed if the credibility and accountability of EAs is to be improved.

The case-study research also indicates that EAs have the potential to contribute to the achievement of policy goals. In particular:

- EAs provide a basis for environmental policy where regulatory or fiscal instruments would be difficult to administer; 'implementation EAs' essentially complement regulatory policy and rely on regulatory (and often fiscal) sanctions or the threat of alternative instruments as a backup;
- EAs provide a framework for pro-active en-

vironmental management, for awareness-raising on environmental issues and for testing new policy responses;

- EAs can facilitate flexible responses and the identification of new mechanisms by improving information flows and promoting awareness of new technical and management practices;
- evidence suggests that EAs may contribute to the overall improvement of the environment; if more stringent targets are necessary, however, EAs will have to be used as part of a broader package of policy instruments.

Future implementation of EAs should take into account key requirements for the improvement of their effectiveness, most importantly the establishment of reliable and verifiable monitoring and reporting mechanisms and the setting of clear targets.

The table below illustrates some of the requirements for the improved use of EAs.

EAs are most suitable for:

- pro-active industries or businesses
- small number of partners or high organisation level of signatory partners
- production of goods (i.e. industry)
- sectors which have matured and face limited competition (i.e. where there are few opportunities for 'free riders')
- environmental problems of limited scale (national and regional environmental problems)
- limited number of sources of pollution
- long-term targets (early signal).

Implementation is more effective when:

- clear targets are set prior to the agreement
- the agreement specifies the baseline against which improvements will be measured
- the agreement specifies reliable and clear monitoring and reporting mechanisms
- technical solutions are available in order to reach the agreed target
- the costs of complying with the EA are limited and are relatively similar for all members of the target group
- third parties are involved in the design and application of EAs.

Recommendations for further work

Listed below are a number of suggestions for areas for further work related, firstly, to the continued research into the operation of EAs and, secondly, to the assessment of their impact:

- assessment of the synergies and counteractions between the operation of EAs and other policy instruments;
- empirical research into the relative effects of EAs and alternative policy instruments on the behaviour of individual companies, including their impacts on market structure and competition issues;
- appraisal of the role and motives of governments in EAs which are used to negotiate targets;
- investigation into the suitability of targets set through EAs, including comparisons with alternative ways of target-setting by the government;
- independent empirical research into the evolution of 'target-setting EAs', regarding the respective roles of those directly involved in their negotiation and of those effectively excluded from this process;
- investigation into the most appropriate operational structure for EAs, according to their specific application (e.g. in relation to EAs at different geographic levels);
- examination of the effect of the EA process (incl. information exchange) on technical change, innovation and the integration of environmental management into sector and corporate activity;
- investigation into why similar activities (e.g. information exchange) had not been launched prior to the EA, including a 'barrier analysis'; or investigation into the best practices of such activities, where they did occur in advance of the EA, or where no EA was applied at all;
- consideration of the methods and resources needed for EAs to encourage local public participation and dialogue;
- review of the links between the operations of different environmental management systems and the reporting and information requirements under the EA;
- further independent research into the environmental (and cost-) effectiveness of EAs and their ability to promote sustainable development (by encouraging systemic behavioural and technological change), in comparison with other policy instruments;
- development of guidelines for standardising EA monitoring and reporting requirements in order to improve the data available and allow for comparable and reliable environmental assessment.

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ACRONYMS AND ABBREVIATIONS

SEAP	5th Environmental Action Programme	ICER	Industry Council for Electronic Equipment Recycling
AIP	Associação Industrial Portuguesa, Association of Portuguese Industries	IEA	International Energy Agency
BDI	Bundesverband der Deutschen Industrie, Federal Association of German Industry	IETP	Integrated Environmental Target Plan
BOD	Biological Oxygen Demand	ifo	Institut für Wirtschaftsforschung, München
CEC	Commission of the European Communities	MEP	Member of Parliament
CEFIC	European Confederation of Chemical Industry	NEPP	National Environmental Policy Plan
CELPA	Portuguese pulp paper association	NFP	National Focal Point
CEP	Company Environmental Plan	NGO	Non-Governmental Organisation (here mainly used for environmental ones)
CFC	Chlorinated Flour-Carbons	NL	Netherlands
CNPA	Conseil National des Professions de l'Automobile, association of car dismantlers	NO_x	Nitrogenoxides
CO	Carbonmonoxide	OECD	Organisation for Economic Co-operation and Development, Paris
CO₂	Carbondioxide	P	Portugal
COD	Chemical Oxygen Demand	P&P	Pulp Paper
COP	Conference of the Parties	PCB	Polychlorobiphenyls
D	Germany	PEDIP	Specific Programme for Development of Portuguese Industry
DG	Directorate General	PET	Polyethylene terephthalate
DGA	Direcção-Geral Do Ambiente, Portuguese Environment Ministry	PRTR	Pollutant Release and Transfer Register
DGI	Direcção Geral Do Industria, Portuguese Industry Ministry	PVC	Polyvinylchlorine
DK	Denmark	PWS	Priority Waste Streams
DOE	Department of Environment, (here: Ireland)	R&D	Research and Development
DSD	Duales System Deutschland GmbH	REPA	Reparegistret, Swedish Packaging Collection
EA	Environmental Agreement	RWI	Rheinisch-Westfälisches Institut für Wirtschaftsforschung, Essen
EC	European Commission	S	Sweden
EEA	European Environment Agency	SME	Small and Medium-sized Enterprises
EEB	European Environmental Bureau	SNM	Stichting Natuur en Milieu, Dutch Environmental NGO
EIONET	European Environment Information and Observation Network	SO₂	Sulphurdioxide
ELV	End-of-life vehicles	SOPORCEL	Portuguese pulp paper producing company
EMAS	Environmental Management and Auditing System	TEU	Treaty on European Union
EP	European Parliament	TSS	Total Suspended Solids
EPA	Environmental Protection Agency	UK	United Kingdom
ETUC	European Trade Union Confederation	UNICE	Union of Industrial and Employers' Confederation of Europe
EU	European Union	VA	Voluntary Agreements
EURELECTRIC	Grouping of the Electricity Supply Industry	VCR	Video-cassette-recorder
FCCC	Framework Convention on Climate Change	VNCI	Dutch Chemical Industries Associations
FoE	Friends of the Earth	VNONCW	Confederation of the Netherlands' Industry and Employers
FR	France	ZEW	Zentrum für Europäische Wirtschaftsforschung, Mannheim
H₂S	Hydrogen Sulfide		
ICCA	International Council of Chemicals Associations		

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